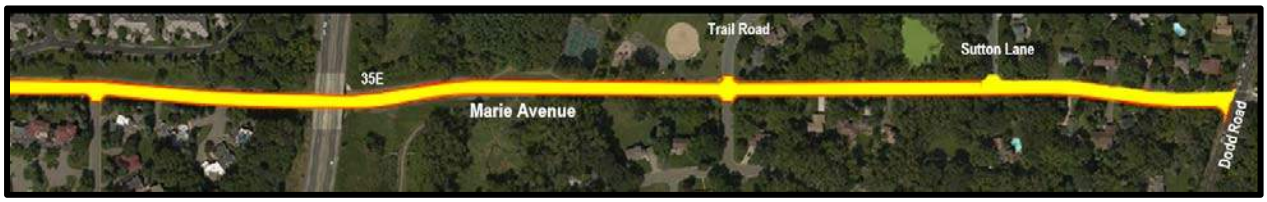

Feasibility Report

Marie Avenue and Wesley Lane Neighborhood Improvements

City of Mendota Heights, Minnesota

City Project No. 201803
TKDA No. 16948.000

January 15, 2019

Revised per City Council Direction December 18, 2018

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Feasibility Report
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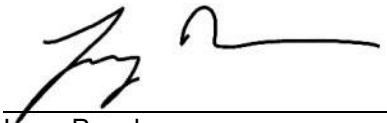
January 15, 2019

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



Larry Poppler
Professional Engineer

Date: January 15, 2019 Lic. No.: 41005

TKDA
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Saint Paul, MN 55101

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Summary

Marie Avenue Improvements:

- Pavement rehabilitation with curb and gutter repair and appurtenant work for Marie Avenue from Lexington Avenue to Dodd Road
- Lane reconfigurations, possibly including bike lanes and width reduction
- Cast iron watermain replacement
- Pedestrian underpass replacement
- Trail rehabilitation
- Retention pond cleanout and ditch improvements
- Retaining wall reconstruction
- Guard rail replacement
- Land bridge assessment

Wesley Lane Neighborhood Improvements:

- Pavement rehabilitation, concrete curb and gutter repair, and appurtenant work on the following areas:
  - Wesley Lane
  - Wesley Court
  - South Lane (between Linden Street to Wesley Lane to the Cul-de-sac)
  - Mager Court
  - Spring Creek Circle
- Pedestrian trail on Dodd Road

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Feasibility Report

Marie Avenue and Wesley Lane Neighborhood Improvements

Prepared for City of Mendota Heights, Minnesota

Introduction

On August 7, 2018, the Mendota Heights Council adopted Resolutions 2018-58 and 2018-59, which ordered the preparation of a Feasibility Report for improvements to the project areas listed below:

Marie Avenue:
Improvements from Lexington Avenue to Dodd Road including:

- Pavement rehabilitation, concrete curb and gutter repair, sidewalk and pedestrian ramp improvements, and appurtenant work
- Lane reconfigurations, possibly including bike lanes
- Cast iron watermain replacement
- Pedestrian underpass replacement
- Trail rehabilitation
- Retention pond cleanout and ditch improvements
- Retaining wall reconstruction
- Guard rail replacement
- Slab bridge assessment

Located within Section 25, Township 28, Range 23, as described on 23 plats: Eagle Ridge Plat 1, Eagle Ridge Plat 2, Valley Curve Estates, Carol F Small 1st Addition, Spring Creek Acres, Somerset Park, Somerset No. 2, Somerset No. 3, Buril and Holmes, Victoria Highlands 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th Additions, Ridgewood Park, Lexington Highland East, and Lexington Highland West in Dakota County, Minnesota.

Wesley Lane Neighborhood:

Bituminous paving, storm water improvements, concrete curb and gutter repair, and appurtenant work on the following areas:

- Wesley Lane (between Dodd Road and South Lane)
- Wesley Court (to Wesley Lane)
- South Lane (between Linden Street to the Cul-de-sac)
- Mager Court (to Dodd Road)
- Spring Creek Circle (to Dodd Road)
- Construction of a pedestrian trail on Dodd Road

Located within Section 25, Township 28, Range 23, as described on five plats: The Ponds of Mendota Heights, Rolling Woods Addition, Rolling Woods 2nd Addition, Jefferson Heights and Spring Creek Acres in Dakota County, Minnesota.

This report evaluates the feasibility of Marie Avenue and Wesley Neighborhood street improvements in the described project areas. All existing infrastructure elements were evaluated, improvements recommended, cost estimates of the proposed improvements prepared and funding strategies developed in this report.

Background

The City of Mendota Heights currently utilizes a multi-year pavement rehabilitation plan to prioritize the infrastructure improvement needs within the city. As reported in the Mendota Heights Street Improvement Plan (SIP), both Marie Avenue and the Wesley Lane Neighborhood were scheduled for rehabilitation.

Marie Avenue is proposed for rehabilitation from Lexington Avenue to Dodd Road. Improvements would include pavement rehabilitation, curb repair, storm water infrastructure improvements, and trail improvements. Additionally, the City of Mendota Heights has proposed pavement rehabilitation and storm water infrastructure improvements for the Wesley Lane Neighborhood including the following streets: Wesley Lane (between Dodd Road and South Lane), Wesley Court (to Wesley Lane), South Lane (between Linden Street to the Cul-de-sac), Mager Court (to Dodd Road) and Spring Creek Circle (to Dodd Road). The 2013-2017 SIP map showing the Marie Avenue and Wesley Lane Neighborhood rehabilitation plan can be found on Exhibit 1 in the appendix.

Marie Avenue Existing Conditions

Streets and Lane Configurations: The majority of properties located within the Marie Avenue project area were platted between 1950 and 1986. Streets built during that timeframe were typically built with an approximately 30 foot width from edge of pavement to edge of pavement. From investigation of the as-built records, Marie Avenue was widened in the 1970s and 1980s to 40 to 42 feet in width. The current configuration of Marie Avenue is two 12 foot driving lanes and two approximately 9 foot parking lanes. Marie Avenue is a collector street with approximately 3,300 vehicle trips per day and is also a Minnesota State Aid (MSA) street.

Since the construction of Marie Avenue, many factors have accounted for roadway deterioration including the following:

- Time and weather
- Underlying soil conditions
- Traffic volumes
- Roadway pavement section
- Heavy vehicle loading
- Storm water drainage

The geotechnical report found that the Marie Avenue pavement averaged 11 inches in depth. Additionally, no suitable base material was found over the entire length of Marie Avenue. Soils ranged from sand with gravel to clay sand. The geotechnical report is located in the appendix under Exhibit 7; additionally the typical cross sections for Marie Avenue, east and west of 35E, can be found under Exhibit 3. During the field inspection of Marie Avenue, many roadway deficiencies were noted including large frost cracks, fatigue cracks, and pot holes. It was also noted that many of the defects had been patched or filled recently.

Curb and Gutter: The current condition of the curb and gutter along Marie Avenue is mostly acceptable with exception to the few areas with settling, large cracks and drainage issues. In general, the curb on Marie Avenue appears to be in better condition than the majority of curb in the Wesley Lane Neighborhood. A large majority of the curb that was in good condition had vegetation growing in the expansion joints. The vegetation seemed to be trapping sediment and other debris causing water to spill out of the gutter onto the roadway.

Utilities: Roughly one third of the manhole and catch basin castings will need to be replaced. It was noted that some structures looked to be covered in debris and beginning to collect sediment in the gutters around them. This has caused drainage issues and could potentially lead to pavement damage.

Watermain: There is a 550 foot section of cast iron pipe (CIP) watermain from Dodd Road to Sutton Lane built in 1966. In addition to the pipe, there are two hydrants that are original to the watermain's construction. This segment of watermain includes eight services and is buried at a depth of 7.5 feet. The cast iron pipe is no longer the standard for watermain and is near the end of its service life.

Walking Trail Rehabilitation: The walking trail near Valley Park and along Marie Avenue are beginning to deteriorate, as fatigue cracks and large frost cracks are visible. The majority of walking path on the north side of Marie Avenue from Dodd Road to Victoria Road will likely need to be replaced and several of the pedestrian crossings do not meet current ADA standards.

There is approximately 6,500 linear feet (5,800 SY) of walking path along Marie Avenue that is becoming unusable due to the large cracks and deterioration present. According to the

geotechnical report, the trail's cross section is currently comprised of 5 inches of bituminous over 3 inches of base material. Details can be found in the appendix under Exhibit 7.

Lexington Trail: A safety concern has been identified on the walking trail from Marie Avenue to Avanti Drive along Lexington Avenue South. There is currently no curb and gutter on Lexington Avenue, which means no separation between pedestrians and vehicles. The 8 foot trail is currently 2 feet from the edge of the roadway for a 600 foot length. The combination of the 40 mph speed limit, 1 foot narrow shoulder, and 2 foot boulevard between the trail and road presents a safety concern due to the proximity of the roadway from the pedestrian trail. The trail currently follows the road closely due to the adjacent detention pond to the east of Lexington. The offset of the pond varies from 15 to 25 feet and has a very steep slope. The arrangement of the road, the pond and the steep slopes provides very little room for the walking trail. The trail pavement is in fair condition.

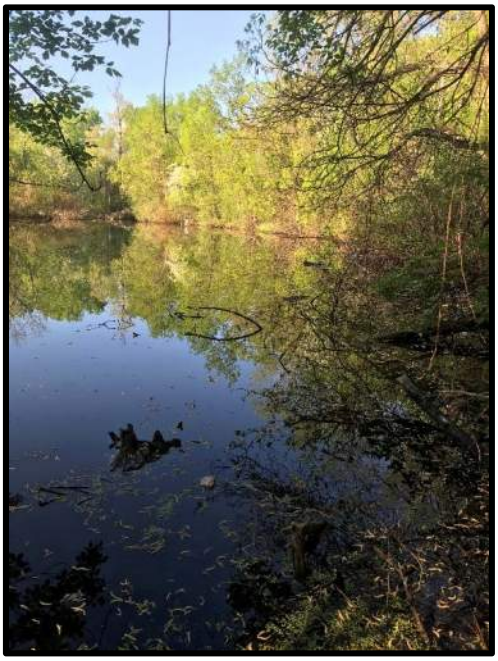
Pedestrian Tunnel: The pedestrian walking tunnel between Trail Road and 35E has been proposed to be replaced. The 125 foot tunnel is a size 132 concrete arch pipe with 8 foot walking trail and no in-tunnel lighting. The tunnel was constructed sometime before 1975 and has become overgrown with large trees. The tunnel seems to be structurally sound but generally outdated. Additionally, as-built records show a section of insulated watermain approximately 1 foot above the tunnel and sanitary sewer below it. Possible utility impacts may be necessary depending on exact locations. Abutting the tunnel are four 10 foot wooden retaining walls.

Guard Rail and Retaining Walls: Several wooden retaining walls are located within the project limits. There are six near the intersection of Marie Avenue and Victoria Road and two at the intersection of Sutton Lane and Marie Avenue. The retaining walls are beginning to creep and are on the verge of failure. There is approximately 1,900 square feet (440 linear feet) of retaining wall that should be removed or replaced. The 325 foot guardrail along the north side of Marie Avenue near 35E over the pedestrian tunnel is also of concern. The guardrail has been damaged in several areas and would likely not function as intended.

Land Bridge: A land bridge exists on Marie Avenue 200 feet east of Trail Road and 375 feet west of Sutton Lane and was constructed in 1974. The 420 foot bridge carries Marie Avenue traffic over unstable soil. While the bridge appears to be functioning well, several repairs are

recommended. The larger repairs include replacement of the east approach panel and the expansion joints. It is also recommended the existing bituminous overlay be removed, the deck inspected and repaired for delamination, and a new concrete wearing course be placed over the bridge. A full report regarding the bridge condition and repair recommendations is provided in the appendix under Exhibit 8.

Detention Ponds: Two storm water detention ponds have been identified as needing maintenance in the Marie Avenue Project area. The first is located between Sutton Lane and Trail Road, and the second is located on the corner of Marie Avenue and Lexington Avenue. These two ponds have collected sediment over time and have lost their full ability to treat storm water before discharging to natural bodies of water. Coring samples were taken in each pond and it was found that there are sediment deposits ranging from 1 foot to 2 foot in depth. The pond coring sample map can be found on Exhibit 7 with the geotechnical report.



Wesley Lane Neighborhood Existing Conditions

Streets: The majority of properties located within the Wesley Lane project area were platted between 1950 and 1986. Streets were built during that same timeframe are of similar 30 foot width from edge of pavement to edge of pavement. The deterioration of the roadway comes from many factors including:

- Time and weather
- Soil conditions beneath the roadway surface
- Traffic volumes
- Roadway pavement section
- Heavy vehicle loading
- Storm water drainage
- Public and private utilities

As shown in the 2013-2017 SIP map, the Wesley Lane Neighborhood was scheduled for pavement rehabilitation. From field and city data, it is estimated the pavement maintenance last occurred in the early 1990s. According to the geotechnical report, the existing pavement section for Wesley Lane is 3 inches of bituminous, 5 inches of crushed limestone base over silty sand or sandy lean clay. On South Lane, Wesley Court, Mager Court, and Spring Creek Circle the street consists of a similar average pavement section with better subgrade material. The geotechnical report is located in the appendix under Exhibit 7; additionally the typical cross sections for the Wesley Lane Neighborhood can be found under Exhibit 3. From field inspection it is clear the bituminous pavement in the area has reached its permissible lifespan. Several areas in the Wesley Lane Neighborhood near and around catch basins and manholes have settled and the majority of the pavement is beginning to experience fatigue cracks, pot holing, and frost cracking. Without preventative maintenance, the pavement will eventually worsen to an unusable condition.

Curb and Gutter: In addition to the street, several sections of curb in the Wesley Lane Neighborhood have experienced settling, cracking, and creep. As a result, the curb's ability to properly drain water off the roadway has been diminished. Replacement of compromised sections of curb and gutter will result in better drainage on roadways in the Wesley Lane Neighborhood.

The image shows a settled piece of curb blocking drainage to a catch basin. Additionally, it can be seen that this section of roadway has been patched numerous times.

Utilities: The public utilities in the Wesley Lane Neighborhood were found to be in acceptable condition with exception of an estimated one third of the manhole and catch basin castings. Several outdated and damaged castings were located during the field inspection.

Dodd Road Walking Trail: Currently there are no walking paths to access the retail area and public transportation (near Highway 62) south of the Wesley Lane Neighborhood. It is believed this represents a safety concern to pedestrians and bicyclists who are forced to walk on Dodd Road.

Dodd Road was recently repaved in 2018. Curb was installed on segments of the road, but not everywhere on the east side. The proposed area of the walking path is currently a drainage ditch with no storm sewer and a narrow ROW (13 feet from edge of roadway at narrowest point). The ditch extends from the corner of Wesley and Dodd to Hilltop Road where it drains to the east. Additionally, there are overhead power lines in the ROW that may need relocation depending on the trail's alignment.

Marie Avenue Proposed Improvements

Streets and Lane Configurations: Considering the existing conditions, deterioration factors, and geotechnical investigation, pavement rehabilitation is proposed for Marie Avenue. It is recommended that the top 4 inches of bituminous be milled and removed. The remaining bituminous depth of 7 inches is then reclaimed for use as the base for the new roadway surface. The reclaiming process grinds the bituminous material, pulverizing it into smaller loose material. To make room for the new roadway base, the reclaimed material would be temporarily removed, the subgrade excavated to a depth of 5 inches, and the reclaimed material flopped back as the new base for the roadway. Additionally 3 inches of new aggregate material is bladed back over the reclaimed material. New bituminous

pavement of 6 inches will be placed over the roadway base across the width to provide a smooth new surface and provide improved roadway drainage. A typical section is shown in Exhibit 3.

With a two lane street as wide as 42 feet, many different lane configurations are possible. In the questionnaire, five different options of street configurations were offered to solicit feedback, including:

- Parking on both sides of the street. (Existing street configuration)
- Parking on one side, with a bike lane on the other.
- Parking on one side, with slightly wide driving lanes and no bike lanes
- No parking, slightly wider driving lanes and a bike lane.
- No parking or bike lanes, reduced width of road.

From the survey responses, the existing street configuration was the most popular option. For the purposes of this report the road was treated as the same width as existing.

Curb and Gutter: Curb removal and replacement is estimated in this report at 30%. From spot checking the curb in the field, it was found that approximately 23% +/- 5% of the curb would need to be replaced. This number may fluctuate based on what curb is considered replaceable and how curb replacement impacts the budget. In addition to curb and gutter replacement, driveways impacted by replaced curb and gutter will be reconstructed to the same, or better than, previous conditions. Turf disturbed as a part of the curb replacement process will be restored with topsoil and sod (or hydro-seed where applicable).

Utilities: With the exception of some damaged and outdated castings, the utilities on Marie Avenue are up to date and in satisfactory condition. It is estimated that around two thirds of the castings will be salvage and one third replaced. Some catch basin structures may need to be cleaned out depending on how much debris/sediment is found in them.

Watermain: The section of cast iron pipe watermain to be replaced between Sutton Lane and Dodd road is approximately 765 feet. The replacement will consist of new ductile iron watermain, eight service connections, and two hydrants. The new watermain will have 7.5 foot cover and will require the full reconstruction of Marie Avenue roadway in the replacement area. For the purposes of this report, half of Marie Avenue is considered for full replacement due to watermain reconstruction. This number may be lower based on exact watermain location.

Walking Trail Rehabilitation: It is recommended that the majority of the 1.25 miles of walking trail along Marie Avenue be overlaid due to its failing condition. Full rehabilitation is proposed for trail adjacent to the curb. With the overlay and rehabilitation of walking paths, full replacement of all non-ADA standard crosswalks is recommended in addition to new

crosswalk paint at pedestrian crossings. For the purposes of this report, full replacement of all concrete crosswalk approaches was assumed.

Lexington Trail: To alleviate the safety issues from Marie Avenue to 700 feet south of Marie Avenue, it is proposed that the walking trail be offset a farther distance than the current 2 feet. To accomplish this, it is likely that a 4 to 5 foot high retaining wall would need to be built to make room for the trail alongside the pond. Current estimates place the length of the retaining wall at approximately 550 feet with a 575 foot long fence. With the retaining wall, the offset of the trail from Lexington Avenue could be increased up to 10 feet. Curb and gutter (B624) has also been included in the cost estimation to further delineate drivers from pedestrians. Due to the fair condition of the existing walking trail, it is believed that it can be salvaged where the offset is far enough off the road. Two catch basins and flared end sections (FES) have been included in the estimate to discharge the water collected by the curb. These FES's would drain directly into the adjacent pond.

Pedestrian Tunnel: The pedestrian tunnel is proposed to be replaced with a 10 foot by 14 foot box culvert. The culvert would be 85-90 feet long and have lighting with a 2 inch bituminous paved bottom. To install the new pedestrian culvert, it is possible that an existing watermain pipe and sanitary sewer would need to be removed and replaced as well as reinsulated. In addition to culvert improvements, the wooden retaining walls on the tunnel ends will be reconstructed with mechanically stabilized earth (MSE) walls or new retaining wall. All road reconstruction needed to restore the tunnel excavation has been included in the estimate. The trail leading down to, and away from, the tunnel has also been included in the cost estimate.

Guard Rail and Retaining Walls: The current condition of both the guard rails and retaining walls is poor. The guard rail on the north side of Marie Avenue near 35E has been proposed to be removed and replaced with a 390 foot long, 4 foot high chain link fence from the pedestrian tunnel to the 35E under pass. The wooden retaining walls will be replaced with modular block retaining walls. The retaining walls near the intersection of Victoria Road and Marie Avenue will likely need reconstruction due to their proximity to the road; however, with a change in grading, the walls may be able to be reduced in height and length. The retaining walls near Sutton

Lane on Marie may be able to be eliminated because they are located farther off the road (further investigation and survey is needed).

Land Bridge: A land bridge exists on Marie Avenue near Dodd Boulevard. The land bridge was constructed in 1974 and has had very little maintenance since original construction. The land bridge was inspected and rated on September 12, 2018. The full inspection report is provided in the appendix under Exhibit 8. The inspection report indicates that the land bridge is in need of repairs. The summary of repairs includes replacing the approach panels, replacing the wearing course, replacing all expansion joints, and sounding the bridge deck to check for delamination. Additionally, it was found that the bridge does not have a bridge number and there are no records of inspection or repair. To become compliant with Minnesota statutes and laws, it is recommended the City of Mendota Heights obtain a bridge number from MnDOT, as well as establish a Bridge and Structure Inspection Program.

Detention Ponds: Over the course of decades, sediment has collected in the ponds adjacent to Marie Avenue. The sediment within the ponds reduces the water volume and functionality of the ponds. Working with Element Materials Technology and Kjolhaug Environmental Services, it was determined that approximately 6,000 cubic yards of sediment deposits should be removed out of the two identified ponds. This equates to about 2 feet of removal over the whole area of the ponds. Sediment sampling was completed to determine the composition of the sediment. It was determined the sediment is classified as unregulated fill which can be removed and deposited off site with some restrictions. The sampling revealed that the sediment does not need to be placed in a landfill. Background reports from Element Materials Technology and Kjolhaug Environmental Services are provided in the appendix under Exhibits 7 and 9.

Wesley Lane Neighborhood Proposed Improvements

Streets: Considering the existing condition, deterioration factors, and geotechnical investigation, pavement rehabilitation is proposed for the streets within the project area. It is recommended the full depth of bituminous be reclaimed and used for the new base of the roadway. To make room for the new roadway base, the reclaimed material would be temporarily removed, the subgrade excavated to a depth of 6 inches, and the reclaimed material flopped back as the new base for the roadway. Additionally, 3 inches of new aggregate material is bladed back over the reclaimed material. New bituminous pavement of 4 inches will be placed over the new roadway base across the width to provide a smooth new surface. A proposed typical section for Wesley Lane is shown in Exhibit 3.

Curb and Gutter: Existing curb and gutter will remain in place except for curb that is damaged, settled, or not draining properly. The existing curb will be inspected and marked for removal prior to construction. It is typical to see between 10% to 20% curb replacement for residential roadways of this age due to settlement or cracking. From spot checking the curb in the field it was found that approximately 30.5% +/- 5% of the curb would need to be replaced due to large cracks or settling. For the purposes of this report, 30% was used for calculation of project costs and scope. In addition to curb and gutter replacement, driveways impacted by replaced curb and gutter will be reconstructed to the same, or better than, previous conditions. Turf disturbed as a part of the curb replacement process will be restored with topsoil and sod.

Utilities**:** It is recommended that all the manhole and catch basin rings be replaced as a part of the pavement rehabilitation project. It is typical to reset all manhole and catch basin grades to match the new grades of the roadway to improve drivability and drainage. In addition to the adjustment rings, outdated manhole and catch basin casting assemblies will be replaced. It is recommended that approximately one third of castings be replaced with new/undamaged versions. A catch basin is proposed at the intersection of Wesley Lane and Wesley Court. No other utility improvements are recommended.

Dodd Road Walking Trail: It was found that the absence of a walking trail between Marie Avenue and Maple Street is a serious safety concern for pedestrians. It is proposed that approximately 380 feet of 24 inch storm sewer be extended from the catch basin manhole on Wesley Lane to the drainage structure located across Dodd Road from Hilltop Road. This would eliminate the need for ditch drainage and allow room for an 8 foot walking path. In addition to the sewer and path, it is suggested B624 curb and gutter be installed on the east side of Dodd Road to delineate drivers from the walking path. The trail would follow a 5 foot offset from the back of curb to maximize use of the ROW. ADA ramps would be constructed at intersections. The overhead utilities would likely need to be moved further toward the road to maximize space for the walking trail.

Resident Input

On August 27, 2018, an informational letter and questionnaire were sent to the 57 property owners in the Marie Avenue project area and 50 property owners in the Wesley Lane Neighborhood, to inform them of the project. The questionnaires asked several questions including drainage issues, rain gardens, tree removal requests, parking issues, traffic complaints, and preferred street configurations.

