



Feasibility Report

2018 Spring Creek Road

City of Northfield, Minnesota

City Project No. STRT2018-A38

NFIEL 143657 | December 22, 2017



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December 22, 2017

RE: 2018 Spring Creek Road
Feasibility Report
City of Northfield, Minnesota
City Project No. STRT2018-A38
SEH No. NFIEL 143657 4.00

Mr. David Bennett, PE
Public Works Director / City Engineer
City of Northfield
801 Washington Street
Northfield, MN 55057-2598

Dear Mr. Bennett:

Short Elliott Hendrickson Inc. (SEH®) is pleased to submit this feasibility report for Spring Creek Road Reconstruction Project. This project is being proposed as part of the City's annual pavement management program.

The improvements were analyzed for watermain, storm sewer, sanitary sewer, curb & gutter, street and sidewalk / trail construction for the following street segments:

1. Spring Creek Road between Jefferson Parkway and just north of Huron Court.
2. Spring Creek Road between Superior Drive and Jefferson Parkway
3. Spring Creek Road between just north of Huron Court and Woodley Street.

This report reviews existing conditions, identifies necessary improvements and includes estimates of total project cost and financing methods to evaluate the feasibility of these proposed improvements.

We find the project necessary, feasible and cost effective from an engineering standpoint. The project can be accomplished in one construction season. The estimated total project cost for a full urban roadway section for the recommended segments 1 & 2 is \$1,826,683, which includes a 10% contingency, 15% for administration, engineering, and legal costs.

We are pleased to have had the opportunity to provide this report and are available for any assistance you may require.

Sincerely,

Aaron Ditzler, PE
Project Manager

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Short Elliott Hendrickson Inc., 10901 Red Circle Drive, Suite 300, Minnetonka, MN 55343-9302
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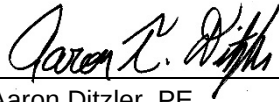
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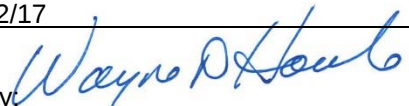
I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



Aaron Ditzler, PE
Project Manager

Date: 12/22/17

License No.: 42003

Reviewed By: 

Date: 12/22/17

Short Elliott Hendrickson Inc.
10901 Red Circle Drive, Suite 300
Minnetonka, MN 55343-9302
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Executive Summary

Executive Summary

On November 15, 2016 the Northfield City Council adopted the 2017-2021 Capital Improvement Program, which included the 2018 Spring Creek Road Reconstruction Project (E-2018-005). At the August 22, 2017, City Council Meeting the City Council approved Resolution No. 2017-065 ordering the feasibility report for this project.

This feasibility report reviews the existing conditions and then discusses in detail the proposed improvement options, costs, and funding for this roadway corridor. The corridor has been separated into the following three segments:

1. Spring Creek Road between Jefferson Parkway and just north of Huron Court.
2. Spring Creek Road between Superior Drive and Jefferson Parkway.
3. Spring Creek Road between just north of Huron Court and Woodley Street.

Due to the unimproved easterly side of the corridor we analyzed the three segments using a full urbanized cross-section and a half-urbanized / half-rural cross-section. A full urbanized cross-section includes two travel lanes with shoulders, curb and gutter on both sides, a boulevard and multi-purpose trail on the westerly side and graded boulevard on the easterly side. A half-urbanized / half-rural cross-section includes two travel lanes; the westerly side will have a shoulder with curb and gutter, boulevard and shared use trail, and the easterly side will have a smaller shoulder and a typical rural drainage ditch.

The overall project costs for a full urban section for all three segments is \$3,544,558. The segments can be constructed individually; the overall segment project costs are \$1,343,025 for Segment 1, \$483,659 for Segment 2, and \$1,717,874 for Segment 3. This project will be funded using Municipal State Aid and local funds.

The overall project costs for a half urban / half rural section for all three segments is \$3,216,671. The segments can be constructed individually; the overall segment project costs are \$1,231,100 for Segment 1, \$442,210 for Segment 2, and \$1,543,361 for Segment 3. This project will be funded using Municipal State Aid and local funds.

It will be beneficial to the City of Northfield to bid out Segments 1 & 2 at this time and Segment 3 when the culvert is replaced at Spring Creek, which is planned for 2022. The major benefit to bid out the two segments together would be the economies of scale which will provide better construction pricing than if you would bid them out separately over time.

These two segments could be constructed in the summer of 2018, if the City decides to move forward with the projects.

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Feasibility Report

2018 Spring Creek Road

Prepared for City of Northfield, Minnesota

Introduction

This feasibility report analyzes the existing conditions, proposed street improvements, cost summary and financing, project schedule, and provides conclusions and recommendations for the three segments of Spring Creek Road:

1. Spring Creek Road between Jefferson Parkway and just north of Huron Court.
2. Spring Creek Road between Superior Drive and Jefferson Parkway.
3. Spring Creek Road between just north of Huron Court and Woodley Street.

The scope of work includes reconstructing a rural roadway section to conform to an urban roadway section that will meet Municipal State Aid requirements. The segments do include pedestrian and bike facilities. Appendix A provides figures of the roadway location areas. Appendix B has a detailed project process chart that has been developed in order to complete this project. Appendix C provides a preliminary engineer's estimate. Appendix D shows the proposed typical sections for the roadway sections.

Background

The adopted 2017-2021 Capital Improvement Program (CIP) includes many capital improvements through the City of Northfield including the Spring Creek Road reconstruction project.

As part of the initial planning for this project a neighborhood meeting will be held to inform affected property owner and other residents located within the project area of the improvements being considered. This meeting will also serve as an opportunity to gather input from the impacted residents and to discuss potential design alternatives.

The Northfield City Council authorized a Feasibility Report for the Spring Creek Road project at their August 22, 2017 City Council meeting with the passing of Resolution No. 2017-065.

Existing Conditions / Future Plans

Roadway

Spring Creek Road is located on the easterly side of Northfield, which the easterly half of Spring Creek Road is in Northfield Township. The existing roadway section, which includes all three segments, is a rural 24-foot wide gravel roadway and that carries approximately 550 vehicles per day. The roadway is flanked on both sides with rural ditch sections. Northfield is experiencing development on the westerly side of Spring Creek Road with the earlier construction of Huron

Court and the extension of Michigan Drive, and previous construction of Superior Drive, see location Map in Appendix A. Jefferson Parkway and Sumac Lane (located just south of Woodley Street East) also intersects with Spring Creek Road. All five of these roadways are constructed to urban standards, meaning that they have concrete curb and gutter, bituminous roadway pavement, and sidewalks (with the exception of Sumac Lane) on one or both sides of the roadway. A sidewalk along Spring Creek Road exists from Jefferson Parkway to the north side of Hills of Spring Creek 4th Addition; rear property line of 1221 Superior Drive.

Spring Creek Road is identified as a Major Collector in the current Northfield Comprehensive Plan. Segments 1 and 3 are designated as a Municipal State Aid (MSA) Roadway.



Photo 1 – Spring Creek Road looking South towards Jefferson Parkway and Superior Drive



Photo 2 – Spring Creek Road looking South towards Huron Court



Photo 3 – Spring Creek Road looking North towards Huron Court

Utilities

A City of Northfield water tower is located adjacent to Spring Creek Road, just north of Jefferson Parkway. This water tower provides water to the City through a 16-inch diameter ductile iron pipe (DIP), which crosses Spring Creek Road at Jefferson Parkway. A 12-inch DIP water main exists from Michigan Drive to Huron Court. A 12-inch DIP water main exists from Sumac Lane to Woodley Street East. The 2006 Comprehensive Water Plan indicates a 12-inch DIP watermain to be installed along Spring Creek Road from Jefferson Parkway to Sumac Lane.

A trunk sanitary sewer line crosses Spring Creek Road adjacent to the Spring Creek crossing. No other sanitary sewer exists along Spring Creek Road from Superior Drive to Woodley Street East. Spring Creek Road is within the Spring Creek Ultimate Gravity Service Area according to the 2007 Comprehensive Sanitary Sewer Plan (CSSP). The CSSP did not identify any addition of a sanitary sewer along Spring Creek Road. The sub-districts identified within the CSSP indicated that the undeveloped properties east of Spring Creek Road will drain their properties to the north/northeast to a future trunk system that will be placed south of Woodley Street, with the exception of a small portion along Spring Creek Road which will drain to the west towards the existing Spring Creek trunk line. All properties located west of Spring Creek Road either have an existing sanitary sewer system or a future planned sanitary sewer system. Adjacent properties east of Spring Creek Road do not have an existing or future system to tie into.

Surface water along Spring Creek Road drains to adjacent roadway ditches. The northerly half of Spring Creek Road drains to Spring Creek through these ditches and driveway culverts. Spring Creek currently flows beneath Spring Creek Road just south of Woodley Street East through a box culvert. The southerly half of Spring Creek Road, from approximately Michigan Drive, drains through ditches and driveway culverts to the low areas south the of the project area. A potential ponding area is located in the northwesterly quadrant of Jefferson Parkway and Spring Creek Road.

Street lights exist at the intersections of Jefferson Parkway, Sumac Lane, and Woodley Street and Spring Creek Road.

Geotechnical Review

SEH prepared a Geotechnical Report from soil borings taken by Braun Intertec Corporation and is attached as Appendix F.

Four soil borings were performed on Spring Creek Road indicating the roadway is constructed of 7 to 8-inches of aggregate base over 4 to 6-feet of fill.

Based on the soil borings we do not feel that the reconstruction of the roadway will require any major soil corrections.

Proposed Improvements

Street / Trail / Sidewalk

The proposed improvements do include a full reconstruction of the roadway. However, due to the undeveloped properties along the easterly side of the corridor, we approached the design of the roadway in two ways, 1. Design both sides to urban standards – meaning to fill in the ditches, provide for a new storm sewer system, and place concrete curb and gutter on both sides of

roadway or 2. Design the roadway to meet urban standards on the west side and rural standards on the east side.

A full urban design corridor section would have an 10-foot wide bituminous shared use trail on the west side, a 8-foot grass boulevard area, a 40-foot (curb face to curb face) wide roadway that will be striped to accommodate two 12-foot wide travel lanes and two 8-foot shoulders. The easterly boulevard area will include a 8-foot wide grass boulevard and a 5-foot wide concrete sidewalk.

A half urban / half rural section would have two 12-travel lanes. The westerly side would be designed with a 10-foot wide bituminous shared use trail, a 8-foot grass boulevard area, concrete curb and gutter, and a 8-foot wide shoulder. The easterly side of the roadway would be designed with a 5-foot shoulder and regrading the existing ditch. The easterly side will be designed such that an urban section could be added in the future by adding the concrete curb and gutter, installing the required catch basins, and installing an 8-foot wide boulevard and 5-foot wide sidewalk.

The horizontal and vertical alignment of the roadway is expected to remain similar to the existing roadway, except where Superior Drive intersects with Spring Creek Roadway which it will need to be lowered and at the crossing of Spring Creek where it will need to be raised.

The roadway section will be designed as a bituminous roadway to meet MSA standards, which is a 10-ton design. The design is also anticipated to acquire at least a 35-year life, if typical maintenance is performed over the life of the pavement.

Storm Water

A storm water system will be designed to meet MSA requirements for drainage from the roadway. Surface water will essentially drain in two directions due to the topography of the corridor. The northerly half will drain towards Spring Creek as the southerly half will drain to the northwest quadrant of Jefferson Parkway and Spring Creek Road. The existing bridge / culvert of Spring Creek below Spring Creek Road is scheduled to be replaced once the City retains funding through the State Bridge Bond bill, which City staff is anticipating to occur in the next legislative session.

The proposed storm sewer system that drains to the north would be phased to temporarily drain across City property that drains towards Spring Creek and then in a future year with Segment 3 be redirected to drain into filtration area no. 1 by Spring Creek, see Appendix F. The proposed storm sewer system that drains to the south would be able to drain into the existing storm sewer system along Jefferson Parkway and into the westerly side ditch and / or City property that is located south of Superior Drive and into filtration area no. 2. It is also proposed to eliminate the roadway high point at Superior Drive to allow drainage to bypass Superior Drive and continue south on Spring Creek Road. Tracking of sediment onto streets such as Jefferson Parkway would also be reduced by combining Segment 1 and 2 due to extending the paved surface south along Spring Creek Road.

Sanitary Sewer

An 8-inch sanitary sewer mainline is proposed to serve the properties along the east side of Spring Creek Road from Michigan Drive to Superior Drive. Services would be stubbed out to the existing residential properties located east of Spring Creek Road; these property owners would not be required to connect at this time.

Water Main

A 12-inch DIP water main is proposed to be installed from Jefferson Parkway to Michigan Drive and then from Huron Court to the northerly end of Segment 1. Segment 3 work will extend the watermain to Sumac Lane.

Services would be stubbed out to serve the existing residential properties (10017 and 10253 Hall Avenue) located on the east side of Spring Creek Road; these property owners would not be required to connect at this time.

Street Lighting

Overhead street lighting is proposed to be installed along the roadway to light up the intersections and provide light to the shared-use path. The proposed lighting style a LED shoe box fixture similar to the fixtures located along Jefferson Parkway. City staff will work with Xcel Energy to install this system.

Estimated Costs / Project Funding

Estimated project costs have been projected for this project. The estimated construction costs are based on recent Northfield and other Metro areas projects. Detailed estimated construction costs were prepared and are included in the Appendix C. Total project costs include estimated construction costs, a 10 percent contingency, 15 percent for legal, fiscal, and administration costs, and engineering costs.

We have provided two estimates for each segment of this project: a base bid which includes an urban design for both sides of Spring Creek Road and one that includes an urban design for the west side and an a rural design for the east side. The total estimated project costs for this improvement is shown in Tables 1, 2, 3 and 7.

The funding for the proposed improvements will come from various sources as indicated in Tables 4, 5, 6 and 8.

If special assessments are utilized in the future to help fund Segment 3, then this report will need to be modified to include the special assessment process, Minnesota Statute 429.

**Table 1 – Segment 1 Full Urban Section - Spring Creek Road between Jefferson Parkway
and just north of Huron Court**

	STREETS	SANITARY SEWER	WATER SYSTEM	STORM DRAINAGE	ESTIMATED TOTAL
ESTIMATED EXPENDITURES					
Estimated Construction Cost	\$717,765	\$62,718	\$122,111	\$159,086	\$1,061,679
Contingencies (10%)	\$71,776	\$6,272	\$12,211	\$15,909	\$106,168
Administration, Engineering, Legal (15%)	\$118,431	\$10,348	\$20,148	\$26,249	\$175,177
Total Estimated Project Costs (Feasibility)	\$907,973	\$79,338	\$154,470	\$201,244	\$1,343,025
ESTIMATED REVENUE					
Bonding / Cash Reserves					
MSA Fund	\$907,973			\$150,933	\$1,058,906
Sanitary Sewer Utility Fund		\$79,338			\$79,338
Water Utility Fund			\$154,470		\$154,470
Storm Drainage Utility Fund				\$50,311	\$50,312
Total Estimated Revenue (Feasibility)	\$907,973	\$79,338	\$154,470	\$201,244	\$1,343,025

**Table 2 – Segment 2: Full Urban Section - Spring Creek Road between Superior Drive
and Jefferson Parkway**

	STREETS	SANITARY SEWER	WATER SYSTEM	STORM DRAINAGE	ESTIMATED TOTAL
ESTIMATED EXPENDITURES					
Estimated Construction Cost	\$300,069	\$26,820		\$55,449	\$382,339
Contingencies (10%)	\$30,007	\$2,682		\$5,545	\$38,234
Administration, Engineering, Legal (15%)	\$49,511	\$4,425		\$9,149	\$63,086
Total Estimated Project Costs (Feasibility)	\$379,588	\$33,927		\$70,143	\$483,658
ESTIMATED REVENUE					
Bonding / Cash Reserves	\$379,588				\$379,588
MSA Fund					
Sanitary Sewer Utility Fund		\$33,927			\$33,927
Water Utility Fund					
Storm Drainage Utility Fund				\$70,143	\$70,144
Total Estimated Revenue (Feasibility)	\$379,588	\$33,927		\$70,143	\$483,659

Table 3 – Segment 3: Full Urban Section - Spring Creek Road between just north of Huron Court and Woodley Street

	STREETS	SANITARY SEWER	WATER SYSTEM	STORM DRAINAGE	ESTIMATED TOTAL
ESTIMATED EXPENDITURES					
Estimated Construction Cost	\$962,137		\$176,739	\$219,126	\$1,358,003
Contingencies (10%)	\$96,214		\$17,674	\$21,913	\$135,800
Administration, Engineering, Legal (15%)	\$158,753		\$29,162	\$36,156	\$224,070
Total Estimated Project Costs (Feasibility)	\$1,217,104		\$223,575	\$277,195	\$1,717,874
ESTIMATED REVENUE					
Street Special Assessments	\$29,960				\$29,960
Bonding / Cash Reserves					
MSA Fund	\$1,187,144			\$207,896	\$1,395,040
Sanitary Sewer Utility Fund					
Water Utility Fund			\$223,575		\$223,575
Storm Drainage Utility Fund				\$69,299	\$69,299
Total Estimated Revenue (Feasibility)	\$1,217,104		\$223,575	\$277,195	\$1,717,874

Table 4 – Segment 1: Half Urban / Half Rural Section - Spring Creek Road
between Jefferson Parkway and just north of Huron Court

	STREETS	SANITARY SEWER	WATER SYSTEM	STORM DRAINAGE	ESTIMATED TOTAL
ESTIMATED EXPENDITURES					
Estimated Construction Cost	\$639,543	\$62,717	\$122,111	\$148,830	\$973,202
Contingencies (10%)	\$63,954	\$6,272	\$12,211	\$14,883	\$97,320
Administration, Engineering, Legal (15%)	\$105,525	\$10,348	\$20,148	\$24,557	\$160,578
Total Estimated Project Costs (Feasibility)	\$809,022	\$79,338	\$154,470	\$188,270	\$1,231,100
ESTIMATED REVENUE					
Bonding / Cash Reserves					
MSA Fund	\$809,022			\$141,203	\$950,225
Sanitary Sewer Utility Fund		\$79,338			\$79,338
Water Utility Fund			\$154,470		\$154,470
Storm Drainage Utility Fund				\$47,068	\$47,068
Total Estimated Revenue (Feasibility)	\$809,022	\$79,338	\$154,470	\$188,270	\$1,231,100

**Table 5 – Segment 2: Half Urban / Half Rural Section - Spring Creek Road
between Superior Drive and Jefferson Parkway**

	STREETS	SANITARY SEWER	WATER SYSTEM	STORM DRAINAGE	ESTIMATED TOTAL
ESTIMATED EXPENDITURES					
Estimated Construction Cost	\$269,868	\$26,820		\$52,885	\$349,573
Contingencies (10%)	\$26,987	\$2,682		\$5,289	\$34,957
Administration, Engineering, Legal (15%)	\$44,528	\$4,425		\$8,726	\$57,680
Total Estimated Project Costs (Feasibility)	\$341,383	\$33,927		\$66,900	\$442,210
ESTIMATED REVENUE					
Bonding / Cash Reserves	\$341,383				\$341,383
MSA Fund					
Sanitary Sewer Utility Fund		\$33,927			\$33,927
Water Utility Fund					
Storm Drainage Utility Fund				\$66,900	\$66,900
Total Estimated Revenue (Feasibility)	\$341,383	\$33,927		\$66,900	\$442,210

**Table 6 – Segment 3: Half Urban / Half Rural Section - Spring Creek Road
between just north of Huron Court and Woodley Street**

	STREETS	SANITARY SEWER	WATER SYSTEM	STORM DRAINAGE	ESTIMATED TOTAL
ESTIMATED EXPENDITURES					
Estimated Construction Cost	\$836,269		\$176,739	\$207,039	\$1,220,047
Contingencies (10%)	\$83,627		\$17,674	\$20,704	\$122,005
Administration, Engineering, Legal (15%)	\$137,984		\$29,162	\$34,161	\$201,308
Total Estimated Project Costs (Feasibility)	\$1,057,881		\$223,575	\$261,904	\$1,543,360
ESTIMATED REVENUE					
Street Special Assessments	\$29,960				\$29,960
Bonding / Cash Reserves					
MSA Fund	\$1,027,921			\$196,428	\$1,224,349
Sanitary Sewer Utility Fund					
Water Utility Fund			\$223,575		\$223,575
Storm Drainage Utility Fund				\$65,476	\$65,477
Total Estimated Revenue (Feasibility)	\$1,057,881		\$223,575	\$261,904	\$1,543,361

Table 7 – Recommended Project Full Urban Section – Segments 1 and 2

	STREETS	SANITARY SEWER	WATER SYSTEM	STORM DRAINAGE	ESTIMATED TOTAL
ESTIMATED EXPENDITURES					
Estimated Construction Cost	\$1,017,834	\$89,538	\$122,111	\$214,536	\$1,444,018
Contingencies (10%)	\$101,783	\$8,954	\$12,211	\$21,454	\$144,402
Administration, Engineering, Legal (15%)	\$167,943	\$14,774	\$20,148	\$35,398	\$238,263
Total Estimated Project Costs (Feasibility)	\$1,287,560	\$113,265	\$154,470	\$271,388	\$1,826,683
ESTIMATED REVENUE					
Bonding / Cash Reserves	\$379,588				\$379,588
MSA Fund	\$907,973			\$150,933	\$1,058,906
Sanitary Sewer Utility Fund		\$113,265			\$113,265
Water Utility Fund			\$154,470		\$154,470
Storm Drainage Utility Fund				\$120,455	\$120,455
Total Estimated Revenue (Feasibility)	\$1,287,560	\$113,265	\$154,470	\$271,388	\$1,826,683

Table 8 – Recommended Project Half Urban / Half Rural Section – Segments 1 and 2

	STREETS	SANITARY SEWER	WATER SYSTEM	STORM DRAINAGE	ESTIMATED TOTAL
ESTIMATED EXPENDITURES					
Estimated Construction Cost	\$909,411	\$89,537	\$122,111	\$201,716	\$1,322,775
Contingencies (10%)	\$90,941	\$8,954	\$12,211	\$20,172	\$132,277
Administration, Engineering, Legal (15%)	\$150,053	\$14,774	\$20,148	\$33,283	\$218,258
Total Estimated Project Costs (Feasibility)	\$1,150,405	\$113,265	\$154,470	\$255,170	\$1,673,310
ESTIMATED REVENUE					
Bonding / Cash Reserves	\$341,383				\$341,383
MSA Fund	\$809,022			\$141,203	\$950,225
Sanitary Sewer Utility Fund		\$113,265			\$113,265
Water Utility Fund			\$154,470		\$154,470
Storm Drainage Utility Fund				\$113,968	\$113,968
Total Estimated Revenue (Feasibility)	\$1,150,405	\$113,265	\$154,470	\$255,170	\$1,673,311

Right-of-Way

Generally, all public infrastructure located on the westerly side of the corridor is owned, maintained and operated by the City and are within easements and/or right-of-way. The east side of the corridor contains properties within the Northfield Township. The entire right-of-way needs to be located within the City of Northfield to be able to utilize State Aid funds. 33-feet of the easterly half of the corridor has been annexed from Northfield Township. Additional annexation from Northfield Township needs to be obtained for the following:

1. 7-feet for a full 40-feet along the east side of the corridor for all three segments.
2. Property near Spring Creek in segment 3 for filtration area no. 1 as referenced in Appendix F.
3. 10004 Hall Avenue property.

Right-of-way from Northfield Township needs to be obtained for the following:

1. The full 40-feet along the east side of the corridor for all three segments.
2. Property near Spring Creek in segment 3 for filtration area no. 1 as referenced in Appendix F.

Temporary easements will likely be needed outside of the 40-feet to be able to match the property owners' driveways and other slope grading that is required. The proposed project on the westerly 40 feet is contained within the existing right-of-way and it is not anticipated that the City

will need to obtain any additional easement for any existing or proposed improvements located within the proposed project limits. If necessary, any identified easement needs during final design will be further coordinated with the City Staff, City Attorney, and identified property owners.

Project Schedule

A detailed project process and schedule for completing this project during the 2018 construction season is shown in Appendix B. The schedule shows the steps required to complete the assessment process, which levies assessment against the benefiting properties. An abbreviated schedule is shown below:

City Council Orders Feasibility Report.....	August 22, 2017
Accept Feasibility Report and Calls for Improvement Hearing.....	January 2, 2018
Order Preparation of Plans and Specifications	January 2, 2018
Neighborhood / Community Meeting	January 2018
Neighborhood Meeting with Property Owners.....	March 28, 2018
Council Approves Plans & Specs and Orders Ad for Bid	April 18, 2018
Receive Bids.....	May 24, 2018
Awards Bids.....	June 5, 2018
Property Owner Meeting.....	June 2018
Construction Begins (estimated)	June 2018
Construction Ends (estimated)	November 2018

Conclusion / Recommendation

The project is feasible, necessary, and cost-effective from an engineering standpoint and should be constructed as proposed in this report.

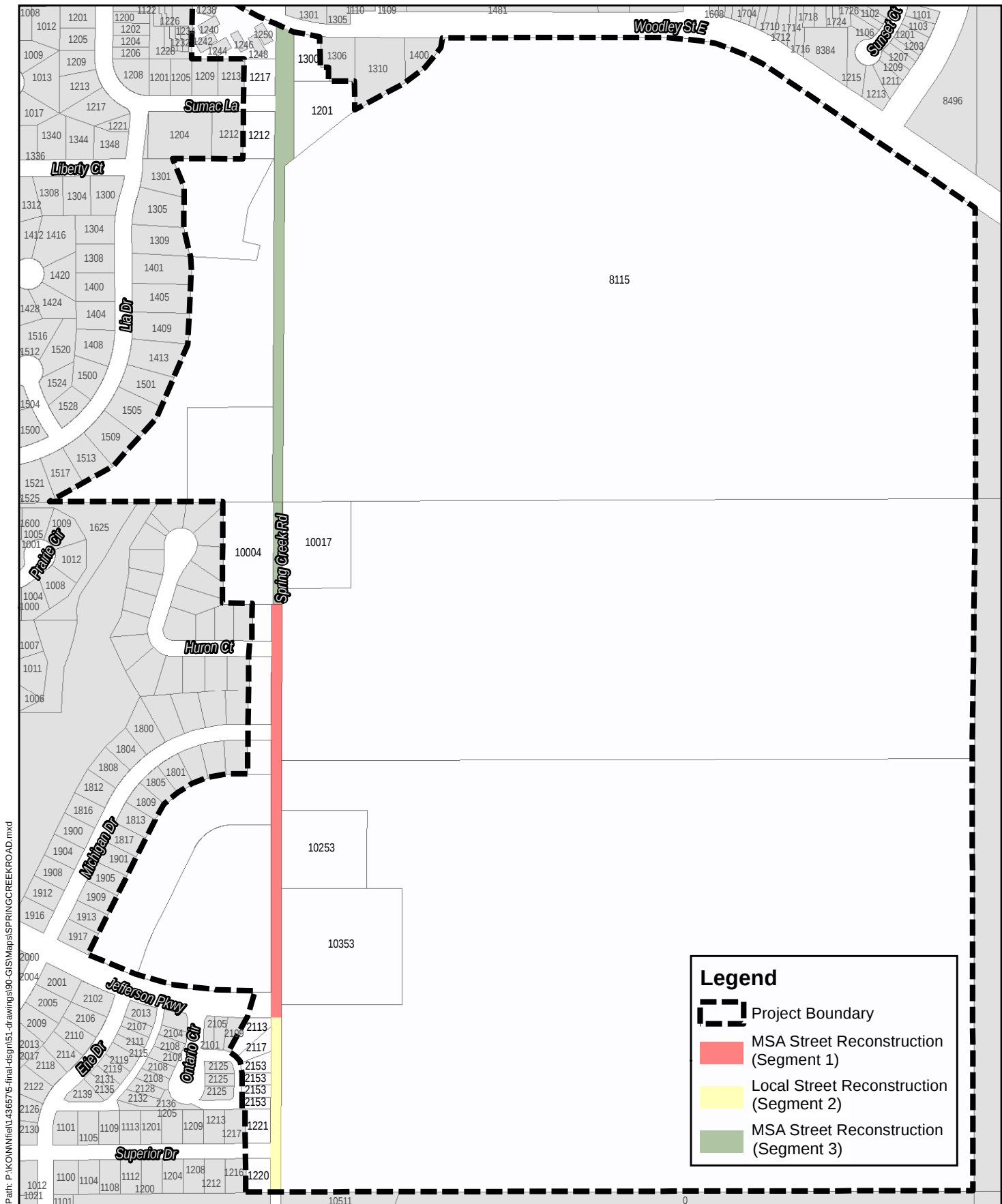
In considering the foregoing conclusions, it is recommended that:

- We recommend that Segment 1 and 2 be constructed in 2018.
- Segment 3 be constructed once the culvert is replaced at Spring Creek, which is planned for 2019. This will enable the City to acquire property for storm water quality treatment prior to draining into Spring Creek, see Appendix F. The water system could then be extended to Sumac Lane. Sanitary Sewer is not required within this segment as the property to the east drains north-easterly to a future sanitary sewer along Spring Creek.

The costs of improvements for Segments 1 & 2 will be recovered from Municipal State Aid and local funding.

Appendix A

Location Map - Spring Creek Road



Path: P:\KOWIN\fig143657\5-final-dsgn\51-drawings\90-GIS\Map\SPRINGCREEKROAD.mxd

Legend

Project Boundary

MSA Street Reconstruction
(Segment 1)

Local Street Reconstruction
(Segment 2)

MSA Street Reconstruction
(Segment 3)

Appendix B

Project Process

2018 Spring Creek Road Reconstruction Project Process (STRT2018-A38)

The following actions detail the required 429 process track for local improvements.

Date ¹	Project Step	Purpose of Step	Council Action ²	Staff Action ³
August 22, 2017	Order Preparation of Feasibility Report	Ordering the Feasibility Report is a required step in the 429 process.	Resolution 2017-065	
December 12, 2017	Discussion of Feasibility			
January 2, 2018	Accept Feasibility Report and Call for Improvement Hearing / Authorize Preparation of Plans and Specifications	The engineer will present the Feasibility Report, the proposed project, and an initial cost estimate.	Resolution TMP-3437	
January 2018	Neighborhood Meeting	The intent of this meeting is to inform the neighborhood of the upcoming project and seek input on the improvements, which will be summarized for City Council.		Mail notice: January 2018
March 28, 2018	Neighborhood Meeting	Present the final detailed plans and specifications to the neighborhood. Also hold a more detailed discussion on what will happen during construction as well as a tentative timeline for events.		
April 18, 2018	Approve Plans and Order Advertisement for Bids		Resolution 2018	
May 9, 16, 23	Publish Ad for Bid in Northfield News	A step in the bidding process. The project will also be advertised on the MnDOT e-Advert website.		
May 24,, 2018	Bid Opening – 2:00 P.M.	Final step in the bidding process. Bids are opened by staff and tabulated. From here staff will make a recommendation to the City Council for award.		
June 5, 2018	Accept Bids and Award Contract		Resolution 2018	
June 2018	Property Owner Meetings	Individual meetings with property owners will be scheduled to go over the details of construction and document existing conditions.		
June – November 2018	Construction	Once the project is awarded staff manages the day-to-day contract execution. Typically a Resident Project Representative is on-site to make sure the project is constructed in accordance to the plans and specifications. Communications between the contractor and city is primarily through the City Engineer, Project Manager and Resident Project Representative.		
July 2019	Accept Improvements and Authorize Final Payment	The City Engineer recommends to City Council when the final payment should be made to the Contractor. The City Council may accept the work by resolution; however, if the city fails to pay the amount due within 30 days of a monthly estimate, or 90 days after the final estimate, the city must pay interest on the past due amount as prescribed by law.	Resolution 2018	

Appendix C

Preliminary Engineer's Estimate – Spring Creek Road



NORTHFIELD, MINNESOTA
SPRING CREEK ROAD RECONSTRUCTION
CITY PROJECT NO. STRT2018-A38
SEH NO. NFIEL 143657
Opinion of Probable Cost
Date: October 31, 2017
Revised Date: November 28, 2017 ; December 22, 2017
P:\KO\N\Nfiel\143657\4-prelim-dsgn-rpts\43.54-Qtys Costs\Opinion Cost & Quantities Report Spring Creek.xlsxOpinion Cost

LINE NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL PROJECT QUANTITIES	UNIT COST	TOTAL ESTIMATED COST	MSA				MSA			
							SPRING CREEK ROAD (SEGMENT 1)				SPRING CREEK ROAD (SEGMENT 3)			
							S.A.P. 149-124-002				S.A.P. 149-124-002			
							STREET		STORM (1)		STREET		STORM (1)	
							EST	COST	EST	COST	EST	COST	EST	COST
1	2021.501	MOBILIZATION	LS	1	\$123,000.00	\$123,000.00	0.25	\$30,750	0.02	\$2,768	0.37	\$45,510	0.03	\$3,690
2	2101.502	CLEARING	TREE	120	\$216.96	\$26,035.20	20	\$4,339			100	\$21,696		
3	2101.507	GRUBBING	TREE	120	\$127.87	\$15,344.40	20	\$2,557			100	\$12,787		
4	2101.603	ROOT CUTTING	LS	1	\$500.00	\$500.00	0.33	\$165			0.50	\$250		
5	2101.604	CLEAR AND GRUB BRUSH	SQ YD	1,556	\$12.94	\$20,128.89	444	\$5,751			1,111	\$14,378		
6	2101.610	TREE TRIMMING	HOUR	10	\$190.00	\$1,900.00	5	\$950			5	\$950		
7	2104.501	REMOVE PIPE STORM SEWER	LIN FT	80	\$9.89	\$791.20							30	\$297
8	2104.501	REMOVE WATER MAIN	LIN FT	20	\$5.25	\$105.00								
9	2104.505	REMOVE CONCRETE DRIVEWAY APRON	SQ YD	67	\$6.41	\$427.33	22	\$142			22	\$142		
10	2104.505	REMOVE CONCRETE DRIVEWAY PAVEMENT	SQ YD	67	\$6.41	\$427.33	22	\$142			22	\$142		
11	2104.505	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	SQ YD	67	\$3.81	\$254.00	22	\$85			22	\$85		
12	2104.505	REMOVE BITUMINOUS PAVEMENT	SQ YD	1,467	\$2.00	\$2,933.33					1,467	\$2,933		
13	2104.509	REMOVE SIGN	EACH	15	\$50.00	\$750.00	5	\$250			5	\$250		
14	2104.509	REMOVE DRAINAGE STRUCTURE	EACH	4	\$452.55	\$1,810.20							2	\$679
15	2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LIN FT	150	\$3.08	\$462.00	50	\$154			50	\$154		
16	2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	150	\$2.01	\$301.50	50	\$101			50	\$101		
17	2104.523	SALVAGE SIGNS - TYPE SPECIAL	EACH	12	\$25.88	\$310.56	5	\$129			5	\$129		
18	2104.523	SALVAGE SIGN, TYPE "C"	EACH	12	\$25.88	\$310.56	5	\$129			5	\$129		
19	2104.523	SALVAGE CASTING	EACH	4	\$52.20	\$208.80							2	\$78
20	2104.603	RELOCATE SPRINKLER SYSTEM	LIN FT	300	\$18.00	\$5,400.00	100	\$1,800			100	\$1,800		
21	2104.603	RELOCATE PET CONTAINMENT SYSTEM	LIN FT	300	\$18.00	\$5,400.00	100	\$1,800			100	\$1,800		
22	2105.501	COMMON EXCAVATION (EV)(P)	CU YD	16,173	\$12.97	\$209,768.13	8,107	\$105,143			5,400	\$70,038		
23	2105.501	COMMON EXCAVATION - TRAIL (EV) (P)	CU YD	3,108	\$23.00	\$71,481.02	985	\$22,659			1,604	\$36,896		
24	2105.503	ROCK EXCAVATION	CU YD	100	\$125.00	\$12,500.00								
25	2105.507	SUBGRADE EXCAVATION	CU YD	681	\$1.19	\$810.39	242	\$288			351	\$418		
26	2105.507	SUBGRADE EXCAVATION (EV)	CU YD	311	\$28.00	\$8,702.04	99	\$2,759			160	\$4,492		
27	2105.522	SELECT GRANULAR BORROW (CV)(Xtra Subcut)	CU YD	681	\$15.00	\$10,215.00	242	\$3,630			351	\$5,265		
28	2105.522	SELECT GRANULAR BORROW (CV)(Xtra Trail Subcut)	CU YD	311	\$15.00	\$4,661.81	99	\$1,478			160	\$2,406		
29	2105.523	COMMON BORROW (CV)(P)	CU YD	14,798	\$3.50	\$51,793.52	7,881	\$27,585			5,713	\$19,995		
30	2105.543	STABILIZING AGGREGATE	TON	60	\$38.38	\$2,302.80	20	\$768			20	\$768		
31	2105.602	POTHOLE EXISTING UTILITIES	EACH	3	\$440.93	\$1,322.79			1	\$331			1	\$331
32	2106.511	EXCAVATION - CHANNEL AND POND	CU YD	7,481	\$6.00	\$44,888.89							3,972	\$23,833
33	2111.501	TEST ROLLING	LIN FT	4,370	\$2.00	\$8,740.00	1,520	\$3,040			2,200	\$4,400		
34	2111.501	TEST ROLLING	LIN FT	4,370	\$0.90	\$3,933.00	1,520	\$1,368			2,200	\$1,980		
35	2112.604	SUBGRADE PREPARATION	SQ YD	5,827	\$1.50	\$8,740.00	2,027	\$3,040			2,933	\$4,400		
36	2123.501	COMMON LABORERS	HOUR	60	\$67.13	\$4,027.80	20	\$1,343			20	\$1,343		
37	2123.507	3.0 CU YD SHOVEL	HOUR	60	\$164.48	\$9,868.80	20	\$3,290			20	\$3,290		
38	2123.610	STREET SWEEPER (WITH PICKUP BROOM)	HOUR	36	\$126.55	\$4,555.80	12	\$1,519			12	\$1,519		
39	2130.501	WATER FOR DUST CONTROL	M GALS	45	\$25.37	\$1,141.65	15	\$381			15	\$381		
40	2130.501	WATER FOR DUST CONTROL / SEED	M GALS	60	\$25.00	\$1,500.00	20	\$500			20	\$500		

LINE NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL PROJECT QUANTITIES	UNIT COST	TOTAL ESTIMATED COST	MSA				MSA			
							SPRING CREEK ROAD (SEGMENT 1)				SPRING CREEK ROAD (SEGMENT 3)			
							S.A.P. 149-124-002				S.A.P. 149-124-002			
							STREET		STORM (1)		STREET		STORM (1)	
							EST	COST	EST	COST	EST	COST	EST	COST
41	2211.501	AGGREGATE BASE, CLASS 5	TON	16,441	\$13.14	\$216,034.74	5,735	\$75,358			8,300	\$109,062		
42	2211.501	AGGREGATE BASE, CLASS 5	TON	1,973	\$15.00	\$29,591.10	702	\$10,534			1,016	\$15,246		
43	2357.502	BITUMINOUS MATERIAL FOR TACK COAT	GALS	988	\$2.96	\$2,924.48	344	\$1,018			497	\$1,471		
44	2360.501	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TON	3,409	\$80.00	\$272,717.13	1,186	\$94,858			1,716	\$137,295		
45	2360.501	TYPE SP 12.5 NON WEARING COURSE MIX (4,B)	TON	3,409	\$75.00	\$255,672.31	1,186	\$88,930			1,716	\$128,714		
46	2360.501	TYPE SPWEB230B WEARING COURSE MIXTURE,	TON	900	\$68.00	\$61,217.57	320	\$21,792			464	\$31,541		
47	2411.618	MODULAR BLOCK RETAINING WALL	SQ FT	600	\$46.93	\$28,158.00	200	\$9,386			200	\$9,386		
48	2451.607	REPLACEMENT BACKFILL (Mn/DOT 3149.2D) (CV)	CU YD	90	\$20.49	\$1,844.10			23	\$461			23	\$461
49	2501.567	21-INCH RC SAFETY APRON & GRATE DES 3128	EACH	4	\$1,200.00	\$4,800.00			1	\$900			2	\$1,800
50	2503.541	12-INCH RC PIPE SEWER, DESIGN 3006, CLASS V	LIN FT	944	\$37.00	\$34,936.22			285	\$10,554			336.19	\$12,439
51	2503.541	15-INCH RC PIPE SEWER, DESIGN 3006, CLASS V	LIN FT	1,600	\$39.00	\$62,400.00			450	\$17,550			637.50	\$24,863
52	2503.541	18-INCH RC PIPE SEWER, DESIGN 3006, CLASS V	LIN FT	900	\$41.00	\$36,900.00			300	\$12,300			300.00	\$12,300
53	2503.541	21-INCH RC PIPE SEWER, DESIGN 3006, CLASS III	LIN FT	900	\$45.00	\$40,500.00			300	\$13,500			300.00	\$13,500
54	2503.602	CONNECT TO EXISTING STORM SEWER	EACH	2	\$715.41	\$1,430.82							0.75	\$537
55	2503.602	CONNECT TO EXISTING MANHOLE (SAN)	EACH	3	\$1,000.00	\$3,000.00								
56	2503.602	8" x 4" PVC WYE, SCHEDULE 40	EACH	2	\$196.26	\$392.52								
57	2503.602	8" x 6" PVC WYE, SCHEDULE 40	EACH	1	\$247.33	\$247.33								
58	2503.603	8" PVC PIPE SEWER (SANITARY SDR 35)	LIN FT	1,575	\$35.00	\$55,125.00								
59	2503.603	4" PVC SANITARY SERVICE PIPE (SCH 40)	LIN FT	80	\$33.28	\$2,662.40								
60	2503.603	6" PVC SANITARY SERVICE PIPE (SCH 40)	LIN FT	40	\$30.62	\$1,224.80								
62	2503.608	DUCTILE IRON FITTINGS	LBS	2,175	\$7.50	\$16,312.50								
63	2504.602	ADJUST GATE VALVE BOX	EACH	4	\$325.64	\$1,302.56	2	\$651			2	\$651		
64	2504.602	INSTALL HYDRANT, GATE VALVE AND 6-INCH DIP	EACH	6	\$7,484.51	\$44,907.06								
65	2504.602	1" CORPORATION STOP	EACH	4	\$350.00	\$1,400.00								
66	2504.602	2" CORPORATION STOP	EACH	2	\$686.99	\$1,373.98								
67	2504.602	12" GATE VALVE & BOX	EACH	6	\$3,500.00	\$21,000.00								
68	2504.602	1" CURB STOP AND BOX	EACH	4	\$375.00	\$1,500.00								
69	2504.602	2" CURB STOP AND BOX	EACH	2	\$773.97	\$1,547.94								
70	2504.602	CONNECT TO EXISTING WATERMAIN	EACH	4	\$1,200.00	\$4,800.00								
71	2504.603	WATERMAIN SERVICE INSULATION	LIN FT	10	\$37.44	\$374.40								
72	2504.603	1" TYPE K COPPER PIPE	LIN FT	240	\$29.17	\$7,000.80								
73	2504.603	2" TYPE K COPPER PIPE	LIN FT	120	\$38.16	\$4,579.20								
74	2504.603	6" WATERMAIN DUCTILE IRON CL 52	LIN FT	50	\$41.00	\$2,050.00								
75	2504.603	8" WATERMAIN DUCTILE IRON CL 52	LIN FT	150	\$46.00	\$6,900.00								
76	2504.603	12" WATERMAIN DUCTILE IRON CL 52	LIN FT	2,900	\$55.00	\$159,500.00								
77	2506.501	CONST DRAINAGE STRUCTURE DES 48-4020	LIN FT	147.0	\$374.22	\$54,993.71			45	\$16,983			53.49	\$20,016
78	2506.501	CONST DRAINAGE STRUCTURE DES 60-4020	LIN FT	20.9	\$490.36	\$10,270.32			6	\$2,860			6.88	\$3,371
79	2506.501	CONST DRAINAGE STRUCTURE DES 72-4020	LIN FT	20.9	\$628.12	\$13,155.62			6	\$3,664			6.88	\$4,318
80	2506.502	CONST DRAINAGE STRUCTURE DES WATER	EACH	2	\$30,000.00	\$60,000.00			1	\$22,500			0.75	\$22,500
81	2506.516	CASTING ASSEMBLY (STORM)	EACH	34	\$800.00	\$27,200.00			11	\$8,400			12.38	\$9,900
82	2506.516	CASTING ASSEMBLY (SANITARY)	EACH	4	\$1,099.70	\$4,398.80								
83	2506.602	CONSTRUCT SANITARY SEWER MANHOLE	EACH	4	\$1,600.00	\$6,400.00								
84	2506.603	CONSTRUCT SANITARY SEWER MANHOLE (EXTRA DEPTH)	LIN FT	20.0	\$300.00	\$6,000.00								
85	2511.501	RANDOM RIPRAP CLASS III	CU YD	230	\$100.00	\$23,022.03			60	\$6,006			86.93	\$8,693
86	2511.515	GEOTEXTILE FILTER TYPE IV	SQ YD	153	\$5.00	\$767.40			40	\$200			57.95	\$290
87	2521.501	6-INCH CONCRETE WALK - PEDESTRIAN CURB RAMPS	SQ FT	800	\$7.98	\$6,384.00	480	\$3,830			160	\$1,277		
88	2521.501	4" CONCRETE WALK	SQ FT	21,350	\$5.00	\$106,750.00	7,600	\$38,000			11,000	\$55,000		
89	2521.501	PEDESTRIAN CURB RAMP	SQ FT	480	\$10.00	\$4,800.00	160	\$1,600			160	\$1,600		
90	2521.605	3.0" BITUMINOUS DRIVEWAY PAVEMENT	SQ YD	67	\$35.00	\$2,333.33	22	\$778			22	\$778		