31 of the Marie Avenue questionnaires were returned, for a 54% return rate.

31 of the Wesley Lane Neighborhood questionnaires were returned, for a 62% return rate.

The two key issues noted from the questionnaire were drainage and traffic/pedestrian related issues, including safety concerns for pedestrians. The letters, questionnaires, and responses are shown in Exhibit 2.

Project Funding

Estimated Costs

The following costs were prepared based upon an Engineer's Estimate (Exhibit 4) and are subject to change, depending on the final design of the project, required easements and/or right of way, soil conditions, bids received, and actual work performed.

Table 1
Marie Avenue Project Costs

Item	Schedule	Estimated Costs	
Marie Avenue Street Improvements (Victoria Road to Dodd Road)	A	$ 634,970	
Marie Avenue Street Improvements (Victoria Road to Lexington Avenue)	B	$ 908,695	
Dodd Road to Sutton Lane Watermain	C	$ 47,850	(Others)
Pedestrian Tunnel	D	$ 276,468	(Others)
Trail Rehabilitation	E	$ 92,598	
Lexington Trail	F	$ 236,729	
Retaining Walls and Fences	G	$ 113,920	
Pond Sediment Removal	H	$ 146,698	
Bridge Repair	I	$ 410,875	
Subtotal		$ 2,868,803	
Contingency (10%)		$ 286,880	
Indirect Costs for City (20%)		$ 573,761	
TOTAL PROJECT COST		**$ 3,729,444**	

Table Notes:
City's Indirect Costs includes the following:
Engineering & Administration
Financing and Bonding

Table 2
Wesley Lane Neighborhood Project Costs

Item	Schedule	Estimated Costs
Wesley Lane Neighborhood Street Improvements	A	$ 573,717
Dodd Road Trail (Wesley to Maple St)	B	$ 177,307
Dodd Road Trail (Marie Ave to Wesley)	C	$ 139,061
Subtotal		$ 890,085
Contingency (10%)		$ 89,008
Indirect Costs for City (20%)		$ 178,017
TOTAL PROJECT COST		**$ 1,157,110**

Table Notes:
City's Indirect Costs includes the following:
Engineering & Administration
Financing and Bonding

Assessment Policy

Per the City's Assessment Policy, benefiting properties shall be assessed 50% of the street improvement costs. The remaining 50% shall be paid through the Street Capital Improvement Fund. The term of the assessment is proposed to be 10 years. The interest rate for the term has not yet been set and will be provided as the process moves forward. The interest rate was assumed to be 4.881% for the purpose of this report.

The area proposed to be assessed is every lot, piece, and parcel within the City limits benefiting from the Marie Avenue improvements, whether abutting or not, within the following described areas located within Section 25, Township 28, Range 23, as described on 23 plats: Eagle Ridge Plat 1, Eagle Ridge Plat 2, Valley Curve Estates, Carol F Small 1st Addition, Spring Creek Acres, Somerset Park, Somerset No. 2, Somerset No. 3, Buril and Holmes, Victoria Highlands 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th Additions, Ridgewood Park, Lexington Highland East, and Lexington Highland West in Dakota County, Minnesota.

The area proposed to be assessed is every lot, piece, and parcel within the City limits benefiting from the Wesley Lane Neighborhood improvements, whether abutting or not, within the following described areas located within Section 25, Township 28, Range 23, as described on five plats: The Ponds of Mendota Heights, Rolling Woods Addition, Rolling Woods 2nd Addition, Jefferson Heights and Spring Creek Acres in Dakota County, Minnesota.

The improvement cost is assessed on a unit basis to the benefiting properties as per the Assessment Policy adopted by the Mendota Heights City Council on June 16, 1992, and as amended. See Exhibit 5 for the preliminary assessment roll and Exhibit 6 for the preliminary assessment map.

Private streets are considered access points or driveways within the improvement area and are therefore assessed as a part of the project. These properties benefit from the improvement because the property owners use the improved roadways to access their property.

Assessment Amount

The assessable amount is divided by the number of units within the project area. The preliminary assessment calculation is derived from taking the overall assessable project costs, multiplying by 50%, then dividing by the number of units within the project area.

The units are shown in the Marie Avenue preliminary assessment roll and include a total number of 94 units.

Total project cost:	$ 3,729,444
Assessable Amount:	$ 2,154,860
Assessment (50% of Assessable amount):	$ 1,077,430
Unit Assessment ($1,077,430 / 94 Units):	$11,462.02/Unit*

*The estimated unit assessments for street rehabilitation are higher than the rates staff anticipates for future rehabilitation projects, due to anticipated subgrade correction. Staff proposes to assess benefiting properties $**5,500.00** per unit to limit financial impacts on residents.

Single Family Dwelling Units: 19 Units
Single Family Dwelling Assessment per Unit: $6,830.72

Eagle Ridge East Townhouse Units: 7 Units
Eagle Ridge East Townhouse Assessment Divided by 7 units – Cost per Unit $6,830.72

Valley Highlands Townhouse Units: 31 Units
Valley Highlands Townhouse Assessment – Cost per Unit $6,830.72

City of Mendota Heights Units: 37 Units
City of Mendota Heights Assessment (37 x $6,830.72): $252,736.64
(Amount moved to Street Capital Improvement Fund)

The units are shown in the Wesley Lane Neighborhood preliminary assessment roll and include a total number of 53 units.

Total project cost:	$ 1,157,110
Assessable Amount:	$ 724,056
Assessment (50% of Assessable amount):	$ 362,028

Single Family Dwelling Units: 49 Units
Single Family Dwelling Assessment per Unit: $6,830.72/Unit*

St. Paul United Methodist Church Units: 4.0 Units
St. Paul United Methodist Church Assessment (4 x $6,830.72): $27,322.88

*The estimated unit assessments for street rehabilitation are higher than the rates staff anticipates for future rehabilitation projects, due to anticipated subgrade correction. Staff proposes to assess benefiting properties $**5,500.00** per unit to limit financial impacts on residents.

Funding Sources

Funding sources for this project are proposed to come from municipal levy, assessments, utility funds, municipal state aid, and Dakota County. Table 3 shows the breakdown of funding sources for this project.

Table 3
Marie Avenue Funding

Funding Source	Amount
Municipal Levy	$ 2,227,772
Assessment (50%)	$ 389,351
Municipal State Aid	$ 500,000
Utility Fund – Water	$ 62,205
Utility Fund – Storm Sewer	$ 190,708
Dakota County (Pedestrian Tunnel)	$ 359,408
TOTAL	**$ 3,729,444**

An alternative option for Marie Avenue would be to complete a mill and overlay instead of reclamation. A mill and overlay would reduce costs now, but the improvements will only last 10 to 15 years. The current cracking on Marie Avenue could reflect through the mill and overlay within two years of completion, because the bituminous base below the surface is not being corrected. The watermain work between Sutton Lane and Dodd Road would not be completed with this alternative. Below is the funding table for the proposed mill and overlay project.

Table 4
Marie Avenue Mill and Overlay Funding (Alternative)

Funding Source	Amount
Municipal Levy	$ 1,371,837
Assessment (50%)	$ 389,351
Municipal State Aid	$ 500,000
Utility Fund – Water	---
Utility Fund – Storm Sewer	$ 190,708
Dakota County (Pedestrian Tunnel)	$ 359,408
TOTAL	**$ 2,811,304**

Table 5
Wesley Lane Neighborhood Funding

Funding Source	Amount
Municipal Levy	$ 362,028
Assessment (50%)	$ 362,028
Municipal State Aid (Dodd Trail)	$ 411,279
Utility Fund – Storm Sewer	$ 21,775
TOTAL	**$ 1,157,110**

The total costs and funding sources for the projects are summarized in the following table:

Table 6
Chapter 429 Funding Summary

Item	Municipal Levy	Assessment	Total Improvement Cost
Street Rehabilitation Marie Avenue	$2,227,772	$389,351	$2,617,123
Street Rehabilitation Wesley Neighborhood	$362,028	$362,028	$795,082
Totals	**$2,589,800**	**$751,379**	**$3,412,205**

With a total improvement cost of $3,412,205, the assessed amount of $751,379 would be equivalent to 22% of the 429 improvement costs. Minnesota Statutes Chapter 429 Special Assessment Bond Issue requires that a minimum of 20% of the improvement costs be recovered through special assessments.

Preliminary Project Schedule

The following project schedule outlines an approach to complete the assessable project in 2019:

Table 7
Project Schedule

Activity	Date
City Awarded Contract	June 5, 2018
Authorize Preparation of Feasibility Report	August 7, 2018
Receive Feasibility Report / Authorize Preparation of Plans and Specs	December 4, 2018
Neighborhood Meeting	January 9, 2019
Preliminary Hearing	January 15, 2019
Plans and Specifications Completed and Bid Solicitation Issued	March, 2019
Bid Opening	April, 2019
Award Contract	April, 2019
Commencement of Construction	May, 2019
Substantial Completion of Construction	September, 2019
Assessment Hearing / Adopt Assessment Roll	October, 2019
Final Completion of Construction	June, 2020

Conclusion and Recommendation

The proposed improvement is necessary, cost effective, and feasible from an engineering standpoint and should be made as proposed.

The City is considering the phasing of this project over two years with indirect costs of 15% and assessments of $5,500. The following is the funding for the project over the two year period.

Phase 1: 2019 Improvements to include Marie Avenue street improvements from 35E to Dodd Road, watermain replacement, pedestrian tunnel, walking trail on Marie Avenue, land bridge repair, retaining wall and fence replacement, pond sediment removal, Dodd Road walking trail and the Wesley Lane neighborhood street improvements.

Table 8

Phase 1: 2019 Improvement Cost

Marie Avenue (35E to Dodd Rd)	$ 793,713
Watermain (Sutton to Dodd Road)	$ 59,813
Pedestrian Tunnel	$ 345,585
Trail on Marie Avenue (35E to Dodd)	$ 57,874
Bridge Repair	$ 513,594
Retaining Walls and Fences	$ 70,504
Pond Sediment Removal	$ 62,561
Wesley Neighborhood Street Imps	$ 717,146
Trail on Dodd Rd (Wesley to Maple)	$ 221,634
Trail on Dodd Rd (Marie to Wesley)	$ 173,826
TOTAL	**$ 3,016,249**
*Costs include 10% contingency & 15% indirect costs	

Table 9

Phase 1: 2019 Improvement Funding

Tax Levy	$ 1,089,349
Assessments	$ 437,166
Municipal State Aid	$ 1,000,000
Utility Fund - Water	$ 59,813
Utility Fund - Storm Sewer	$ 84,336
Dakota County	$ 345,585
TOTAL	**$ 3,016,249**
*Assessment restricted to $5,500 per unit	

Phase 2: 2020 Improvements to include Marie Avenue street improvements from Lexington Avenue to 35E, walking trail on Marie Avenue, walking trail on Lexington Avenue, retaining wall and fence replacement, and pond sediment removal.

Table 10

Phase 2: 2020 Improvement Costs

Marie Avenue (Lexington to 35E)	$ 1,135,869
Trail on Marie Avenue (Lexington to 35E)	$ 57,874
Trail on Lexington (Marie to Avanti)	$ 295,911
Retaining Walls and Fences	$ 71,896
Pond Sediment Removal	$ 120,811
TOTAL	**$ 1,682,361**
*Costs include 10% contingency & 15% indirect costs	

Table 11
Phase 2: 2020 Improvement Funding

Tax Levy	$	847,337
Assessments	$	314,213
Municipal State Aid	$	400,000
Utility Fund - Water	$	0
Utility Fund - Storm Sewer	$	120,811
TOTAL	**$**	**1,682,361**
*Assessment restricted to $5,500 per unit		

The total estimated cost of the recommended improvements is $4,698,610 over the two year process.

Exhibit 1

SIP Rehabilitation Map

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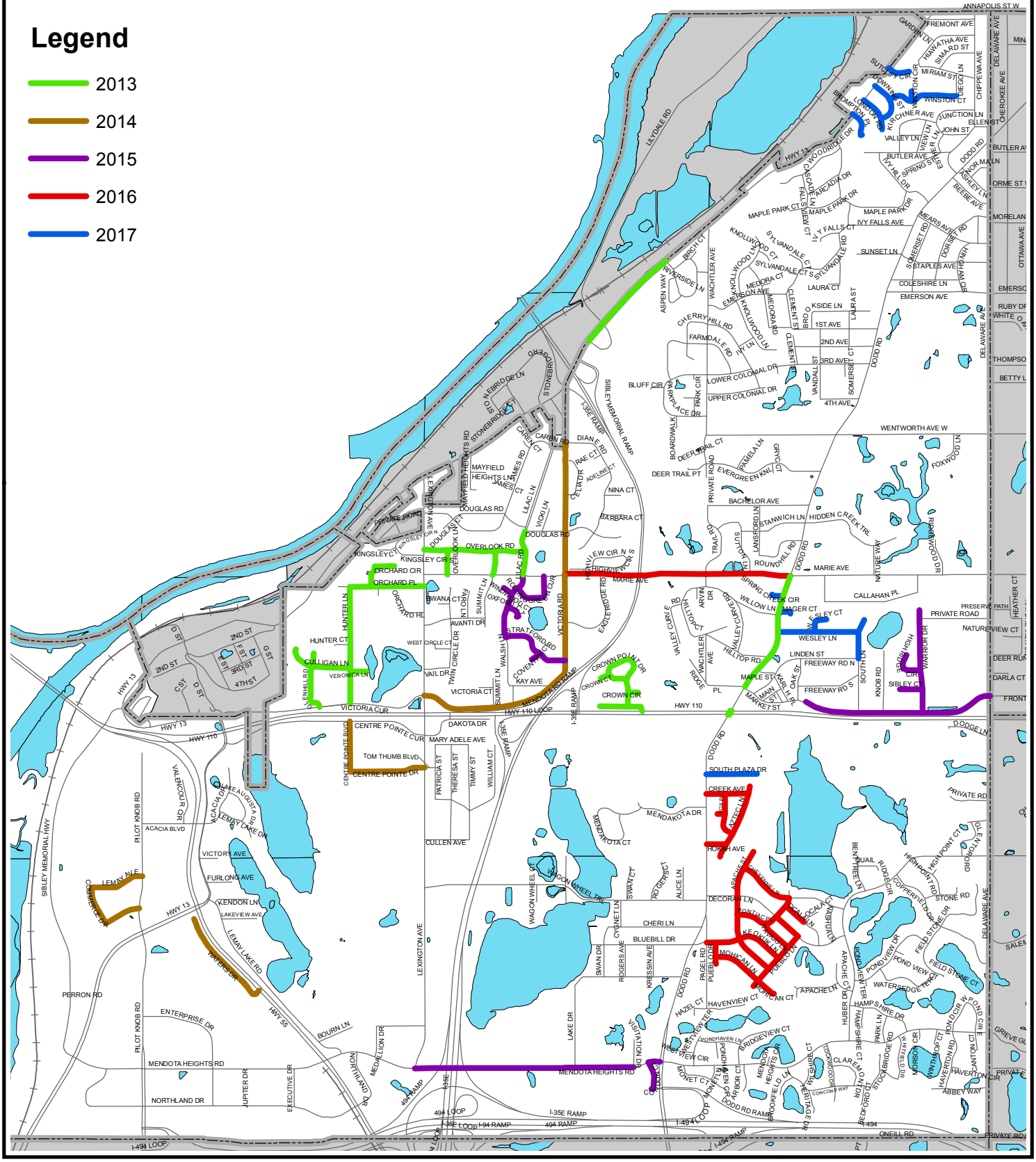
Street Improvement Plan 2013-2017 Projects - 5 Year Plan

December 13, 2012

0 2,500

SCALE IN FEET

City of Mendota Heights



Street Improvement Plan 2013-2017 Rehabilitation Projects

December 13, 2012

0 2,500

SCALE IN FEET

City of Mendota Heights

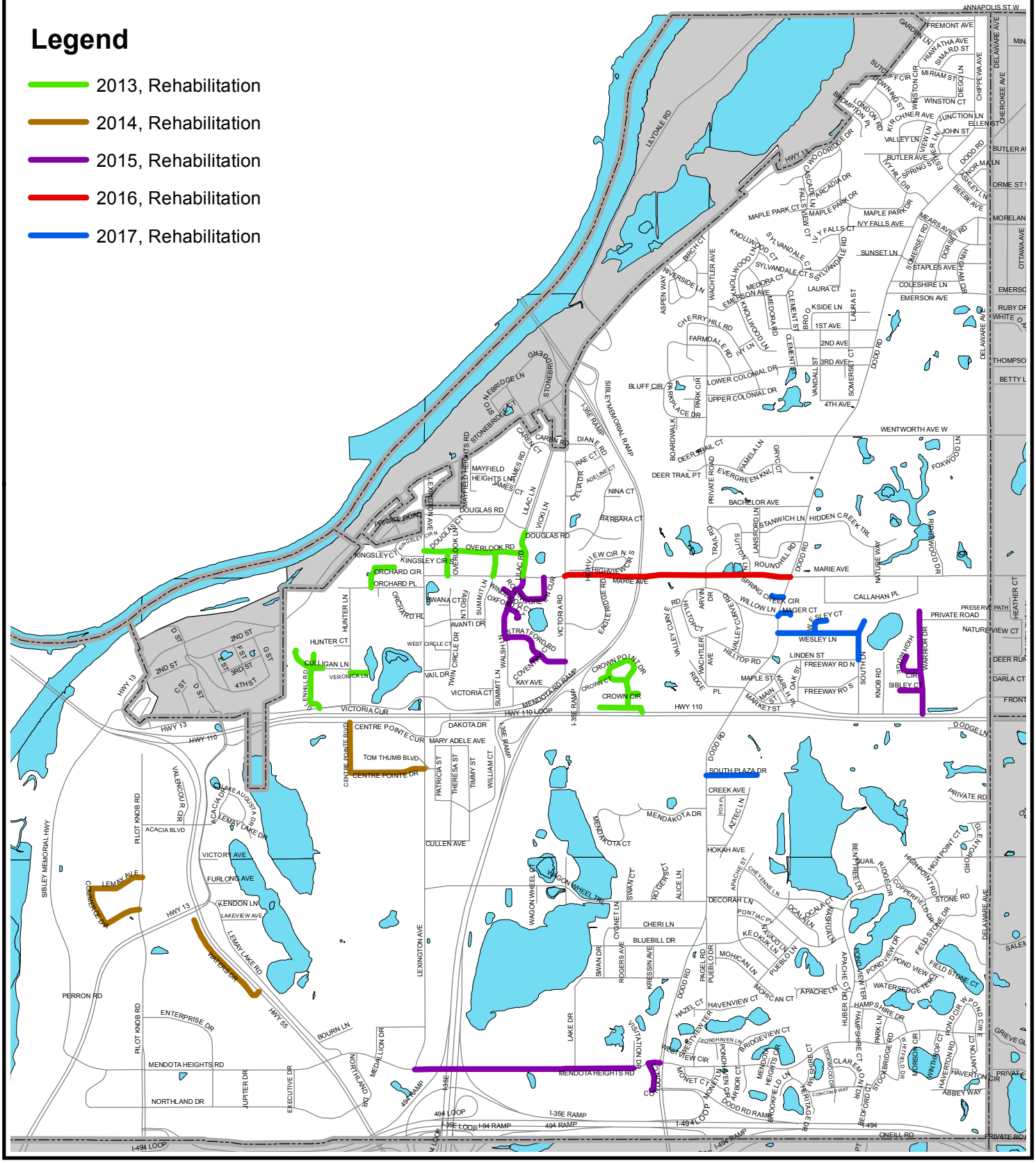


Exhibit 2

Resident Input

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September 6, 2018

RE: Marie Avenue Improvements – Property Owners Questionnaire
City Project Number 201805

Dear Resident:

The City of Mendota Heights has initiated the process of roadway rehabilitation and utility improvements for the summer of 2019 which includes street rehabilitation of Marie Avenue from Dodd Road to Lexington Avenue South. The City of Mendota Heights Street Improvement Plan (SIP) identifies future street rehabilitation and reconstruction projects, and the Marie Avenue street rehabilitation project was planned for 2019. The Mendota Heights City Council ordered the preparation of a feasibility report for the Marie Avenue Improvements at the August 7th, 2018, city council meeting.

The next step is to get feedback from you regarding a number of key components of the project. The information you share with us is essential in determining certain aspects of the project that may be constructed.

Things to know and consider if an improvement project is approved:

- Residents pay a portion of the overall project cost in the form of a special assessment. You will not be billed for the special assessment until Fall 2019. Estimated special assessments for your neighborhood will not be determined until after information has been gathered from the questionnaires and a feasibility report is completed.
- Components of a project vary and are based on questionnaire responses. Special assessments typically include the cost of the new roadway. Other utility upgrades such as water main, sanitary sewer, and storm sewer are funded through utility funds and are not assessed.
- Construction typically starts in spring/early summer and ends in late fall of the same year.

The following information explains the questionnaire that is enclosed. A map showing the boundaries of the area to be reconstructed is also enclosed. After reading this letter completely, please complete the questionnaire and return by September 16th, 2018, in the self-addressed stamped envelope.

Drainage and Erosion Issues
Typically, the installation of curb and gutter as well as rain gardens go a long way in correcting drainage issues due to concentrated flows from streets onto private property.

The City would like to know about any local drainage problems that you may have. Does storm water run-off stand in the street or in front of your house? As part of the storm sewer design process, we would like to know if this or similar situations are occurring in your neighborhood. If so, please describe it in the drainage and erosion section of the questionnaire. We will review them for possible corrective action.

Rain Gardens
A rain garden is simply a "sunken" flowerbed, designed to retain and infiltrate as much storm water as possible. Rather than having the typical "raised" flowerbed that drains water away from the plants that need it, how about creating a garden to capture and use storm water to water the plants? The benefit to the environment is the reduction in the amount of storm water entering our ponds, lakes and streams. Every drop of water entering the street is directed to the gutter, it then flows through storm sewer pipes and into our ponds, lakes, streams and rivers.

Should you choose to have a rain garden, it will be graded, prepared and plants supplied as part of the project at NO additional cost to you. The only condition is that you take ownership of the garden as far as maintaining it as part of your landscaping. Please call or stop in at the Engineering Department in City Hall for more information.

Private Underground Utilities
Some residents install private underground utilities in the City owned right-of-way. Typically the right-of-way is 15' to 20' behind the roadway. These utilities are usually lawn irrigation or pet containment systems. Utility and roadway reconstruction can damage these utilities. The contractor is responsible for protecting marked irrigation systems and pet fences, if damaged; they will be replaced to their original condition by the contractor. However, if the contractor knows the location of these private utilities, they can attempt to avoid damaging them.

If you have any private underground utilities, please tell us in the private underground utilities section of the questionnaire.

Tree Issues
The City regards trees as an important element in any neighborhood environment and will do everything possible to design around any boulevard trees - especially mature trees. *By no means will the City ever clear-cut entire boulevards of trees as part of a construction project!*

Property owners must understand, however, there are some instances in which boulevard trees may need to be removed. Several instances include:

1) The tree is an obstruction for the new street
2) The tree has been a maintenance problem or sight distance hazard
3) The tree is located over an existing utility pipe in need of repair.

If a tree needs to be removed, the City will notify the property owner whose yard fronts the boulevard in which the tree stands prior to removal and explain the reason for removal. *Residents who desire to have **boulevard** trees removed must notify the city prior to construction bidding which usually occurs in early spring. Residents who desire to have non-boulevard trees removed or trimmed must do so at their expense.*

Traffic/Pedestrian Issues
The City of Mendota Heights typically reviews traffic or pedestrian issues on local streets. We would like to know if you feel that your roadway has any traffic or pedestrian issues.