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							SPRING CREEK ROAD (SEGMENT 1)				SPRING CREEK ROAD (SEGMENT 3)			
							S.A.P. 149-124-002				S.A.P. 149-124-002			
							STREET		STORM (1)		STREET		STORM (1)	
							EST	COST	EST	COST	EST	COST	EST	COST
91	2531.501	CONCRETE CURB AND GUTTER, DESIGN B618	LIN FT	8,740	\$11.00	\$96,140.00	3,040	\$33,440			4,400	\$48,400		
92	2531.507	6-INCH CONCRETE DRIVEWAY PAVEMENT	SQ YD	67	\$46.65	\$3,110.00	22	\$1,037			22	\$1,037		
93	2531.618	TRUNCATED DOMES	SQ FT	120	\$44.64	\$5,356.80	72	\$3,214			24	\$1,071		
94	2531.618	TRUNCATED DOMES	SQ FT	72	\$50.00	\$3,600.00	24	\$1,200			24	\$1,200		
95	2540.602	SANITATY SEWER LOCATE BOX	EACH	4	\$100.00	\$400.00								
96	2563.601	TRAFFIC CONTROL	LS	1	\$15,000.00	\$15,000.00	0.25	\$3,750	0.02	\$338	0.37	\$5,550	0.03	\$450
97	2564.537	INSTALL SALVAGED SIGNS, TYPE "C"	EACH	6	\$103.55	\$621.30	2	\$207			2	\$207		
98	2564.602	FURNISH AND INSTALL SIGN PANELS, TYPE SPECIAL DESIGN A	EACH	9	\$232.96	\$2,096.64	3	\$699			3	\$699		
99	2564.602	FURNISH AND INSTALL SIGN PANELS, TYPE SPECIAL DESIGN B	EACH	6	\$258.86	\$1,553.16	2	\$518			2	\$518		
100	2571.502	DECIDUOUS TREE 2" CAL B&B	TREE	15	\$415.52	\$6,232.80	5	\$2,078			5	\$2,078		
101	2571.541	TRANSPLANT TREE (SPADE SIZE 66")	TREE	3	\$500.00	\$1,500.00	1	\$500			1	\$500		
102	2571.541	TRANSPLANT TREE (SPADE SIZE 92")	TREE	3	\$500.00	\$1,500.00	1	\$500			1	\$500		
103	2573.502	SILT FENCE, TYPE HEAVY DUTY	LIN FT	7,113	\$3.00	\$21,337.50	1,900	\$5,700			4,400	\$13,200		
104	2573.502	SILT FENCE - STANDARD MACHINE SLICED	LIN FT	8,740	\$2.25	\$19,665.00	3,040	\$6,840			4,400	\$9,900		
105	2573.530	INLET PROTECTION - TYPE A	EACH	7	\$109.75	\$768.25	5	\$549			2	\$220		
106	2573.530	INLET PROTECTION - TYPE B	EACH	7	\$109.75	\$768.25	5	\$549			2	\$220		
107	2574.508	COMMERCIAL FERTILIZER, ANALYSIS 12-0-12	LB	1,756	\$1.19	\$2,089.19	611	\$727			884	\$1,052		
108	2574.508	FERTILIZER TYPE 2, ANALYSIS 22-0-10	LBS	421	\$1.00	\$421.35	147	\$147			212	\$212		
109	2574.525	TOPSOIL BORROW (LV)	CU YD	1,597	\$26.58	\$42,448.26	552	\$14,672			808	\$21,477		
110	2574.525	TOPSOIL BORROW (LV)	CU YD	647	\$25.00	\$16,185.19	225	\$5,630			326	\$8,148		
111	2575.501	SEEDING	ACRE	1.20	\$500.00	\$601.93	0.42	\$209			0.61	\$303		
112	2575.505	SODDING, TYPE LAWN	SQ YD	9,579	\$2.12	\$20,307.48	3,312	\$7,021			4,845	\$10,271		
113	2575.525	EROSION CONTROL BLANKET, CATEGORY 3	SQ YD	24,278	\$2.50	\$60,694.44	8,444	\$21,111			12,222	\$30,556		
114	2575.601	EROSION CONTROL	LS	1	\$10,561.25	\$10,561.25	0.33	\$3,485			0.50	\$5,281		
115	2575.605	HYDROSEEDING	ACRE	5	\$5,011.42	\$25,137.63	1.74	\$8,744			2.53	\$12,655		
116	2575.608	SEED, MIXTURE 270	LBS	181	\$3.25	\$586.88	63	\$204			91	\$295		
117	2575.609	HYDRAULIC SOIL STABILIZER, TYPE 6	TON	1.81	\$2,500.00	\$4,514.46	0.6	\$1,570			0.9	\$2,273		
118	2582.502	4" SOLID LINE WHITE - PAINT	LIN FT	8,740	\$0.90	\$7,866.00	3,040	\$2,736			4,400	\$3,960		
119	2582.502	24" STOP LINE - PAINT	LIN FT	20	\$4.91	\$98.20					20	\$98		
120	2582.502	24" STOP LINE - EPOXY	LIN FT	20	\$10.62	\$212.40					20	\$212		
121	2582.502	4" SOLID LINE WHITE-EPOXY	LIN FT	8,740	\$4.00	\$34,960.00	3,040	\$12,160			4,400	\$17,600		
122	2582.502	4" DOUBLE SOLID LINE YELLOW-EPOXY	LIN FT	4,370	\$2.50	\$10,925.00	1,520	\$3,800			2,200	\$5,500		
123	2582.503	CROSSWALK MARKING-PAINT	SQ FT	180	\$10.00	\$1,800.00					180	\$1,800		
124	2582.503	CROSSWALK MARKING-EPOXY	SQ FT	180	\$10.00	\$1,800.00					180	\$1,800		

OPINION OF PROBABLE COST - URBAN SECTION

SUBTOTAL ESTIMATED CONSTRUCTION COST	\$2,802,021	\$717,765	\$119,315	\$962,137	\$164,345
10% CONTINGENCY	\$280,202	\$71,776	\$11,931	\$96,214	\$16,434
TOTAL ESTIMATED CONSTRUCTION COST	\$3,082,223	\$789,541	\$131,246	\$1,058,351	\$180,779
15% LEGAL, ADMINISTRATIVE, ENGINEERING	\$462,333	\$118,431	\$19,687	\$158,753	\$27,117
TOTAL PROJECT COST	\$3,544,557	\$907,973	\$150,933	\$1,217,104	\$207,896

OPINION OF PROBABLE COST - RURAL SECTION

LESS TOTAL ESTIMATED CONSTRUCTION COST DEDUCT - RURAL SECTION	(\$285,116)	(\$86,043)	(\$8,461)	(\$138,454)	(\$9,972)
TOTAL ESTIMATED CONSTRUCTION COST - RURAL SECTION	\$2,797,107	\$703,498	\$122,785	\$919,897	\$170,807
15% LEGAL, ADMINISTRATIVE, ENGINEERING - RURAL SECTION	\$419,566	\$105,525	\$18,418	\$137,985	\$25,621
TOTAL PROJECT COST - RURAL SECTION	\$3,216,673	\$809,023	\$141,203	\$1,057,882	\$196,428

Notes:
(1) - Quantities assume a MnDOT State Aid 75% participation rate



NORTHFIELD, MINNESOTA
SPRING CREEK ROAD RECONSTRUCTION
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							SPRING CREEK ROAD (SEGMENT 1)		SPRING CREEK ROAD (SEGMENT 2)				SPRING CREEK ROAD (SEGMENT 3)	
							STORM SEWER ⁽¹⁾		STREET		STORM SEWER		STORM SEWER ⁽¹⁾	
							EST	COST	EST	COST	EST	COST	EST	COST
1	2021.501	MOBILIZATION	LS	1	\$123,000.00	\$123,000.00	0.01	\$923	0.13	\$15,990	0.02	\$2,460	0.01	\$1,230
2	2101.502	CLEARING	TREE	120	\$216.96	\$26,035.20								
3	2101.507	GRUBBING	TREE	120	\$127.87	\$15,344.40								
4	2101.603	ROOT CUTTING	LS	1	\$500.00	\$500.00			0.17	\$85				
5	2101.604	CLEAR AND GRUB BRUSH	SQ YD	1,556	\$12.94	\$20,128.89								
6	2101.610	TREE TRIMMING	HOUR	10	\$190.00	\$1,900.00								
7	2104.501	REMOVE PIPE STORM SEWER	LIN FT	80	\$9.89	\$791.20					40	\$396	10	\$99
8	2104.501	REMOVE WATER MAIN	LIN FT	20	\$5.25	\$105.00								
9	2104.505	REMOVE CONCRETE DRIVEWAY APRON	SQ YD	67	\$6.41	\$427.33			22	\$142				
10	2104.505	REMOVE CONCRETE DRIVEWAY PAVEMENT	SQ YD	67	\$6.41	\$427.33			22	\$142				
11	2104.505	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	SQ YD	67	\$3.81	\$254.00			22	\$85				
12	2104.505	REMOVE BITUMINOUS PAVEMENT	SQ YD	1,467	\$2.00	\$2,933.33								
13	2104.509	REMOVE SIGN	EACH	15	\$50.00	\$750.00			5	\$250				
14	2104.509	REMOVE DRAINAGE STRUCTURE	EACH	4	\$452.55	\$1,810.20					2	\$905	1	\$226
15	2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LIN FT	150	\$3.08	\$462.00			50	\$154				
16	2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	150	\$2.01	\$301.50			50	\$101				
17	2104.523	SALVAGE SIGNS - TYPE SPECIAL	EACH	12	\$25.88	\$310.56			2	\$52				
18	2104.523	SALVAGE SIGN, TYPE "C"	EACH	12	\$25.88	\$310.56			2	\$52				
19	2104.523	SALVAGE CASTING	EACH	4	\$52.20	\$208.80					2	\$104	1	\$26
20	2104.603	RELOCATE SPRINKLER SYSTEM	LIN FT	300	\$18.00	\$5,400.00			100	\$1,800				
21	2104.603	RELOCATE PET CONTAINMENT SYSTEM	LIN FT	300	\$18.00	\$5,400.00			100	\$1,800				
22	2105.501	COMMON EXCAVATION (EV)(P)	CU YD	16,173	\$12.97	\$209,768.13			2,667	\$34,587				
23	2105.501	COMMON EXCAVATION - TRAIL (EV) (P)	CU YD	3,108	\$23.00	\$71,481.02			519	\$11,926				
24	2105.503	ROCK EXCAVATION	CU YD	100	\$125.00	\$12,500.00								
25	2105.507	SUBGRADE EXCAVATION	CU YD	681	\$1.19	\$810.39			88	\$105				
26	2105.507	SUBGRADE EXCAVATION (EV)	CU YD	311	\$28.00	\$8,702.04			52	\$1,452				
27	2105.522	SELECT GRANULAR BORROW (CV)(Xtra Subcut)	CU YD	681	\$15.00	\$10,215.00			88	\$1,320				
28	2105.522	SELECT GRANULAR BORROW (CV)(Xtra Trail Subcut)	CU YD	311	\$15.00	\$4,661.81			52	\$778				
29	2105.523	COMMON BORROW (CV)(P)	CU YD	14,798	\$3.50	\$51,793.52			1,204	\$4,213				
30	2105.543	STABILIZING AGGREGATE	TON	60	\$38.38	\$2,302.80			20	\$768				
31	2105.602	POTHOLE EXISTING UTILITIES	EACH	3	\$440.93	\$1,322.79	0	\$110			1	\$441	0	\$110
32	2106.511	EXCAVATION - CHANNEL AND POND	CU YD	7,481	\$6.00	\$44,888.89					2,185	\$13,111	1,324	\$7,944
33	2111.501	TEST ROLLING	LIN FT	4,370	\$2.00	\$8,740.00			650	\$1,300				
34	2111.501	TEST ROLLING	LIN FT	4,370	\$0.90	\$3,933.00			650	\$585				
35	2112.604	SUBGRADE PREPARATION	SQ YD	5,827	\$1.50	\$8,740.00			867	\$1,300				
36	2123.501	COMMON LABORERS	HOUR	60	\$67.13	\$4,027.80			20	\$1,343				
37	2123.507	3.0 CU YD SHOVEL	HOUR	60	\$164.48	\$9,868.80			20	\$3,290				
38	2123.610	STREET SWEEPER (WITH PICKUP BROOM)	HOUR	36	\$126.55	\$4,555.80			12	\$1,519				
39	2130.501	WATER FOR DUST CONTROL	M GALS	45	\$25.37	\$1,141.65			15	\$381				
40	2130.501	WATER FOR DUST CONTROL / SEED	M GALS	60	\$25.00	\$1,500.00			20	\$500				

LINE NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL PROJECT QUANTITIES	UNIT COST	TOTAL ESTIMATED COST	LOCAL							
							SPRING CREEK ROAD (SEGMENT 1)		SPRING CREEK ROAD (SEGMENT 2)				SPRING CREEK ROAD (SEGMENT 3)	
							STORM SEWER ⁽¹⁾		STREET		STORM SEWER		STORM SEWER ⁽¹⁾	
							EST	COST	EST	COST	EST	COST	EST	COST
41	2211.501	AGGREGATE BASE, CLASS 5	TON	16,441	\$13.14	\$216,034.74			2,406	\$31,615				
42	2211.501	AGGREGATE BASE, CLASS 5	TON	1,973	\$15.00	\$29,591.10			254	\$3,812				
43	2357.502	BITUMINOUS MATERIAL FOR TACK COAT	GALS	988	\$2.96	\$2,924.48			147	\$435				
44	2360.501	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TON	3,409	\$80.00	\$272,717.13			507	\$40,564				
45	2360.501	TYPE SP 12.5 NON WEARING COURSE MIX (4,B)	TON	3,409	\$75.00	\$255,672.31			507	\$38,029				
46	2360.501	TYPE SPWEB230B WEARING COURSE MIXTURE,	TON	900	\$68.00	\$61,217.57			116	\$7,885				
47	2411.618	MODULAR BLOCK RETAINING WALL	SQ FT	600	\$46.93	\$28,158.00			200	\$9,386				
48	2451.607	REPLACEMENT BACKFILL (Mn/DOT 3149.2D) (CV)	CU YD		\$20.49									
				90		\$1,844.10	8	\$154			30	\$615	8	\$154
49	2501.567	21-INCH RC SAFETY APRON & GRATE DES 3128	EACH	4	\$1,200.00	\$4,800.00	0	\$300			1	\$1,200	1	\$600
50	2503.541	12-INCH RC PIPE SEWER, DESIGN 3006, CLASS V	LIN FT	944	\$37.00	\$34,936.22	95	\$3,518			116	\$4,279	112	\$4,146
51	2503.541	15-INCH RC PIPE SEWER, DESIGN 3006, CLASS V	LIN FT	1,600	\$39.00	\$62,400.00	150	\$5,850			150	\$5,850	213	\$8,288
52	2503.541	18-INCH RC PIPE SEWER, DESIGN 3006, CLASS V	LIN FT	900	\$41.00	\$36,900.00	100	\$4,100			100	\$4,100	100	\$4,100
53	2503.541	21-INCH RC PIPE SEWER, DESIGN 3006, CLASS III	LIN FT	900	\$45.00	\$40,500.00	100	\$4,500			100	\$4,500	100	\$4,500
54	2503.602	CONNECT TO EXISTING STORM SEWER	EACH	2	\$715.41	\$1,430.82					1	\$715	0	\$179
55	2503.602	CONNECT TO EXISTING MANHOLE (SAN)	EACH	3	\$1,000.00	\$3,000.00								
56	2503.602	8" x 4" PVC WYE, SCHEDULE 40	EACH	2	\$196.26	\$392.52								
57	2503.602	8" x 6" PVC WYE, SCHEDULE 40	EACH	1	\$247.33	\$247.33								
58	2503.603	8" PVC PIPE SEWER (SANITARY SDR 35)	LIN FT	1,575	\$35.00	\$55,125.00								
59	2503.603	4" PVC SANITARY SERVICE PIPE (SCH 40)	LIN FT	80	\$33.28	\$2,662.40								
60	2503.603	6" PVC SANITARY SERVICE PIPE (SCH 40)	LIN FT	40	\$30.62	\$1,224.80								
62	2503.608	DUCTILE IRON FITTINGS	LBS	2,175	\$7.50	\$16,312.50								
63	2504.602	ADJUST GATE VALVE BOX	EACH	4	\$325.64	\$1,302.56								
64	2504.602	INSTALL HYDRANT, GATE VALVE AND 6-INCH DIP	EACH	6	\$7,484.51	\$44,907.06								
65	2504.602	1" CORPORATION STOP	EACH	4	\$350.00	\$1,400.00								
66	2504.602	2" CORPORATION STOP	EACH	2	\$686.99	\$1,373.98								
67	2504.602	12" GATE VALVE & BOX	EACH	6	\$3,500.00	\$21,000.00								
68	2504.602	1" CURB STOP AND BOX	EACH	4	\$375.00	\$1,500.00								
69	2504.602	2" CURB STOP AND BOX	EACH	2	\$773.97	\$1,547.94								
70	2504.602	CONNECT TO EXISTING WATERMAIN	EACH	4	\$1,200.00	\$4,800.00								
71	2504.603	WATERMAIN SERVICE INSULATION	LIN FT	10	\$37.44	\$374.40								
72	2504.603	1" TYPE K COPPER PIPE	LIN FT	240	\$29.17	\$7,000.80								
73	2504.603	2" TYPE K COPPER PIPE	LIN FT	120	\$38.16	\$4,579.20								
74	2504.603	6" WATERMAIN DUCTILE IRON CL 52	LIN FT	50	\$41.00	\$2,050.00								
75	2504.603	8" WATERMAIN DUCTILE IRON CL 52	LIN FT	150	\$46.00	\$6,900.00								
76	2504.603	12" WATERMAIN DUCTILE IRON CL 52	LIN FT	2,900	\$55.00	\$159,500.00								
77	2506.501	CONST DRAINAGE STRUCTURE DES 48-4020	LIN FT	147.0	\$374.22	\$54,993.71	15	\$5,661			15	\$5,661	18	\$6,672
78	2506.501	CONST DRAINAGE STRUCTURE DES 60-4020	LIN FT	20.9	\$490.36	\$10,270.32	2	\$953			4	\$1,961	2	\$1,124
79	2506.501	CONST DRAINAGE STRUCTURE DES 72-4020	LIN FT	20.9	\$628.12	\$13,155.62	2	\$1,221			4	\$2,512	2	\$1,439
80	2506.502	CONST DRAINAGE STRUCTURE DES WATER	EACH	2	\$30,000.00	\$60,000.00	0	\$7,500					0	\$7,500
81	2506.516	CASTING ASSEMBLY (STORM)	EACH	34	\$800.00	\$27,200.00	4	\$2,800			4	\$2,800	4	\$3,300
82	2506.516	CASTING ASSEMBLY (SANITARY)	EACH	4	\$1,099.70	\$4,398.80								
83	2506.602	CONSTRUCT SANITARY SEWER MANHOLE	EACH	4	\$1,600.00	\$6,400.00								
84	2506.603	CONSTRUCT SANITARY SEWER MANHOLE (EXTRA DEPTH)	LIN FT		\$300.00									
				20.0		\$6,000.00								
85	2511.501	RANDOM RIPRAP CLASS III	CU YD	230	\$100.00	\$23,022.03	20	\$2,002			34	\$3,424	29	\$2,898
86	2511.515	GEOTEXTILE FILTER TYPE IV	SQ YD	153	\$5.00	\$767.40	13	\$67			23	\$114	19	\$97
87	2521.501	6-INCH CONCRETE WALK - PEDESTRIAN CURB RAMPS	SQ FT	800	\$7.98	\$6,384.00			160	\$1,277				
88	2521.501	4" CONCRETE WALK	SQ FT	21,350	\$5.00	\$106,750.00			2,750	\$13,750				
89	2521.501	PEDESTRIAN CURB RAMP	SQ FT	480	\$10.00	\$4,800.00			160	\$1,600				
90	2521.605	3.0" BITUMINOUS DRIVEWAY PAVEMENT	SQ YD	67	\$35.00	\$2,333.33			22	\$778				

LINE NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL PROJECT QUANTITIES	UNIT COST	TOTAL ESTIMATED COST	LOCAL							
							SPRING CREEK ROAD (SEGMENT 1)		SPRING CREEK ROAD (SEGMENT 2)				SPRING CREEK ROAD (SEGMENT 3)	
							STORM SEWER ⁽¹⁾		STREET		STORM SEWER		STORM SEWER ⁽¹⁾	
							EST	COST	EST	COST	EST	COST	EST	COST
91	2531.501	CONCRETE CURB AND GUTTER, DESIGN B618	LIN FT		\$11.00									
				8,740		\$96,140.00			1,300	\$14,300				
92	2531.507	6-INCH CONCRETE DRIVEWAY PAVEMENT	SQ YD	67	\$46.65	\$3,110.00			22	\$1,037				
93	2531.618	TRUNCATED DOMES	SQ FT	120	\$44.64	\$5,356.80			24	\$1,071				
94	2531.618	TRUNCATED DOMES	SQ FT	72	\$50.00	\$3,600.00			24	\$1,200				
95	2540.602	SANITATY SEWER LOCATE BOX	EACH	4	\$100.00	\$400.00								
96	2563.601	TRAFFIC CONTROL	LS	1	\$15,000.00	\$15,000.00	0.01	\$113	0.13	\$1,950	0.02	\$300	0	\$150
97	2564.537	INSTALL SALVAGED SIGNS, TYPE "C"	EACH	6	\$103.55	\$621.30			2	\$207				
98	2564.602	FURNISH AND INSTALL SIGN PANELS, TYPE SPECIAL DESIGN A	EACH	9	\$232.96	\$2,096.64			3	\$699				
99	2564.602	FURNISH AND INSTALL SIGN PANELS, TYPE SPECIAL DESIGN B	EACH	6	\$258.86	\$1,553.16			2	\$518				
100	2571.502	DECIDUOUS TREE 2" CAL B&B	TREE	15	\$415.52	\$6,232.80			5	\$2,078				
101	2571.541	TRANSPLANT TREE (SPADE SIZE 66")	TREE	3	\$500.00	\$1,500.00			1	\$500				
102	2571.541	TRANSPLANT TREE (SPADE SIZE 92")	TREE	3	\$500.00	\$1,500.00			1	\$500				
103	2573.502	SILT FENCE, TYPE HEAVY DUTY	LIN FT	7,113	\$3.00	\$21,337.50			813	\$2,438				
104	2573.502	SILT FENCE - STANDARD MACHINE SLICED	LIN FT	8,740	\$2.25	\$19,665.00			1,300	\$2,925				
105	2573.530	INLET PROTECTION - TYPE A	EACH	7	\$109.75	\$768.25								
106	2573.530	INLET PROTECTION - TYPE B	EACH	7	\$109.75	\$768.25								
107	2574.508	COMMERCIAL FERTILIZER, ANALYSIS 12-0-12	LB	1,756	\$1.19	\$2,089.19			261	\$311				
108	2574.508	FERTILIZER TYPE 2, ANALYSIS 22-0-10	LBS	421	\$1.00	\$421.35			63	\$63				
109	2574.525	TOPSOIL BORROW (LV)	CU YD	1,597	\$26.58	\$42,448.26			237	\$6,299				
110	2574.525	TOPSOIL BORROW (LV)	CU YD	647	\$25.00	\$16,185.19			96	\$2,407				
111	2575.501	SEEDING	ACRE	1.20	\$500.00	\$601.93			0.18	\$90				
112	2575.505	SODDING, TYPE LAWN	SQ YD	9,579	\$2.12	\$20,307.48			1,422	\$3,015				
113	2575.525	EROSION CONTROL BLANKET, CATEGORY 3	SQ YD	24,278	\$2.50	\$60,694.44			3,611	\$9,028				
114	2575.601	EROSION CONTROL	LS	1	\$10,561.25	\$10,561.25			0.17	\$1,795				
115	2575.605	HYDROSEEDING	ACRE	5	\$5,011.42	\$25,137.63			0.75	\$3,739				
116	2575.608	SEED, MIXTURE 270	LBS	181	\$3.25	\$586.88			27	\$87				
117	2575.609	HYDRAULIC SOIL STABILIZER, TYPE 6	TON	1.81	\$2,500.00	\$4,514.46			0.3	\$671				
118	2582.502	4" SOLID LINE WHITE - PAINT	LIN FT	8,740	\$0.90	\$7,866.00			1,300	\$1,170				
119	2582.502	24" STOP LINE - PAINT	LIN FT	20	\$4.91	\$98.20								
120	2582.502	24" STOP LINE - EPOXY	LIN FT	20	\$10.62	\$212.40								
121	2582.502	4" SOLID LINE WHITE-EPOXY	LIN FT	8,740	\$4.00	\$34,960.00			1,300	\$5,200				
122	2582.502	4" DOUBLE SOLID LINE YELLOW-EPOXY	LIN FT	4,370	\$2.50	\$10,925.00			650	\$1,625				
123	2582.503	CROSSWALK MARKING-PAINT	SQ FT	180	\$10.00	\$1,800.00								
124	2582.503	CROSSWALK MARKING-EPOXY	SQ FT	180	\$10.00	\$1,800.00								

OPINION OF PROBABLE COST - URBAN SECTION

SUBTOTAL ESTIMATED CONSTRUCTION COST	\$2,802,021	\$39,772	\$300,069	\$55,449	\$54,782
10% CONTINGENCY	\$280,202	\$3,977	\$30,007	\$5,545	\$5,478
TOTAL ESTIMATED CONSTRUCTION COST	\$3,082,223	\$43,749	\$330,076	\$60,994	\$60,260
15% LEGAL, ADMINISTRATIVE, ENGINEERING	\$462,333	\$6,562	\$49,511	\$9,149	\$9,039
TOTAL PROJECT COST	\$3,544,557	\$50,311	\$379,588	\$70,143	\$69,299

OPINION OF PROBABLE COST - RURAL SECTION

LESS TOTAL ESTIMATED CONSTRUCTION COST DEDUCT - RURAL SECTION	(\$285,116)	(\$2,820)	(\$33,221)	(\$2,820)	(\$3,324)
TOTAL ESTIMATED CONSTRUCTION COST - RURAL SECTION	\$2,797,107	\$40,928	\$296,855	\$58,174	\$56,936
15% LEGAL, ADMINISTRATIVE, ENGINEERING - RURAL SECTION	\$419,566	\$6,139	\$44,528	\$8,726	\$8,540
TOTAL PROJECT COST - RURAL SECTION	\$3,216,673	\$47,068	\$341,383	\$66,900	\$65,476

Notes:
(1) - Quantities assume a MnDOT State Aid 75% participation rate



NORTHFIELD, MINNESOTA
SPRING CREEK ROAD RECONSTRUCTION
CITY PROJECT NO. STRT2018-A38
SEH NO. NFIEL 143657
Opinion of Probable Cost
Date: October 31, 2017
Revised Date: November 28, 2017 ; December 22, 2017
P:\KO\N\Nfiel\143657\4-prelim-dsgn-rpts\43.54-Qtys Costs\Opinion Cost & Quantities Report Spring Creek.xlsxOpinion Cost

LINE NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL PROJECT QUANTITIES	UNIT COST	TOTAL ESTIMATED COST	LOCAL			
							SPRING CREEK ROAD (SEGMENTS 1, 2 & 3)			
							WATER MAIN		SANITARY SEWER	
							EST	COST	EST	COST
1	2021.501	MOBILIZATION	LS	1	\$123,000.00	\$123,000.00	0.12	\$14,760	0.04	\$4,920
2	2101.502	CLEARING	TREE	120	\$216.96	\$26,035.20				
3	2101.507	GRUBBING	TREE	120	\$127.87	\$15,344.40				
4	2101.603	ROOT CUTTING	LS	1	\$500.00	\$500.00				
5	2101.604	CLEAR AND GRUB BRUSH	SQ YD	1,556	\$12.94	\$20,128.89				
6	2101.610	TREE TRIMMING	HOURL	10	\$190.00	\$1,900.00				
7	2104.501	REMOVE PIPE STORM SEWER	LIN FT	80	\$9.89	\$791.20				
8	2104.501	REMOVE WATER MAIN	LIN FT	20	\$5.25	\$105.00	20	\$105		
9	2104.505	REMOVE CONCRETE DRIVEWAY APRON	SQ YD	67	\$6.41	\$427.33				
10	2104.505	REMOVE CONCRETE DRIVEWAY PAVEMENT	SQ YD	67	\$6.41	\$427.33				
11	2104.505	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	SQ YD	67	\$3.81	\$254.00				
12	2104.505	REMOVE BITUMINOUS PAVEMENT	SQ YD	1,467	\$2.00	\$2,933.33				
13	2104.509	REMOVE SIGN	EACH	15	\$50.00	\$750.00				
14	2104.509	REMOVE DRAINAGE STRUCTURE	EACH	4	\$452.55	\$1,810.20				
15	2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LIN FT	150	\$3.08	\$462.00				
16	2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	150	\$2.01	\$301.50				
17	2104.523	SALVAGE SIGNS - TYPE SPECIAL	EACH	12	\$25.88	\$310.56				
18	2104.523	SALVAGE SIGN, TYPE "C"	EACH	12	\$25.88	\$310.56				
19	2104.523	SALVAGE CASTING	EACH	4	\$52.20	\$208.80				
20	2104.603	RELOCATE SPRINKLER SYSTEM	LIN FT	300	\$18.00	\$5,400.00				
21	2104.603	RELOCATE PET CONTAINMENT SYSTEM	LIN FT	300	\$18.00	\$5,400.00				
22	2105.501	COMMON EXCAVATION (EV)(P)	CU YD	16,173	\$12.97	\$209,768.13				
23	2105.501	COMMON EXCAVATION - TRAIL (EV) (P)	CU YD	3,108	\$23.00	\$71,481.02				
24	2105.503	ROCK EXCAVATION	CU YD	100	\$125.00	\$12,500.00	67	\$8,333	33	\$4,167
25	2105.507	SUBGRADE EXCAVATION	CU YD	681	\$1.19	\$810.39				
26	2105.507	SUBGRADE EXCAVATION (EV)	CU YD	311	\$28.00	\$8,702.04				
27	2105.522	SELECT GRANULAR BORROW (CV)(Xtra Subcut)	CU YD	681	\$15.00	\$10,215.00				
28	2105.522	SELECT GRANULAR BORROW (CV)(Xtra Trail Subcut)	CU YD	311	\$15.00	\$4,661.81				
29	2105.523	COMMON BORROW (CV)(P)	CU YD	14,798	\$3.50	\$51,793.52				
30	2105.543	STABILIZING AGGREGATE	TON	60	\$38.38	\$2,302.80				
31	2105.602	POTHOLE EXISTING UTILITIES	EACH	3	\$440.93	\$1,322.79				
32	2106.511	EXCAVATION - CHANNEL AND POND	CU YD	7,481	\$6.00	\$44,888.89				
33	2111.501	TEST ROLLING	LIN FT	4,370	\$2.00	\$8,740.00				
34	2111.501	TEST ROLLING	LIN FT	4,370	\$0.90	\$3,933.00				
35	2112.604	SUBGRADE PREPARATION	SQ YD	5,827	\$1.50	\$8,740.00				
36	2123.501	COMMON LABORERS	HOURL	60	\$67.13	\$4,027.80				
37	2123.507	3.0 CU YD SHOVEL	HOURL	60	\$164.48	\$9,868.80				
38	2123.610	STREET SWEEPER (WITH PICKUP BROOM)	HOURL	36	\$126.55	\$4,555.80				
39	2130.501	WATER FOR DUST CONTROL	M GALS	45	\$25.37	\$1,141.65				
40	2130.501	WATER FOR DUST CONTROL / SEED	M GALS	60	\$25.00	\$1,500.00				

LINE NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL PROJECT QUANTITIES	UNIT COST	TOTAL ESTIMATED COST	LOCAL			
							SPRING CREEK ROAD (SEGMENTS 1, 2 & 3)			
							WATER MAIN		SANITARY SEWER	
							EST	COST	EST	COST
41	2211.501	AGGREGATE BASE, CLASS 5	TON	16,441	\$13.14	\$216,034.74				
42	2211.501	AGGREGATE BASE, CLASS 5	TON	1,973	\$15.00	\$29,591.10				
43	2357.502	BITUMINOUS MATERIAL FOR TACK COAT	GALS	988	\$2.96	\$2,924.48				
44	2360.501	TYPE SP 12.5 WEARING COURSE MIX (4,F)	TON	3,409	\$80.00	\$272,717.13				
45	2360.501	TYPE SP 12.5 NON WEARING COURSE MIX (4,B)	TON	3,409	\$75.00	\$255,672.31				
46	2360.501	TYPE SPWEB230B WEARING COURSE MIXTURE,	TON	900	\$68.00	\$61,217.57				
47	2411.618	MODULAR BLOCK RETAINING WALL	SQ FT	600	\$46.93	\$28,158.00				
48	2451.607	REPLACEMENT BACKFILL (Mn/DOT 3149.2D) (CV)	CU YD	90	\$20.49	\$1,844.10				
49	2501.567	21-INCH RC SAFETY APRON & GRATE DES 3128	EACH	4	\$1,200.00	\$4,800.00				
50	2503.541	12-INCH RC PIPE SEWER, DESIGN 3006, CLASS V	LIN FT	944	\$37.00	\$34,936.22				
51	2503.541	15-INCH RC PIPE SEWER, DESIGN 3006, CLASS V	LIN FT	1,600	\$39.00	\$62,400.00				
52	2503.541	18-INCH RC PIPE SEWER, DESIGN 3006, CLASS V	LIN FT	900	\$41.00	\$36,900.00				
53	2503.541	21-INCH RC PIPE SEWER, DESIGN 3006, CLASS III	LIN FT	900	\$45.00	\$40,500.00				
54	2503.602	CONNECT TO EXISTING STORM SEWER	EACH	2	\$715.41	\$1,430.82				
55	2503.602	CONNECT TO EXISTING MANHOLE (SAN)	EACH	3	\$1,000.00	\$3,000.00			3	\$3,000
56	2503.602	8" x 4" PVC WYE, SCHEDULE 40	EACH	2	\$196.26	\$392.52			2	\$393
57	2503.602	8" x 6" PVC WYE, SCHEDULE 40	EACH	1	\$247.33	\$247.33			1	\$247
58	2503.603	8" PVC PIPE SEWER (SANITARY SDR 35)	LIN FT	1,575	\$35.00	\$55,125.00			1,575	\$55,125
59	2503.603	4" PVC SANITARY SERVICE PIPE (SCH 40)	LIN FT	80	\$33.28	\$2,662.40			80	\$2,662
60	2503.603	6" PVC SANITARY SERVICE PIPE (SCH 40)	LIN FT	40	\$30.62	\$1,224.80			40	\$1,225
62	2503.608	DUCTILE IRON FITTINGS	LBS	2,175	\$7.50	\$16,312.50	2,175	\$16,313		
63	2504.602	ADJUST GATE VALVE BOX	EACH	4	\$325.64	\$1,302.56				
64	2504.602	INSTALL HYDRANT, GATE VALVE AND 6-INCH DIP	EACH	6	\$7,484.51	\$44,907.06	6	\$44,907		
65	2504.602	1" CORPORATION STOP	EACH	4	\$350.00	\$1,400.00	4	\$1,400		
66	2504.602	2" CORPORATION STOP	EACH	2	\$686.99	\$1,373.98	2	\$1,374		
67	2504.602	12" GATE VALVE & BOX	EACH	6	\$3,500.00	\$21,000.00	6	\$21,000		
68	2504.602	1" CURB STOP AND BOX	EACH	4	\$375.00	\$1,500.00	4	\$1,500		
69	2504.602	2" CURB STOP AND BOX	EACH	2	\$773.97	\$1,547.94	2	\$1,548		
70	2504.602	CONNECT TO EXISTING WATERMAIN	EACH	4	\$1,200.00	\$4,800.00	4	\$4,800		
71	2504.603	WATERMAIN SERVICE INSULATION	LIN FT	10	\$37.44	\$374.40	10	\$374		
72	2504.603	1" TYPE K COPPER PIPE	LIN FT	240	\$29.17	\$7,000.80	240	\$7,001		
73	2504.603	2" TYPE K COPPER PIPE	LIN FT	120	\$38.16	\$4,579.20	120	\$4,579		
74	2504.603	6" WATERMAIN DUCTILE IRON CL 52	LIN FT	50	\$41.00	\$2,050.00	50	\$2,050		
75	2504.603	8" WATERMAIN DUCTILE IRON CL 52	LIN FT	150	\$46.00	\$6,900.00	150	\$6,900		
76	2504.603	12" WATERMAIN DUCTILE IRON CL 52	LIN FT	2,900	\$55.00	\$159,500.00	2,900	\$159,500		
77	2506.501	CONST DRAINAGE STRUCTURE DES 48-4020	LIN FT	147.0	\$374.22	\$54,993.71				
78	2506.501	CONST DRAINAGE STRUCTURE DES 60-4020	LIN FT	20.9	\$490.36	\$10,270.32				
79	2506.501	CONST DRAINAGE STRUCTURE DES 72-4020	LIN FT	20.9	\$628.12	\$13,155.62				
80	2506.502	CONST DRAINAGE STRUCTURE DES WATER	EACH	2	\$30,000.00	\$60,000.00				
81	2506.516	CASTING ASSEMBLY (STORM)	EACH	34	\$800.00	\$27,200.00				
82	2506.516	CASTING ASSEMBLY (SANITARY)	EACH	4	\$1,099.70	\$4,398.80			4	\$4,399
83	2506.602	CONSTRUCT SANITARY SEWER MANHOLE	EACH	4	\$1,600.00	\$6,400.00			4	\$6,400
84	2506.603	CONSTRUCT SANITARY SEWER MANHOLE (EXTRA DEPTH)	LIN FT	20.0	\$300.00	\$6,000.00			20	\$6,000
85	2511.501	RANDOM RIPRAP CLASS III	CU YD	230	\$100.00	\$23,022.03				
86	2511.515	GEOTEXTILE FILTER TYPE IV	SQ YD	153	\$5.00	\$767.40				
87	2521.501	6-INCH CONCRETE WALK - PEDESTRIAN CURB RAMPS	SQ FT	800	\$7.98	\$6,384.00				
88	2521.501	4" CONCRETE WALK	SQ FT	21,350	\$5.00	\$106,750.00				
89	2521.501	PEDESTRIAN CURB RAMP	SQ FT	480	\$10.00	\$4,800.00				
90	2521.605	3.0" BITUMINOUS DRIVEWAY PAVEMENT	SQ YD	67	\$35.00	\$2,333.33				

LINE NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL PROJECT QUANTITIES	UNIT COST	TOTAL ESTIMATED COST	LOCAL			
							SPRING CREEK ROAD (SEGMENTS 1, 2 & 3)			
							WATER MAIN		SANITARY SEWER	
							EST	COST	EST	COST
91	2531.501	CONCRETE CURB AND GUTTER, DESIGN B618	LIN FT							
				8,740	\$11.00	\$96,140.00				
92	2531.507	6-INCH CONCRETE DRIVEWAY PAVEMENT	SQ YD	67	\$46.65	\$3,110.00				
93	2531.618	TRUNCATED DOMES	SQ FT	120	\$44.64	\$5,356.80				
94	2531.618	TRUNCATED DOMES	SQ FT	72	\$50.00	\$3,600.00				
95	2540.602	SANITATY SEWER LOCATE BOX	EACH	4	\$100.00	\$400.00			4	\$400
96	2563.601	TRAFFIC CONTROL	LS	1	\$15,000.00	\$15,000.00	0.12	\$1,800	0.04	\$600
97	2564.537	INSTALL SALVAGED SIGNS, TYPE "C"	EACH	6	\$103.55	\$621.30				
98	2564.602	FURNISH AND INSTALL SIGN PANELS, TYPE SPECIAL DESIGN A	EACH	9	\$232.96	\$2,096.64				
99	2564.602	FURNISH AND INSTALL SIGN PANELS, TYPE SPECIAL DESIGN B	EACH	6	\$258.86	\$1,553.16				
100	2571.502	DECIDUOUS TREE 2" CAL B&B	TREE	15	\$415.52	\$6,232.80				
101	2571.541	TRANSPLANT TREE (SPADE SIZE 66")	TREE	3	\$500.00	\$1,500.00				
102	2571.541	TRANSPLANT TREE (SPADE SIZE 92")	TREE	3	\$500.00	\$1,500.00				
103	2573.502	SILT FENCE, TYPE HEAVY DUTY	LIN FT	7,113	\$3.00	\$21,337.50				
104	2573.502	SILT FENCE - STANDARD MACHINE SLICED	LIN FT	8,740	\$2.25	\$19,665.00				
105	2573.530	INLET PROTECTION - TYPE A	EACH	7	\$109.75	\$768.25				
106	2573.530	INLET PROTECTION - TYPE B	EACH	7	\$109.75	\$768.25				
107	2574.508	COMMERCIAL FERTILIZER, ANALYSIS 12-0-12	LB	1,756	\$1.19	\$2,089.19				
108	2574.508	FERTILIZER TYPE 2, ANALYSIS 22-0-10	LBS	421	\$1.00	\$421.35				
109	2574.525	TOPSOIL BORROW (LV)	CU YD	1,597	\$26.58	\$42,448.26				
110	2574.525	TOPSOIL BORROW (LV)	CU YD	647	\$25.00	\$16,185.19				
111	2575.501	SEEDING	ACRE	1.20	\$500.00	\$601.93				
112	2575.505	SODDING, TYPE LAWN	SQ YD	9,579	\$2.12	\$20,307.48				
113	2575.525	EROSION CONTROL BLANKET, CATEGORY 3	SQ YD	24,278	\$2.50	\$60,694.44				
114	2575.601	EROSION CONTROL	LS	1	\$10,561.25	\$10,561.25				
115	2575.605	HYDROSEEDING	ACRE	5	\$5,011.42	\$25,137.63				
116	2575.608	SEED, MIXTURE 270	LBS	181	\$3.25	\$586.88				
117	2575.609	HYDRAULIC SOIL STABILIZER, TYPE 6	TON	1.81	\$2,500.00	\$4,514.46				
118	2582.502	4" SOLID LINE WHITE - PAINT	LIN FT	8,740	\$0.90	\$7,866.00				
119	2582.502	24" STOP LINE - PAINT	LIN FT	20	\$4.91	\$98.20				
120	2582.502	24" STOP LINE - EPOXY	LIN FT	20	\$10.62	\$212.40				
121	2582.502	4" SOLID LINE WHITE-EPOXY	LIN FT	8,740	\$4.00	\$34,960.00				
122	2582.502	4" DOUBLE SOLID LINE YELLOW-EPOXY	LIN FT	4,370	\$2.50	\$10,925.00				
123	2582.503	CROSSWALK MARKING-PAINT	SQ FT	180	\$10.00	\$1,800.00				
124	2582.503	CROSSWALK MARKING-EPOXY	SQ FT	180	\$10.00	\$1,800.00				

OPINION OF PROBABLE COST - URBAN SECTION

SUBTOTAL ESTIMATED CONSTRUCTION COST	\$2,802,021	\$298,850	\$89,538
10% CONTINGENCY	\$280,202	\$29,885	\$8,954
TOTAL ESTIMATED CONSTRUCTION COST	\$3,082,223	\$328,735	\$98,491
15% LEGAL, ADMINISTRATIVE, ENGINEERING	\$462,333	\$49,310	\$14,774
TOTAL PROJECT COST	\$3,544,557	\$378,045	\$113,265

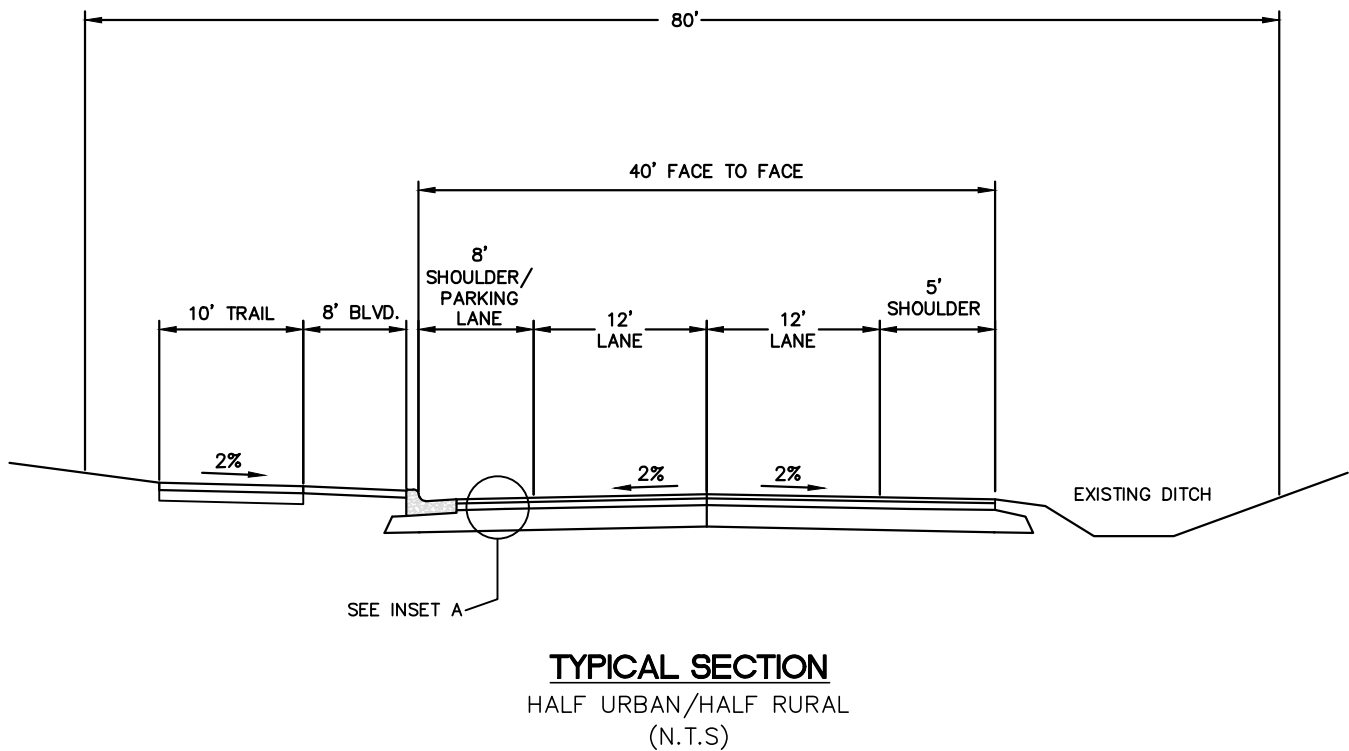
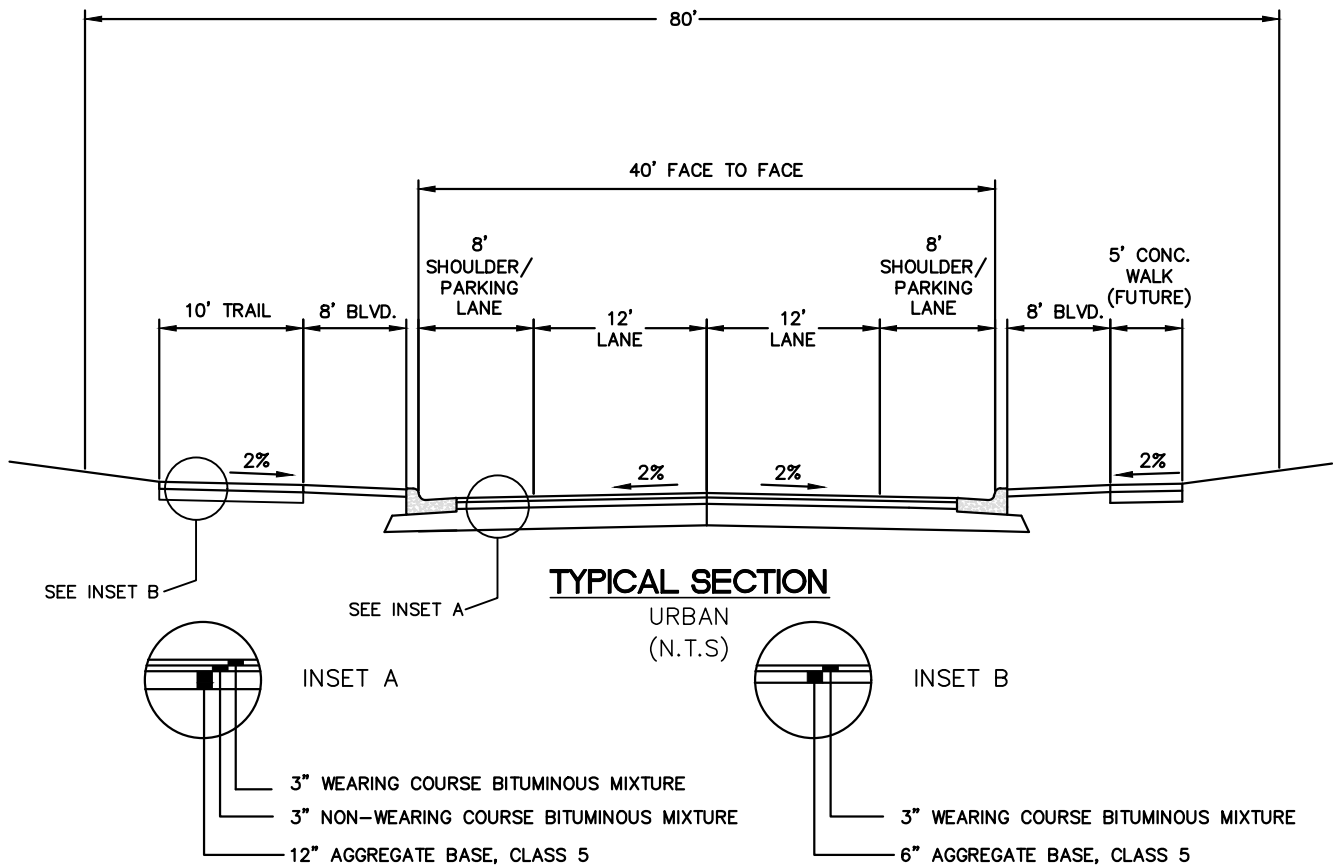
OPINION OF PROBABLE COST - RURAL SECTION

LESS TOTAL ESTIMATED CONSTRUCTION COST DEDUCT - RURAL SECTION	(\$285,116)		
TOTAL ESTIMATED CONSTRUCTION COST - RURAL SECTION	\$2,797,107	\$328,735	\$98,491
15% LEGAL, ADMINISTRATIVE, ENGINEERING - RURAL SECTION	\$419,566	\$49,310	\$14,774
TOTAL PROJECT COST - RURAL SECTION	\$3,216,673	\$378,045	\$113,265

Notes:
(1) - Quantities assume a MnDOT State Aid 75% participation rate

Appendix D

Proposed Typical Sections



**SPRING CREEK ROAD
RECONSTRUCTION PROJECT
TYPICAL SECTION**

DATE:
10/26/17

FIGURE
D1

Appendix E

Soil Borings

Soil Borings, Pavement Coring, and Laboratory Testing Report

2018 Northfield Street Improvement Projects
Northfield, Minnesota

Prepared for

Short Elliott Hendrickson, Inc.