The existing street width on Marie Avenue is approximately 41 feet wide from edge of asphalt to edge of asphalt. With a width this large, there are many different configurations of Marie Avenue that are possible. Currently, Marie Avenue has 12 foot driving lanes in both directions and approximately 9 foot parking lanes on both sides. The City is exploring several different roadway configurations, including utilizing bike lanes and less parking, to maximize function and pedestrian safety. Please tell us your preferred street configuration and give your opinion about bike lanes in the traffic/pedestrian issues section of the questionnaire. Additionally, the City is exploring options to rehabilitate and improve walking paths in the areas around Marie Avenue. Please give your opinion on walking trails and crosswalks in the traffic/pedestrian issues section of the questionnaire.

Questions
If you have questions after reading this letter, please call me or the engineering staff at 651-452-1850.

Sincerely,

Ryan Ruzek, PE
Public Works Director
ryanr@mendota-heights.com

Enclosed: Property Owners Questionnaire
Rehabilitation Map
Self-Addressed Stamped Envelope

PROPERTY OWNERS QUESTIONAIRE

MARIE AVENUE STREET REHABILITATION & IMPROVEMENTS, CITY OF MENDOTA HEIGHTS

Please do **NOT** answer these questions before you have read the attached letter. Please complete and return this survey by **September 16th, 2018**, using the self-addressed stamped-envelope.

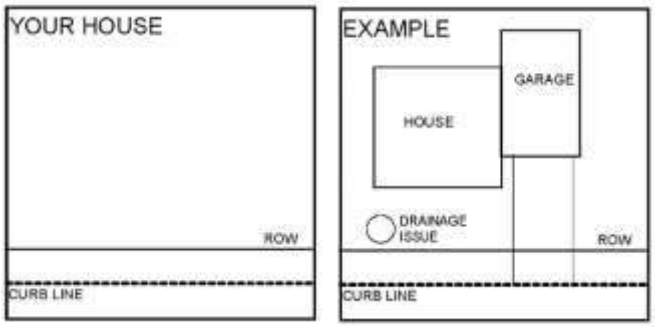
Address _____

Drainage and Erosion Issues

1. Do you regularly get water in your basement? ☐ Yes ☐ No
   If yes, when? (CHECK ALL THAT APPLY)
   ☐ After big rain storms ☐ After almost any rain or melting event
   ☐ In the spring - during snow melt ☐ All the time - continuous
   Comments_____
   _____

2. Do you have any of the following? (CHECK ALL THAT APPLY)
   ☐ Basement drain tile ☐ Sump pump ☐ None

3. Does water stand in your yard after big storms? ☐ Yes ☐ No
   If yes,
   A. How long is it there? _____
   B. How far away is it from your house? _____
   C. Where is it in relation to your house (direction and feet)? _____
   D. Is the standing water creating damage to the property or is it just a nuisance?
   _____
   E. Please sketch in the space below: your house, garage, driveway, and where drainage problem is occurring:



4. Please list specific surface water drainage or erosion problems on your street:
   _____
   _____
   _____

NOTE: Most private drainage problems (which are usually attributed to grades at or near the foundation) will likely **NOT** be solved by this street project. However, with this information we may be able to take a look at the whole picture and possibly address some occurrences.

Rain Gardens

5. If it is feasible to do so, do you wish to have a rain garden placed in the boulevard on your parcel? ☐ Yes ☐ No

   If you answered "yes",

   A. Do you have a preferred size? _____

   B. Preferred location: _____

   Comments or questions about rain gardens:

   _____

   _____

Please visit www.bluethumb.org for more information on rain gardens or contact the Engineering Department at 651-452-1850.

Private Underground Utilities

6. Do you have an underground lawn irrigation system in the City right-of-way? (Typically the right-of-way is 15' to 20' behind the roadway.)

   ☐ Yes ☐ No

7. Do you have an underground electric pet containment system in the City's right-of-way?

   ☐ Yes ☐ No

8. Do you have any private wiring, private pipes, etc in the City's right-of-way?

   ☐ Yes ☐ No

Tree Issues

9. Do you have any trees in the City right-of-way that you would like removed? (Typically the right-of-way is 15' to 20' behind the roadway.) ☐ Yes ☐ No

Traffic/Pedestrian Issues

10. If you live on Marie Avenue would you prefer on street parking lane/space in front of your property?

    ☐ No Parking ☐ Parking allowed

11. Do you feel Marie Avenue would benefit from designated biking lanes?

    ☐ Yes ☐ No

    Comments or questions about bike lanes:

    _____

    _____

12. Preferred street arrangement for Marie Avenue.

    ☐ Parking on both sides (existing arrangement)
    ☐ Parking on one side, with a bike lane
    ☐ Parking on one side, with slightly wider driving lanes and shoulders, and no bike lanes
    ☐ No parking on either side, with bike lanes and slightly wider driving lanes
    ☐ No parking or bike lanes on either side, reduce the width of the roadway

    Suggestions:

    _____

    _____

13. Do you feel your neighborhood or roadway has any pedestrian or traffic issues (e.g. crossing adjacent to busy roadways, parking, excessive speed, traffic volumes, etc.)?
☐ Yes ☐ No
If so, where do the issues happen?
_____
_____

14. Do you feel your neighborhood or roadway would benefit from improved walking trails, sidewalks and crosswalks?
☐ Yes ☐ No
If so, which areas are most important to you?
_____
_____

Other Issues

15. Additional Comments/Questions:
_____
_____

Thank you for your cooperation. Please return this questionnaire in the enclosed self-addressed, stamped-envelope. **Please complete all questions and return to the City of Mendota Heights by September 16th, 2018**.

September 6, 2018

RE: Wesley Lane Neighborhood Improvements – Property Owners Questionnaire
City Project Number 201805

Dear Resident:

The City of Mendota Heights has initiated the process of roadway rehabilitation and utility improvements for the summer of 2019 which includes your neighborhood. The City of Mendota Heights Street Improvement Plan (SIP) identifies future street rehabilitation and reconstruction projects, and the Wesley Lane Neighborhood street rehabilitation project was planned for 2019. The Mendota Heights City Council ordered the preparation of a feasibility report for the Wesley Lane Neighborhood Improvements at the August 7th, 2018, city council meeting.

The next step is to get feedback from you regarding a number of key components of the project. The information you share with us is essential in determining certain aspects of the project that may be constructed.

Things to know and consider if an improvement project is approved:

- Residents pay a portion of the overall project cost in the form of a special assessment. You will not be billed for the special assessment until Fall 2019. Estimated special assessments for your neighborhood will not be determined until after information has been gathered from the questionnaires and a feasibility report is completed.
- Components of a project vary and are based on questionnaire responses. Special assessments typically include the cost of the new roadway. Other utility upgrades such as water main, sanitary sewer, and storm sewer are funded through utility funds and are not assessed.
- Construction typically starts in spring/early summer and ends in late fall of the same year.

The following information explains the questionnaire that is enclosed. A map showing the boundaries of the area to be reconstructed is also enclosed. After reading this letter completely, please complete the questionnaire and return by September 16th, 2018, in the self-addressed stamped envelope.

Drainage and Erosion Issues
Typically, the installation of curb and gutter as well as rain gardens go a long way in correcting drainage issues due to concentrated flows from streets onto private property.

The City would like to know about any local drainage problems that you may have. Does storm water run-off stand in the street or in front of your house? As part of the storm sewer design process, we would like to know if this or similar situations are occurring in your neighborhood. If so, please describe it in the drainage and erosion section of the questionnaire. We will review them for possible corrective action.

Rain Gardens
A rain garden is simply a "sunken" flowerbed, designed to retain and infiltrate as much storm water as possible. Rather than having the typical "raised" flowerbed that drains water away from the plants that need it, how about creating a garden to capture and use storm water to water the plants? The benefit to the environment is the reduction in the amount of storm water entering our ponds, lakes and streams. Every drop of water entering the street is directed to the gutter, it then flows through storm sewer pipes and into our ponds, lakes, streams and rivers.

Should you choose to have a rain garden, it will be graded, prepared and plants supplied as part of the project at NO additional cost to you. The only condition is that you take ownership of the garden as far as maintaining it as part of your landscaping. Please call or stop in at the Engineering Department in City Hall for more information.

Private Underground Utilities
Some residents install private underground utilities in the City owned right-of-way. Typically the right-of-way is 15' to 20' behind the roadway. These utilities are usually lawn irrigation or pet containment systems. Utility and roadway reconstruction can damage these utilities. The contractor is responsible for protecting marked irrigation systems and pet fences, if damaged; they will be replaced to their original condition by the contractor. However, if the contractor knows the location of these private utilities, they can attempt to avoid damaging them.

If you have any private underground utilities, please tell us in the private underground utilities section of the questionnaire.

Tree Issues
The City regards trees as an important element in any neighborhood environment and will do everything possible to design around any boulevard trees - especially mature ones. *By no means will the City ever clear-cut entire boulevards of trees as part of a construction project!*

There are some instances in which boulevard trees may need to be removed. Several instances include:

1) The tree is an obstruction for the new street
2) The tree has been a maintenance problem or sight distance hazard
3) The tree is located over an existing utility in need of repair.

If a tree needs to be removed, the City will notify the property owner whose yard fronts the boulevard in which the tree stands prior to removal and explain the reason for removal. *Residents who desire to have **boulevard** trees removed must notify the city prior to construction bidding which usually occurs in early spring. Residents who desire to have non-boulevard trees removed or trimmed must do so at their expense.*

Traffic/Pedestrian Issues
The City of Mendota Heights typically reviews traffic or pedestrian issues on local streets. We would like to know if you feel that your roadway has any traffic or pedestrian issues. If you feel that the streets in Wesley Lane neighborhood are overcrowded or are subject to speeding vehicles, please make a comment on the traffic/pedestrian issues section of the questionnaire.

Questions
If you have questions after reading this letter, please call me or the engineering staff at 651-452-1850.

Sincerely,

Ryan Ruzek, PE
Public Works Director
ryanr@mendota-heights.com

Enclosed: Property Owners Questionnaire
Reconstruction Map
Self-Addressed Stamped Envelope

PROPERTY OWNERS QUESTIONAIRE

WESLEY LANE NEIGHBORHOOD SREET IMPROVEMENTS, CITY OF MENDOTA HEIGHTS

Please do **NOT** answer these questions before you have read the attached letter. Please complete and return this survey by **September 16th, 2018**, using the self-addressed stamped-envelope.

Address _____

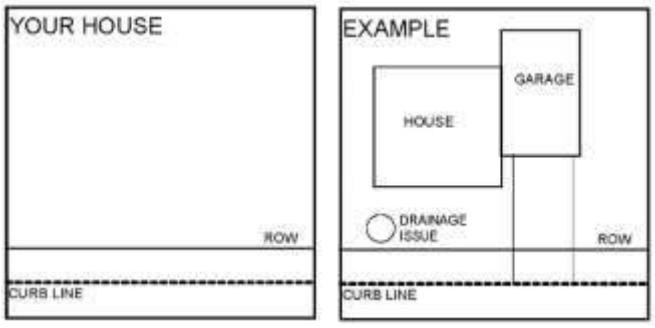
Drainage and Erosion Issues:

1. Do you regularly get water in your basement? ☐ Yes ☐ No
   If yes, when? (CHECK ALL THAT APPLY)
   ☐ After big rain storms ☐ After almost any rain or melting event
   ☐ In the spring - during snow melt ☐ All the time - continuous
   Comments_____
   _____

2. Do you have any of the following? (CHECK ALL THAT APPLY)
   ☐ Basement drain tile ☐ Sump pump ☐ None

3. Does water stand in your yard after big storms? ☐ Yes ☐ No

   If yes,
   A. How long is it there? _____
   B. How far away is it from your house? _____
   C. Where is it in relation to your house (direction and feet)? _____
   D. Is the standing water creating damage to the property or is it just a nuisance?
      _____
   E. Please sketch in the space below: your house, garage, driveway, and where drainage problem is occurring:



4. Please list specific surface water drainage or erosion problems in your neighborhood:
   _____
   _____
   _____

   NOTE: Most private drainage problems (which are usually attributed to grades at or near the foundation) will likely **NOT** be solved by this street project. However, with this information we may be able to take a look at the whole picture and possibly address some occurrences.

Rain Gardens:

5. If it is feasible to do so, do you wish to have a rain garden placed in the boulevard on your parcel? ☐ Yes ☐ No
   If you answered yes:
   A. Do you have a preferred size? _____
   B. Preferred location: _____

6. Additional Comments/Questions about Rain Gardens:
   _____
   _____

Please check out www.bluethumb.org for more information on rain gardens or contact the Engineering Department at 651-452-1850.

Private Underground Utilities

7. Do you have an underground lawn irrigation system in the City right-of-way? (Typically the right-of-way is 15' to 20' behind the roadway.)
   ☐ Yes ☐ No

8. Do you have an underground electric pet containment system in the City's right-of-way?
   ☐ Yes ☐ No

9. Do you have any private wiring, private pipes, etc in the City's right-of-way?
   ☐ Yes ☐ No

Tree Issues

10. Do you have any trees in the City right-of-way that you would like removed? (Typically the right-of-way is 15' to 20' behind the roadway.) ☐ Yes ☐ No

Traffic/Pedestrian Issues

11. Do you feel your neighborhood or roadway has any pedestrian or traffic issues (e.g. crossing adjacent to busy roadways, parking, excessive speed, traffic volumes, etc.)?
    ☐ Yes ☐ No

    If yes, where?
    _____
    _____

Other Issues

12. Additional Comments/Questions:
    _____
    _____

Thank you for your cooperation. Please return this questionnaire in the enclosed self-addressed, stamped-envelope. **Please complete all questions and return to the City of Mendota Heights by September 16th, 2018**.

QUESTIONNAIRE RESPONSES																																	
CITY OF MENDOTA HEIGHTS					Questionnaires Sent Out:			56																									
PROJECT:	Marie Avenue Improvements				Questionnaires Returned:			31																									
PROJECT #:	201805				Percent Returned:			55%																									
General Information				Drainage and Erosion Issues											Rain Gardens			Private Underground Utilities						Tree Issues									
Address			Returned Survey	Water in basement?		Do you have any of the following?			Comments	Does water stand in your yard after big storms?		Describe specific drainage or erosion problems on your street:	If feasible, would you like a rain garden in your yard?			Irrigation Sys. in ROW?		Pet Containment Sys. in ROW?		Other Private Utilities in ROW?		Do you have a tree in the ROW you would like removed?		Would You Prefer street parking space in front of your property?							
				Yes	No	Basement drain tile	Sump Pump	None		Yes	No		Yes	No	Maybe	Yes	No	Yes	No	Yes	No	Yes	No	No Parking	Parking Allowed							
XXX	XXX	XXX	1		1			1			1		x	x	x	x	x		1				1	1								
717	Marie	Avenue	1		1		1				1	N/A		1		1			1		1		1			1						
721	Marie	Avenue	1		1		1				1			1			1		1		1		1	x	x							
725	Marie	Avenue	1		1	1	1				1		1				1		1		1		1		1							
726	Marie	Avenue	1		1	1					1			1			1		1		1		1	1								
730	Marie	Avenue	1		1			1			1			1		1			1	1			1		1							
766	Marie	Avenue	1		1	1	1		15-20 days - spring time. Near Marie east side of driveway culvert. Culvert may need to be cleaned out! No - more of a nuisance.	1				1			1		1		1		1			1							
776	Marie	Avenue	1		1	1	1				1	N/A		1			1		1		1		1			1						
786	Marie	Avenue	1	1			1		After heavy rain in July ran 1/4 floor vents flooded. Water proofers dug deeper to existing sump pump around SE - SW side of basement. After big rain storms, in the spring during rain melt, After almost any rain or melting, all the time - continuous	1		Minor - how long there - 1-2 days of dry weather, 10 30 feet from house, East side to back yard - no damage	1				1		1		1		1			1						
890	Marie	Avenue	1		1			1				None		1			1		1		1		1			1						
886	Marie	Avenue	1		1	x	x	x			1			1			1		1		1		1	1								
1005	Marie	Avenue	1		1			1		x	x		x	x	x	1		1			1		1		1							
1037	Marie	Avenue	1		1			1		x	x			1			1		1	1			1	1								
1041	Marie	Avenue	1		1			1			1			1			1		1		1		1			1						
1051	Marie	Avenue	1		1			1			1		x	x	x		1		1		1		1			1						

Traffic/Pedestrian Issues														Other Issues
Designated biking Lanes?		Comments or questions about bike lanes	Preferred Street Arrangement					Do you feel your neighborhood or roadway has traffic Issues?		Where do issues happen?	Neighborhood or roadway would benefit from walking trails, sidewalks and crosswalk?		Areas most Important?	Describe other issues or concerns in your neighborhood.
Yes	No		Parking both sides (existing arrangement)	Parking on one side, bike lanes both sides	Park on one side, wider driving lanes - no bike lanes	No parking either side, w/bike lanes & slightly wider driving lanes & shoulders	No parking or bike lanes on either side, reduce width of roadway	Yes	No		Yes	No		
1				1					1		1			
1				1					1			1		
1		a lot of bike traffic- they are currently just using the parking lane		1				1		There is no way to safely walk to the village - a side walk up Dodd Road would have been nice	1			The sidewalk needs improvement from Dodd to Trail Rd - very bumpy & cracked. Also, it's so dark. I know there is a desire to keep things incognito, and I'm all in favor of not adding to light pollution, but maybe 2 or 3 street lamps along Marie (focused downward) would be nice - and would feel much safer.
1		Many bike groups may not use the lanes but it may help. It may slow down traffic as well		1				1		There is excess speed on Marie in front our house. The wide roadway my contribute to it. I think bike lanes may help give the perception of a neighborhood rather than a highway.	1		The path needs to be redone. It is extremely important for kids and walkers, and needs to stay. The path is a priority. It needs to be as wide as the snow plow so our yard does not get turned up every winter.	
1						1			1			1		Marie Ave. is very dark! Perhaps a street light.
	1				1			x	x			1		
1				1				1		Yes! Excessive speed. Doing anything to reduce the speed would be greatly appreciated.	1		The walking trail on the north side of Marie just needs to be upgraded.	Solar powered digital speed signs. Concerned about the floating bridge in front of our house, updated? Speed bumps?
	1		1					x	x	Excessive speed - speed limit should be 30 MPH to Lex with better posting		1	Existing path in this area is adequate.	
	1	Current roadway is fine for bikers, do not want to take away space existing for parking or roadway traffic (car)	1						1	Only at Valley Park may consider pedestrian crossing - safer to cross street	1		Valley Park Area	
	1		1						1			1		
	1		1						1			1		
1		I do not live directly on Marie - I am part of Eagle Ridge - there are 6 residences in our cul-de-sac		1				x	x		x	x		
	1	Bike path already across our street	1					1		Traffic detours to Marie when 13 & 110/62 are worked on	1			We already have a sewer drain off our driveway - we will be selling our property in Spring 2019 - we are building new property elsewhere.
	1				1				1		1			
	1		1					1		There are a number of intersections with curved roads & just yield signs that always feel unsafe		1		
1				1				1		Cars speed on Marie between Victoria & Lex Need speed bumps and digital speed signs. Lots of young kids in area - very dangerous		1	Need to keep trails along Marie smooth and resurfaced. No other sidewalk needed	

General Information				Drainage and Erosion Issues									Rain Gardens			Private Underground Utilities						Tree Issues			
Address			Returned Survey	Water in basement?		Do you have any of the following?			Comments	Does water stand in your yard after big storms?		Describe specific drainage or erosion problems on your street:	If feasible, would you like a rain garden in your yard?			Irrigation Sys. in ROW?		Pet Containment Sys. in ROW?		Other Private Utilities in ROW?		Do you have a tree in the ROW you would like removed?		Would You Prefer street parking space in front of your property?	
				Yes	No	Basement drain tile	Sump Pump	None		Yes	No		Yes	No	Maybe	Yes	No	Yes	No	Yes	No	Yes	No	No Parking	Parking Allowed
1059	Marie	Avenue	1		1			1			1			1			1		1		1		1		1
1091	Marie	Avenue	1		1	1					1			1		1			1		1		1		1
876	Marie	Avenue	1	x	x		1				1			1		x	x		1			x	x	x	x
884	North Highviev	Circle	1		1			1			1			1			1		1		1		1	1	
892	North Highviev	Circle	1		1			1			1	No drainage problem exists		1		x	x		1	x	x		1		1
908	North Highviev	Circle	1		1			1			1	We live in Victoria Highlands - a private street! There is a problem with water at our entrance - water stands on there anytime after rain or ice melting	x	x	x	x	x	x	x	x	x	x	x	x	x
912	North Highviev	Circle	1		1			1		x	x			1			1		1		1		1	1	
920	North Highviev	Circle	1		1			1			1			1			1		1		1		1		1
924	North Highviev	Circle	1		1	1	1		sump pump never used		1	None		1			1		1		1		1	1	
926	South Highviev	Circle	1		1		1				1			1		1			1		1		1	x	x
890	South Highviev	Circle	1		1	1					1			1			1		1		1		1	x	x
902	South Highviev	Circle	1		1	1					1	Not aware	1				1		1		1		1		1
910	South Highviev	Circle	1		1			1			1			1			1		1		1		1	1	
942	South Highviev	Circle	1		1	x	x	x	A few hours - 10 feet - south & about 10 ft. - nuisance	1		Ice forms in winter along curbs. Entrance road to Marie holds wash out		1		x	x		1		1		1	x	x
878	South Highviev	Circle	1	x	x	x	x	x			1			1		x	x		1		1	x	x	1	
894	South Highviev	Circle	1		1	1					1			1		1			1	x	x		1	1	
Returned			31	1	**28**	9	9	14		3	**24**		3	**24**	0	6	**19**	1	**29**	2	**24**	2	**26**	10	**15**
Percent of Returned Responses			100%	3%	**97%**	32%	32%	50%		11%	**86%**		11%	**89%**	0%	24%	**76%**	3%	**97%**	7%	**86%**	7%	**93%**	40%	**60%**

Traffic/Pedestrian Issues														Other Issues
Designated biking Lanes?		Comments or questions about bike lanes	Preferred Street Arrangement					Do you feel your neighborhood or roadway has traffic Issues?		Where do issues happen?	Neighborhood or roadway would benefit from walking trails, sidewalks and crosswalk?		Areas most Important?	Describe other issues or concerns in your neighborhood.
Yes	No		Parking both sides (existing arrangement)	Parking on one side, bike lanes both sides	Park on one side, wider driving lanes - no bike lanes	No parking either side, w/bike lanes & slightly wider driving lanes & shoulders	No parking or bike lanes on either side, reduce width of roadway	Yes	No		Yes	No		
	1		1					1		Crosswalk across Marie to Marie Park . People speed going east on Marie and limited visibility of crosswalk due to hill	1		Improved crosswalk on Walsh/Lilac	Possible radar sign showing speed limit and cars current speed.
	1		1					1		excessive speed		1		I would like a street light or two on Marie. Ave.
	1					1			1			1		
1		Safety issues - important for bikers		1					1		1		Improve walking trails - plant wild flowers in small Blvd. like Victoria Rd or ground cover	
	1	Ped & bikers should share existing pathways	1						1			1		Unknown about underground irrigation & private wiring - along association's Marie Ave. property line
1				1				**x**	**x**		**x**	**x**		
x	**x**					1			1		1		A significant amount of ice accumulates on the walking path below the 35E bridge. Extremely slippery - drains on path	
	1	Bike lanes are used infrequently. Too little use to justify expense.	1						1			1		We have plenty of walking trails. Bike lanes are not used enough to justify expense. The easiest think to do is spend money. Watch your property tax statements. Taxpayers are the ones who feel the pinch.
	1	# of bikes using Marie may use the walking paths					1		1			1		Not sure of private underground utilities - association
	1		**x**	**x**	**x**	**x**	**x**		1			1		
	1		**x**	**x**	**x**	**x**	**x**		1			1		Only work I think is necessary is surfacing roadway
	1	not sure - most bikes are on the path			1				1		1		Need trails on Dodd Road - both directions from Marie - now have to walk on roads - not good	Would love to have wildflowers/prairie grasses on Marie Ave. just like what is on Victoria - they look lovely. - Rain garden yes if it works in development
1						1			1		1			
	1	roads are paid by cars license plates	1						1			1		Need lights on Victoria Road at Hwy 13 that run from 3-6 PM
1						1			1		1		Surface is rough but assume that will be addressed.	not sure if they have private underground lawn irrigation system in r-o-w.
	1					1			1			1		
12	**18**		**10**	9	3	6	1	8	**19**		13	**16**		
40%	**60%**		**34%**	31%	10%	21%	3%	30%	**70%**		45%	**55%**		