Professional Certification:

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

Brian J. Schreurs, PE
Project Engineer
License Number: 53147
October 6, 2017

Projects B1708653

Braun Intertec Corporation

October 6, 2017

Project B1708653

Luke Thompson, PE
Short Elliott Hendrickson, Inc.
3535 Vadnais Center Drive, Suite 200
St. Paul, MN 55110

Re: Soil Borings, Pavement Coring, and Laboratory Testing
2018 Northfield Street Improvement Projects
Northfield, Minnesota

Dear Mr. Thompson:

We have completed the soil borings, pavement coring, and laboratory testing requested by Short Elliott Hendrickson, Inc. (SEH) for the 2018 Northfield Street Improvement Projects located along various streets and parking lots in Northfield, Minnesota.

Scope of Services

Our work was completed in general accordance with our Proposal for Geotechnical Investigation and Laboratory Testing provided to SEH, dated August 28, 2017.

The 2018 Street Improvements will include two separate projects. The first project includes the Division Street and Seventh Street Reconstruction; Washington Street Mill and Overlay; and Various Parking Lot Rehabilitation Projects. The second project includes the Spring Creek Road Reconstruction Project.

For the first project, our scope of services included the following:

- Coordinating the clearing of public utilities.
- Performing six (6) standard penetration test (SPT) borings to nominal depths of about 6 to 15 feet beneath the surface.
- Performing nine (9) pavement cores and hand auger (HA) borings to aid in identifying pavement and aggregate base thickness and collect samples to observe material condition.

- Laboratory testing as requested by SEH.
- Preparation of this factual soil boring report.

For the second project, our scope of services included the following:

- Coordinating the clearing of public utilities.
- Performing four (4) SPT borings to nominal depths of about 6 to 20 feet.
- Performing one (1) pavement core and HA borings to aid in identifying pavement and aggregate base thickness and collect samples to observe material condition.
- Laboratory testing as requested by SEH.
- Preparation of this factual soil boring report.

Documents Provided

SEH provided us with maps titled “2018 Reconstruction Project” for the various street and parking lot projects with dates ranging from May 6, 2017 to July 14, 2017. The maps provide the approximate exploration locations selected by SEH for the boring and pavement core/HA borings completed for this report. A copy of each map is attached to this report.

Boring Locations and Elevations

The exploration locations were identified as ST-1 through ST-10 for the SPT borings and C-1 through C-10 for the pavement core/HA borings. The borings and pavement cores were performed at the approximate locations shown on the attached maps. The exploration locations were selected and staked by SEH. Ground surface elevations and coordinates at the exploration locations were surveyed by SEH.

Drilling and Sampling

Standard Penetration Test Borings

The SPT borings were drilled with a truck-mounted core and auger drill rig equipped with 3 1/4-inch diameter hollow-stem auger in accordance with ASTM D 1586. A coring machine was utilized when needed to penetrate underlying concrete pavements.

During drilling, penetration test samples were generally taken at 2 1/2-foot and 5-foot intervals to the termination depth of the borings. A 140-pound automatic hammer was used for the penetration tests. Actual sample intervals and corresponding depths are shown on the boring logs.

Subgrade Soil Samples

Subgrade soil samples were collected from SPT Borings ST-1 through ST-4 from the auger cuttings and placed in sampled bags and returned to our laboratory as requested by SEH.

Pavement Coring

At each noted coring location, we cored through the existing bituminous pavement, then hand augered through the aggregate base materials to measure its thickness. Where possible, samples of the subgrade soils beneath the pavement section were also obtained for limited laboratory testing. Representative samples of each soil strata were taken and sealed in jars and were returned to our office.

Sample Storage

Representative soil samples will remain in our Minneapolis office for a period of 60 days to be available for your examination.

Groundwater Observations and Borehole Abandonment

The drillers checked for groundwater as the SPT borings were advanced. The borings were typically checked again for the presence of groundwater after auger withdrawal. The boreholes were then backfilled with soil cuttings or bentonite grout after completion in accordance with Minnesota Department of Health regulations.

Log of Boring Sheets

Standard Penetration Test Boring Logs

Log of Boring sheets for our SPT borings are attached to this report. The logs identify and describe the geologic materials that were penetrated, present the results of penetration resistance tests, laboratory tests performed on penetration test samples, and groundwater measurements.

Strata boundaries were inferred from changes in the penetration test samples and/or the auger cuttings. The strata boundary depths are only approximate. The boundary depths likely vary away from the boring locations, and the boundaries themselves may also occur as gradual rather than abrupt transitions.

Pavement Coring

The thickness of the bituminous pavement, concrete pavement, and approximate thickness of aggregate base layers are recorded as observed on the attached boring logs and core results table.

Where discernible, we attempted to measure the in-place thickness of aggregate to the nearest 1/2 inch. These measurements were taken within the 3-inch diameter borehole. It can be difficult to identify strata boundaries, particularly between the aggregate base consisting of sand and gravel and the sand subbase or sandy subgrade soils and therefore should be considered approximate if used to determine mill and overlay thicknesses. Our results and pictures of the cores are provided in the Appendix of this report.

Soil Classification

The geologic materials encountered were visually and manually classified in accordance with ASTM Test Method D 2488. A chart explaining the classification system is attached.

Groundwater Fluctuations

Groundwater measurements were made under the conditions reported herein and shown on the exploration logs. It should be noted that the observation period was relatively short, and groundwater can be expected to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications, and other seasonal and annual factors.

Laboratory Testing

Laboratory testing was performed on samples recovered from the borings as requested by SEH. Laboratory testing performed included moisture content tests, organic content tests, Atterberg limits, mechanical sieve analysis (#200 sieve only and full sieve set), and R-Value tests. The tests were performed in accordance with ASTM and MnDOT procedures.

The test results are shown or noted on the right side of the Log of Boring sheets, across from the associated sample and on the attached grain size accumulation curves, Atterberg limits results sheet, and R-Value test result sheets.

Level of Care

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

General

We appreciate the opportunity to be of service to you on this project. If you have any questions regarding this report, please contact Brian Schreurs at 651.487.7055 or Josh Kirk at 952.995.2222.

Sincerely,

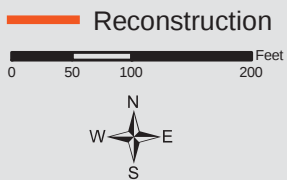
BRAUN INTERTEC CORPORATION

Brian J. Schreurs, PE
Project Engineer

Joshua L. Kirk, PE
Associate Principal – Senior Engineer

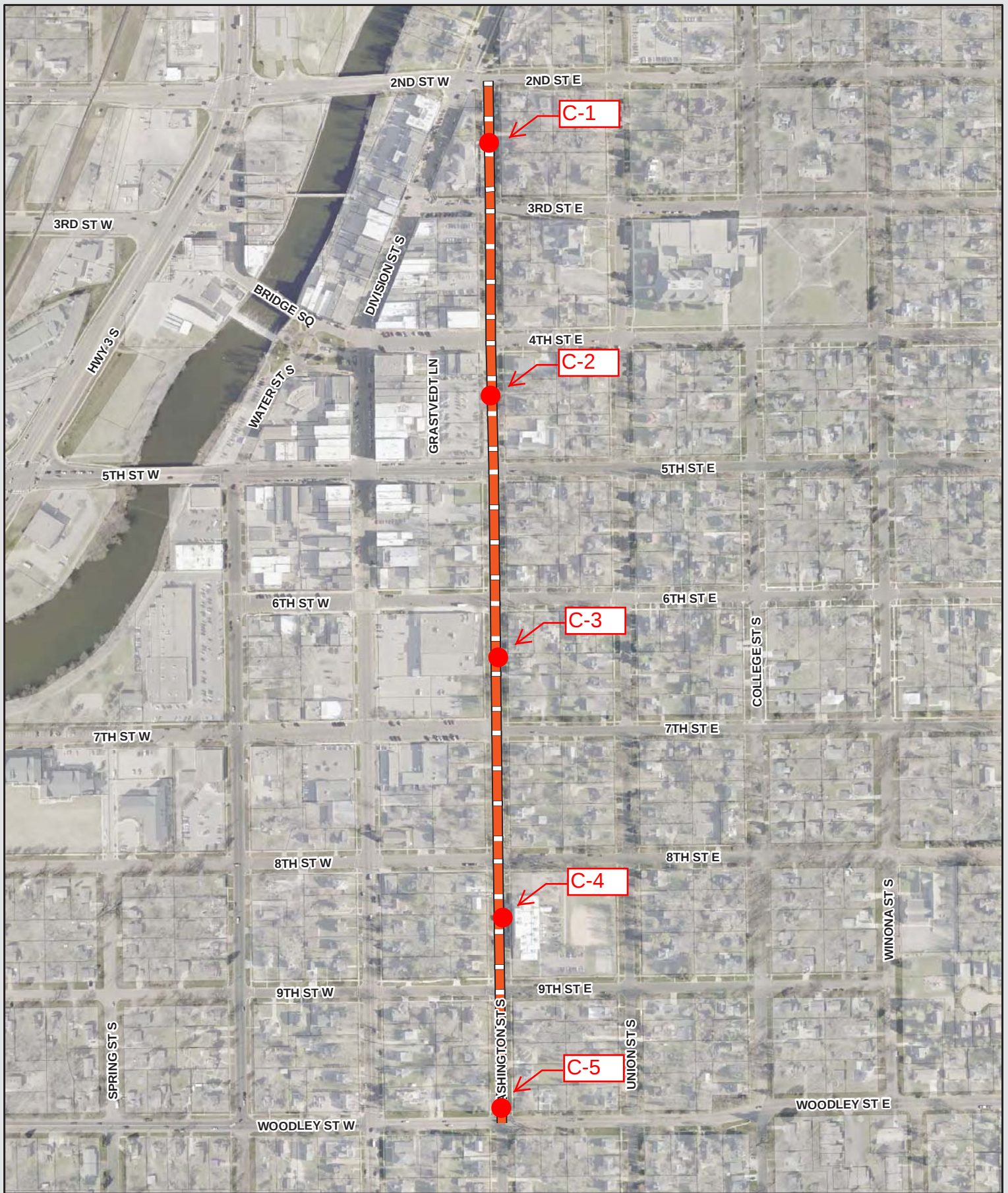
Attachments:

Boring Location Maps (4 sheets)
Log of Boring Sheets ST-1 through ST-10
Summary of Cores and Hand Augers
Grain Size Accumulation Curves (6 sheets)
Atterberg Limits Results (2 sheets)
Standard Proctor Curves (2 sheets)
R-Value Test Results (2 sheets)
Descriptive Terminology of Soil



2018 Reconstruction Project

Seventh St. and Division St.



 Mill and Overlay

0 100 200 400 Feet

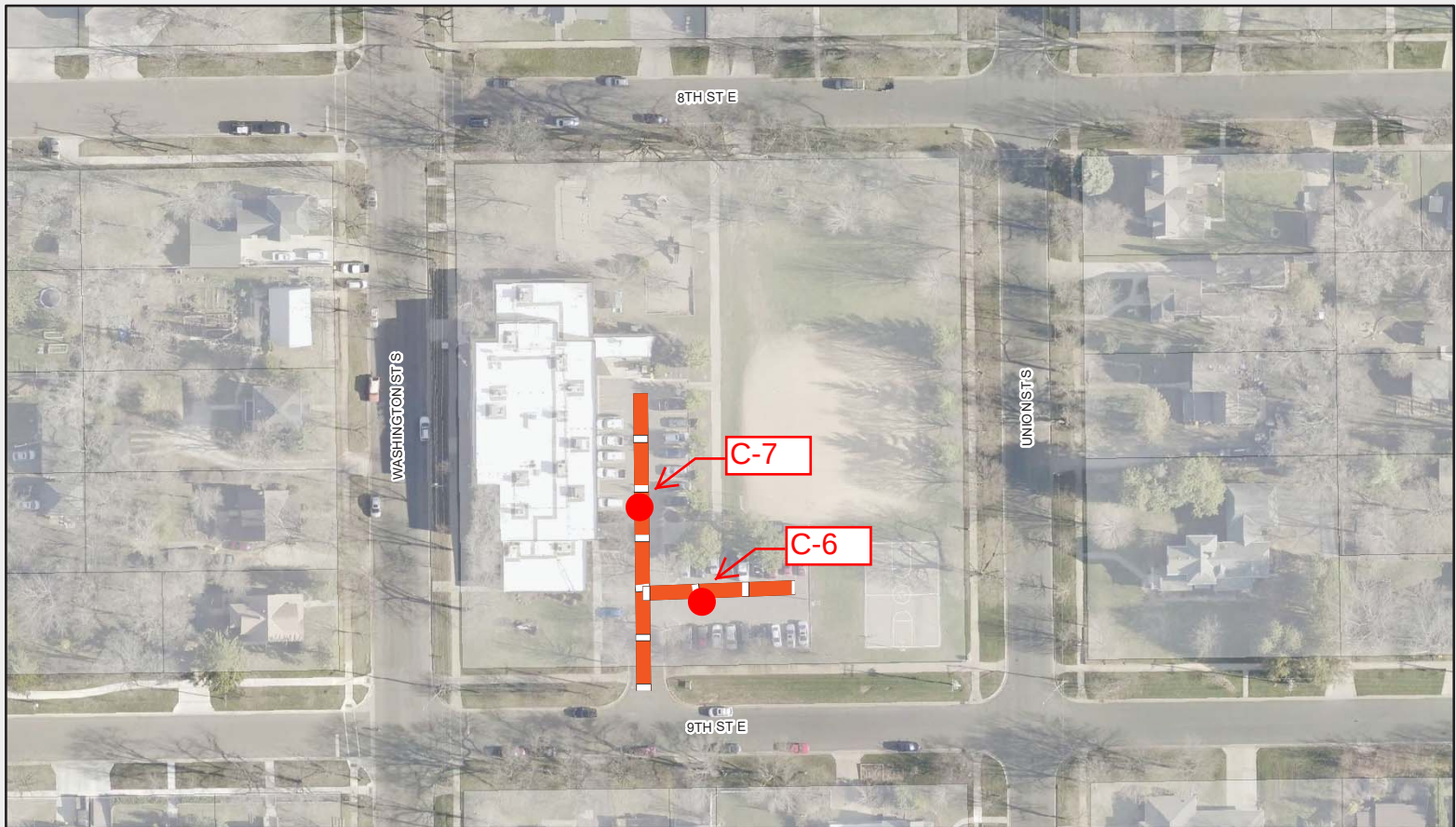
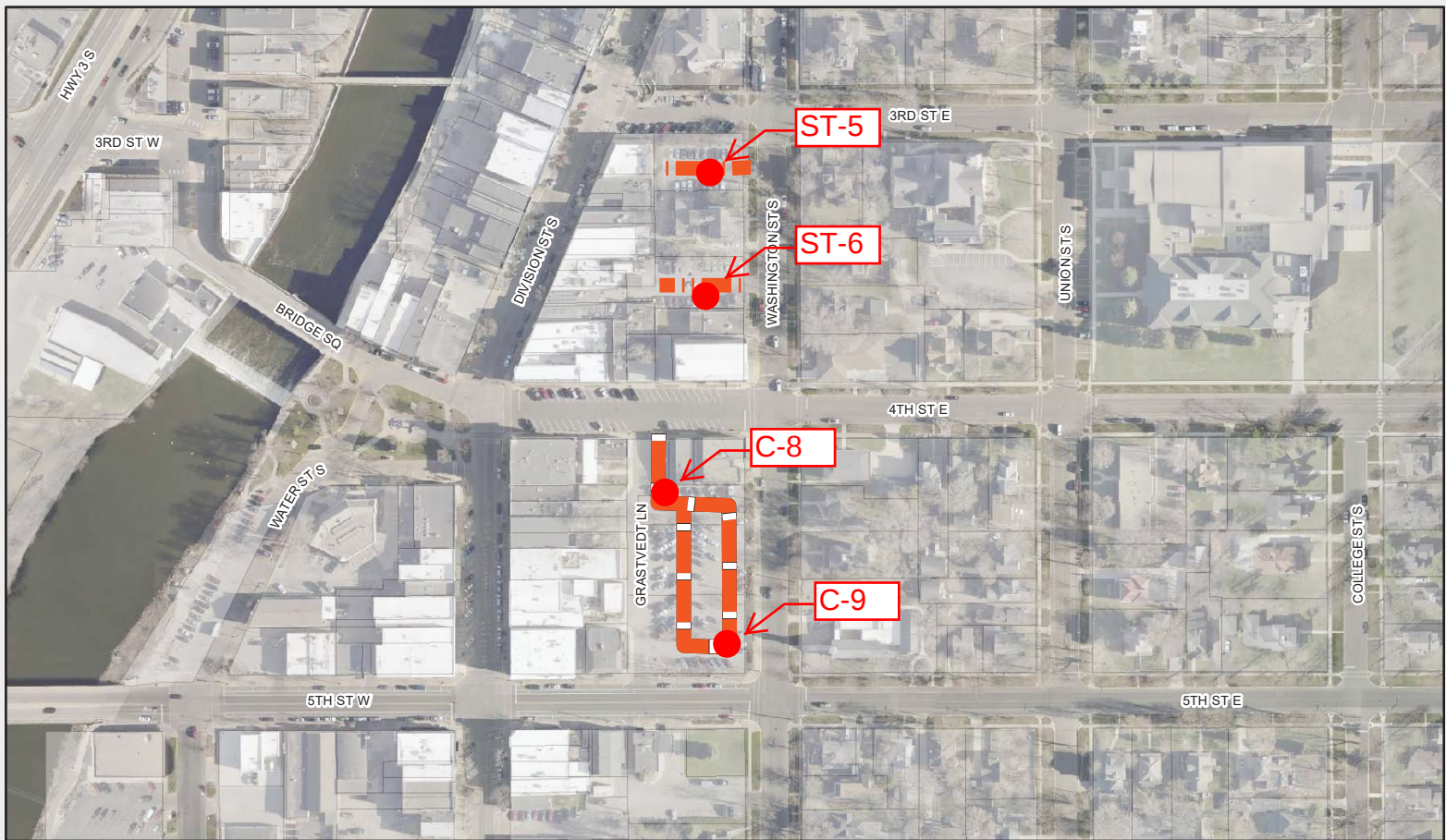


2018 Mill and Overlay Project

Washington Street



Engineering 6/7/2017



Mill and Overlay

Reclamation



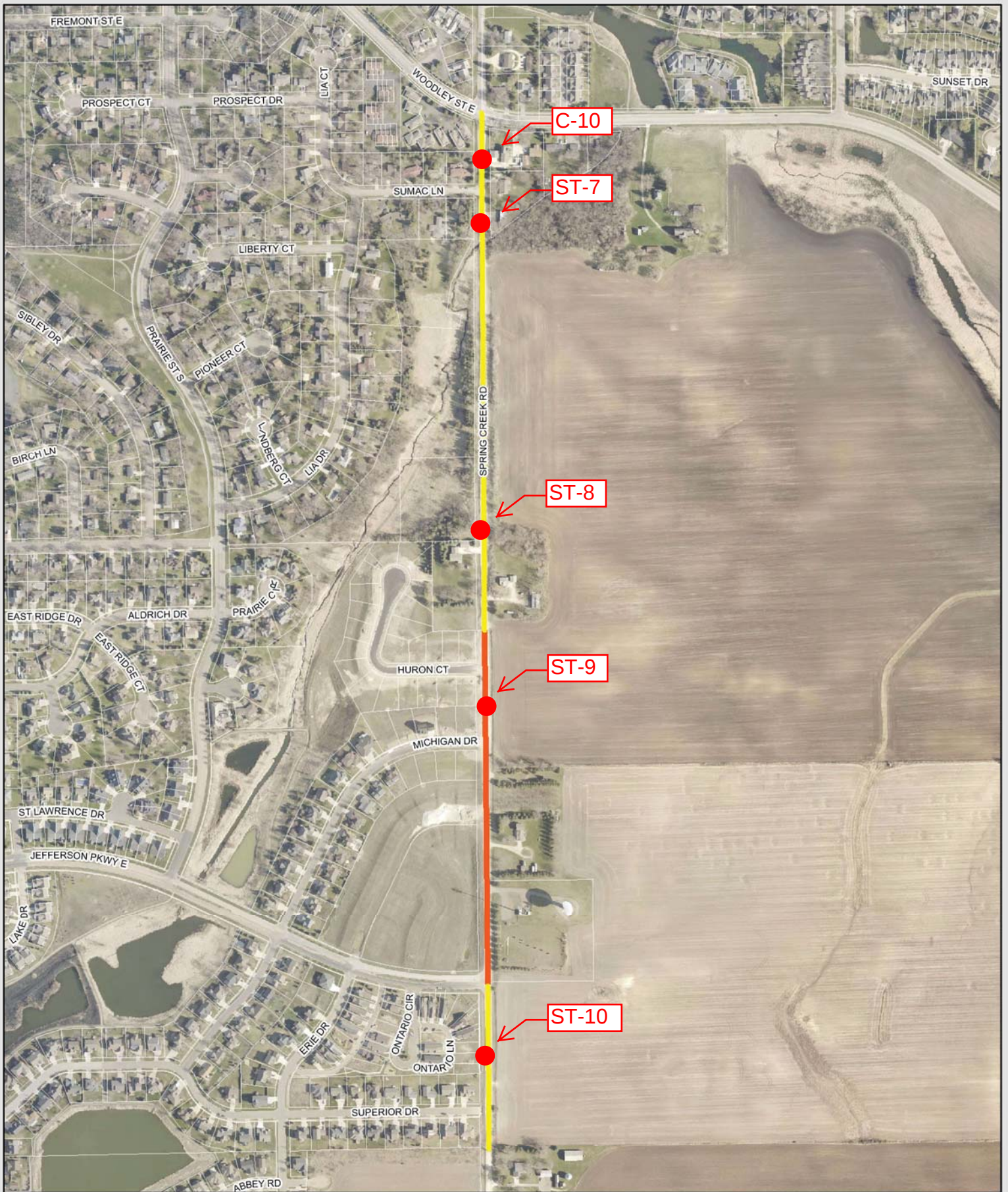
0 25 50 100 Feet

2018 Parking Lot Improvements

Washington St. #1 & #2, Fifth & Washington St., & City Hall

City Of
Northfield
Minnesota

Engineering 7/14/2017



2018 CIP Project Area
Additional Feasibility Area

0 150 300 600 Feet



2018 Reconstruction Project

Spring Creek Road

City Of
Northfield
Minnesota

Engineering 7/5/2017

Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: **ST-1**

LOCATION: See attached sketch.

DRILLER: C. McClain

METHOD: 3 1/4" HSA, Autohammer

DATE: **9/6/17**

SCALE: **1" = 4'**

Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	MC %	P200 %	Tests or Notes
0.0							
0.4	BIT	5 inches of bituminous.					
1.1	CONC	8 inches of concrete.					
	FILL	FILL: Well-Graded Gravel with Silt and Sand, fine- to coarse-grained, with Gravel, occasional Cobbles, brown, dry to moist.	55*				*Pushed rock.
6.0	SC	CLAYEY SAND, trace Gravel, brown, moist, rather stiff. (Glacial Till)	22*		2	10	*Sieve Analysis.
12.0			9		19	46	LL=34, PL=15, PI=19
14.5	SP-SM	POORLY GRADED SAND with SILT, fine- to coarse-grained, trace Gravel, brown, moist, medium dense. (Glacial Outwash)	24		2	9	Benchmark: Elevations were obtained using GPS and the State of Minnesota's permanent base station network.
		END OF BORING.					
		Water not observed while drilling.					
		Water not observed with 13 feet of hollow-stem auger in the ground.					
		Boring immediately backfilled.					

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING-DRAFT N:\GINT\PROJECTS\AX PROJECTS\2017\08653.GPJ BRAUN_V8_CURRENT.GDT 10/6/17 10:18

DRAFT

Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-2
LOCATION: See attached sketch.

DRILLER: C. McClain

METHOD: 3 1/4" HSA, Autohammer

DATE: 9/6/17

SCALE: 1" = 4'

Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	MC %	P200 %	Tests or Notes
0.0							
0.1	BIT	2 inches of bituminous.					
0.8	CONC	8 inches of concrete.					
	FILL	FILL: Silty Sand, fine- to medium-grained, trace Gravel, dark brown, moist.	16		4	13	R-value 1'-3': 37 See attached Proctor Curve.
6.0	FILL	FILL: Silty Sand, fine-grained, slightly organic, dark brown to brown, moist.	8		14	49	
			5				
12.0			3		13	38	OC=2%
	SP-SM	POORLY GRADED SAND with SILT, fine-grained, brown, moist, loose. (Glacial Outwash)	7				
14.5		END OF BORING.					
		Water not observed while drilling.					
		Water not observed with 13 feet of hollow-stem auger in the ground.					
		Water not observed to cave-in depth of 8 feet immediately after withdrawal of auger.					
		Boring immediately backfilled.					

(See Descriptive Terminology sheet for explanation of abbreviations)

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Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-3
LOCATION: See attached sketch.

DRILLER: C. McClain

METHOD: 3 1/4" HSA, Autohammer

DATE: 9/6/17

SCALE: 1" = 4'

Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	MC %	P200 %	Tests or Notes
0.0							
0.4	BIT	5 inches of bituminous.	*		5	11	*Sieve Analysis. **Apparent aggregate base classified as Silty Sand with Gravel.
1.3	AGG	10 inches of aggregate base.**					
	FILL	FILL: Well-Graded Sand with Silt, fine- to medium-grained, trace Gravel, occasional Cobbles, brown, moist.	17				
		Lenses of Silty Sand encountered at 5 feet.	9				
6.0	SP- SM	POORLY GRADED SAND with SILT, fine- to coarse-grained, with Gravel, occasional Cobbles, brown, moist, medium dense. (Glacial Outwash)	18		7	8	
			21				
12.0	SP- SM	POORLY GRADED SAND with SILT, fine- to medium-grained, trace Gravel, brown, moist, medium dense. (Glacial Outwash)	27				
14.5		END OF BORING.					
		Water not observed while drilling.					
		Water not observed with 13 feet of hollow-stem auger in the ground.					
		Water not observed to cave-in depth of 6 feet immediately after withdrawal of auger.					
		Boring immediately backfilled.					

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING-DRAFT N:\GINT\PROJECTS\AX PROJECTS\2017\08653.GPJ BRAUN_V8_CURRENT.GDT 10/6/17 10:18

Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-4
LOCATION: See attached sketch.

DRILLER: C. McClain

METHOD: 3 1/4" HSA, Autohammer

DATE: 9/6/17

SCALE: 1" = 4'

Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	MC %	P200 %	Tests or Notes
0.0							
0.4	BIT	5 inches of bituminous.	*		4	12	*Sieve Analysis. **Apparent aggregate base classified as Silty Sand with Gravel. R-value 1'-3': 45 See attached Proctor Curve.
1.4	AGG	12 inches of aggregate base.**					
2.5	FILL	FILL: Well-Graded Sand with Silt, fine- to medium-grained, trace Gravel, dark brown, moist.			8	24	
4.0	FILL	FILL: Clayey Sand, trace Gravel, dark brown, moist.	13				
6.0	FILL	FILL: Poorly Graded Sand with Silt, fine- to medium-grained, trace Gravel, brown, moist.	38				
		END OF BORING.					
		Water not observed while drilling.					
		Water not observed with 4 1/2 feet of hollow-stem auger in the ground.					
		Boring immediately backfilled.					

LOG OF BORING-DRAFT N:\GINT\PROJECTS\AX PROJECTS\2017\08653.GPJ BRAUN_V8_CURRENT.GDT 10/6/17 10:18

DRAFT

LOG OF BORING-DRAFT N:\GINT\PROJECTS\AX PROJECTS\2017\08653.GPJ BRAUN_V8_CURRENT.GDT 10/6/17 10:18
(See Descriptive Terminology sheet for explanation of abbreviations)

Braun Project B1708653 GEOTECHNICAL EVALUATION 2018 Street Improvements Northfield, Minnesota				BORING: ST-5 LOCATION: See attached sketch.	
DRILLER: C. McClain		METHOD: 3 1/4" HSA, Autohammer		DATE: 9/6/17	
				SCALE: 1" = 4'	

Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
0.0					
0.1	BIT	1 1/2 inches of bituminous.			
0.4	AGG	3 inches of aggregate base.*			
	FILL	FILL: Poorly Graded Sand with Silt, fine- to medium-grained, trace Gravel, with inclusions of Lean Clay with pieces of brick, brown, moist.	10		*Apparent aggregate base classified as Silty Sand with Gravel.
5.0					
6.0	FILL	FILL: Sandy Lean Clay, trace Gravel, with pieces of brick, dark brown, moist.	12		
		END OF BORING.			
		Water not observed while drilling.			
		Water not observed with 4 1/2 feet of hollow-stem auger in the ground.			
		Boring immediately backfilled.			

DRAFT

Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-6
LOCATION: See attached sketch.

DRILLER: C. McClain

METHOD: 3 1/4" HSA, Autohammer

DATE: 9/6/17

SCALE: 1" = 4'

Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	Tests or Notes
0.0					
0.2	BIT	2 inches of bituminous.			
0.8	AGG	10 inches of aggregate base.			
	FILL	FILL: Mixture of Silty Sand and Clayey Sand, fine- to medium-grained, trace Gravel, dark brown and brown, moist.	22		*Apparent aggregate base classified as Silty Sand with Gravel.
4.0	FILL	FILL: Silty Sand, fine- to medium-grained, trace Gravel, with occasional Cobble and concrete pieces, grayish brown, moist.	24		
6.0		END OF BORING.			
		Water not observed while drilling.			
		Water not observed with 4 1/2 feet of hollow-stem auger in the ground.			
		Boring immediately backfilled.			

DRAFT

LOG OF BORING-DRAFT N:\GINT\PROJECTS\AX PROJECTS\2017\08653.GPJ BRAUN_V8_CURRENT.GDT 10/6/17 10:18

Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-7
LOCATION: See attached sketch.

DRILLER: C. McClain

METHOD: 3 1/4" HSA, Autohammer

DATE: 9/6/17

SCALE: 1" = 4'

Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	MC %	P200 %	Tests or Notes
0.0							
0.3	BIT	3 1/2 inches of bituminous.	*		12	43	*Sieve Analysis.
0.5	AGG	3 inches of aggregate base.**					**Apparent
	FILL	FILL: Clayey Sand, trace Gravel, dark brown, moist.			10	37	aggregate base classified as Silty Sand with Gravel.
4.0			15				
	LS	LIMESTONE, tan, dry to moist, dense to very dense, sample retrieved as "Silty Sand (SM)" in split spoon sampler. (Shakopee Formation)	*				*50/6" (set)
			45				
10.0		END OF BORING - AUGER REFUSAL AT 10 FEET.	*				*50/5" (set)
		Water not observed while drilling.					
		Water not observed with 10 feet of hollow-stem auger in the ground.					
		Boring immediately backfilled.					

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING-DRAFT N:\GINT\PROJECTS\AX PROJECTS\2017\08653.GPJ BRAUN_V8_CURRENT.GDT 10/6/17 10:18

DRAFT

LOG OF BORING-DRAFT N:\GINT\PROJECTS\AX PROJECTS\2017\08653.GPJ BRAUN_V8_CURRENT.GDT 10/6/17 10:18
(See Descriptive Terminology sheet for explanation of abbreviations)

Braun Project B1708653 GEOTECHNICAL EVALUATION 2018 Street Improvements Northfield, Minnesota				BORING: ST-8 LOCATION: See attached sketch.			
DRILLER: C. McClain		METHOD: 3 1/4" HSA, Autohammer		DATE: 9/6/17		SCALE: 1" = 4'	
Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	MC %	P200 %	Tests or Notes
0.0							
0.7	AGG	8 inches of aggregate base.*			12	43	*Apparent aggregate base classified as Silty Sand with Gravel.
	FILL	FILL: Silty Sand, fine- to medium-grained, trace Gravel, with inclusions of Lean Clay, brown and dark brown, moist.	9		10	37	
6.0		END OF BORING. Water not observed while drilling. Water not observed with 4 1/2 feet of hollow-stem auger in the ground. Boring immediately backfilled.	12				

DRAFT

Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-9

LOCATION: Offset to east side of road. See attached sketch.

DRILLER: C. McClain

METHOD: 3 1/4" HSA, Autohammer

DATE: 9/6/17

SCALE: 1" = 4'

Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	MC %	P200 %	Tests or Notes
0.0							
0.7	AGG	8 inches of aggregate base.					*Apparent aggregate base classified as Silty Sand with Gravel. LL=26, PL=12, PI=14
	SC	CLAYEY SAND, trace Gravel, brown, moist, rather stiff. (Glacial Till)	9		10	42	
7.0			11				
	SM	SILTY SAND, fine- to medium-grained, trace Gravel, brown, moist, medium dense. (Glacial Till)	29				
9.0	SS	SANDSTONE, buff to white, dry to moist, medium dense to very dense, sample retrieved as "Poorly Graded Sand (SP)" in split spoon sampler. (St. Peter Formation)	18				*50/2" (set)
			50/4"				
			*				
19.8		END OF BORING	*				*50/4" (set)
		Water not observed while drilling.					
		Water not observed with 19 1/2 feet of hollow-stem auger in the ground.					
		Water not observed to cave-in depth of 17 feet immediately after withdrawal of auger.					
		Boring immediately backfilled with bentonite grout.					

LOG OF BORING-DRAFT N:\GINT\PROJECTS\AX PROJECTS\2017\08653.GPJ BRAUN_V8_CURRENT.GDT 10/6/17 10:18

Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-10

LOCATION: See attached sketch.

DRILLER: C. McClain

METHOD: 3 1/4" HSA, Autohammer

DATE: 9/6/17

SCALE: 1" = 4'

Depth feet	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	MC %	P200 %	Tests or Notes
0.0							
0.6	AGG	7 inches of aggregate base.*					*Apparent aggregate base classified as Silty Sand with Gravel.
	FILL	FILL: Sandy Lean Clay, with seams of Silty Sand, brown, moist.					
4.0			9		18	82	
	SC	CLAYEY SAND, trace Gravel, brown, moist, medium. (Glacial Till)					
6.0			7		12		LL=31, PL=12, PI=19
		END OF BORING.					
		Water not observed while drilling.					
		Water not observed with 4 1/2 feet of hollow-stem auger in the ground.					
		Boring immediately backfilled.					

DRAFT

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING-DRAFT N:\GINT\PROJECTS\AX PROJECTS\2017\08653.GPJ BRAUN_V8_CURRENT.GDT 10/6/17 10:18

Table 1. Summary of Cores and Hand Augers – 2018 Northfield Street Improvement Projects

Core Number	Bituminous Pavement Thickness (in)	Apparent Aggregate Base Thickness (in)	Summary of Subgrade Soils
C-1	4	10	0" - 4" Bituminous Pavement 4" - 10" Apparent Aggregate Base 14" Hand Auger Refusal
C-2	3 1/2	9 1/2	0" - 3 1/2" Bituminous Pavement 3 1/2" - 13" Apparent Aggregate Base 13" Hand Auger Refusal
C-3	3 1/2	6 1/2	0" - 3 1/2" Bituminous Pavement 3 1/2" - 10" Apparent Aggregate Base 10" - 18" SM, fine to medium grained, with inclusions of CL, dark brown, moist
C-4	3 1/2	11 1/2	0" - 3 1/2" Bituminous Pavement (Top 1/2" layer of core broke off) 3 1/2" - 15" Apparent Aggregate Base 15" - 24" SM, fine to medium grained, with inclusions of CL, dark brown, moist
C-5	3 1/2	8 1/2	0" - 3 1/2" Bituminous Pavement 3 1/2" - 12" Apparent Aggregate Base 12" - 18" Mix of SM and SC, fine to medium grained, dark brown to black, moist
C-6	6 1/2	7 1/2	0" - 6 1/2" Bituminous Pavement 6 1/2" - 14" Apparent Aggregate Base 14" - 20" SC, trace of Gravel, brown, moist
C-7	4 1/2	5 1/2	0" - 4 1/2" Bituminous Pavement (Top 1/2" layer of core broke off) 4 1/2" - 10" Apparent Aggregate Base 10" - 18" SM, fine to medium grained, with inclusions of CL, dark brown, moist
C-8	3 3/4	9	0" - 3 3/4" Bituminous Pavement 3 3/4" - 13" Apparent Aggregate Base 13" - 18" SM, fine to medium grained, trace of Gravel, dark brown, moist
C-9	7 3/4	8	0" - 7 3/4" Bituminous Pavement 7 3/4" - 16" Apparent Aggregate Base 16" Hand Auger Refusal (pulled out larger chunks of cobble/chunks of limestone)
C-10	6 1/2	8	0" - 6 1/2" Bituminous Pavement 6 1/2" - 14 1/2" Apparent Aggregate Base 14 1/2" - 18" SP, fine to medium grained, trace of Gravel, brown, moist

Notes:

See attached Soil Boring Map for coring locations.

SP = Poorly Graded Sand, SM = Silty Sand, SC = Clayey Sand, CL = Lean Clay

Apparent Aggregate Base classified as Poorly Graded Sand with Silt (SP-SM) and Silty Sand (SM) with varying amounts of Gravel. No laboratory testing was performed for classification.

See pictures attached to this report for bituminous core thickness and condition of core.



Photograph #: 001 – C-1
Date: October 3, 2016
Subject: 2018 Street Improvements – City of Northfield

B1708653

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Photograph #: 002 – C-2
Date: 10/03/2017
Subject: 2018 Street Improvements – City of Northfield

B1708653

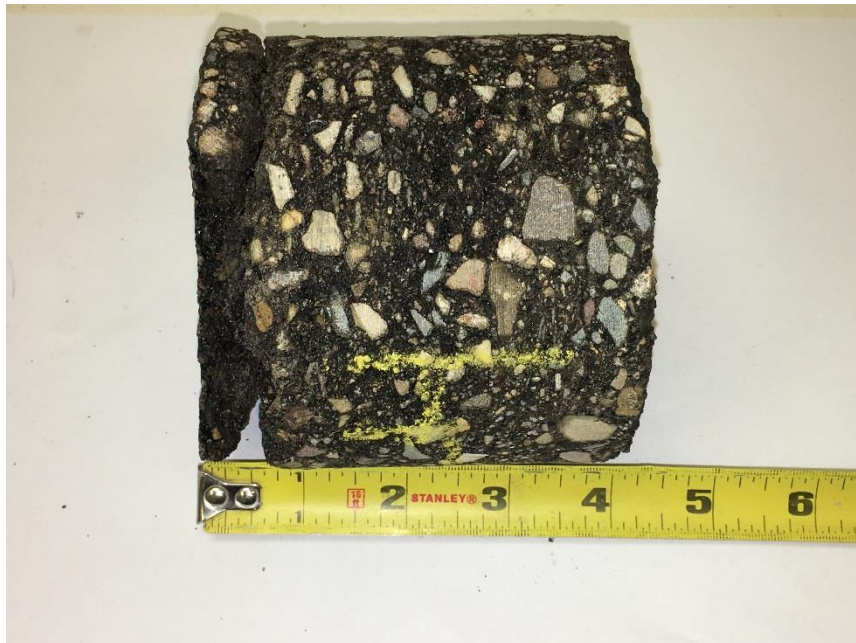
BRAUN
INTERTEC



Photograph #: 003 – C-3
Date: 10/03/2017
Subject: 2018 Street Improvements – City of Northfield

B1708653

BRAUN
INTERTEC



Photograph #: 004 – C-4
Date: 10/03/2017
Subject: 2018 Street Improvements – City of Northfield

B1708653

BRAUN
INTERTEC



Photograph #: 005 – C-5
Date: 10/03/2017
Subject: 2018 Street Improvements – City of Northfield

B1708653

BRAUN
INTERTEC



Photograph #: 006 – C-6
Date: 10/03/2017
Subject: 2018 Street Improvements – City of Northfield

B1708653

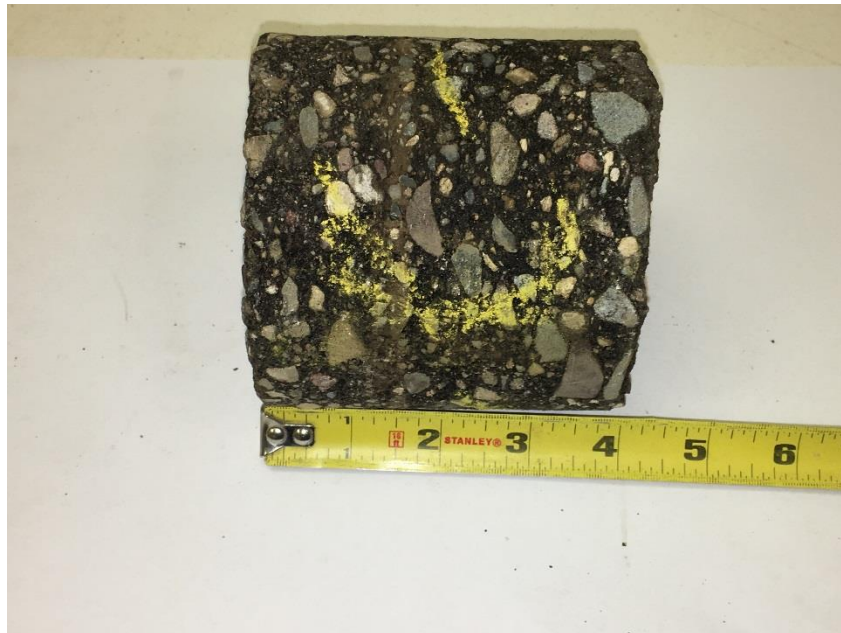
BRAUN
INTERTEC



Photograph #: 007 – C-7
Date: 10/03/2017
Subject: 2018 Street Improvements – City of Northfield

B1708653

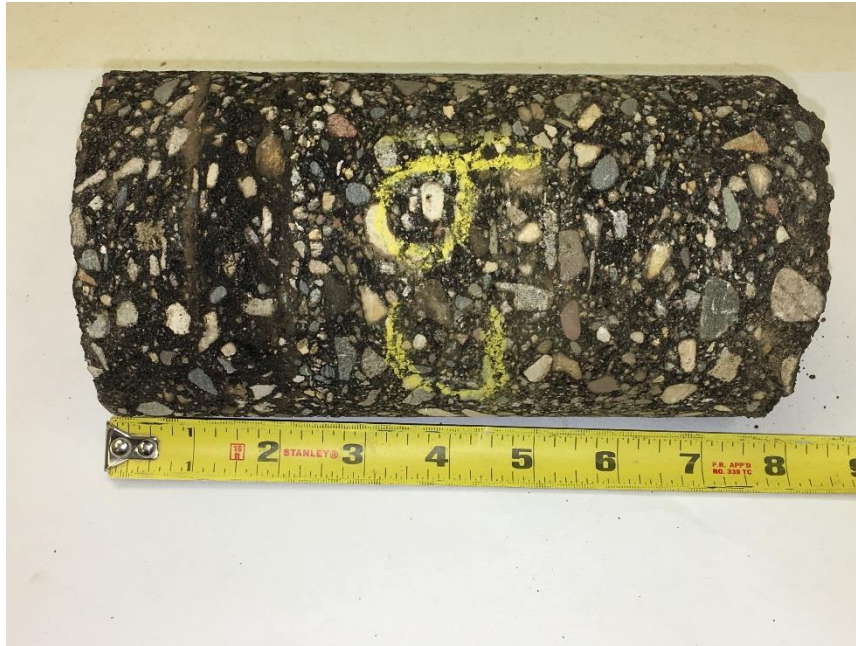
BRAUN
INTERTEC



Photograph #: 008 – C-8
Date: 10/03/2017
Subject: 2018 Street Improvements – City of Northfield

B1708653

BRAUN
INTERTEC



Photograph #: 009 – C-9
Date: 10/03/2017
Subject: 2018 Street Improvements – City of Northfield

B1708653

BRAUN
INTERTEC



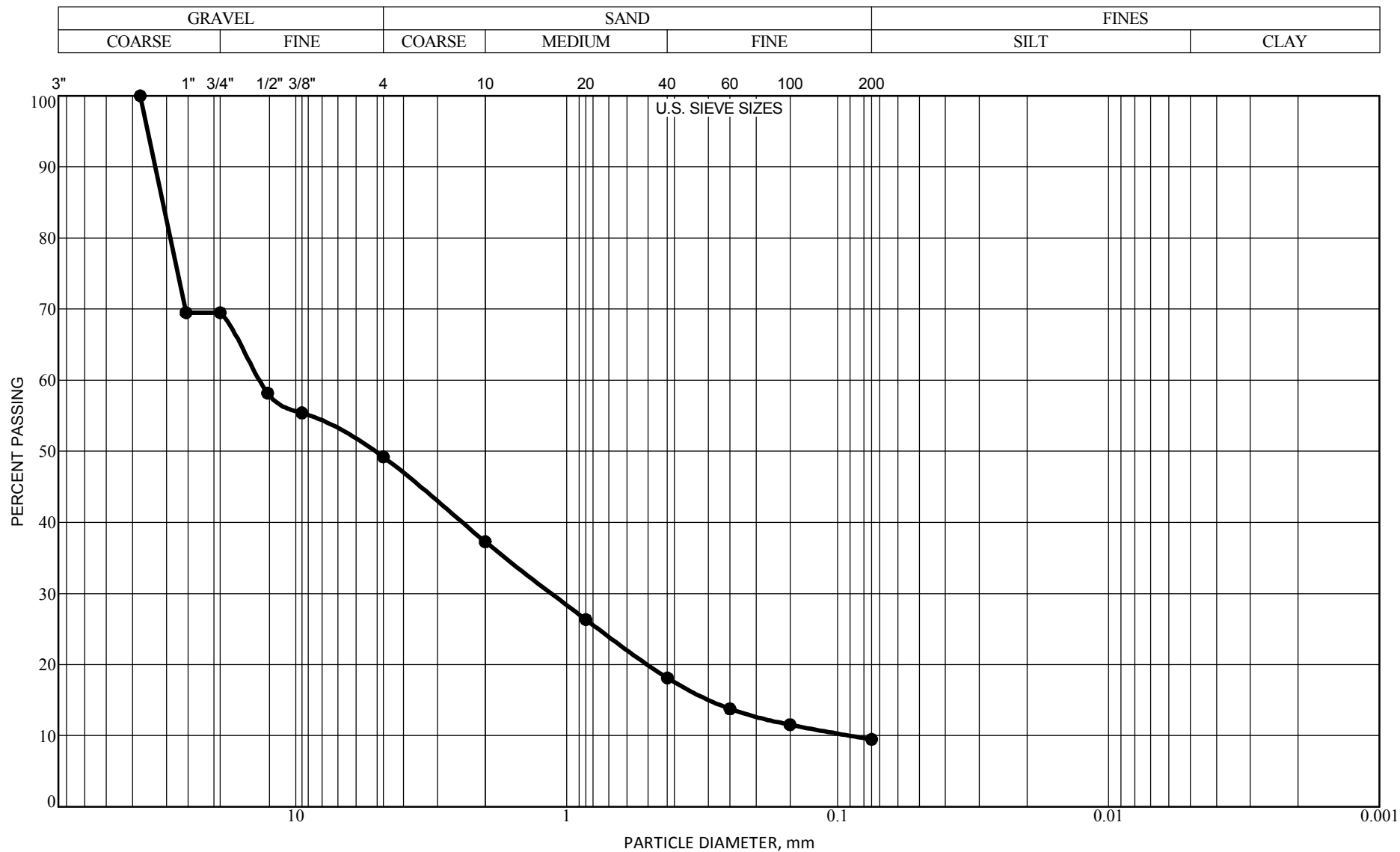
Photograph #: 010 – C-10
Date: 10/03/2017
Subject: 2018 Street Improvements – City of Northfield

B1708653

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INTERTEC

GS ASTM N:\GINT\PROJECTS\X-GEO\LAB\1-GINT FILES\AX PROJECTS GEO LAB\2017\B1708653.GPJ BRAUN_V8_CURRENT.GDT 9/26/17 14:57

GRAIN SIZE ACCUMULATION CURVE (ASTM)



Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-1 DEPTH: 5.0'