QUESTIONNAIRE RESPONSES

CITY OF MENDOTA HEIGHTS	Questionnaires Sent Out:	**80**	
Wesley Lane Improvements	Questionnaires Returned:	**33**	
PN: 201805	Percent Returned:	**41%**	

General Information				Drainage and Erosion Issues												Rain Gardens		
Address			Returned Survey	Water in basement?		Do you have any of the following?			Does water stand in your yard after big storms?		Comments	Length water is there?	How far away from house?	In Relation to the house?	Creating damage to property or nuisance?	Describe specific drainage or erosion problems in your neighborhood.	If feasible, would you like a rain garden in your yard?		
				Yes	No	Basement drain tile	Sump pump	None	Yes	No							Yes	No	Maybe
XXX	XXX	XXX	1		1	1	1		1			Not long - only spring & huge rains	300 ft. - backyard	north west	Nuisance - yard was graded for hockey rink years ago			1	
1844	Dodd	Road	1	x	x			1		1								1	
706	Mager	Court	1		1			1		1								1	
710	Mager	Court	1		1		1			1								1	
714	Mager	Court	1		1	1	1		1			1-3 days	12-15 feet	south	backyard is settling	backyard from east to west flowing and standing water after rainfall and snow melt		1	
718	Mager	Court	1		1		1			1	None							1	
1851	South	Lane	1		1	1	1			1								1	
1852	South	Lane	1		1			1		1						None		1	
1862	South	Lane	1		1		1			1								1	
1891	South	Lane	1		1	1	1			1						None		1	
1901	South	Lane	1		1		1			1						sump pump has not run in 28 years	x	x	x
1902	South	Lane	1		1	1	1			1							1		
716	Spring Creek	Circle	1		1	1				1								1	
719	Spring Creek	Circle	1		1	1	1			1							1		
724	Spring Creek	Circle	1		1			1		1						none		1	
727	Spring Creek	Circle	1		1	1			1			1 day	15 yards from house		Water drains from south neighbor along a path to the woods - seems ok.	All water from the culdesac drains towards our house into the city sewer - debris comes with it and can clog the area - might want to look at a better opening. Does not get in our yard but snow from culdesac gets plowed in our northeast yard.	1		

Private Underground Utilities						Tree Issues		Traffic/Pedestrian Issues			Other Issues
Irrigation Sys. in ROW?		Pet Containment Sys. in ROW?		Other Private Utilities in ROW?		Do you have a tree in the ROW you would like removed?		Does your neighborhood have any pedestrian or traffic issues?		Describe specific pedestrian or traffic issues in your neighborhood.	Describe other issues or concerns in your neighborhood.
Yes	No	Yes	No	Yes	No	Yes	No	Yes	No		
1		1			1		1		1		
	1		1		1		1	x	x	It is difficult to enter Dodd Road between 0700 to 0830 and 1330 to 1800	
	1		1		1		1		1		
1			1	1			1	1		Yard lamp in front yard (the wiring for the lamp probably is not in the r-o-w).	The traffic heading N on Dodd from the intersection of 62 & Dodd has gotten quite heavy and moves pretty fast - especially during the evening commute. Sometimes it is difficult to make a left hand turn out of our cul-de-sac during the evening commute - especially in bad weather. The traffic is going fast enough the pedestrians on the burrum need to be really attentive. In the winter, the plows put all the snow in our front yard rather than distributing it. There is an empty area in the cul-de-sac where some snow could be pushed.
1		1		1			1	1		Crossing Dodd Road is close to impossible at times. No sidewalk from Mager Court along Dodd Road is very dangerous.	
1			1		1		1	x	x		None
1			1		1		1		1		
	1	1			1		1		1		We do not need the city providing unwanted and unneeded services for which we are taxed. This is why we moved from St. Paul.
1		1			1		1		1		
1			1		1		1		1		
	1		1		1		1	1		The property at South Ln & Hwy 110 (62) frontage (west side) has shrubs that limit visibility of pedestrian traffic. You almost have to pull out into the intersection to see if anyone is approaching from the west	
1			1		1		1	1		Lack of street lighting & sidewalks in the whole neighborhood	
1			1		1		1		1		
1			1		1		1	1		There is no walkway on Dodd Road	
1			1		1		1		1		None
1		1			1		1	1		Hard to get onto Dodd Road. Too fast - people don't stop at the stop sign on Marie & Dodd	Keep foliage low near Dodd exit so we can see traffic and spring creek sign.

Address			Returned Survey	Water in basement?		Do you have any of the following?			Does water stand in your yard after big storms?		Comments	Length water is there?	How far away from house?	In Relation to the house?	Creating damage to property or nuisance?	Describe specific drainage or erosion problems in your neighborhood.	If feasible, would you like a rain garden in your yard?		
				Yes	No	Basement drain tile	Sump pump	None	Yes	No							Yes	No	Maybe
675	Wesley	Court	1		1			1		1						none		1	
(Empty Lot)	Wesley	Court	1		1	x	x	x		1								1	
680	Wesley	Court	1		1	1	1			1								1	
687	Wesley	Court	1		1			1		1						NW corner of Wesley Court/Wesley Ln intersection water always standing	1		
695	Wesley	Court	1		1	x	x	x	1			1-2 days	60'	NW back yard/west	mostly nuisance			1	
645	Wesley	Lane	1	1			1		1		water in basement - continuous	depends 1 to 2 days,	10 feet	back-west	water has flowed in my back door even though I raised door & replaced 2X sidewalk	I am on a hill and I have problem water table behind house. I had Cornerstone Construction put in French drain to street not working since deck replaced 7 years ago	x	x	x
650	Wesley	Lane	1		1		1		1		backyard					Every spring heavy rain water flows through our backyard - through 3 neighbors (656, 664, & 672) backyards, from S Lane homes		1	
656	Wesley	Lane	1	x	x		1			1								1	
651	Wesley	Lane	1		1		1			1								1	
664	Wesley	Lane	1		1	1	1			1								1	
665	Wesley	Lane	1		1	1	1		1		We would have water in the basement if we did not have the drain tile & sump pump	1 day or so	20-40 feet	N of house (backyard)	nuisance & damage to grass	Rain & snow melt run-off between our house and neighbor to the west			1
672	Wesley	Lane	1		1	1	1		1		3 years ago the city helped install a special drainage system to abate water damages on our property	long time, part of property rarely dries	50 feet	south fence line in backyard	nuisance			1	
688	Wesley	Lane	1		1	1	1		1			1-2 weeks backyard only	30'-40'	SW Corner of lot	nuisance			1	
696	Wesley	Lane	1		1		1		1							Water pools at the entrance of Wesley Court on W side of entrance of Court		1	
697	Wesley	Lane	1		1	x	x	x	x	x	We are building a new home now, but don't expect any issue - great sand base soil					On the corner of Wesley Lane & Wesley Court seems to be standing water all the time on NW corner of those intersections.		1	
703	Wesley	Lane	1		1	1				1								1	
721	Wesley	Lane	1		1	1	1			1	No -drainage erosion issues - none when we built, we graded the water path away from house to lot line							1	
Returned			**33**	1	**30**	15	21	6	10	**22**							4	**26**	1
Percent of Returned Responses			**41.3%**	3.3%	**100.0%**	51.7%	72.4%	20.7%	32.3%	**71.0%**							13.3%	**86.7%**	3.3%

Irrigation Sys. in ROW?		Pet Containment Sys. in ROW?		Other Private Utilities in ROW?		Do you have a tree in the ROW you would like removed?		Does your neighborhood have any pedestrian or traffic issues?		Describe specific pedestrian or traffic issues in your neighborhood.	Describe other issues or concerns in your neighborhood.
Yes	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**		
1			1	1			1		1		
1			1	1			1		1		
1			1		1	1		1		When turning from Wesley Lane onto Dodd, the oncoming traffic is often too fast and difficult to see due to curve. West side of church (700 Wesley) should do a better job of mowing tall grasses along the ditch.	One tree issue. Street corner retains standing water - this is the NW corner where Wesley Court & Wesley Lane intersect.
1			1	**x**	**x**		1		1		not sure about private wiring in ROW
x	**x**		1		1	**x**	**x**	**x**	**x**		may have private wiring in ROW - not sure
1			1	1			1		1	Private utilities for pool and French drain The water table is high my house built in 1989 should have not signed off by City? Our heating ducts in ground!! I had to redo bottom of footings of my deck are in water and I'm at the top of a hill.	The pool may have been part of issue but I'm at the top of a hill.
1			1		1		1	1		Excessive speed	
1			1		1		1		1		Traffic very light - no problems on Wesley Lane or South Lane
1			1	**x**	**x**		1		1		
1			1		1		1		1		
1		1			1	1			1		
1		1			1		1		1		
1			1	1			1	1		Dodd and Wesley is very busy, but for the moment still manageable	Sump pump gets pumped through plastic pipe from basement out to the front - exits through curb
1		1			1		1	1		Excessive speed going both up and down Wesley Lane	Thank you!
	1		1		1	**x**	**x**	**x**	**x**		Not sure about private underground utilities in ROW/tree issues/traffic pedestrian issues yet - building new
1			1		1		1		1		How long will this project last on Wesley Lane?
1			1		1		1	1		Dodd Highway - too fast and too croweded	No more trail pleaese, unneded - stop with the commercial development
27	5	8	**25**	6	**25**	2	**29**	11	**18**		
87.1%	16.1%	25.0%	**78.1%**	20.0%	**83.3%**	6.7%	**96.7%**	39.3%	**64.3%**		

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Exhibit 3

Typical Cross Sections

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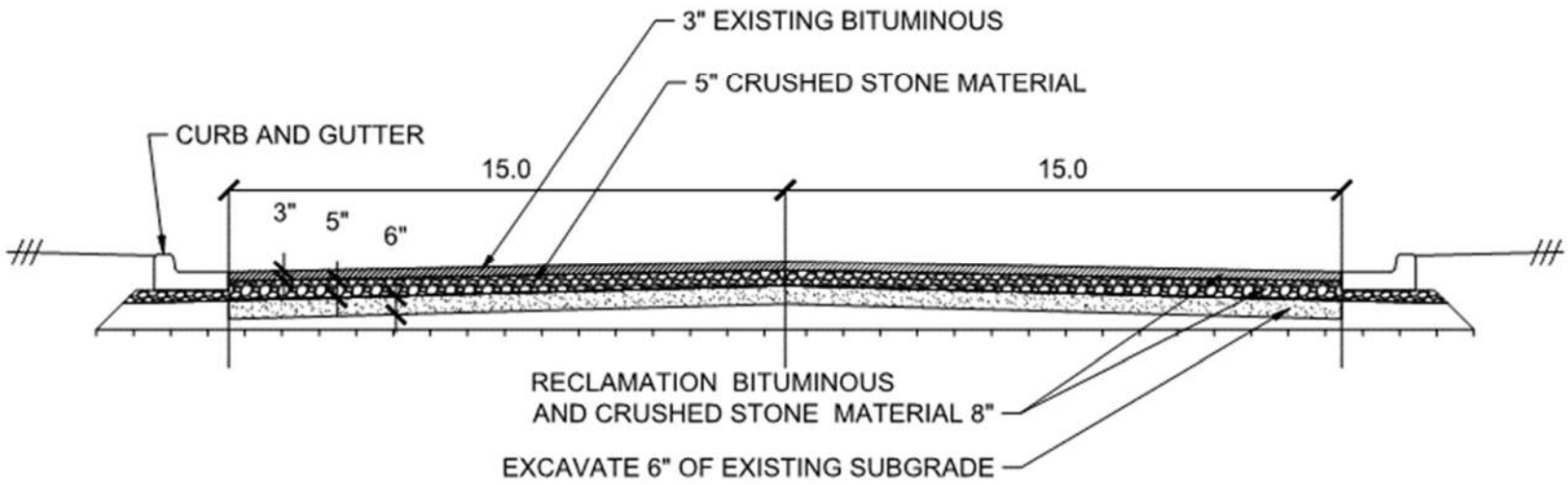
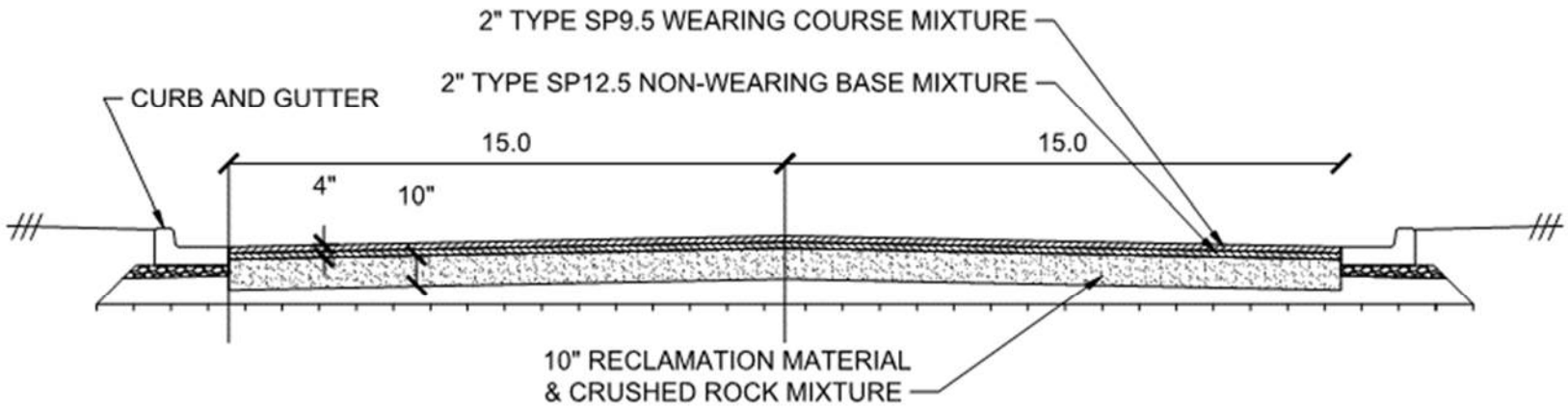
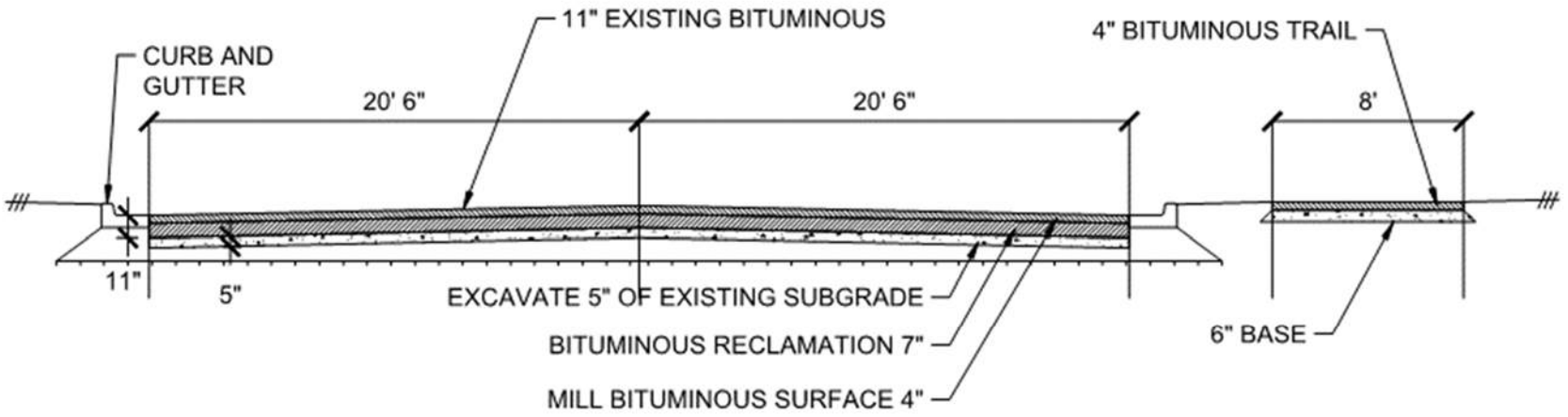
EXISTING WESLEY NEIGHBORHOOD



PROPOSED WESLEY NEIGHBORHOOD



EXISTING MARIE AVENUE



PROPOSED MARIE AVENUE

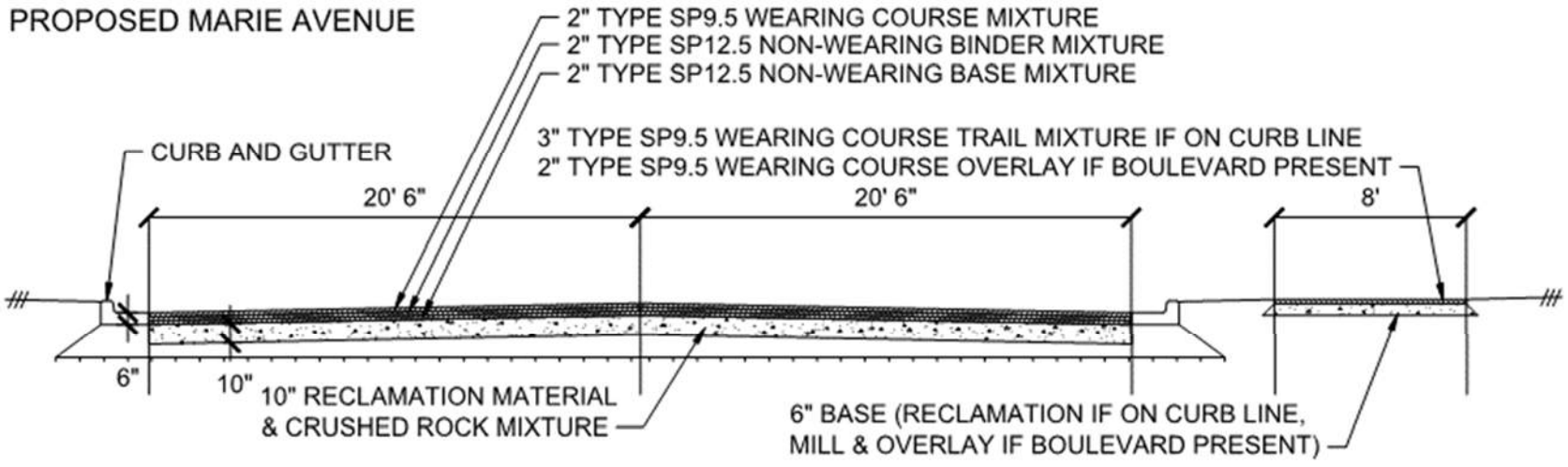


Exhibit 4

Engineer's Estimate

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A

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (35E TO DODD ROAD)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	MOBILIZATION	LS	0.5	$ 70,000.00	$ 35,000.00
2	TRAFFIC CONTROL	LS	0.5	$ 15,000.00	$ 7,500.00
3	INLET PROTECTION	EA	17	$ 150.00	$ 2,550.00
4	STREET SWEEPER	HR	10	$ 200.00	$ 2,000.00
5	SAWCUT PAVEMENT (ALL TYPES)	LF	255	$ 1.90	$ 484.50
6	COMMON EXCAVATION	CY	3450	$ 14.00	$ 48,300.00
7	SUBGRADE CORRECTION	CY	500	$ 30.00	$ 15,000.00
8	REMOVE CONCRETE CURB & GUTTER	LF	2290	$ 8.00	$ 18,320.00
9	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	SY	122	$ 15.00	$ 1,830.00
10	REMOVE CONCRETE DRIVEWAY PAVEMENT	SY	33	$ 25.00	$ 825.00
11	REMOVE CASTING (CB)	EA	4	$ 200.00	$ 800.00
12	REMOVE CASTING (MH)	EA	4	$ 200.00	$ 800.00
13	SALVAGE & REINSTALL CATCH BASIN CASTING W/ NEW CONCRETE RINGS	EA	8	$ 700.00	$ 5,600.00
14	SALVAGE & REINSTALL MANHOLE CASTING W/ NEW CONCRETE RINGS	EA	8	$ 700.00	$ 5,600.00
15	FURNISH AND INSTALL CASTING ASSEMBLY (CB)	EA	4	$ 1,500.00	$ 6,000.00
16	FURNISH AND INSTALL CASTING ASSEMBLY (MH)	EA	4	$ 1,500.00	$ 6,000.00
17	ADJUST GATE VALVE BOX	EA	7	$ 200.00	$ 1,400.00
18	MILL BITUMINOUS SURFACE (4.0")	SY	11290	$ 3.00	$ 33,870.00
19	FULL DEPTH RECLAMATION (7.0")	SY	11290	$ 3.00	$ 33,870.00
20	SELECT GRANULAR BORROW	TON	500	$ 25.00	$ 12,500.00
21	AGGREGATE BASE (CV) CLASS 5	TON	115	$ 30.00	$ 3,450.00
22	3" MINUS CRUSHED	TON	250	$ 30.00	$ 7,500.00
23	1" MINUS CRUSHED	TON	1715	$ 30.00	$ 51,450.00
24	TYPE SP 9.5 WEARING COURSE MIXTURE	TON	1490.5	$ 60.00	$ 89,430.00
25	TYPE SP 12.5 NON WEARING BINDER COURSE MIXTURE	TON	1490.5	$ 60.00	$ 89,430.00
26	TYPE SP 12.5 NON WEARING BASE COURSE MIXTURE	TON	1490.5	$ 60.00	$ 89,430.00
27	BITUMINOUS MATERIAL FOR TACK COAT	GAL	2260	$ 1.50	$ 3,390.00
28	CONCRETE CURB AND GUTTER B618	LF	2290	$ 18.00	$ 41,220.00
29	3" BITUMINOUS DRIVEWAY PAVEMENT	SY	122	$ 40.00	$ 4,880.00
30	6" CONCRETE DRIVEWAY PAVEMENT	SY	33	$ 57.00	$ 1,881.00
31	STRIPING	LS	0.5	$ 10,000.00	$ 5,000.00
32	TOPSOIL BORROW	CY	140	$ 30.00	$ 4,200.00
33	SOD TYPE SALT TOLERANT	SY	840	$ 6.50	$ 5,460.00
				TOTAL	**$ 634,970.50**