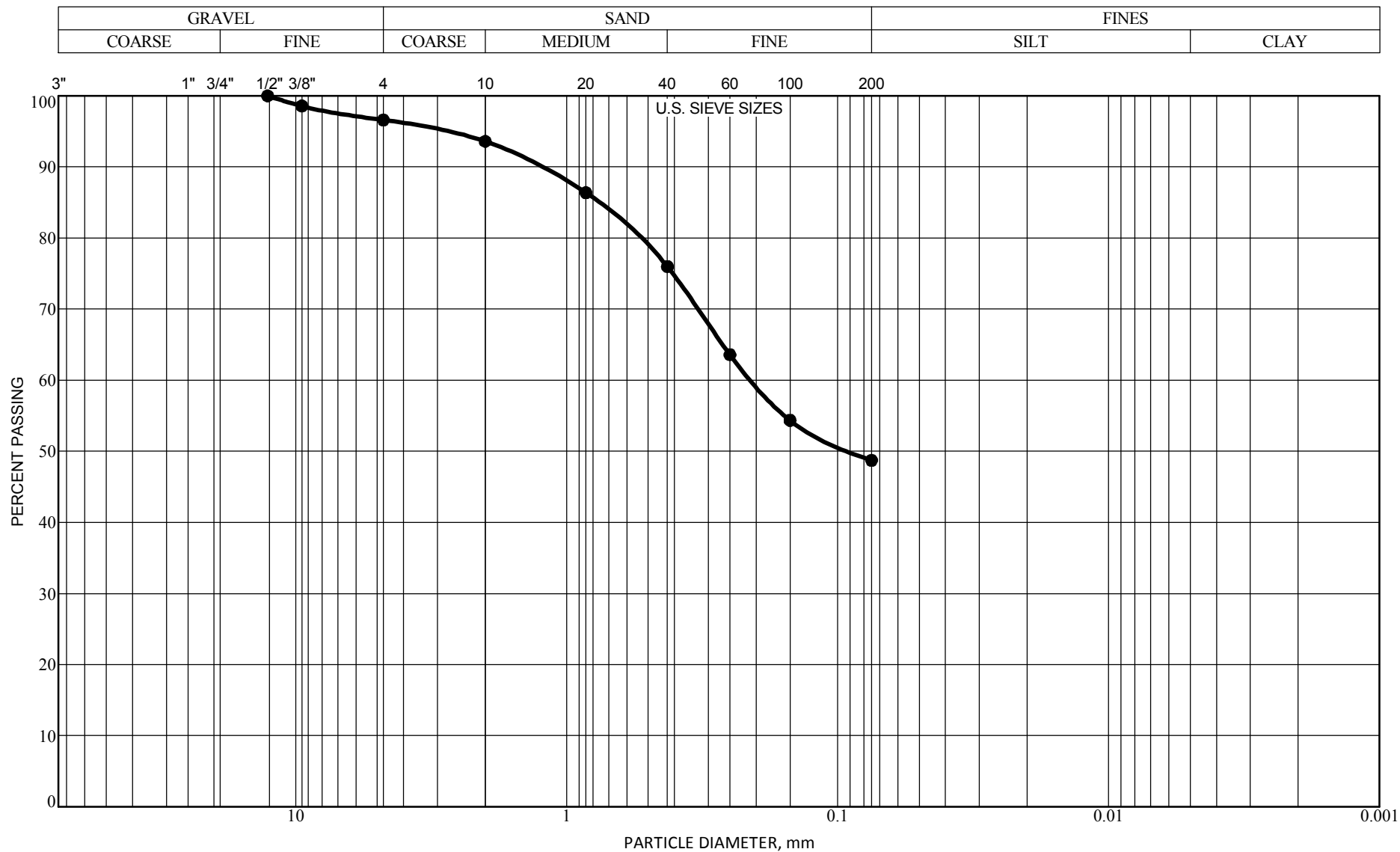
GRAVEL 50.8%
SAND 39.7%
FINES 9.5%

D60=13.547
D30=1.132
D10=0.089
Cu=151.7
Cc=1.1

CLASSIFICATION:
WELL-GRADED GRAVEL with SILT and
SAND(GW-GM)

GS ASTM N:\GINT\PROJECTS\X-GEO\LAB\1-GINT FILES\AX PROJECTS GEO LAB\2017\B1708653.GPJ BRAUN_V8_CURRENT.GDT 9/26/17 14:57

GRAIN SIZE ACCUMULATION CURVE (ASTM)



Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-2 DEPTH: 5.0'

GRAVEL 3.4%
SAND 47.9%
FINES 48.7%

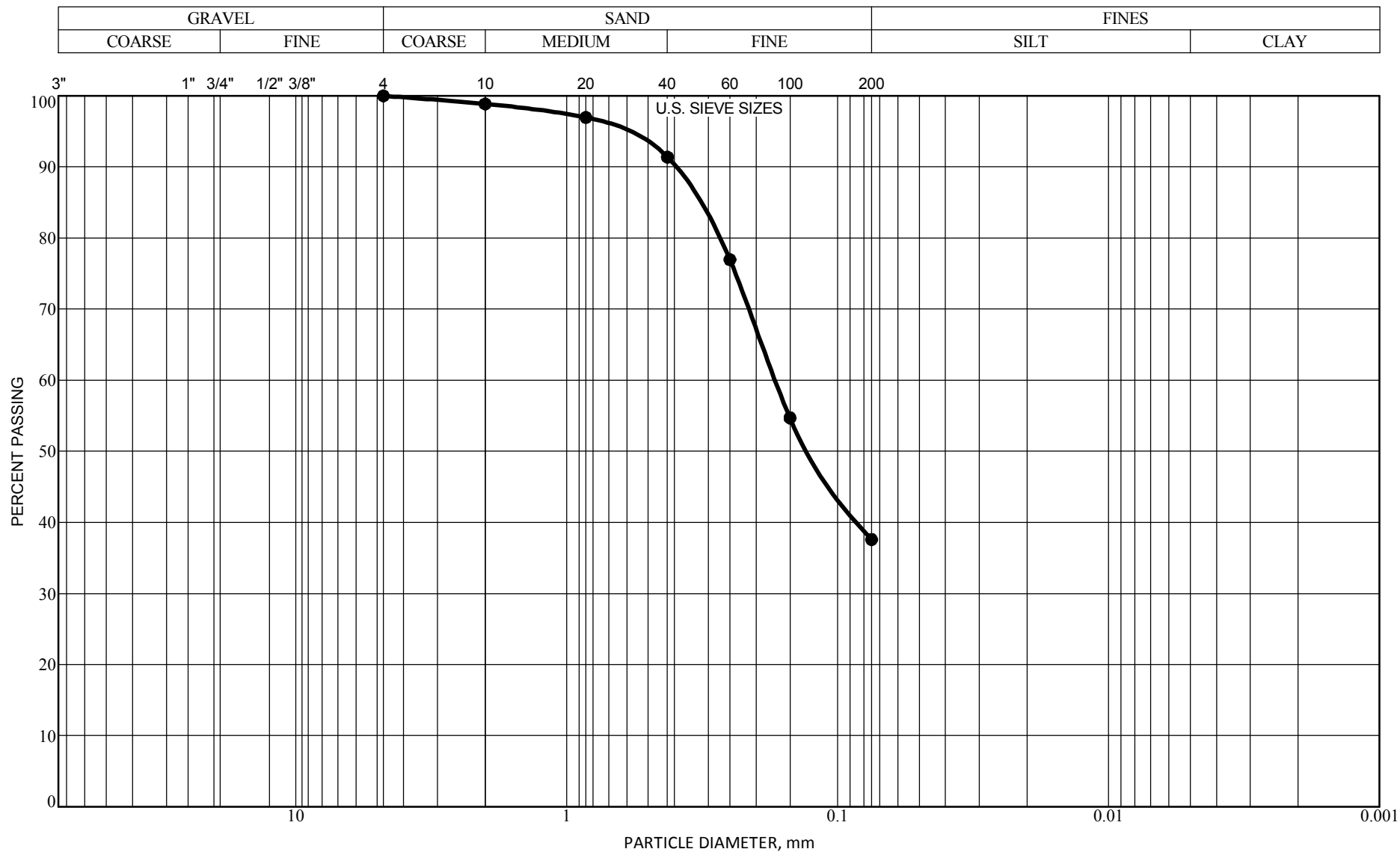
D60=0.205
D30=
D10=

Cu=
Cc=

CLASSIFICATION:
SILTY SAND(SM)

GS ASTM N:\GINT\PROJECTS\X-GEO\LAB\1-GINT FILES\AX PROJECTS GEO LAB\2017\B1708653.GPJ BRAUN_V8_CURRENT.GDT 9/26/17 14:57

GRAIN SIZE ACCUMULATION CURVE (ASTM)



Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-2 DEPTH: 10.0'

GRAVEL 0.0%
SAND 62.4%
FINES 37.6%

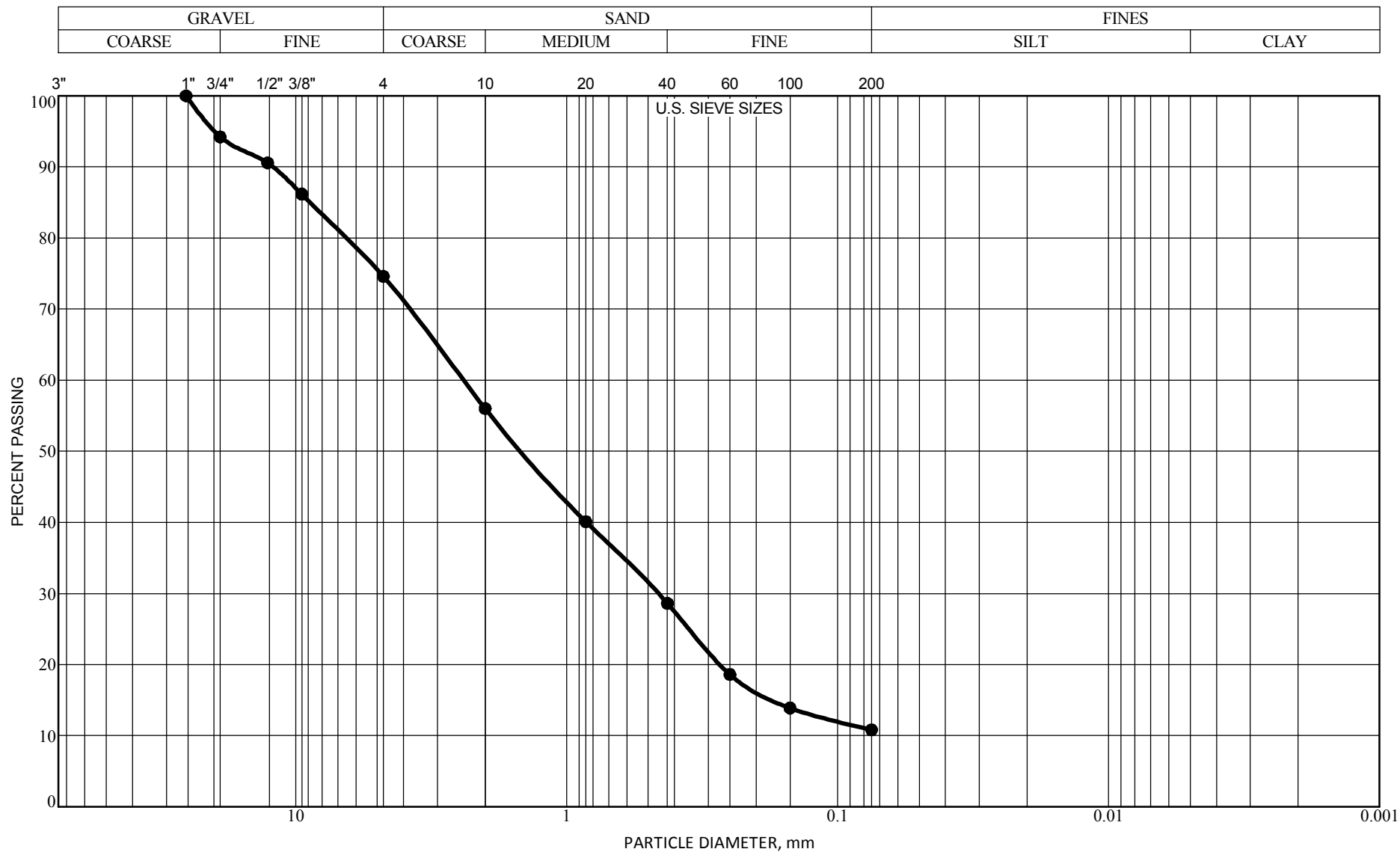
D60=0.169
D30=
D10=

Cu=
Cc=

CLASSIFICATION:
SILTY SAND(SM)

GS ASTM N:\GINT\PROJECTS\X-GEO\LAB\1-GINT FILES\AX PROJECTS GEO LAB\2017\B1708653.GPJ BRAUN_V8_CURRENT.GDT 9/26/17 14:57

GRAIN SIZE ACCUMULATION CURVE (ASTM)



Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-3 DEPTH: 0.0'-2.0'

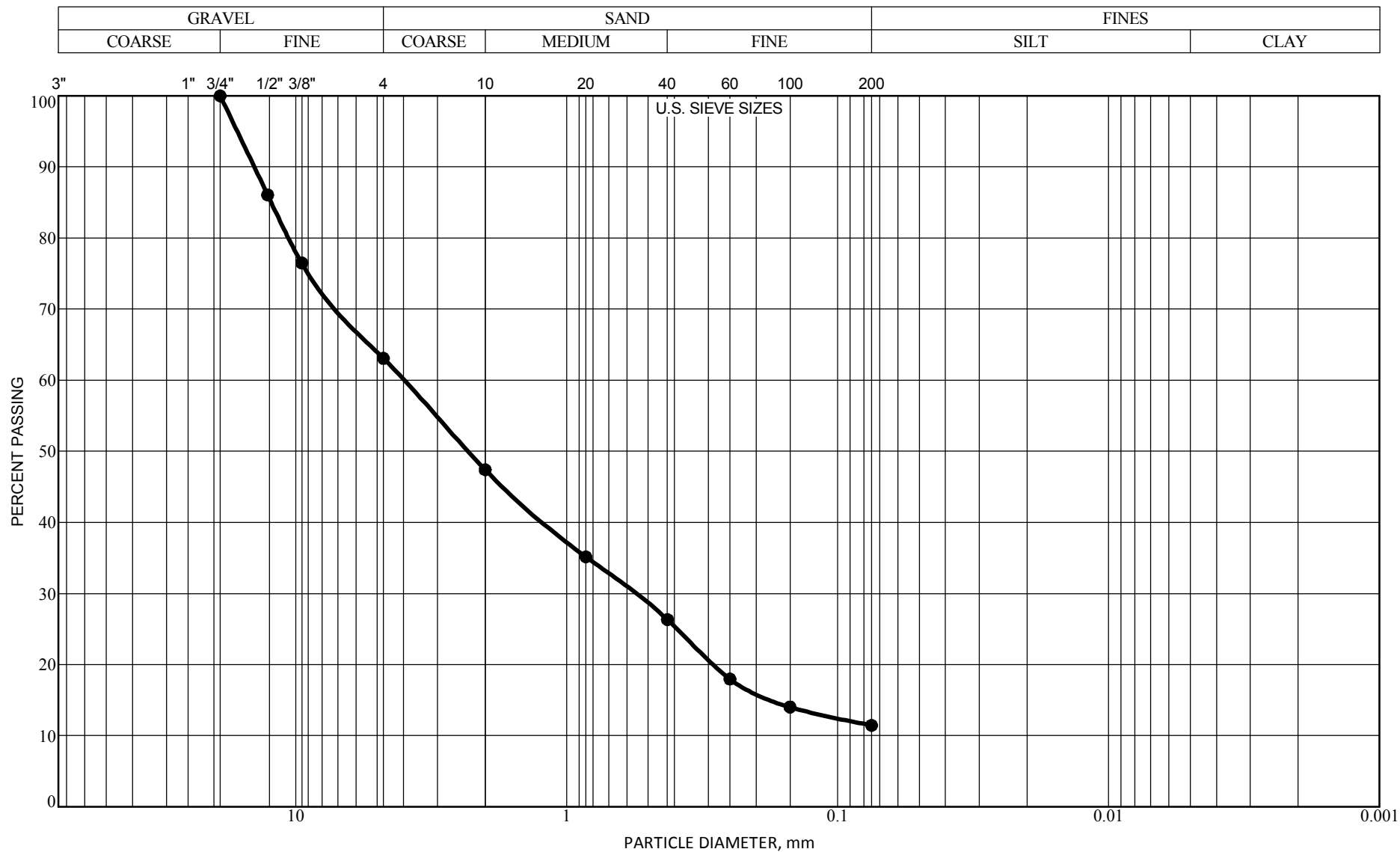
GRAVEL 25.4%
SAND 63.8%
FINES 10.8%

D60=2.407
D30=0.462
D10=
Cu=38.6
Cc=1.4

CLASSIFICATION:
WELL-GRADED SAND with SILT and
GRAVEL(SW-SM)

GS ASTM N:\GINT\PROJECTS\X-GEO\LAB\1-GINT FILES\AX PROJECTS GEO LAB\2017\B1708653.GPJ BRAUN_V8_CURRENT.GDT 9/26/17 14:57

GRAIN SIZE ACCUMULATION CURVE (ASTM)



Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

BORING: ST-4 DEPTH: 0.0'

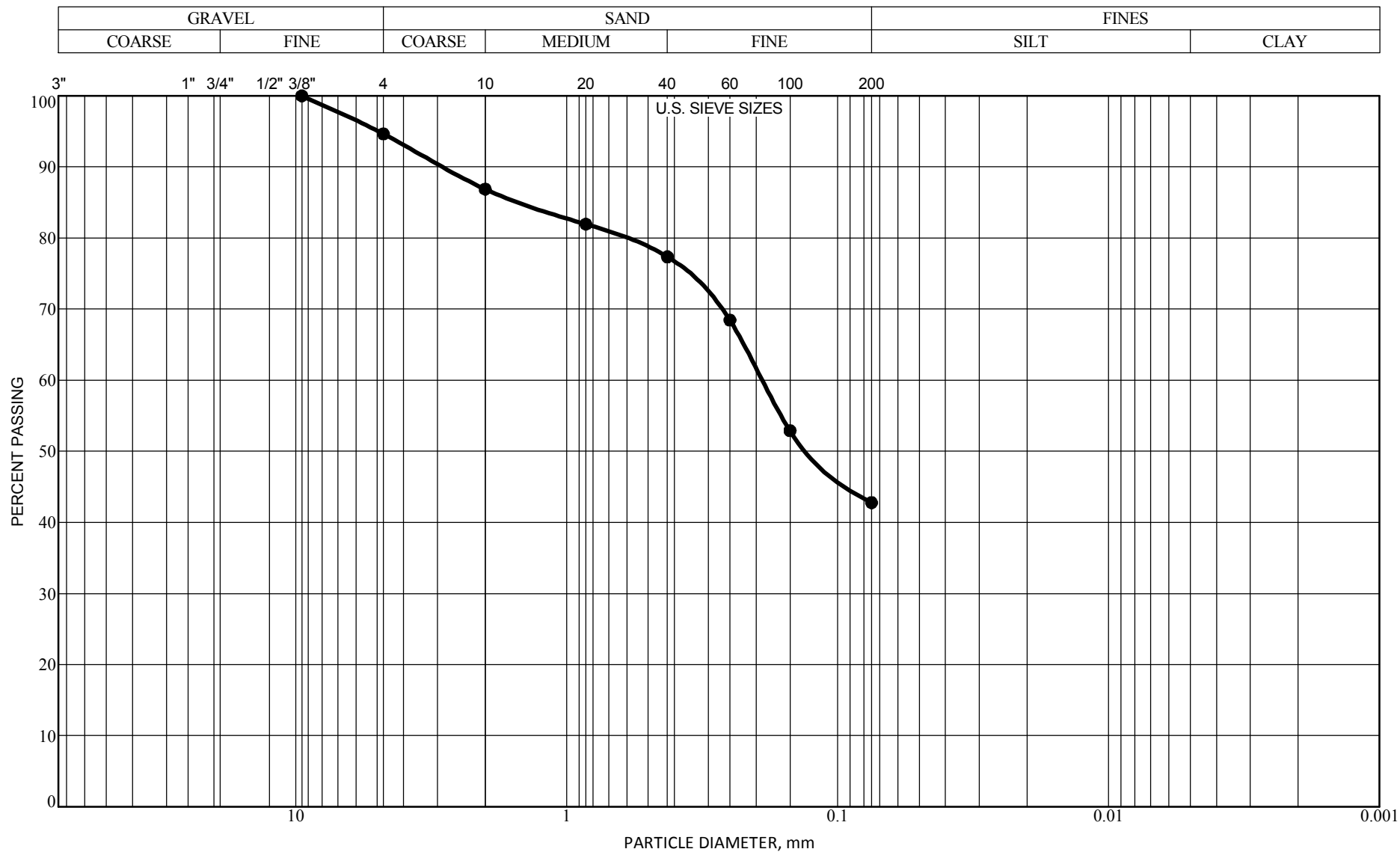
GRAVEL 36.9%
SAND 51.6%
FINES 11.5%

D60=4.007
D30=0.567
D10=
Cu=79.0
Cc=1.6

CLASSIFICATION:
WELL-GRADED SAND with SILT and
GRAVEL(SW-SM)

GS ASTM N:\GINT\PROJECTS\X-GEO\LAB\1-GINT FILES\AX PROJECTS GEO LAB\2017\B1708653.GPJ BRAUN_V8_CURRENT.GDT 9/26/17 12:52

GRAIN SIZE ACCUMULATION CURVE (ASTM)



Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota

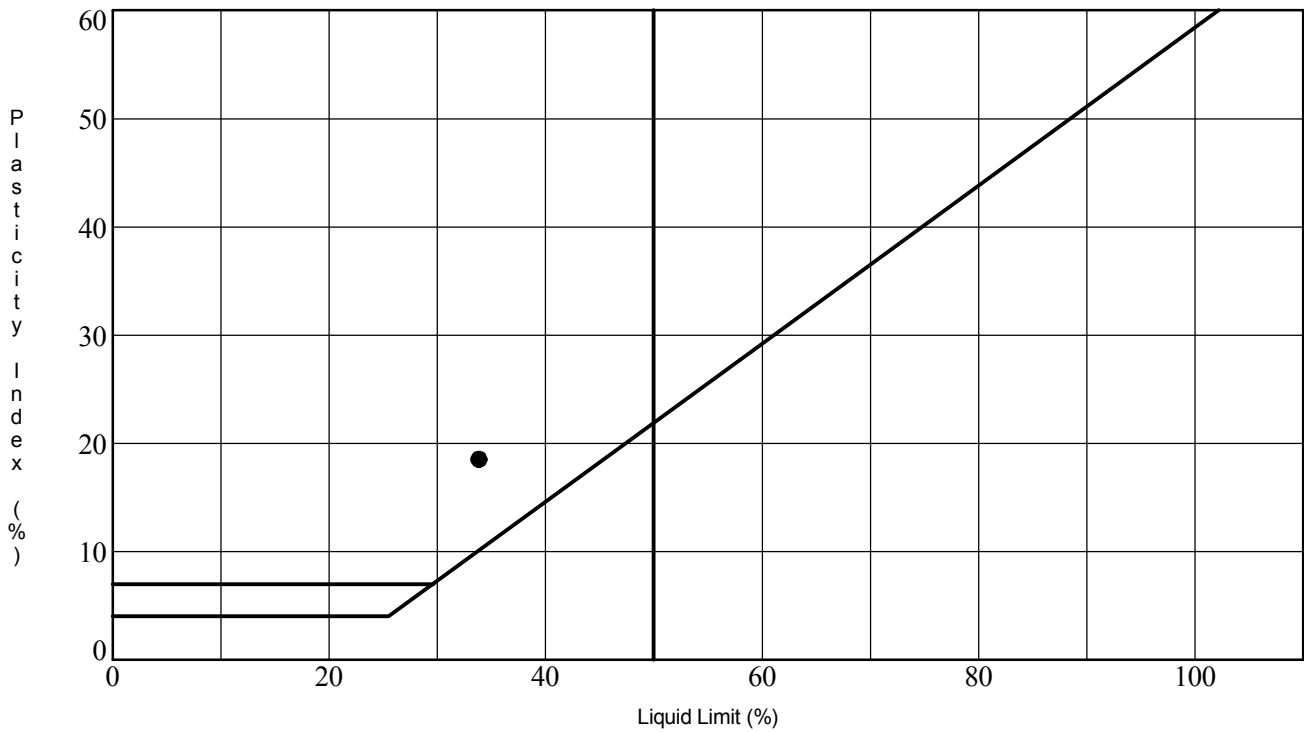
BORING: ST-7 DEPTH: 0.0'

GRAVEL 5.3%
SAND 51.9%
FINES 42.8%

D60=0.189
D30=
D10=

Cu=
Cc=

CLASSIFICATION:
CLAYEY SAND(SC)



**Braun Project B1708653
GEOTECHNICAL EVALUATION
2018 Street Improvements
Northfield, Minnesota**

Proctor Report

Report No: PTR:W17-007323-S1

Issue No: 1

Client: Luke Thompson
Short-Elliott-Hendrickson, Incorporated
3535 Vadnais Center Dr
Saint Paul, MN, 55110

Project: B1708653
2018 Street Improvements - City of Northfield

Northfield, MN,
TR: Brian Schreurs, bschreurs@braunintertec.com

Laboratory Results Reviewed by:



Jim Streier

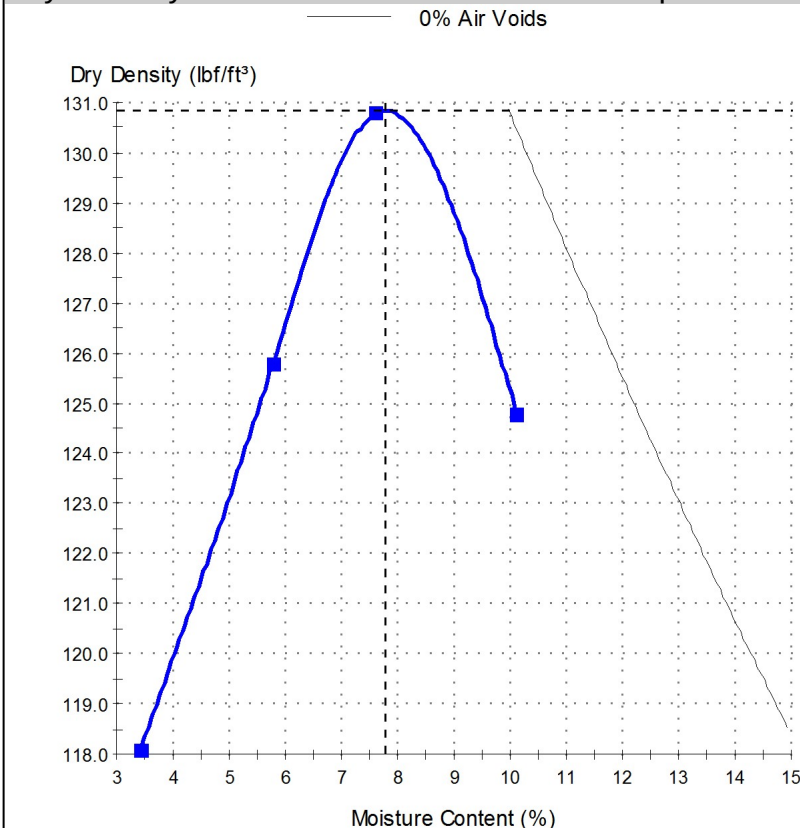
Geotechnical Laboratory

Date of Issue: 9/22/2017

Sample Details

Sample ID:	W17-007323-S1	Alternate Sample ID:	P-02
Date Sampled:	9/6/2017	Date Submitted:	9/21/2017
Sampled By:	Drill Crew	Sampling Method:	Auger Cuttings
Source:	Onsite material		
Material:	Silty Sand with Gravel		
Specification:			
Location:	ST-2, 1-3'		
Date Tested:	9/22/2017		

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lb/ft³):	130.8
Corrected Maximum Dry Density (lb/ft³):	134.4
Optimum Moisture Content (%):	7.8
Corrected Optimum Moisture Content (%):	7.0
Method:	B
Preparation Method:	Dry
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve 3/8" (9.5mm) (%)	11
Passing Sieve 3/8" (9.5mm) (%)	89
Specific Gravity (Oversize):	2.75
Excluded Oversize Retained Sieve 3/8" (9.5mm) (%)	11
Visual Description:	SM Silty Sand with Gravel, fine-coarse grained, brown

Comments

P200=24.1%

Proctor Report

Report No: PTR:W17-007321-S1

Issue No: 1

Client: Luke Thompson
Short-Elliott-Hendrickson, Incorporated
3535 Vadnais Center Dr
Saint Paul, MN, 55110

Project: B1708653
2018 Street Improvements - City of Northfield

Northfield, MN,
TR: Brian Schreurs, bschreurs@braunintertec.com

Laboratory Results Reviewed by:



Jim Streier

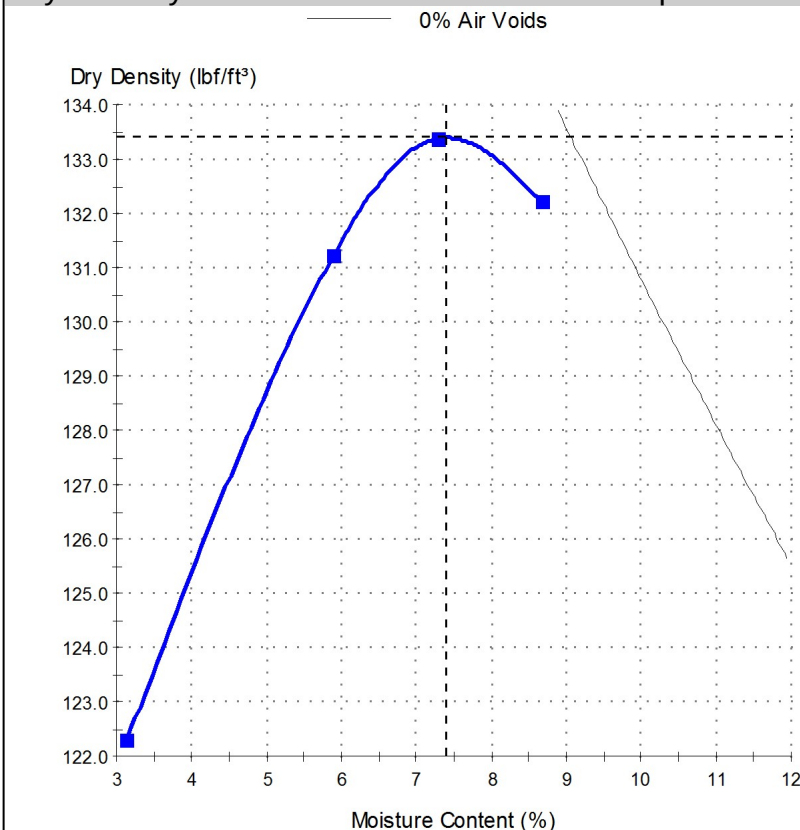
Geotechnical Laboratory

Date of Issue: 10/6/2017

Sample Details

Sample ID:	W17-007321-S1	Alternate Sample ID:	P-01
Date Sampled:	9/6/2017	Date Submitted:	9/21/2017
Sampled By:	Drill Crew	Sampling Method:	Auger Cuttings
Source:	Native		
Material:	Silty Sand with Gravel		
Specification:			
Location:	ST-4, 1-3'		
Date Tested:	9/22/2017		

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lb/ft³):	133.4
Corrected Maximum Dry Density (lb/ft³):	139.6
Optimum Moisture Content (%):	7.4
Corrected Optimum Moisture Content (%):	6.0
Method:	B
Preparation Method:	Dry
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve 3/8" (9.5mm) (%)	20
Passing Sieve 3/8" (9.5mm) (%)	80
Specific Gravity (Oversize):	2.75
Excluded Oversize Retained Sieve 3/8" (9.5mm) (%)	20
Visual Description:	SM Silty Sand with Gravel, fine-coarse grained, brown

Comments

P200=12.8%

R Value Report

Report No: RV:W17-007390-S1

Issue No: 1

Client: Luke Thompson
Short-Elliott-Hendrickson, Incorporated
3535 Vadnais Center Dr
Saint Paul, MN, 55110

Project: B1708653
2018 Street Improvements - City of Northfield

Northfield, MN,
TR: Brian Schreurs, bschreurs@braunintertec.com

Laboratory Results Reviewed by:



Jason Limley

Jason Limley

Engineering Technician III

Date of Issue: 9/28/2017

Sample Details

Sample ID: W17-007390-S1 Alternate Sample ID:

Date Sampled: 9/6/2017 Date Submitted: 9/21/2017

Sampled By: Drill Crew Sampling Method: Auger Cuttings

Source: Onsite material

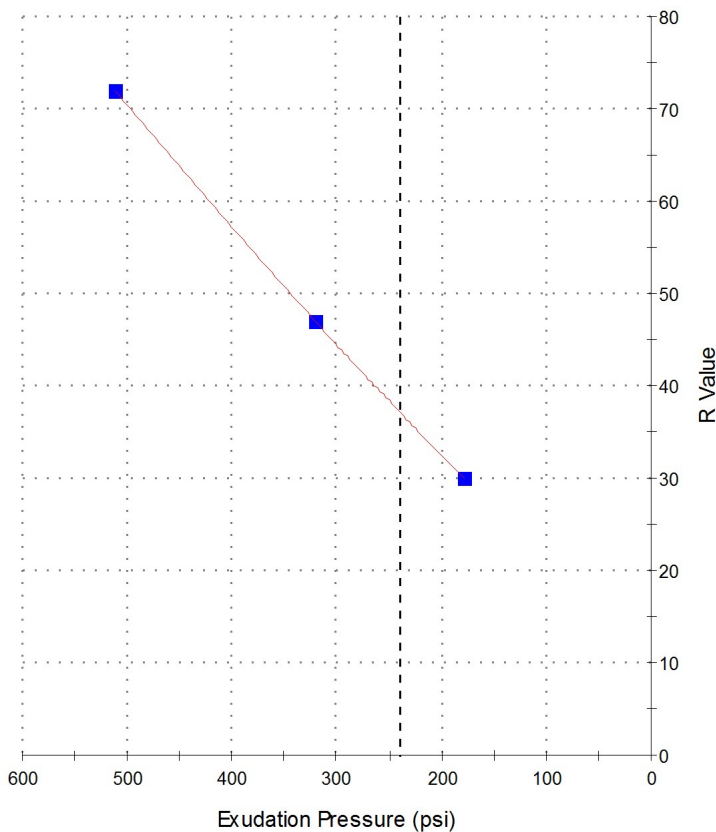
Material: Silty Sand with Gravel

Specification:

Location: ST-2, 1-3'

Date Tested: 9/28/2017

R Value



Test Results

MnDOT 1307 - 95^
R Value at 240 psi Exudation: 37

Specimen Results

Moisture Content (%)	8.0	7.3	6.8
Dry Density (lb/ft³)	135.4	136.7	136.4
Exudation Load (psi)	2253	4032	6430
R Value	30	47	72

Comments

^ Only ASTM and AASHTO equivalent test methods are covered by our current AAP accreditation.

R Value Report

Report No: RV:W17-007390-S2

Issue No: 1

Client: Luke Thompson
Short-Elliott-Hendrickson, Incorporated
3535 Vadnais Center Dr
Saint Paul, MN, 55110

Project: B1708653
2018 Street Improvements - City of Northfield

Northfield, MN,
TR: Brian Schreurs, bschreurs@braunintertec.com

Laboratory Results Reviewed by:



Jim Streier

Geotechnical Laboratory

Date of Issue: 10/6/2017

Sample Details

Sample ID: W17-007390-S2 Alternate Sample ID:

Date Sampled: 9/6/2017 Date Submitted: 9/21/2017

Sampled By: Drill Crew Sampling Method: Auger Cuttings

Source: Onsite material

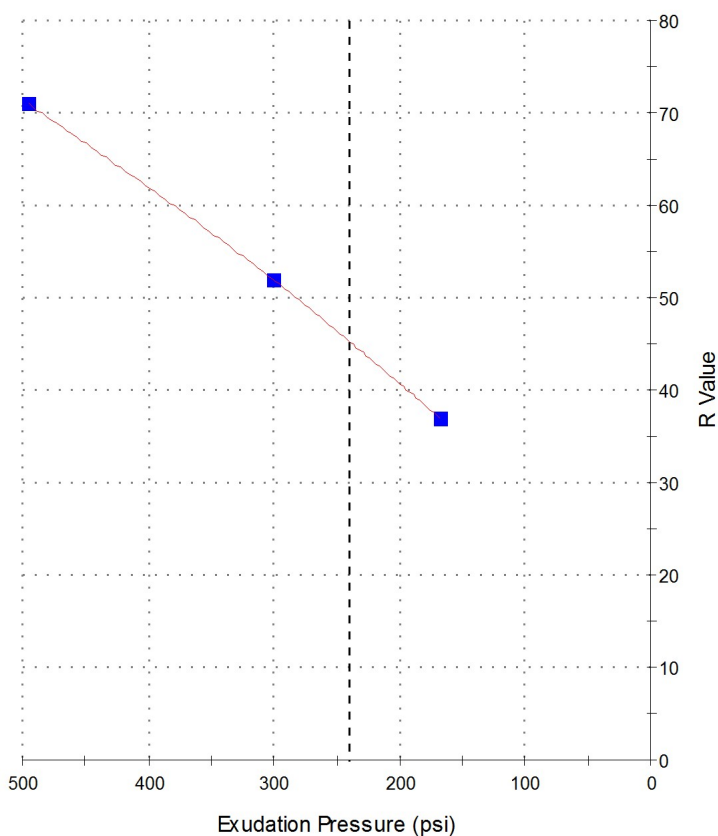
Material: Silty Sand with Gravel

Specification:

Location: ST-4, 1-3'

Date Tested: 9/28/2017

R Value



Test Results

MnDOT 1307 - 95^

R Value at 240 psi Exudation: 45

Specimen Results

Moisture Content (%)	6.0	7.1	7.9
Dry Density (lb/ft³)	138.7	131.4	126.9
Exudation Load (psi)	6238	3781	2114
R Value	71	52	37

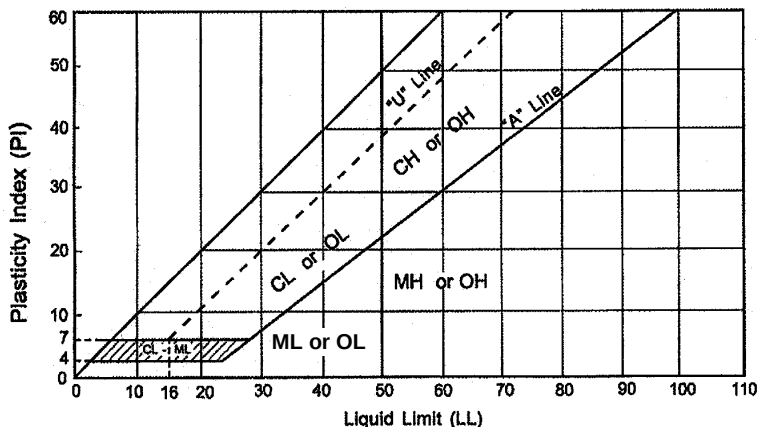
Comments

^ Only ASTM and AASHTO equivalent test methods are covered by our current AAP accreditation.



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

- Based on the material passing the 3-inch (75mm) sieve.
- If field sample contained cobbles or boulders, or both, add "with cobbles or boulders or both" to group name.
- $C_u = D_{60}/D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
- If soil contains $\geq 15\%$ sand, add "with sand" to group name.
- 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
- If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
- If fines are organic, add "with organic fines" to group name.
- If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.
- Sand 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
- If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.
- If soil contains 10 to 29% plus No. 200, add "with sand" or "with gravel" whichever is predominant.
- If soil contains $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.
- If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.
- PI ≥ 4 and plots on or above "A" line.
- PI < 4 or plots below "A" line.
- PI plots on or above "A" lines.
- PI plots below "A" line.



Laboratory Tests

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

Particle Size Identification

Boulders.....	over 12"
Cobbles	3" to 12"
Gravel	
Coarse	3/4" to 3"
Fine.....	No. 4 to 3/4"
Sand	
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine.....	No. 40 to No. 200
Silt	<No. 200, PI < 4 or below "A" line
Clay	<No. 200, PI ≥ 4 and on or about "A" line

Relative Density of Cohesionless Soils

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

Consistency of Cohesive Soils

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

Drilling Notes

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

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

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

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

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

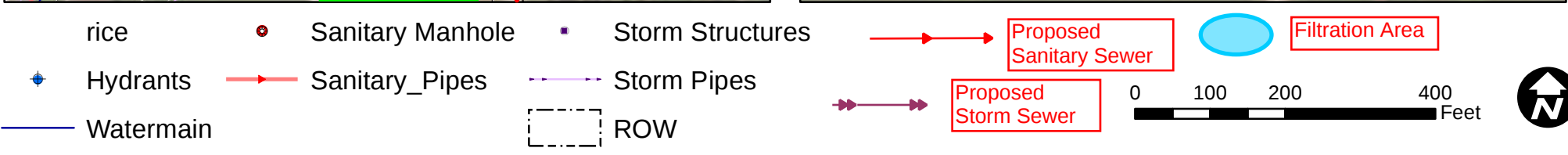
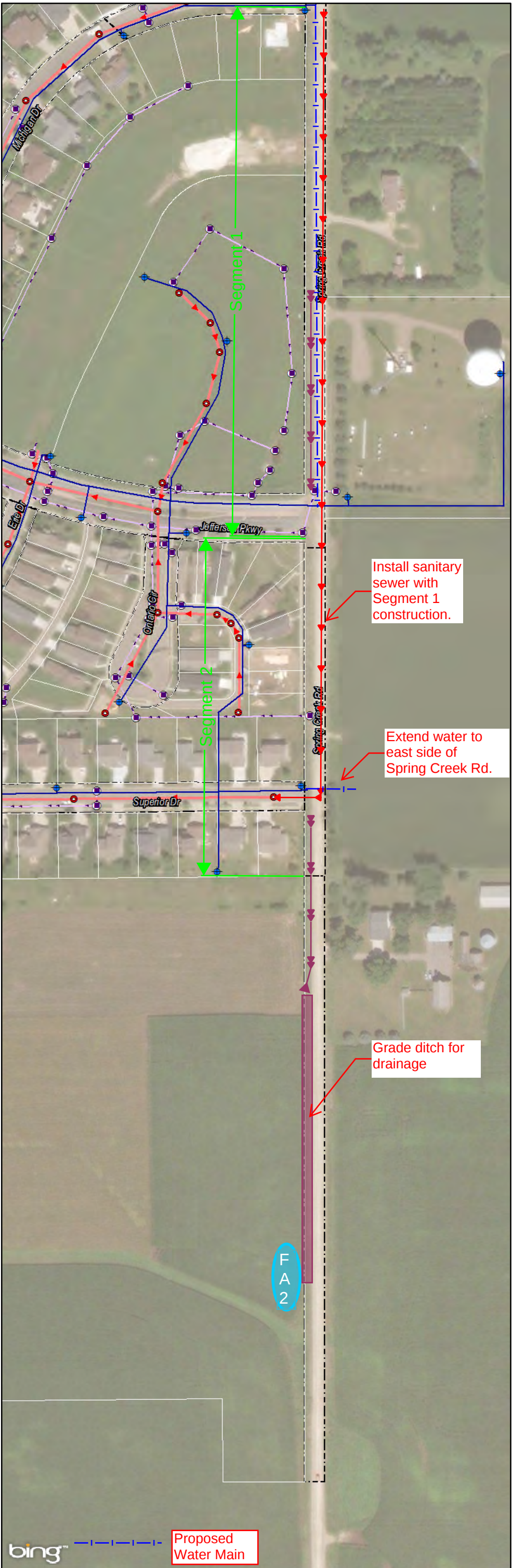
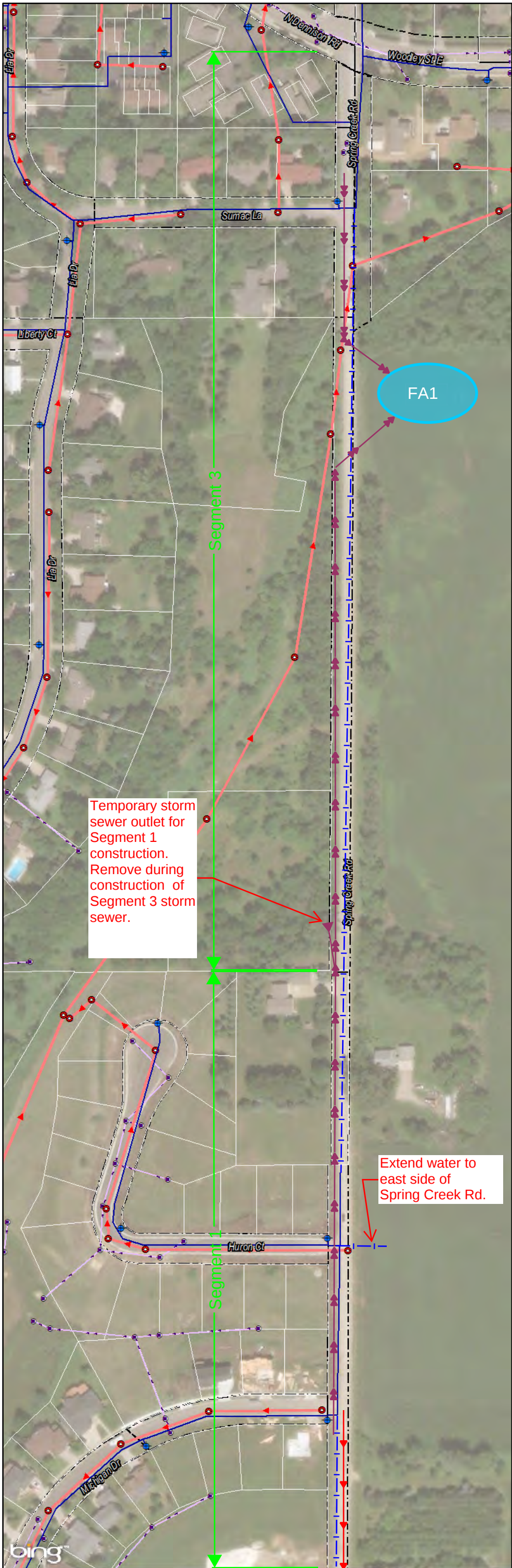
WR: WR indicates the sampler penetrated soil under weight of rods alone; hammer weight, and driving not required.

TW: TW indicates thin-walled (undisturbed) tube sample.

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

Appendix F

Existing and Proposed Utilities



Appendix G

2018 Assessment Roll Draft

ASSESSMENT ROLL

2018 Street Improvement Project Special Assessment Roll

The City's Assesment Policy calls for lots to be assessed according to their long footage and short footage. Short footage adjacent to an improvement is assessed 100% of the benefit amount set by the City Council. Long footage is only assessed 10%. The policy also includes frontage calculation formulas for odd shaped lots.

Assessment	
	Rate
Reconstruct-Residential	\$70
Reconstruct-Commercial	\$158
Mill & Overlay-Commercial	\$69
Mill & Overlay-Residential	\$41
Mill & Overlay-Multifamily	\$59

				#NAME?			A	B = A (rounded)	C	D = 10% x C (rounded)	= Rate x (B + D)
Parcel ID	Deed Holder	Property Address		Zone2010a	Project Type	Property Type	Short Footage(Ft)	Rounded Short Footage	Long Footage (Ft)	Rounded Long Footage Percentage	Assessment
							100%		10%		
2205325009	MACHACEK JOHN P & GLORIA J	1201	SPRING CREEK RD	N1-B	Reconstruct	Residential			183	18.00	\$ 1,260.00
2206403001	EVERGREEN SQUARE HOMEOWNERS	0		N1-B	Reconstruct	Residential	236	236.00			\$ 16,520.00
2205325008	GROH DENNIS	1300	WOODLEY ST E	N1-B	Reconstruct	Residential	142	142.00			\$ 9,940.00
2206403010	MARSHALL DOUGLAS B	1217	SUMAC LN	N1-B	Reconstruct	Residential			140	14.00	\$ 980.00
2206426252	REMES MICHAEL & PATRICIA TRUST	1212	SUMAC LN	N1-B	Reconstruct	Residential			180	18.00	\$ 1,260.00



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