B

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (35E TO LEXINGTON AVE)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	MOBILIZATION	LS	0.5	$ 70,000.00	$ 35,000.00
2	TRAFFIC CONTROL	LS	0.5	$ 15,000.00	$ 7,500.00
3	INLET PROTECTION	EA	22	$ 150.00	$ 3,300.00
4	STREET SWEEPER	HR	10	$ 200.00	$ 2,000.00
5	SAWCUT PAVEMENT (ALL TYPES)	LF	550	$ 1.90	$ 1,045.00
6	COMMON EXCAVATION	CY	5480	$ 14.00	$ 76,720.00
7	SUBGRADE CORRECTION	CY	500	$ 30.00	$ 15,000.00
8	REMOVE CONCRETE CURB & GUTTER	LF	2225	$ 8.00	$ 17,800.00
9	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	SY	115	$ 15.00	$ 1,725.00
10	REMOVE CONCRETE DRIVEWAY PAVEMENT	SY	50	$ 25.00	$ 1,250.00
11	REMOVE CASTING (CB)	EA	6	$ 200.00	$ 1,200.00
12	REMOVE CASTING (MH)	EA	7	$ 200.00	$ 1,400.00
13	SALVAGE & REINSTALL CATCH BASIN CASTING W/ NEW CONCRETE RINGS	EA	11	$ 700.00	$ 7,700.00
14	SALVAGE & REINSTALL MANHOLE CASTING W/ NEW CONCRETE RINGS	EA	15	$ 700.00	$ 10,500.00
15	FURNISH AND INSTALL CASTING ASSEMBLY (CB)	EA	6	$ 1,500.00	$ 9,000.00
16	FURNISH AND INSTALL CASTING ASSEMBLY (MH)	EA	7	$ 1,500.00	$ 10,500.00
17	ADJUST GATE VALVE BOX	EA	15	$ 200.00	$ 3,000.00
18	MILL BITUMINOUS SURFACE (4.0")	SY	17935	$ 3.00	$ 53,805.00
19	FULL DEPTH RECLAMATION (7.0")	SY	17935	$ 3.00	$ 53,805.00
20	SELECT GRANULAR BORROW	TON	500	$ 25.00	$ 12,500.00
21	AGGREGATE BASE (CV) CLASS 5	TON	75	$ 30.00	$ 2,250.00
22	3" MINUS CRUSHED	TON	250	$ 30.00	$ 7,500.00
23	1" MINUS CRUSHED	TON	2725	$ 30.00	$ 81,750.00
24	TYPE SP 9.5 WEARING COURSE MIXTURE	TON	2365	$ 60.00	$ 141,900.00
25	TYPE SP 12.5 NON WEARING BINDER COURSE MIXTURE	TON	2365	$ 60.00	$ 141,900.00
26	TYPE SP 12.5 NON WEARING BASE COURSE MIXTURE	TON	2365	$ 60.00	$ 141,900.00
27	BITUMINOUS MATERIAL FOR TACK COAT	GAL	3590	$ 1.50	$ 5,385.00
28	CONCRETE CURB AND GUTTER B618	LF	2225	$ 18.00	$ 40,050.00
29	3" BITUMINOUS DRIVEWAY PAVEMENT	SY	115	$ 40.00	$ 4,600.00
30	6" CONCRETE DRIVEWAY PAVEMENT	SY	50	$ 57.00	$ 2,850.00
31	STRIPING	LS	0.5	$ 10,000.00	$ 5,000.00
32	TOPSOIL BORROW	CY	135	$ 30.00	$ 4,050.00
33	SOD TYPE SALT TOLERANT	SY	740	$ 6.50	$ 4,810.00
				TOTAL	**$ 908,695.00**

C

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (DODD ROAD TO SUTTON LANE WATERMAIN)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	EXPLORATORY EXCAVATION	HR	12	$ 800.00	$ 9,600.00
2	WATERMAIN TRENCH EXCAVATION	LF	765	$ 50.00	$ 38,250.00
				TOTAL	**$ 47,850.00**

D

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (PEDESTRIAN TUNNEL)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	CLEARING	TREE	5	$ 300.00	$ 1,500.00
2	GRUBBING	TREE	5	$ 300.00	$ 1,500.00
3	SAWCUT PAVEMENT (ALL TYPES)	LF	50	$ 1.90	$ 95.00
4	REMOVE UNDERGROUND PEDSTRIAN TUNNEL	LF	125	$ 100.00	$ 12,500.00
5	REMOVE TIMBER RETAINING WALL	LF	40	$ 10.00	$ 400.00
6	14 X 10 PRECAST CONCRETE END SECTIONS	EA	2	$ 17,500.00	$ 35,000.00
7	14X10 PRECAST CONCRETE BOX CULVERT	LF	90	$ 1,500.00	$ 135,000.00
8	COMMON EXCAVATION	CY	1666.66667	$ 14.00	$ 23,333.33
9	GRANULAR BEDDING	CY	30	$ 40.00	$ 1,200.00
10	AGGREGATE BEDDING (CV)	CY	85	$ 50.00	$ 4,250.00
11	RETAINING WALL	SY	675	$ 40.00	$ 27,000.00
12	PROTECT, INSULATE WATERMAIN AND SANITARY	LS	1	$ 5,000.00	$ 5,000.00
13	TUNNEL LIGHTING	LS	1	$ 10,000.00	$ 10,000.00
14	ANTI-GRAFFITI COATING	SF	3060	$ 1.50	$ 4,590.00
15	ASPHALT WALKING TRAIL	TON	100	$ 60.00	$ 6,000.00
16	TRAIL BASE MATERIAL	CY	0	$ 30.00	$ -
17	TOPSOIL BORROW	CY	20	$ 30.00	$ 600.00
18	HYDROSEED WITH SEED MIX 25-131	ACRE	0.2	$ 35,000.00	$ 7,000.00
19	SILT FENCE TYPE MS	LF	300	$ 5.00	$ 1,500.00
				TOTAL	**$ 276,468.33**

E

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (TRAIL REHABILITATION)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	SAWCUT PAVEMENT (ALL TYPES)	LF	150	$ 1.90	$ 285.00
2	FULL DEPTH RECLAMATION (8")	SY	2445	$ 3.00	$ 7,335.00
3	MILL BITUMINOUS SURFACE (2")	SY	0	$ 3.00	$ -
4	ASPHALT WALKING TRAIL	TON	869	$ 60.00	$ 52,140.00
5	TRAIL BASE MATERIAL	TON	50	$ 30.00	$ 1,500.00
6	TRUNCATED DOMES	SF	135	$ 50.00	$ 6,750.00
7	6" CONCRETE WALK	SF	720	$ 10.00	$ 7,200.00
8	CROSSWALK PAINT	SF	600	$ 1.92	$ 1,152.00
9	TOPSOIL BORROW	CY	241.643519	$ 30.00	$ 7,249.31
10	HYDROSEED WITH SEED MIX 25-131	ACRE	0.59911616	$ 15,000.00	$ 8,986.74
				TOTAL	**$ 92,598.05**

F

QUANTITY/PRICE ESTIMATION - LEXINGTON AVENUE TRAIL (MARIE AVE TO ORCHARD HILL)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	MOBILIZATION	LS	1.0	$ 15,000.00	$ 15,000.00
2	TRAFFIC CONTROL	LS	1.0	$ 5,000.00	$ 5,000.00
3	INLET PROTECTION	EA	5.0	$ 150.00	$ 750.00
4	CLEARING	TREE	20.0	$ 300.00	$ 6,000.00
5	GRUBBING	TREE	20.0	$ 300.00	$ 6,000.00
6	STREET SWEEPER	HR	5.0	$ 200.00	$ 1,000.00
7	SAWCUT PAVEMENT (ALL TYPES)	LF	750.0	$ 1.90	$ 1,425.00
8	REMOVE BITUMINOUS PAVEMENT (FULL DEPTH)	SF	750.0	$ 1.40	$ 1,050.00
9	REMOVE ASPHALT WALKING TRAIL	SY	552.2	$ 7.00	$ 3,865.56
10	MODULAR BLOCK RETAINING WALL	SF	2220.0	$ 40.00	$ 88,800.00
11	RETAINING WALL BASE	CY	60.0	$ 30.00	$ 1,800.00
12	RETAINING WALL FENCE	LF	575.0	$ 25.00	$ 14,375.00
13	COMMON EXCAVATION	CY	286.9	$ 14.00	$ 4,015.93
14	SELECT GRANULAR BORROW	CY	513.9	$ 25.00	$ 12,847.22
15	AGGREGATE BACKFILL (COURSE)	CY	127.8	$ 50.00	$ 6,388.89
16	RETAINING WALL DRAIN TILE/FABRIC	SF	555.0	$ 2.00	$ 1,110.00
17	15" RC PIPE SEWER	LF	70.0	$ 50.00	$ 3,500.00
18	CATCH BASIN MANHOLE	EA	2.0	$ 5,000.00	$ 10,000.00
19	CATCH BASIN CASTING ASSEMBLY	EA	2.0	$ 800.00	$ 1,600.00
20	FLARED END SECTIONS (DRAINAGE STRUCTURES)	EA	2.0	$ 1,000.00	$ 2,000.00
21	TYPE SP 12.5 NON-WEARING COURSE MIX (2;B)	TON	20.0	$ 60.00	$ 1,200.00
22	TYPE SP 9.5 WEARING COURSE MIX (2;B)	TON	10.0	$ 60.00	$ 600.00
23	BITUMINOUS MATERIAL FOR TACK COAT	GAL	20.0	$ 1.50	$ 30.00
24	CONCRETE CURB AND GUTTER B624	LF	705.0	$ 20.00	$ 14,100.00
25	AGGREGATE BASE (CURB AND GUTTER)	TON	95.2	$ 30.00	$ 2,855.25
26	ASPHALT WALKING TRAIL	TON	95.0	$ 60.00	$ 5,700.00
27	TRAIL BASE MATERIAL	TON	170.0	$ 30.00	$ 5,100.00
28	TRUNCATED DOMES	SF	15.0	$ 50.00	$ 750.00
29	6" CONCRETE WALK	SF	160.0	$ 10.00	$ 1,600.00
30	CROSSWALK PAINT	SF	100.0	$ 4.00	$ 400.00
31	STRIPING	LS	0.1	$ 10,000.00	$ 1,000.00
32	TOPSOIL BORROW	CY	130.6	$ 30.00	$ 3,916.67
33	HYDROSEED WITH SEED MIX 25-131	ACRE	0.2	$ 35,000.00	$ 7,000.00
34	SILT FENCE TYPE MS	LF	700.0	$ 5.00	$ 3,500.00
35	EROSION CONTROL BLANKETS CATEGORY 3N	SY	490.0	$ 5.00	$ 2,450.00
36	CLASS III RIPRAP	CY	8.0	$ 65.00	$ 520.00
				TOTAL	**$ 236,729.51**

G

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (RETAINING WALLS AND FENCES)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	CLEARING	TREE	8	$ 300.00	$ 2,400.00
2	GRUBBING	TREE	8	$ 300.00	$ 2,400.00
3	REMOVE CABLE GUARD RAIL	LF	315	$ 4.00	$ 1,260.00
4	REMOVE TIMBER RETAINING WALL	LF	440	$ 8.50	$ 3,740.00
5	MODULAR BLOCK RETAINING WALL	SF	1901	$ 40.00	$ 76,040.00
6	RETAINING WALL BASE	CY	50	$ 30.00	$ 1,500.00
7	RETAINING WALL FENCE	LF	390	$ 40.00	$ 15,600.00
8	COMMON EXCAVATION	CY	80	$ 10.00	$ 800.00
9	AGGREGATE BACKFILL (COURSE)	CY	80	$ 50.00	$ 4,000.00
10	RETAINING WALL DRAIN TILE/FABRIC	SY	440	$ 2.00	$ 880.00
11	TOPSOIL BORROW	CY	60	$ 30.00	$ 1,800.00
12	HYDROSEED WITH SEED MIX 25-131	ACRE	0.1	$ 35,000.00	$ 3,500.00
				TOTAL	**$ 113,920.00**

H

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (POND AND DITCH CLEAN OUT)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	CLEARING	TREE	10	$ 300.00	$ 3,000.00
2	GRUBBING	TREE	10	$ 300.00	$ 3,000.00
3	POND EXCAVATION	CY	6018.5	$ 7.50	$ 45,138.89
4	HAUL AND DISPOSE OF CONTAMINATED MATERIAL	CY	6018.5	$ 14.00	$ 84,259.26
5	RANDOM RIPRAP CLASS II	CY	90	$ 75.00	$ 6,750.00
6	CLEAN DRAINAGE DITCH	LF	100	$ 18.25	$ 1,825.00
7	CONSTRUCT DRAINAGE DITCH	LF	100	$ 5.00	$ 500.00
8	EROSION CONTROL BLANKETS CATEGORY 3N	SY	445	$ 5.00	$ 2,225.00
				TOTAL	**$ 146,698.15**

I

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (SLAB BRIDGE REPAIR)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	EXPANSION JOINT DEVICE TYPE 4	LF	132	$ 150.00	$ 19,800.00
2	CONCRETE WEARING COURSE (3U17A)	SF	19800	$ 4.00	$ 79,200.00
3	RECONSTRUCT EXPANSION JOINT TYPE A	LF	132	$ 650.00	$ 85,800.00
4	REMOVE BITUMINOUS WEARING COURSE	SF	17300	$ 2.25	$ 38,925.00
5	REMOVE AND PATCH SLAB TYPE A	SF	1730	$ 50.00	$ 86,500.00
6	RECONSTRUCT APPROACH PANEL	SF	2684	$ 37.50	$ 100,650.00
				TOTAL	**$ 410,875.00**

			WITH CONTINGENCY (10%)	ENGINEERING AND ADMINISTRATION (20%)
A	MARIE AVENUE (35E TO DODD ROAD)	$ 634,970.50	$ 698,467.55	$ 838,161.06
B	MARIE AVENUE (35E TO LEXINGTON AVE)	$ 908,695.00	$ 999,564.50	$ 1,199,477.40
C	DODD ROAD TO SUTTON LANE WATERMAIN	$ 47,850.00	$ 52,635.00	$ 63,162.00
D	PEDESTRIAN TUNNEL	$ 276,468.33	$ 304,115.17	$ 364,938.20
E	TRAIL REHABILITATION	$ 92,598.05	$ 101,857.85	$ 122,229.42
F	LEXINGTON AVENUE TRAIL (MARIE AVE TO ORCHARD HILL)	$ 236,729.51	$ 260,402.46	$ 312,482.95
G	RETAINING WALLS AND FENCES	$ 113,920.00	$ 125,312.00	$ 150,374.40
H	POND AND DITCH CLEAN OUT	$ 146,698.15	$ 161,367.96	$ 193,641.56
I	SLAB BRIDGE REPAIR	$ 410,875.00	$ 451,962.50	$ 542,355.00
	TOTALS	**$ 2,868,804.54**	**$ 3,155,684.99**	**$ 3,786,821.99**

A

QUANTITY/PRICE ESTIMATION - WESLEY NEIGHBORHOOD					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	MOBILIZATION	LS	0.8	$ 50,000.00	$ 40,000.00
2	TRAFFIC CONTROL	LS	0.5	$ 10,000.00	$ 5,000.00
3	INLET PROTECTION	EA	17	$ 150.00	$ 2,550.00
4	CLEARING	TREE	2	$ 300.00	$ 600.00
5	GRUBBING	TREE	2	$ 300.00	$ 600.00
6	STREET SWEEPER	HR	1	$ 200.00	$ 200.00
7	SAWCUT PAVEMENT (ALL TYPES)	LF	1255	$ 1.90	$ 2,384.50
8	COMMON EXCAVATION	CY	4645	$ 14.00	$ 65,030.00
9	SUBGRADE CORRECTION	CY	200	$ 30.00	$ 6,000.00
10	REMOVE CONCRETE CURB & GUTTER	LF	1915	$ 10.00	$ 19,150.00
11	REMOVE CONCRETE VALLEY GUTTER	LF	50	$ 10.00	$ 500.00
12	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	SY	135	$ 15.00	$ 2,025.00
13	REMOVE CONCRETE DRIVEWAY PAVEMENT	SY	335	$ 25.00	$ 8,375.00
14	REMOVE CASTING (CB)	EA	17	$ 200.00	$ 3,400.00
15	REMOVE CASTING (MH)	EA	14	$ 200.00	$ 2,800.00
16	SALVAGE & REINSTALL CATCH BASIN CASTING W/ NEW CONCRETE RINGS	EA	12	$ 700.00	$ 8,400.00
17	SALVAGE & REINSTALL MANHOLE CASTING W/ NEW CONCRETE RINGS	EA	10	$ 700.00	$ 7,000.00
18	FURNISH AND INSTALL CASTING ASSEMBLY W/CONCRETE RINGS (CB)	EA	5	$ 1,500.00	$ 7,500.00
19	FURNISH AND INSTALL CASTING ASSEMBLY W/CONCRETE RINGS (MH)	EA	4	$ 1,500.00	$ 6,000.00
20	ADJUST GATE VALVE BOX	EA	12	$ 200.00	$ 2,400.00
21	SELECT GRANULAR BORROW	TON	200	$ 25.00	$ 5,000.00
22	AGGREGATE BASE (CV) CLASS 5	TON	100	$ 40.00	$ 4,000.00
23	3" MINUS CRUSHED	TON	100	$ 30.00	$ 3,000.00
24	1" MINUS CRUSHED	TON	1815	$ 30.00	$ 54,450.00
25	FULL DEPTH RECLAMATION (8")	SY	11946	$ 3.00	$ 35,838.00
26	TYPE SP 9.5 WEARING COURSE MIXTURE	TON	1578.5	$ 60.00	$ 94,710.00
27	TYPE SP 12.5 NON WEARING COURSE MIXTURE	TON	1578.5	$ 60.00	$ 94,710.00
28	BITUMINOUS MATERIAL FOR TACK COAT	GAL	1194.6	$ 1.50	$ 1,791.90
29	CONCRETE CURB AND GUTTER B618	LF	1915	$ 18.00	$ 34,470.00
30	7" CONCRETE VALLEY GUTTER	LF	50	$ 20.00	$ 1,000.00
31	3" BITUMINOUS DRIVEWAY PAVEMENT	SY	135	$ 40.00	$ 5,400.00
32	6" CONCRETE DRIVEWAY PAVEMENT	SY	335	$ 57.00	$ 19,095.00
33	CONNECT TO EXISTING STORM SEWER	EA	1	$ 750.00	$ 750.00
34	12" PIPE SEWER	LF	40	$ 30.00	$ 1,200.00
35	CATCH BASIN (2'x3')	EA	1	$ 3,500.00	$ 3,500.00
36	CATCH BASIN CASTING ASSEMBLY (2x3')	EA	1	$ 800.00	$ 800.00
37	TOPSOIL BORROW	CY	114.625	$ 30.00	$ 3,438.75
38	RAIN GARDEN	EA	3	$ 3,500.00	$ 10,500.00
39	SODDING TYPE SALT TOLERANT	SY	638.333333	$ 6.50	$ 4,149.17
40	IRRIGATION REPAIR	EA	20	$ 300.00	$ 6,000.00
				TOTAL	**$ 573,717.32**

B

QUANTITY/PRICE ESTIMATION - DODD TRAIL SOUTH (WESLEY LANE TO MAPLE STREET)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	MOBILIZATION	LS	0.2	$ 50,000.00	$ 10,000.00
2	TRAFFIC CONTROL	LS	0.5	$ 10,000.00	$ 5,000.00
3	INLET PROTECTION	EA	10.0	$ 150.00	$ 1,500.00
4	CLEARING	TREE	15.0	$ 300.00	$ 4,500.00
5	GRUBBING	TREE	15.0	$ 300.00	$ 4,500.00
6	STREET SWEEPER	HR	5.0	$ 200.00	$ 1,000.00
7	SAWCUT PAVEMENT (ALL TYPES)	LF	1000.0	$ 1.90	$ 1,900.00
8	COMMON EXCAVATION	CY	155.0	$ 15.00	$ 2,325.00
9	SELECT GRANULAR BORROW	CY	1415.0	$ 30.00	$ 42,450.00
10	24" RC PIPE SEWER	LF	380.0	$ 50.00	$ 19,000.00
11	PIPE BEDDING MATERIAL	CY	70.4	$ 35.00	$ 2,462.96
12	CATCH BASIN MANHOLE	EA	2.0	$ 5,000.00	$ 10,000.00
13	CATCH BASIN CASTING ASSEMBLY	EA	2.0	$ 800.00	$ 1,600.00
14	FLAIRED END SECTIONS (DRAINAGE STRUCTURES)	EA	1.0	$ 1,000.00	$ 1,000.00
15	CONNECT TO EXISTING STORM SEWER	EA	1.0	$ 750.00	$ 750.00
16	12" PIPE SEWER	LF	80.0	$ 30.00	$ 2,400.00
17	CATCH BASIN (2'x3')	EA	2.0	$ 3,500.00	$ 7,000.00
18	CATCH BASIN CASTING ASSEMBLY (2x3')	EA	2.0	$ 800.00	$ 1,600.00
19	CONCRETE CURB AND GUTTER B624	LF	860.0	$ 20.00	$ 17,200.00
20	AGGREGATE BASE (CURB AND GUTTER)	CY	95.6	$ 40.00	$ 3,822.22
21	ASPHALT WALKING TRAIL	TON	135.0	$ 60.00	$ 8,100.00
22	TRAIL BASE MATERIAL	TON	245.0	$ 30.00	$ 7,350.00
23	TRUNCATED DOMES	SF	60.0	$ 50.00	$ 3,000.00
24	RECONSTRUCT CROSSWALK ADA	SF	320.0	$ 15.00	$ 4,800.00
25	CROSSWALK PAINT	SF	300.0	$ 4.00	$ 1,200.00
26	TOPSOIL BORROW	CY	157.4	$ 30.00	$ 4,722.22
27	HYDROSEED WITH SEED MIX 25-131	ACRE	0.3	$ 10,000.00	$ 3,000.00
28	SILT FENCE TYPE MS	LF	700.0	$ 5.00	$ 3,500.00
29	CLASS III RIPRAP	CY	25.0	$ 65.00	$ 1,625.00
				TOTAL	**$ 177,307.41**

C

QUANTITY/PRICE ESTIMATION - DODD TRAIL NORTH (MARIE AVENUE TO WESLEY LANE)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	MOBILIZATION	LS	0.2	$ 50,000.00	$ 10,000.00
2	TRAFFIC CONTROL	LS	0.5	$ 10,000.00	$ 5,000.00
3	INLET PROTECTION	EA	15.0	$ 150.00	$ 2,250.00
4	CLEARING	TREE	40.0	$ 300.00	$ 12,000.00
5	GRUBBING	TREE	40.0	$ 300.00	$ 12,000.00
6	SALVAGE AND REINSTALL SIGN	EA	5.0	$ 300.00	$ 1,500.00
7	SALVAGE AND REINSTALL MAILBOX	EA	4.0	$ 100.00	$ 400.00
8	REMOVE RETAINING WALL	SF	60.0	$ 20.00	$ 1,200.00
9	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	SY	133.3	$ 15.00	$ 2,000.00
10	STREET SWEEPER	HR	5.0	$ 200.00	$ 1,000.00
11	COMMON EXCAVATION	CY	865.0	$ 15.00	$ 12,975.00
12	SELECT GRANULAR BORROW	CY	345.0	$ 30.00	$ 10,350.00
13	3" BITUMINOUS DRIVEWAY PAVEMENT	SY	44.4	$ 40.00	$ 1,777.78
14	6" CONCRETE DRIVEWAY PAVEMENT	SY	44.4	$ 57.00	$ 2,533.33
15	ASPHALT WALKING TRAIL	TON	139.9	$ 60.00	$ 8,395.88
16	TRAIL BASE MATERIAL	TON	265.0	$ 30.00	$ 7,950.00
17	TRUNCATED DOMES	SF	75.0	$ 50.00	$ 3,750.00
18	RECONSTRUCT CROSSWALK ADA	SF	422.0	$ 15.00	$ 6,330.00
19	CROSSWALK PAINT	SF	150.0	$ 4.00	$ 600.00
20	TOPSOIL BORROW	CY	173.1	$ 30.00	$ 5,194.44
21	HYDROSEED WITH SEED MIX 25-131	ACRE	0.3	$ 10,000.00	$ 2,754.82
22	SILT FENCE TYPE MS	LF	450.0	$ 5.00	$ 2,250.00
				SUBTOTAL	$ 112,211.25
				ROW PURCHASE	$ 26,850.00
				TOTAL	**$ 139,061.25**

UPDATED 11/5/2018 SB

SUMMARY OF COSTS - WESLEY NEIGHBORHOOD			WITH CONTINGENCY (10%)	ENGINEERING AND ADMINISTRATION (20%)
A	WESLEY NEIGHBORHOOD	$ 573,717.32	$ 631,089.05	$ 757,306.86
B	DODD TRAIL (SOUTH)	$ 177,307.41	$ 195,038.15	$ 234,045.78
C	DODD TRAIL (NORTH)	$ 139,061.25	$ 152,967.38	$ 183,560.85
	TOTALS	**$ 890,085.98**	**$ 979,094.57**	**$ 1,174,913.49**

Mill and Overlay Estimate

A

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (35E TO DODD ROAD)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	MOBILIZATION	LS	0.5	$ 70,000.00	$ 35,000.00
2	TRAFFIC CONTROL	LS	0.5	$ 15,000.00	$ 7,500.00
3	INLET PROTECTION	EA	17	$ 150.00	$ 2,550.00
4	STREET SWEEPER	HR	10	$ 200.00	$ 2,000.00
5	SAWCUT PAVEMENT (ALL TYPES)	LF	255	$ 1.90	$ 484.50
6	COMMON EXCAVATION	CY	0	$ 14.00	$ -
7	SUBGRADE CORRECTION	CY	0	$ 30.00	$ -
8	REMOVE CONCRETE CURB & GUTTER	LF	1540	$ 8.00	$ 12,320.00
9	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	SY	122	$ 15.00	$ 1,830.00
10	REMOVE CONCRETE DRIVEWAY PAVEMENT	SY	33	$ 25.00	$ 825.00
11	REMOVE CASTING (CB)	EA	4	$ 200.00	$ 800.00
12	REMOVE CASTING (MH)	EA	4	$ 200.00	$ 800.00
13	SALVAGE & REINSTALL CATCH BASIN CASTING W/ NEW CONCRETE RINGS	EA	8	$ 700.00	$ 5,600.00
14	SALVAGE & REINSTALL MANHOLE CASTING W/ NEW CONCRETE RINGS	EA	8	$ 700.00	$ 5,600.00
15	FURNISH AND INSTALL CASTING ASSEMBLY (CB)	EA	4	$ 1,500.00	$ 6,000.00
16	FURNISH AND INSTALL CASTING ASSEMBLY (MH)	EA	4	$ 1,500.00	$ 6,000.00
17	ADJUST GATE VALVE BOX	EA	7	$ 200.00	$ 1,400.00
18	MILL BITUMINOUS SURFACE (4.0")	SY	11290	$ 3.00	$ 33,870.00
19	FULL DEPTH RECLAMATION (7.0")	SY	0	$ 3.00	$ -
20	SELECT GRANULAR BORROW	TON	500	$ 25.00	$ 12,500.00
21	AGGREGATE BASE (CV) CLASS 5	TON	80	$ 30.00	$ 2,400.00
22	3" MINUS CRUSHED	TON	0	$ 30.00	$ -
23	1" MINUS CRUSHED	TON	0	$ 30.00	$ -
24	TYPE SP 9.5 WEARING COURSE MIXTURE	TON	1490.5	$ 60.00	$ 89,430.00
25	TYPE SP 12.5 NON WEARING BINDER COURSE MIXTURE	TON	1490.5	$ 60.00	$ 89,430.00
26	TYPE SP 12.5 NON WEARING BASE COURSE MIXTURE	TON	0	$ 60.00	$ -
27	BITUMINOUS MATERIAL FOR TACK COAT	GAL	2260	$ 1.50	$ 3,390.00
28	CONCRETE CURB AND GUTTER B618	LF	1540	$ 18.00	$ 27,720.00
29	3" BITUMINOUS DRIVEWAY PAVEMENT	SY	122	$ 40.00	$ 4,880.00
30	6" CONCRETE DRIVEWAY PAVEMENT	SY	33	$ 57.00	$ 1,881.00
31	STRIPING	LS	0.5	$ 10,000.00	$ 5,000.00
32	TOPSOIL BORROW	CY	95	$ 30.00	$ 2,850.00
33	SOD TYPE SALT TOLERANT	SY	565	$ 6.50	$ 3,672.50
				TOTAL	**$ 365,733.00**

Mill and Overlay Estimate

B

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (35E TO LEXINGTON AVE)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	MOBILIZATION	LS	0.5	$ 70,000.00	$ 35,000.00
2	TRAFFIC CONTROL	LS	0.5	$ 15,000.00	$ 7,500.00
3	INLET PROTECTION	EA	22	$ 150.00	$ 3,300.00
4	STREET SWEEPER	HR	10	$ 200.00	$ 2,000.00
5	SAWCUT PAVEMENT (ALL TYPES)	LF	550	$ 1.90	$ 1,045.00
6	COMMON EXCAVATION	CY	0	$ 14.00	$ -
7	SUBGRADE CORRECTION	CY	0	$ 30.00	$ -
8	REMOVE CONCRETE CURB & GUTTER	LF	2225	$ 8.00	$ 17,800.00
9	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	SY	115	$ 15.00	$ 1,725.00
10	REMOVE CONCRETE DRIVEWAY PAVEMENT	SY	50	$ 25.00	$ 1,250.00
11	REMOVE CASTING (CB)	EA	6	$ 200.00	$ 1,200.00
12	REMOVE CASTING (MH)	EA	7	$ 200.00	$ 1,400.00
13	SALVAGE & REINSTALL CATCH BASIN CASTING W/ NEW CONCRETE RINGS	EA	11	$ 700.00	$ 7,700.00
14	SALVAGE & REINSTALL MANHOLE CASTING W/ NEW CONCRETE RINGS	EA	15	$ 700.00	$ 10,500.00
15	FURNISH AND INSTALL CASTING ASSEMBLY (CB)	EA	6	$ 1,500.00	$ 9,000.00
16	FURNISH AND INSTALL CASTING ASSEMBLY (MH)	EA	7	$ 1,500.00	$ 10,500.00
17	ADJUST GATE VALVE BOX	EA	15	$ 200.00	$ 3,000.00
18	MILL BITUMINOUS SURFACE (4.0")	SY	17935	$ 3.00	$ 53,805.00
19	FULL DEPTH RECLAMATION (7.0")	SY	0	$ 3.00	$ -
20	SELECT GRANULAR BORROW	TON	0	$ 25.00	$ -
21	AGGREGATE BASE (CV) CLASS 5	TON	75	$ 30.00	$ 2,250.00
22	3" MINUS CRUSHED	TON	0	$ 30.00	$ -
23	1" MINUS CRUSHED	TON	0	$ 30.00	$ -
24	TYPE SP 9.5 WEARING COURSE MIXTURE	TON	2365	$ 60.00	$ 141,900.00
25	TYPE SP 12.5 NON WEARING BINDER COURSE MIXTURE	TON	2365	$ 60.00	$ 141,900.00
26	TYPE SP 12.5 NON WEARING BASE COURSE MIXTURE	TON	0	$ 60.00	$ -
27	BITUMINOUS MATERIAL FOR TACK COAT	GAL	3590	$ 1.50	$ 5,385.00
28	CONCRETE CURB AND GUTTER B618	LF	2225	$ 18.00	$ 40,050.00
29	3" BITUMINOUS DRIVEWAY PAVEMENT	SY	115	$ 40.00	$ 4,600.00
30	6" CONCRETE DRIVEWAY PAVEMENT	SY	50	$ 57.00	$ 2,850.00
31	STRIPING	LS	0.5	$ 10,000.00	$ 5,000.00
32	TOPSOIL BORROW	CY	135	$ 30.00	$ 4,050.00
33	SOD TYPE SALT TOLERANT	SY	740	$ 6.50	$ 4,810.00
				TOTAL	**$ 519,520.00**

Mill and Overlay Estimate

C

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (DODD ROAD TO SUTTON LANE WATERMAIN)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	EXPLORATORY EXCAVATION	HR	0	$ 800.00	$ -
2	WATERMAIN TRENCH EXCAVATION	LF	0	$ 50.00	$ -
				TOTAL	**$ -**

D

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (PEDESTRIAN TUNNEL)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	CLEARING	TREE	5	$ 300.00	$ 1,500.00
2	GRUBBING	TREE	5	$ 300.00	$ 1,500.00
3	SAWCUT PAVEMENT (ALL TYPES)	LF	50	$ 1.90	$ 95.00
4	REMOVE UNDERGROUND PEDSTRIAN TUNNEL	LF	125	$ 100.00	$ 12,500.00
5	REMOVE TIMBER RETAINING WALL	LF	40	$ 10.00	$ 400.00
6	14 X 10 PRECAST CONCRETE END SECTIONS	EA	2	$ 17,500.00	$ 35,000.00
7	14X10 PRECAST CONCRETE BOX CULVERT	LF	90	$ 1,500.00	$ 135,000.00
8	COMMON EXCAVATION	CY	1666.66667	$ 14.00	$ 23,333.33
9	GRANULAR BEDDING	CY	30	$ 40.00	$ 1,200.00
10	AGGREGATE BEDDING (CV)	CY	85	$ 50.00	$ 4,250.00
11	RETAINING WALL	SY	675	$ 40.00	$ 27,000.00
12	PROTECT, INSULATE WATERMAIN AND SANITARY	LS	1	$ 5,000.00	$ 5,000.00
13	TUNNEL LIGHTING	LS	1	$ 10,000.00	$ 10,000.00
14	ANTI-GRAFFITI COATING	SF	3060	$ 1.50	$ 4,590.00
15	ASPHALT WALKING TRAIL	TON	100	$ 60.00	$ 6,000.00
16	TRAIL BASE MATERIAL	CY	0	$ 30.00	$ -
17	TOPSOIL BORROW	CY	20	$ 30.00	$ 600.00
18	HYDROSEED WITH SEED MIX 25-131	ACRE	0.2	$ 35,000.00	$ 7,000.00
19	SILT FENCE TYPE MS	LF	300	$ 5.00	$ 1,500.00
				TOTAL	**$ 276,468.33**

Mill and Overlay Estimate

E

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (TRAIL REHABILITATION)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	SAWCUT PAVEMENT (ALL TYPES)	LF	150	$ 1.90	$ 285.00
2	FULL DEPTH RECLAMATION (8")	SY	2445	$ 3.00	$ 7,335.00
3	MILL BITUMINOUS SURFACE (2")	SY	0	$ 3.00	$ -
4	ASPHALT WALKING TRAIL	TON	869	$ 60.00	$ 52,140.00
5	TRAIL BASE MATERIAL	TON	50	$ 30.00	$ 1,500.00
6	TRUNCATED DOMES	SF	135	$ 50.00	$ 6,750.00
7	6" CONCRETE WALK	SF	720	$ 10.00	$ 7,200.00
8	CROSSWALK PAINT	SF	600	$ 1.92	$ 1,152.00
9	TOPSOIL BORROW	CY	241.643519	$ 30.00	$ 7,249.31
10	HYDROSEED WITH SEED MIX 25-131	ACRE	0.59911616	$ 15,000.00	$ 8,986.74
				TOTAL	**$ 92,598.05**

Mill and Overlay Estimate

F

QUANTITY/PRICE ESTIMATION - LEXINGTON AVENUE TRAIL (MARIE AVE TO ORCHARD HILL)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	MOBILIZATION	LS	1.0	$ 15,000.00	$ 15,000.00
2	TRAFFIC CONTROL	LS	1.0	$ 5,000.00	$ 5,000.00
3	INLET PROTECTION	EA	5.0	$ 150.00	$ 750.00
4	CLEARING	TREE	20.0	$ 300.00	$ 6,000.00
5	GRUBBING	TREE	20.0	$ 300.00	$ 6,000.00
6	STREET SWEEPER	HR	5.0	$ 200.00	$ 1,000.00
7	SAWCUT PAVEMENT (ALL TYPES)	LF	750.0	$ 1.90	$ 1,425.00
8	REMOVE BITUMINOUS PAVEMENT (FULL DEPTH)	SF	750.0	$ 1.40	$ 1,050.00
9	REMOVE ASPHALT WALKING TRAIL	SY	552.2	$ 7.00	$ 3,865.56
10	MODULAR BLOCK RETAINING WALL	SF	2220.0	$ 40.00	$ 88,800.00
11	RETAINING WALL BASE	CY	60.0	$ 30.00	$ 1,800.00
12	RETAINING WALL FENCE	LF	575.0	$ 25.00	$ 14,375.00
13	COMMON EXCAVATION	CY	286.9	$ 14.00	$ 4,015.93
14	SELECT GRANULAR BORROW	CY	513.9	$ 25.00	$ 12,847.22
15	AGGREGATE BACKFILL (COURSE)	CY	127.8	$ 50.00	$ 6,388.89
16	RETAINING WALL DRAIN TILE/FABRIC	SF	555.0	$ 2.00	$ 1,110.00
17	15" RC PIPE SEWER	LF	70.0	$ 50.00	$ 3,500.00
18	CATCH BASIN MANHOLE	EA	2.0	$ 5,000.00	$ 10,000.00
19	CATCH BASIN CASTING ASSEMBLY	EA	2.0	$ 800.00	$ 1,600.00
20	FLARED END SECTIONS (DRAINAGE STRUCTURES)	EA	2.0	$ 1,000.00	$ 2,000.00
21	TYPE SP 12.5 NON-WEARING COURSE MIX (2;B)	TON	20.0	$ 60.00	$ 1,200.00
22	TYPE SP 9.5 WEARING COURSE MIX (2;B)	TON	10.0	$ 60.00	$ 600.00
23	BITUMINOUS MATERIAL FOR TACK COAT	GAL	20.0	$ 1.50	$ 30.00
24	CONCRETE CURB AND GUTTER B624	LF	705.0	$ 20.00	$ 14,100.00
25	AGGREGATE BASE (CURB AND GUTTER)	TON	95.2	$ 30.00	$ 2,855.25
26	ASPHALT WALKING TRAIL	TON	95.0	$ 60.00	$ 5,700.00
27	TRAIL BASE MATERIAL	TON	170.0	$ 30.00	$ 5,100.00
28	TRUNCATED DOMES	SF	15.0	$ 50.00	$ 750.00
29	6" CONCRETE WALK	SF	160.0	$ 10.00	$ 1,600.00
30	CROSSWALK PAINT	SF	100.0	$ 4.00	$ 400.00
31	STRIPING	LS	0.1	$ 10,000.00	$ 1,000.00
32	TOPSOIL BORROW	CY	130.6	$ 30.00	$ 3,916.67
33	HYDROSEED WITH SEED MIX 25-131	ACRE	0.2	$ 35,000.00	$ 7,000.00
34	SILT FENCE TYPE MS	LF	700.0	$ 5.00	$ 3,500.00
35	EROSION CONTROL BLANKETS CATEGORY 3N	SY	490.0	$ 5.00	$ 2,450.00
36	CLASS III RIPRAP	CY	8.0	$ 65.00	$ 520.00
				TOTAL	**$ 236,729.51**

Mill and Overlay Estimate

G

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (RETAINING WALLS AND FENCES)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	CLEARING	TREE	8	$ 300.00	$ 2,400.00
2	GRUBBING	TREE	8	$ 300.00	$ 2,400.00
3	REMOVE CABLE GUARD RAIL	LF	315	$ 4.00	$ 1,260.00
4	REMOVE TIMBER RETAINING WALL	LF	440	$ 8.50	$ 3,740.00
5	MODULAR BLOCK RETAINING WALL	SF	1901	$ 40.00	$ 76,040.00
6	RETAINING WALL BASE	CY	50	$ 30.00	$ 1,500.00
7	RETAINING WALL FENCE	LF	390	$ 40.00	$ 15,600.00
8	COMMON EXCAVATION	CY	80	$ 10.00	$ 800.00
9	AGGREGATE BACKFILL (COURSE)	CY	80	$ 50.00	$ 4,000.00
10	RETAINING WALL DRAIN TILE/FABRIC	SY	440	$ 2.00	$ 880.00
11	TOPSOIL BORROW	CY	60	$ 30.00	$ 1,800.00
12	HYDROSEED WITH SEED MIX 25-131	ACRE	0.1	$ 35,000.00	$ 3,500.00
				TOTAL	**$ 113,920.00**

H

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (POND AND DITCH CLEAN OUT)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	CLEARING	TREE	10	$ 300.00	$ 3,000.00
2	GRUBBING	TREE	10	$ 300.00	$ 3,000.00
3	POND EXCAVATION	CY	6018.5	$ 7.50	$ 45,138.89
4	HAUL AND DISPOSE OF CONTAMINATED MATERIAL	CY	6018.5	$ 14.00	$ 84,259.26
5	RANDOM RIPRAP CLASS II	CY	90	$ 75.00	$ 6,750.00
6	CLEAN DRAINAGE DITCH	LF	100	$ 18.25	$ 1,825.00
7	CONSTRUCT DRAINAGE DITCH	LF	100	$ 5.00	$ 500.00
8	EROSION CONTROL BLANKETS CATEGORY 3N	SY	445	$ 5.00	$ 2,225.00
				TOTAL	**$ 146,698.15**

I

QUANTITY/PRICE ESTIMATION - MARIE AVENUE (SLAB BRIDGE REPAIR)					
ITEM NO.	DESCRIPTION	UNIT	ESTIMATE QUANTITY	UNIT PRICE	TOTAL COST
1	EXPANSION JOINT DEVICE TYPE 4	LF	132	$ 150.00	$ 19,800.00
2	CONCRETE WEARING COURSE (3U17A)	SF	19800	$ 4.00	$ 79,200.00
3	RECONSTRUCT EXPANSION JOINT TYPE A	LF	132	$ 650.00	$ 85,800.00
4	REMOVE BITUMINOUS WEARING COURSE	SF	17300	$ 2.25	$ 38,925.00
5	REMOVE AND PATCH SLAB TYPE A	SF	1730	$ 50.00	$ 86,500.00
6	RECONSTRUCT APPROACH PANEL	SF	2684	$ 37.50	$ 100,650.00
				TOTAL	**$ 410,875.00**

Mill and Overlay Estimate

			WITH CONTINGENCY (10%)	ENGINEERING AND ADMINISTRATION (20%)
A	MARIE AVENUE (35E TO DODD ROAD)	$ 365,733.00	$ 402,306.30	$ 482,767.56
B	MARIE AVENUE (35E TO LEXINGTON AVE)	$ 519,520.00	$ 571,472.00	$ 685,766.40
C	DODD ROAD TO SUTTON LANE WATERMAIN	$ -	$ -	$ -
D	PEDESTRIAN TUNNEL	$ 276,468.33	$ 304,115.17	$ 364,938.20
E	TRAIL REHABILITATION	$ 92,598.05	$ 101,857.85	$ 122,229.42
F	LEXINGTON AVENUE TRAIL (MARIE AVE TO ORCHARD HILL)	$ 236,729.51	$ 260,402.46	$ 312,482.95
G	RETAINING WALLS AND FENCES	$ 113,920.00	$ 125,312.00	$ 150,374.40
H	POND AND DITCH CLEAN OUT	$ 146,698.15	$ 161,367.96	$ 193,641.56
I	SLAB BRIDGE REPAIR	$ 410,875.00	$ 451,962.50	$ 542,355.00
	TOTALS	**$ 2,162,542.04**	**$ 2,378,796.24**	**$ 2,854,555.49**

Exhibit 5

Preliminary Assessment Rolls

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DESCRIPTION: **2019 STREET IMPROVEMENTS**

ASSESSMENT UNIT RATE (50%): **$ 6,830.72**
INTEREST RATE: **4.125**
TERM: **10**
INITIAL YEAR: **2020**

TOTAL UNITS: **53.0**
PAYMENT METHOD:

NUMBER	PARCEL ADDRESS	PARCEL NUMBER	LEGAL DESCRIPTION	PROPERTY OWNER	JOINT OWNER	OWNER ADDRESS	CITY AND ZIP	ASSESSIBLE UNITS	STREET ASSESSMENT	TOTAL ASSESSMENT AMOUNT
1	716 SPRING CREEK CIR	277150001080	SPRING CREEK ACRES, LOT 8 BLOCK 1	JOHN R SAMEC		716 SPRING CREEK CIR	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
2	719 SPRING CREEK CIR	277150001010	SPRING CREEK ACRES, LOT 1 BLOCK 1	SIMON W & MAYA G ABRAMOVICH		719 SPRING CREEK CIR	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
3	720 SPRING CREEK CIR	277150001070	SPRING CREEK ACRES, LOT 7 BLOCK 1	KATHLEEN C TUCK		720 SPRING CREEK CIR	SAINT PAUL MN 55118-4300	1.0	$ 6,830.72	$ 6,830.72
4	724 SPRING CREEK CIR	277150001060	SPRING CREEK ACRES, LOT 6 BLOCK 1	RONALD J & JOY B CACICIA		724 SPRING CREEK CIR	SAINT PAUL MN 55118-4300	1.0	$ 6,830.72	$ 6,830.72
5	727 SPRING CREEK CIR	277150001050	SPRING CREEK ACRES, LOT 5 BLOCK 1	ELIZABETH A STAPLES		727 SPRING CREEK CIRCLE	MENDOTA HEIGHTS MN 55118-4300	1.0	$ 6,830.72	$ 6,830.72
6	706 MAGER CT	276475001090	ROLLING WOODS ADDITION, LOT 9 BLOCK 1	DANIEL R & LISA M BUE		706 MAGER CT	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
7	710 MAGER CT	276475001080	ROLLING WOODS ADDITION, LOT 8 BLOCK 1	DAVID P & MARY LOUIS DRESBACH		710 MAGER CT	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
8	714 MAGER CT	276475001070	ROLLING WOODS ADDITION, LOT 7 BLOCK 1	MICHAEL B & STACY J DOCKMAN		714 MAGER CT	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
9	718 MAGER CT	276475001060	ROLLING WOODS ADDITION, LOT 6 BLOCK 1	IRENE & JAMES Y GOLDBERG	FLORENCE GOLDBERG	718 MAGER CT	SAINT PAUL MN 55118-4356	1.0	$ 6,830.72	$ 6,830.72
10	1844 DODD RD	270250026010	SECTION 25 TWN 28 RANGE 23	LOUIS H ESCHLE		1844 DODD RD	SAINT PAUL MN 55118-4305	1.0	$ 6,830.72	$ 6,830.72
11	645 WESLEY LN	277590001170	ROLLING WOODS ADDITION, LOT 17 BLOCK 1	JOAN M JAKUBAS		645 WESLEY LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
12	650 WESLEY LN	277590002020	THE PONDS OF MENDOTA HEIGHTS, LOT 2 BLOCK 2	TIMOTHY J & BARBARA DORAN		650 WESLEY LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
13	651 WESLEY LN	277590001180	THE PONDS OF MENDOTA HEIGHTS, LOT 18 BLOCK 1	BRIAN J & KATHRYN A KLECAN		651 WESLEY LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
14	656 WESLEY LN	277590002010	THE PONDS OF MENDOTA HEIGHTS, LOT 1 BLOCK 2	ELIE GERTNER		656 WESLEY LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
15	657 WESLEY LN	277590001190	THE PONDS OF MENDOTA HEIGHTS, LOT 19 BLOCK 1	JOHNSON JULIE ANN LIVING TRUST		657 WESLEY LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
16	664 WESLEY LN	276475101010	ROLLING WOODS 2ND ADDITION, LOT 1 BLOCK 1	JULIE & PAUL BURKHARDT		664 WESLEY LN	SAINT PAUL MN 55118-4348	1.0	$ 6,830.72	$ 6,830.72
17	665 WESLEY LN	276475001150	ROLLING WOODS ADDITION, LOT 15 BLOCK 1	STEVEN J & SUSAN S FINN		665 WESLEY LN	SAINT PAUL MN 55118-4347	1.0	$ 6,830.72	$ 6,830.72
18	672 WESLEY LN	276475101020	ROLLING WOODS 2ND ADDITION, LOT 2 BLOCK 1	THOMAS A & MICHELE L MINGO		672 WESLEY LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
19	673 WESLEY LN	276475001160	ROLLING WOODS ADDITION, LOT 16 BLOCK 1	STEPHEN W & MARY K SANTOS		673 WESLEY LN	MENDOTA HEIGHTS MN 55118-4347	1.0	$ 6,830.72	$ 6,830.72
20	680 WESLEY LN	276475101030	ROLLING WOODS 2ND ADDITION, LOT 3 BLOCK 1	STEVEN J & THERESA RIEF		680 WESLEY LN	SAINT PAUL MN 55118-4348	1.0	$ 6,830.72	$ 6,830.72
21	688 WESLEY LN	276475101040	ROLLING WOODS 2ND ADDITION, LOT 4 BLOCK 1	MICHAEL S & KATHLEEN JOYCE		688 WESLEY LN	SAINT PAUL MN 55118-4348	1.0	$ 6,830.72	$ 6,830.72
22	692 WESLEY LN	276475101050	ROLLING WOODS 2ND ADDITION, LOT 5 BLOCK 1	DANIEL J & ANNE MCKI ELDREDGE		692 WESLEY LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
23	696 WESLEY LN	276475101062	ROLLING WOODS 2ND ADDITION, LOT 6 BLOCK 1 WEST	WADE A & MOLLY E SEDGWICK		696 WESLEY LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
24	697 WESLEY LN	276475001011	ROLLING WOODS ADDITION, LOT 1 BLOCK 1	KEITH SCHWEIGER		697 WESLEY LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
25	701 WESLEY LN	276475001012	ROLLING WOODS ADDITION, LOT 1 BLOCK 1	KEITH SCHWEIGER		697 WESLEY LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
26	700 WESLEY LN	276475101061	ROLLING WOODS 2ND ADDITION, LOT 6 BLOCK 1	ST PAUL UNITED METHODIST CHURCH		700 WESLEY LN	MENDOTA HEIGHTS MN 55118	4.0	$ 6,830.72	$ 27,322.88
27	703 WESLEY LN	276475001020	ROLLING WOODS ADDITION, LOT 2 BLOCK 1	KENNETH H & ROSEMARY LARSON		703 WESLEY LN	SAINT PAUL MN 55118-4349	1.0	$ 6,830.72	$ 6,830.72
28	709 WESLEY LN	276475001030	ROLLING WOODS ADDITION, LOT 3 BLOCK 1	ANDY & WENDY STAEBELL		709 WESLEY LN	SAINT PAUL MN 55118-4349	1.0	$ 6,830.72	$ 6,830.72
29	715 WESLEY LN	276475001040	ROLLING WOODS ADDITION, LOT 4 BLOCK 1	JAMEEL R QIBLAWI	ANGELA L WUTZ QIBLAWI	715 WESLEY LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
30	721 WESLEY LN	276475001050	ROLLING WOODS ADDITION, LOT 5 BLOCK 1	PHILLIP R HINZE		721 WESLEY LN	MENDOTA HEIGHTS MN 55118-4349	1.0	$ 6,830.72	$ 6,830.72
31	672 WESLEY CT	276475001140	ROLLING WOODS ADDITION, LOT 14 BLOCK 1	RICK & LYNN MCNABB		672 WESLEY CT	SAINT PAUL MN 55118-4350	1.0	$ 6,830.72	$ 6,830.72
32	675 WESLEY CT	276475001120	ROLLING WOODS ADDITION, LOT 12 BLOCK 1	DIANE K CARUSO		675 WESLEY CT	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
33	675 WESLEY CT	276475001130	ROLLING WOODS ADDITION, LOT 13 BLOCK 1	DIANE K CARUSO		675 WESLEY CT	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
34	680 WESLEY CT	276475001170	ROLLING WOODS ADDITION, LOT 17 BLOCK 1	STEVEN T & MARIE A KRUECKEBERG		680 WESLEY CT	MENDOTA HEIGHTS MN 55118-4350	1.0	$ 6,830.72	$ 6,830.72
35	686 WESLEY CT	276475001180	ROLLING WOODS ADDITION, LOT 18 BLOCK 1	ANDREW T & SARA J RUFF		686 WESLEY CT	SAINT PAUL MN 55118-4350	1.0	$ 6,830.72	$ 6,830.72
36	687 WESLEY CT	276475001110	ROLLING WOODS ADDITION, LOT 11 BLOCK 1	MATTHEW D & TRACY L MCCOLLISTER		687 WESLEY CT	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
37	695 WESLEY CT	276475001100	ROLLING WOODS ADDITION, LOT 10 BLOCK 1	PATRICK L & KATHERIN SMITH		695 WESLEY CT	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
38	1851 SOUTH LN	277590001140	THE PONDS OF MENDOTA HEIGHTS, LOT 14 BLOCK 1	STEPHEN A BAKER	CLARICE ANN GRIMM BAKER	1851 SOUTH LN	SAINT PAUL MN 55118-4346	1.0	$ 6,830.72	$ 6,830.72
39	1852 SOUTH LN	277590001120	THE PONDS OF MENDOTA HEIGHTS, LOT 12 BLOCK 1	LAUREEN MARIE BRUBER	HERBERT JAMES III BRUBER	1852 SOUTH LN	MENDOTA HEIGHTS MN 55118-4328	1.0	$ 6,830.72	$ 6,830.72
40	1861 SOUTH LN	277590001150	THE PONDS OF MENDOTA HEIGHTS, LOT 15 BLOCK 1	NICHOLAS G & SONIA N HOULE		1861 SOUTH LN	SAINT PAUL MN 55118-4346	1.0	$ 6,830.72	$ 6,830.72
41	1862 SOUTH LN	277590001110	THE PONDS OF MENDOTA HEIGHTS, LOT 11 BLOCK 1	JUSTIN M & ELIZABETH JOYCE		1862 SOUTH LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
42	1871 SOUTH LN	277590001160	THE PONDS OF MENDOTA HEIGHTS, LOT 16 BLOCK 1	MICHAEL D & CHARLENE MCHUGH		1871 SOUTH LN	SAINT PAUL MN 55118-4346	1.0	$ 6,830.72	$ 6,830.72
43	1872 SOUTH LN	277590001100	THE PONDS OF MENDOTA HEIGHTS, LOT 10 BLOCK 1	TERRY H & CYNTHIA A RUST		1872 SOUTH LN	SAINT PAUL MN 55118-4328	1.0	$ 6,830.72	$ 6,830.72
44	1882 SOUTH LN	277590001090	THE PONDS OF MENDOTA HEIGHTS, LOT 9 BLOCK 1	ROBERT CASSELMAN		1882 SOUTH LN	SAINT PAUL MN 55114	1.0	$ 6,830.72	$ 6,830.72
45	1891 SOUTH LN	277590002030	THE PONDS OF MENDOTA HEIGHTS, LOT 3 BLOCK 2	MITCHELL A & CAROL W ROSSMAN		1891 SOUTH LN	SAINT PAUL MN 55118-4346	1.0	$ 6,830.72	$ 6,830.72
46	1892 SOUTH LN	277590001080	THE PONDS OF MENDOTA HEIGHTS, LOT 8 BLOCK 1	GLATZMAIER JOHN W TSTE		1520 27TH ST W	MINNEAPOLIS MN 55408	1.0	$ 6,830.72	$ 6,830.72
47	1901 SOUTH LN	277590002040	THE PONDS OF MENDOTA HEIGHTS, LOT 4 BLOCK 2	KENNETH J KAISER	MARY E WEBER	1901 SOUTH LN	SAINT PAUL MN 55118-4346	1.0	$ 6,830.72	$ 6,830.72
48	1902 SOUTH LN	277590001070	THE PONDS OF MENDOTA HEIGHTS, LOT 7 BLOCK 1	MATTHEW JORDAN & HEI JOHNSON		1902 SOUTH LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
49	1912 SOUTH LN	273860002010	JEFFERSON HEIGHTS, LOT 1 BLOCK 2	LOUIS WILLIAM & ALIS HAWKINS		1912 SOUTH LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
50	1925 SOUTH LN	273860002020	JEFFERSON HEIGHTS, LOT 2 BLOCK 2	NICOLE MARIE CONZEMIUS		1925 SOUTH LN	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
								53.0	**$ 341,536.00**	**$ 362,028.16**

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DESCRIPTION: **2019 STREET IMPROVEMENTS**

ASSESSMENT UNIT RATE (50%): **$ 6,830.72**
INTEREST RATE: **4.125**
TERM: **10**
INITIAL YEAR: **2020** plus interest from assessment hearing to december 31st in 2019

TOTAL UNITS: **94.0**
PAYMENT METHOD:

NUMBER	PARCEL ADDRESS	PARCEL NUMBER	LEGAL DESCRIPTION	PROPERTY OWNER	JOINT OWNER	OWNER ADDRESS	CITY AND ZIP	ASSESSIBLE UNITS	STREET ASSESSMENT	TOTAL ASSESSMENT AMOUNT
1	720 MARIE AVE	277150001020	SPRING CREEK ACRES, LOT 2 BLOCK 1	LISA M NASSEFF		720 MARIE AVE W	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
2	726 MARIE AVE	277150001030	SPRING CREEK ACRES, LOT 3 BLOCK 1	BETTY J ELLIS		726 MARIE AVE	SAINT PAUL MN 55118-3708	1.0	$ 6,830.72	$ 6,830.72
3	730 MARIE AVE	277150001040	SPRING CREEK ACRES, LOT 4 BLOCK 1	DAVID E MILLER	VICKI VIAL TAYLOR	730 MARIE AVE W	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
4	766 MARIE AVE	278115001040	VALLEY CURVE ESTATES, LOT 4 BLOCK 1	KEVIN ALAN & NANCY G MANLEY		766 MARIE AVE W	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
5	776 MARIE AVE	278115001030	VALLEY CURVE ESTATES, LOT 3 BLOCK 1	THOMAS K HASTINGS		776 MARIE AVE W	SAINT PAUL MN 55118-3708	1.0	$ 6,830.72	$ 6,830.72
6	786 MARIE AVE	278115001020	VALLEY CURVE ESTATES, LOT 2 BLOCK 1	MARK S SACEWICZ		786 MARIE AVE	MENDOTA HEIGHTS MN 55118-3708	1.0	$ 6,830.72	$ 6,830.72
7	729 MARIE AVE	277110001010	SOMERSET PARK, LOT 1 BLOCK1	JACK & GENELLE FORSBERG		729 MARIE AVE W	SAINT PAUL MN 55118-3707	1.0	$ 6,830.72	$ 6,830.72
8	725 MARIE AVE	277110001020	SOMERSET PARK, LOT 2 BLOCK1	CHRISTIAN B & TARA O RIBA		725 MARIE AVE W	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
9	721 MARIE AVE	277110001030	SOMERSET PARK, LOT 3 BLOCK1	MARK M & KATHLEEN C MILLER		721 MARIE AVE	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
10	717 MARIE AVE	277110001040	SOMERSET PARK, LOT 4 BLOCK1	LARRY J SNYDER		717 MARIE AVE	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
11	713 MARIE AVE	277110001050	SOMERSET PARK, LOT 5 BLOCK1	REBEKAH VILLAFUERTE		713 MARIE AVE	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
12	884 MARIE AVE	272250101010	EAGLE RIDGE EAST PLAT 2, LOT 1 BLOCK 1	SHANE I & MAVIS A GOLDSTEIN		884 MARIE AVE	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
13	886 MARIE AVE	272250101020	EAGLE RIDGE EAST PLAT 2, LOT 2 BLOCK 1	PAULINE G TSTE OBRIEN		886 MARIE AVE	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
14	888 MARIE AVE	272250101030	EAGLE RIDGE EAST PLAT 2, LOT 3 BLOCK 1	MARY ANN CONNEY		888 MARIE AVE	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
15	890 MARIE AVE	272250101040	EAGLE RIDGE EAST PLAT 2, LOT 4 BLOCK 1	ELLNORA H MCGIVERN		890 MARIE AVE	SAINT PAUL MN 55118-4224	1.0	$ 6,830.72	$ 6,830.72
16	892 MARIE AVE	272250101050	EAGLE RIDGE EAST PLAT 2, LOT 5 BLOCK 1	THOMAS J KLAS		892 MARIE AVE	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
17	894 MARIE AVE	272250001080	EAGLE RIDGE EAST PLAT 1, LOT 8 BLOCK 1	GEORGE T DONOVAN		894 MARIE AVE	SAINT PAUL MN 55118	1.0	$ 6,830.72	$ 6,830.72
18	896 MARIE AVE	272250001070	EAGLE RIDGE EAST PLAT 1, LOT 7 BLOCK 1	LEONARD A MURRAY		896 MARIE AVE	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
19	1091 MARIE AVE	270230053020	SECTION 23 TWN 28 RANGE 23	IVAN J POSTHUMUS	SUSAN KAYE LINNELL	1091 MARIE AVE	SAINT PAUL MN 55118-4132	1.0	$ 6,830.72	$ 6,830.72
20	1059 MARIE AVE	271555001030	BURIL AND HOLMES, LOT 3 BLOCK 1	JASON & VALERIE V TORNQUIST		1059 MARIE AVE	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
21	1051 MARIE AVE	271555001040	BURIL AND HOLMES, LOT 4 BLOCK 1	JOHN P & BRITNEY L KLOCKE		1051 MARIE AVE	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
22	1047 MARIE AVE	271555001050	BURIL AND HOLMES, LOT 5 BLOCK 1	JOHN FRANCIS VOGEL		11241 WHITE SPRUCE DR UNIT 8	LOUISVILLE KY 40229	1.0	$ 6,830.72	$ 6,830.72
23	1041 MARIE AVE	271555001060	BURIL AND HOLMES, LOT 6 BLOCK 1	BRENNA SATTLER		1041 MARIE AVE	MENDOTA HEIGHTS MN 55118-4131	1.0	$ 6,830.72	$ 6,830.72
24	1037 MARIE AVE	271555001070	BURIL AND HOLMES, LOT 7 BLOCK 1	JOHN C & WENDY L SHEETS		1037 MARIE AVE	MENDOTA HEIGHTS MN 55118-4131	1.0	$ 6,830.72	$ 6,830.72
25	1005 MARIE AVE	271650001030	CARROLL F SMALL 1ST ADDITION, LOT 3 BLOCK 1	THERESA A & KEVIN L MCNULTY		1005 MARIE AVE	MENDOTA HEIGHTS MN 55118-4228	1.0	$ 6,830.72	$ 6,830.72
26	1795 VICTORIA RD S	270230054030	SECTION 23 TWN 28 RANGE 23	MONICA MOGREN		1795 VICTORIA RD S	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
27	950 HIGHVIEW CIR S	278195101010	VICTORIA HIGHLANDS 2ND ADDITION, LOT 1 BLOCK 1	ROBERT C & FRANCES A KLAS		950 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
28	946 HIGHVIEW CIR S	278195101020	VICTORIA HIGHLANDS 2ND ADDITION, LOT 2 BLOCK 1	ERIC & MARYBETH JOHNSON		946 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
29	942 HIGHVIEW CIR S	278195101030	VICTORIA HIGHLANDS 2ND ADDITION, LOT 3 BLOCK 1	MICHAEL P & PATRICIA MYSER		942 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
30	938 HIGHVIEW CIR S	278195101040	VICTORIA HIGHLANDS 2ND ADDITION, LOT 4 BLOCK 1	MARC JAMIE COHEN	JO ELLYN COHEN	938 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118-3686	1.0	$ 6,830.72	$ 6,830.72
31	934 HIGHVIEW CIR S	278195301010	VICTORIA HIGHLANDS 4TH ADDITION, LOT 1 BLOCK 1	ROBERT G & EILEEN A FAHRENKRUG		934 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118-3686	1.0	$ 6,830.72	$ 6,830.72
32	930 HIGHVIEW CIR S	278195301020	VICTORIA HIGHLANDS 4TH ADDITION, LOT 2 BLOCK 1	OTHILD SCHWARTZKOPFF-GOHL		949 SIBLEY MEMORIAL HWY STE 311	SAINT PAUL MN 55118	1.0	$ 6,830.72	$ 6,830.72
33	926 HIGHVIEW CIR S	278195301030	VICTORIA HIGHLANDS 4TH ADDITION, LOT 3 BLOCK 1	KAREN ANN WINTER		926 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118-3686	1.0	$ 6,830.72	$ 6,830.72
34	910 HIGHVIEW CIR S	278195901010	VICTORIA HIGHLANDS 10TH ADDITION, LOT 1 BLOCK 1	JACQUELINE J TSTE BERG		910 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118-3686	1.0	$ 6,830.72	$ 6,830.72
35	906 HIGHVIEW CIR S	278195901020	VICTORIA HIGHLANDS 10TH ADDITION, LOT 2 BLOCK 1	DAVID R & LESLIE M METZEN		906 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
36	902 HIGHVIEW CIR S	278195801010	VICTORIA HIGHLANDS 9TH ADDITION, LOT 1 BLOCK 1	JUDITH M GENDRON		902 HIGHVIEW CIR S	SAINT PAUL MN 55118-3686	1.0	$ 6,830.72	$ 6,830.72
37	898 HIGHVIEW CIR S	278195801020	VICTORIA HIGHLANDS 9TH ADDITION, LOT 2 BLOCK 1	ROBERT C SAMEC	MICHAELENE M SAMEC	898 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
38	894 HIGHVIEW CIR S	278195801030	VICTORIA HIGHLANDS 9TH ADDITION, LOT 3 BLOCK 1	NORMA J REVOCABLE TR CASHILL		894 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
39	890 HIGHVIEW CIR S	278196101010	VICTORIA HIGHLANDS 12TH ADDITION, LOT 1 BLOCK 1	THOMAS W MCKEOWN	MARY C MCKEOWN	890 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
40	886 HIGHVIEW CIR S	278196101020	VICTORIA HIGHLANDS 12TH ADDITION, LOT 2 BLOCK 1	BRIAN G SKOOG		886 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
41	882 HIGHVIEW CIR S	278196101030	VICTORIA HIGHLANDS 12TH ADDITION, LOT 3 BLOCK 1	THOMAS ARTHUR VOGELPOHL	ALISON TROST	882 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118-3686	1.0	$ 6,830.72	$ 6,830.72
42	878 HIGHVIEW CIR S	278196001010	VICTORIA HIGHLANDS 11TH ADDITION, LOT 1 BLOCK 1	LINDA J BJORNBERG		878 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
43	874 HIGHVIEW CIR S	278196001020	VICTORIA HIGHLANDS 11TH ADDITION, LOT 2 BLOCK 1	RICHARD G SPICER	ELIZABETH A SPICER	874 HIGHVIEW CIR S	MENDOTA HEIGHTS MN 55118-3686	1.0	$ 6,830.72	$ 6,830.72
44	872 HIGHVIEW CIR N	278195701020	VICTORIA HIGHLANDS 8TH ADDITION, LOT 2 BLOCK 1	TERRY T & REBECCA L KURUVILLA		16 MILL SHARES RD	PEMBROKE HM 05 BERMUDA	1.0	$ 6,830.72	$ 6,830.72
45	876 HIGHVIEW CIR N	278195701010	VICTORIA HIGHLANDS 8TH ADDITION, LOT 1 BLOCK 1	RICHARD C & CATHERIN EHRMANNTRAUT		876 HIGHVIEW CIR N	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
46	880 HIGHVIEW CIR N	278195601010	VICTORIA HIGHLANDS 7TH ADDITION, LOT 1 BLOCK 1	RICHARD J & RITA R BERENS		880 HIGHVIEW CIR N	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
47	884 HIGHVIEW CIR N	278195501030	VICTORIA HIGHLANDS 6TH ADDITION, LOT 3 BLOCK 1	HENSE THOMAS TSTEE HENSE JOANNE TSTEE		884 HIGHVIEW CIR N	MENDOTA HEIGHTS MN 55118-3687	1.0	$ 6,830.72	$ 6,830.72
48	888 HIGHVIEW CIR N	278195501020	VICTORIA HIGHLANDS 6TH ADDITION, LOT 2 BLOCK 1	WILLIAM H TSTE QUEENAN	CAROL MARY TSTE QUEENAN	8171 BAY COLONY DR UNIT 403	NAPLES FL 34108	1.0	$ 6,830.72	$ 6,830.72
49	892 HIGHVIEW CIR N	278195501010	VICTORIA HIGHLANDS 6TH ADDITION, LOT 1 BLOCK 1	JOHN W & NANCY K CULLIGAN		892 HIGHVIEW CIR N	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
50	896 HIGHVIEW CIR N	278195201030	VICTORIA HIGHLANDS 3RD ADDITION, LOT 3 BLOCK 1	PATRICIA L PEDERSON		896 HIGHVIEW CIR N	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
51	900 HIGHVIEW CIR N	278195201020	VICTORIA HIGHLANDS 3RD ADDITION, LOT 2 BLOCK 1	ELAINE TREACY	WILLIAM P TREACY	900 HIGHVIEW CIR N	MENDOTA HEIGHTS MN 55118-3687	1.0	$ 6,830.72	$ 6,830.72
52	904 HIGHVIEW CIR N	278195201010	VICTORIA HIGHLANDS 3RD ADDITION, LOT 1 BLOCK 1	WILLIAM H TSTE MADDEN	DONALD W & DEBORAH J WENDLING	904 HIGHVIEW CIR N	SAINT PAUL MN 55118	1.0	$ 6,830.72	$ 6,830.72
53	908 HIGHVIEW CIR N	278195402030	VICTORIA HIGHLANDS 5TH ADDITION, LOT 3 BLOCK 2	PAUL D TSTE TRITSCHLER	JOYCE E TSTE TRITSCHLER	908 HIGHVIEW CIR N	SAINT PAUL MN 55118-3687	1.0	$ 6,830.72	$ 6,830.72
54	912 HIGHVIEW CIR N	278195402020	VICTORIA HIGHLANDS 5TH ADDITION, LOT 2 BLOCK 2	KATHRYN EYRICH TSTE KRUGER	MICHAEL L TSTE KRUGER	912 HIGHVIEW CIR N	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
55	916 HIGHVIEW CIR N	278195402010	VICTORIA HIGHLANDS 5TH ADDITION, LOT 1 BLOCK 2	BARRY R & RENA GLASER		916 HIGHVIEW CIR N	MENDOTA HEIGHTS MN 55118	1.0	$ 6,830.72	$ 6,830.72
56	920 HIGHVIEW CIR N	278195401020	VICTORIA HIGHLANDS 5TH ADDITION, LOT 2 BLOCK 1	JON & JERRILYN MATHISRUD		920 HIGHVIEW CIR N	MENDOTA HEIGHTS MN 55118-3687	1.0	$ 6,830.72	$ 6,830.72
57	924 HIGHVIEW CIR N	278195401010	VICTORIA HIGHLANDS 5TH ADDITION, LOT 1 BLOCK 1	JAMES A TSTE PETERSON		924 HIGHVIEW CIR N	MENDOTA HEIGHTS MN 55118-3687	1.0	$ 6,830.72	$ 6,830.72
58		270250025010	SECTION 25 TWN 28 RANGE 23	CITY OF MENDOTA HEIGHTS		1101 VICTORIA CURVE	SAINT PAUL MN 55118-4167	2.0	$ 6,830.72	$ 13,661.44
59		277090001010	SOMERSET NO 2, LOT 1 BLOCK 1	CITY OF MENDOTA HEIGHTS		1101 VICTORIA CURVE	SAINT PAUL MN 55118-4167	1.5	$ 6,830.72	$ 10,246.08
60		277090000010	SOMERSET NO 2, OUTLOT	CITY OF MENDOTA HEIGHTS		1101 VICTORIA CURVE	SAINT PAUL MN 55118-4167	1.4	$ 6,830.72	$ 9,563.01
61		277110200010	SOMERSET NO 3, OUTLOT	CITY OF MENDOTA HEIGHTS		1101 VICTORIA CURVE	SAINT PAUL MN 55118-4167	3.2	$ 6,830.72	$ 21,858.30
62		270230076011	SECTION 23 TWN 28 RANGE 23	CITY OF MENDOTA HEIGHTS		1101 VICTORIA CURVE	SAINT PAUL MN 55118-4167	10.5	$ 6,830.72	$ 71,722.56
63		276400001031	RIDGEWOOD PARK, LOT 3 BLOCK 1	CITY OF MENDOTA HEIGHTS		1101 VICTORIA CURVE	SAINT PAUL MN 55118-4167	3.0	$ 6,830.72	$ 20,492.16
64		270260002020	SECTION 26 TWN 28 RANGE 23	CITY OF MENDOTA HEIGHTS		1101 VICTORIA CURVE	SAINT PAUL MN 55118-4167	1.0	$ 6,830.72	$ 6,830.72
65	1780 LILAC LN	270230054020	SECTION 23 TWN 28 RANGE 23	CITY OF MENDOTA HEIGHTS		1101 VICTORIA CURVE	SAINT PAUL MN 55118-4167	4.5	$ 6,830.72	$ 30,738.24
66		274495000011	LEXINGTON HIGHLAND EAST	CITY OF MENDOTA HEIGHTS		1101 VICTORIA CURVE	SAINT PAUL MN 55118-4167	3.9	$ 6,830.72	$ 26,639.81
67		274495500010	LEXINGTON HIGHLAND WEST	CITY OF MENDOTA HEIGHTS		1101 VICTORIA CURVE	SAINT PAUL MN 55118-4167	6.0	$ 6,830.72	$ 40,984.32
								94.00		**$ 642,087.68**

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Exhibit 6

Assessment Maps

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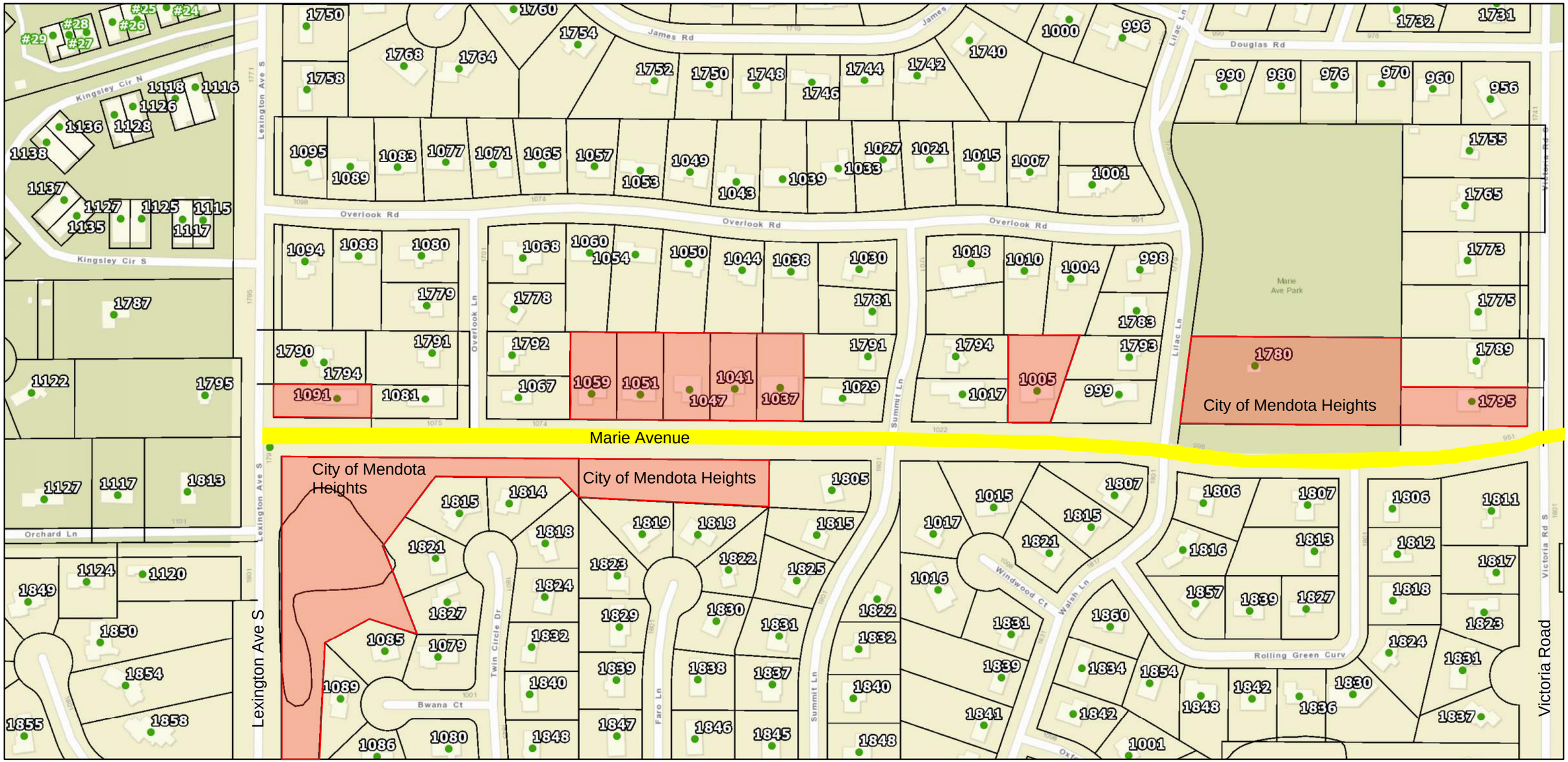
Dakota County, MN



August 13, 2018

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0 155 310 620 ft

0 45 90 180 m

Property Information
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

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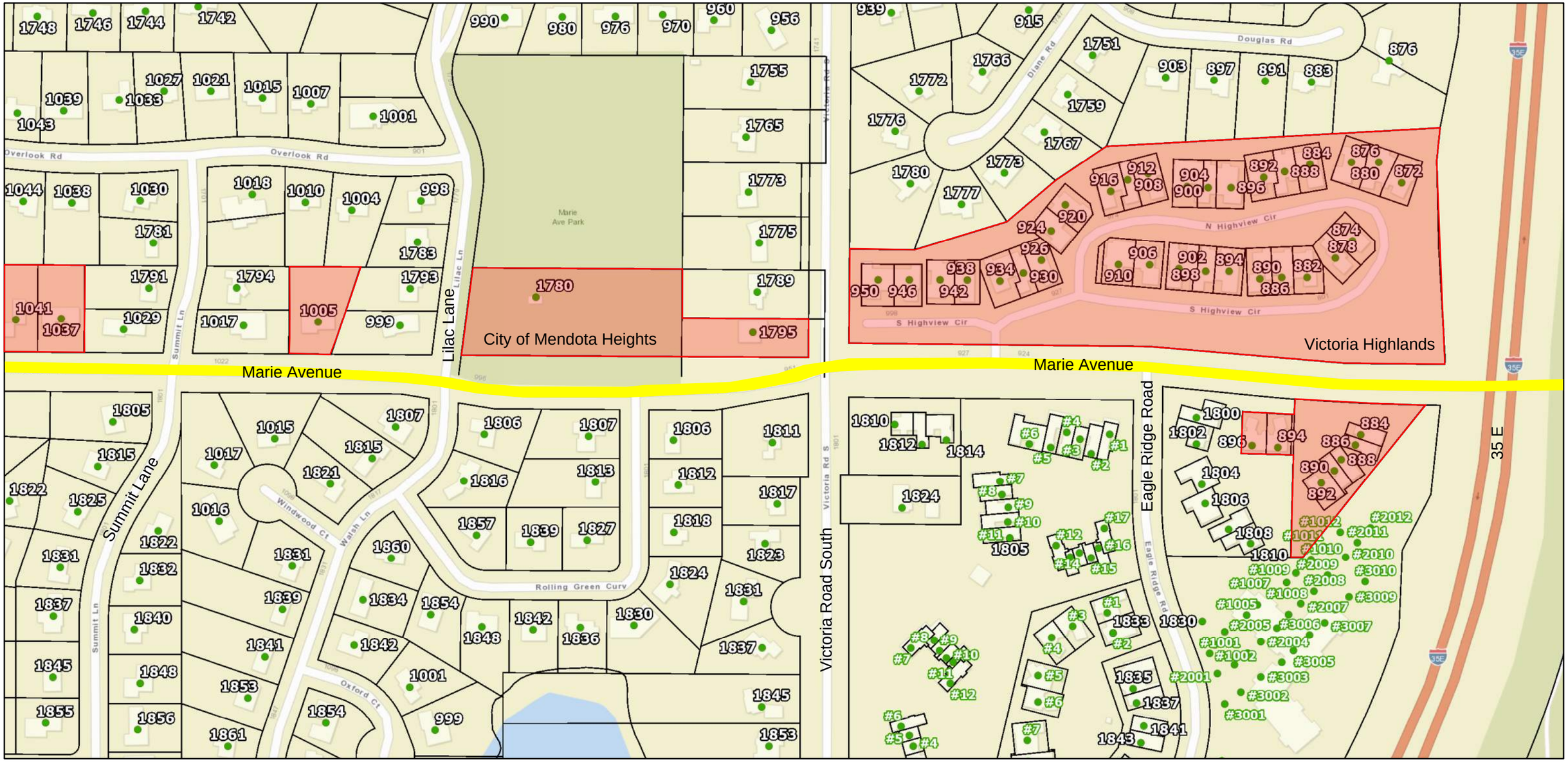
Dakota County, MN



August 13, 2018

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Property Information

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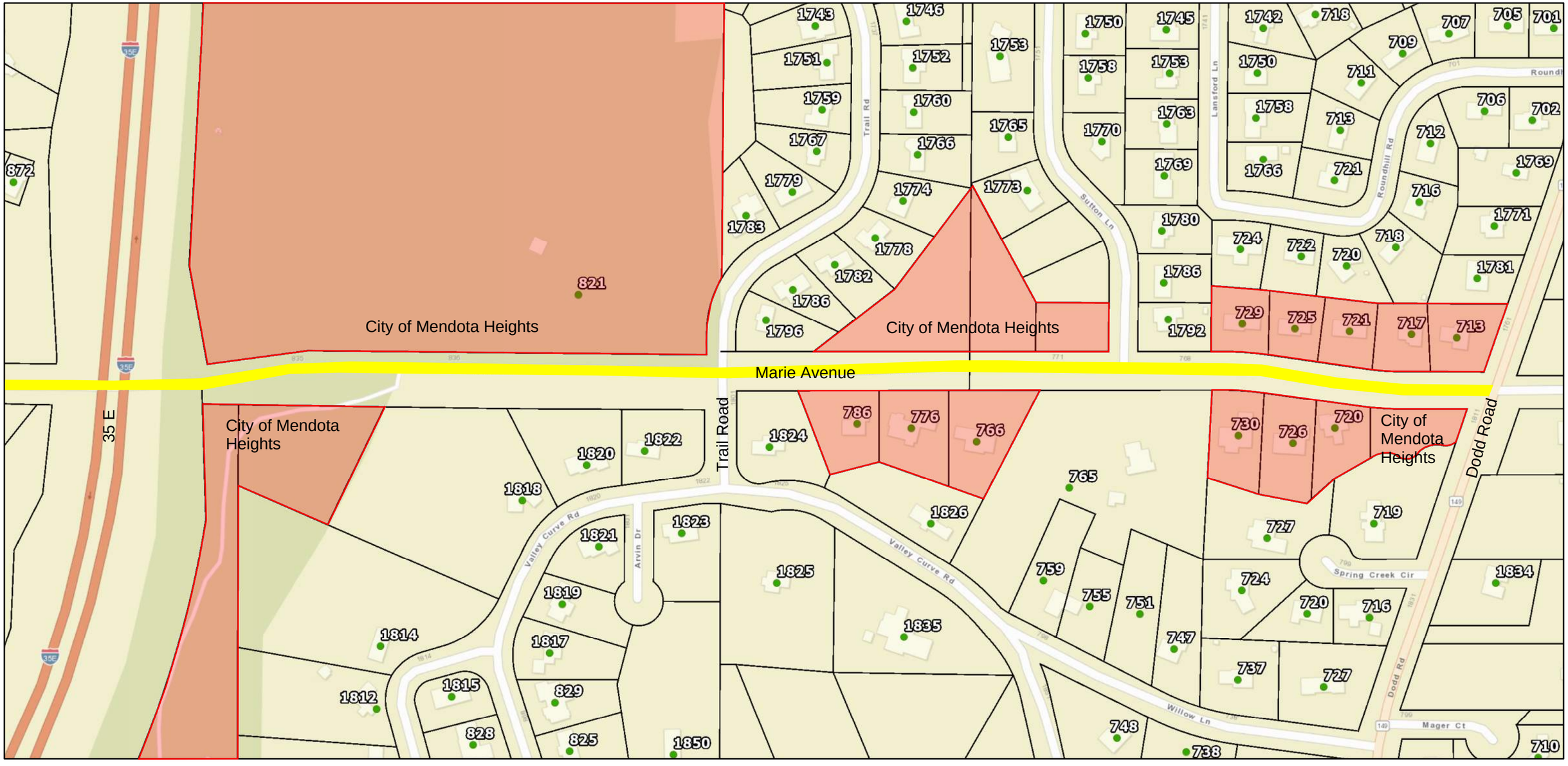
Dakota County, MN



August 13, 2018

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0 45 90 180 m

Property Information

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

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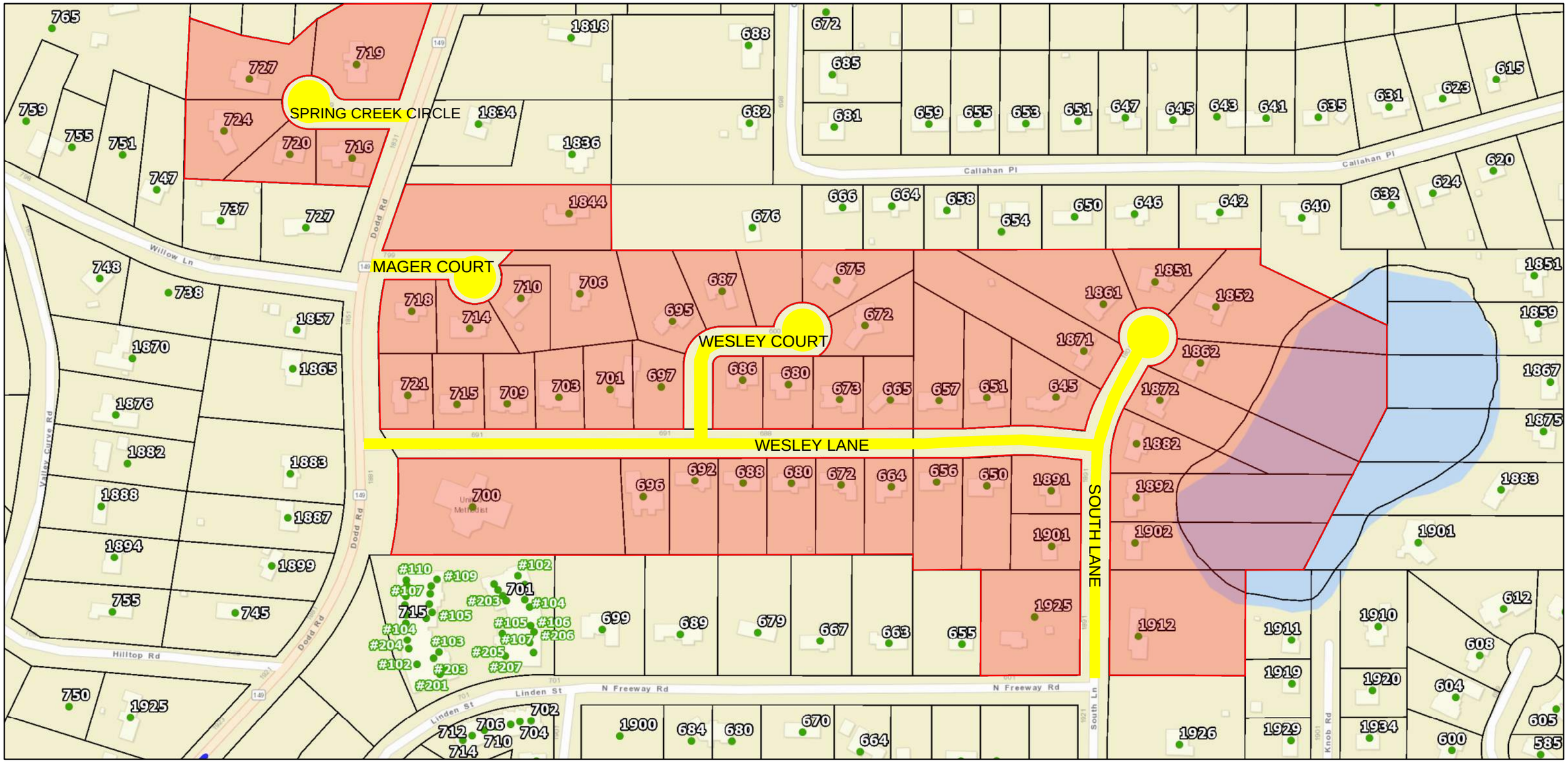
Wesley Lane Neighborhood

Dakota County, MN

EXHIBIT 6



August 13, 2018

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0 155 310 620 ft

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Transportation
Property Information
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS

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Exhibit 7

Geotechnical Report

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element

Element Materials Technology
662 Cromwell Avenue
St Paul, MN
55114-1720 USA

P 651 645 3601
F 651 659 7348
T 888 786 7555
info.stpaul@element.com
element.com

Geotechnical Exploration Program
City of Mendota Heights
Marie Avenue and Wesley Neighborhood Rehabilitation Projects

City of Mendota Heights, Minnesota
Element Materials Technology St. Paul Inc. Project No. ESP029130P

Prepared for:

City of Mendota Heights
c/o TKDA

September 28, 2018

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.

Mark Straight, P.E.
Senior Project Engineer
MN Reg. No. 41658

element

September 28, 2018

TKDA
Attn: Mr. Larry Poppler, P.E.
Group Manager, Municipal Services
444 Cedar Street, Suite 1500
Saint Paul, MN 55101

RE: Geotechnical Exploration Program
City of Mendota Heights Marie Avenue and Wesley Neighborhood
Rehabilitation Projects
Mendota Heights, Minnesota
Element Materials Technology St. Paul Inc. Project No. ESP029130P

Dear Mr. Poppler:

We have completed the geotechnical exploration and engineering analysis for the above referenced project. This report presents the results of our field and laboratory review programs, and provides recommendations concerning the soil and groundwater conditions as they relate to the proposed construction.

The soil samples will be retained in our laboratory for 30 days, at which time we will dispose of them. If you desire Element Materials Technology St. Paul Inc. to retain the samples longer than 30 days, please notify us.

We are pleased to be of service to you in this important phase of the project. If there are any questions regarding the information contained in this report or if we can be of further service to you, please contact John Starke at (651) 645-7429, email: john.starke@element.com or Mark Straight at (651) 659-7447, email: at mark.straight@element.com.

Respectfully Submitted,

ELEMENT MATERIALS TECHNOLOGY ST. PAUL INC.

John Starke, P.E.
Senior Geotechnical Engineer
MN Reg. No. 23546

Mark Straight, P.E.
Senior Project Engineer
MN Reg. No. 41658

1.0 INTRODUCTION

This report presents the results of our recent geotechnical exploration program conducted for the proposed Marie Avenue and Wesley Neighborhood Street Rehabilitation Projects located in the City of Mendota Heights, Minnesota. We understand a geotechnical exploration program was needed to evaluate existing street pavement profiles and subsurface conditions to aid in the design and construction of these projects. This report presents the results of the field exploration, our laboratory testing, geotechnical and pavement review and analysis, and recommendations.

1.1 Scope of Work

We recently performed a geotechnical exploration program in accordance with our May 30, 2018 proposal and subsequent authorization by TKDA to proceed. The scope of our work for the project was as follows:

1. Meet and discuss with City staff and TKDA the project requirements and finalize the boring locations. Ground surface elevations at the boring locations would be provided by TKDA.
2. Arrange to have buried public utilities marked through the Gopher-State-One-Call System.
3. Provide traffic control as needed to allow drilling to be conducted in roadways.
4. Explore the subsurface conditions by drilling thirty-one (31) Standard Penetration Test (SPT) borings within the project areas. Subsequently as directed by TKDA, two borings were eliminated from the project scope. Standard Penetration Test borings would be drilled to depths ranging from approximately 5' to 30'.
5. Perform six (6) hand auger borings within perimeters of two existing stormwater basins (Marie Avenue Project Area) to depths of 5' each to determine approximate sediment thickness and to collected samples for chemical analysis. Six (6) sediment samples would be tested for extended PAH's, arsenic and copper per Minnesota Pollution Control Agency (MPCA) Stormwater Best Management Practice

Guidelines. The sediment test results will be submitted to TKDA under a separate report.

6. Backfill the borings per Minnesota Department of Health (MDH) guidelines. The borings conducted within bituminous pavement areas were surfaced with bituminous cold patch matching the thickness of the existing surface pavement profile.
7. Visually classify the extracted soil samples and perform laboratory testing including moisture content and gradation analysis as needed to aid in soil classification and to determine engineering properties.
8. Prepare a geotechnical report for the project areas providing the following information:
   a. Logs of the soil test borings showing the existing pavement profile where applicable, soil and groundwater data, including the N-Values.
   b. Summary tables listing pavement and base course thickness with estimated R-Values.
   c. Site plans showing the approximate boring and core locations.
   d. Written description of encountered soil and groundwater conditions.
   e. Results of laboratory testing performed.
   f. Recommendations for pavement reclamation and design and construction of retaining walls and below grade structures.

The scope of our work is intended for geotechnical purposes only. This scope is not intended to explore for the presence or extent of environmental contamination within the various pavement areas explored.

2.0 SITE CONDITIONS

2.1 Surface Conditions Surrounding the Project Areas

Properties surrounding the project areas are largely residential. Single family residences occupy the majority of the properties that abut the project roadways.

The Marie Avenue project extends approximately 1.3 miles from Lexington Avenue to Dodd Street. Two stormwater retention basins are located within the project area; one located southeast of the intersection of Marie Avenue and Lexington Avenue and the other located northwest of the intersection of Marie Avenue and Sutton Lane. Topography surrounding Marie Avenue is somewhat variable, having a high elevation of 900' MSL at the western end of the project area, near Lexington Avenue, dropping to the east to a low elevation of 820' MSL near Trail Road.

The Wesley Neighborhood Project Area includes Spring Creek Circle, Mager Court, Wesley Lane from Dodd Road to South Lane, and Wesley Court. Single family homes occupied the properties surrounding the project roads. Topography surrounding the Wesley Neighborhood project area generally slopes to the northwest, from South Lane near elevation 930'MSL to Spring Creek Circle, near elevation 870'MSL.

Overhead utilities mainly electric services are present along some of the project roadways. During the utility clearance process through the Gopher-State-One-Call system, several below grade utilities were identified and marked on the pavement by utility locate contractors. These included water, gas, sanitary sewer, storm sewer, phone and cable.

2.2 Existing Pavement Conditions within the Project Areas

The existing pavement surface condition of the project area roads were generally in a poor to moderate state. The pavement condition along Marie Avenue was generally observed to be in a fair to moderate state of service. Numerous transverse and longitudinal cracks were noted. Many of these cracks were previously filled and patched. Due to the existing pavement thickness of Marie Avenue it appeared that several overlays had been previously performed on the roadway. Within the Wesley Neighborhood area, the pavement was generally observed to be in a poor state of service, having many areas showing extensive transverse and longitudinal cracks and numerous overlays and patched areas. At a number of locations the pavement surface was deteriorated having some dislodgement and "pot-holes".

Many of the roadways showed previous significant areas of repair including overlay and patch work and sealing of large cracks. However, at this point in time and given the age and state of the road surfaces we believe that further seal and patch programs will have limited value and would likely not significantly extend the service life of the roads.

In our opinion, some of the observed pavement distress may have occurred due to seasonal frost heaving, particularly from recent severe winter seasons. The presence of frost susceptible soils with the available moisture in the upper reaches of subgrade could induce noticeable frost heaving. This was particularly evident along Wesley lane. Severe distress to pavement generally occurs in the spring season, just after the subgrade thaws but still retains moisture.

Surface water can infiltrate through cracks in the pavement especially during the fall, which upon freezing will significantly increase the frost movement of the upper layers due to the lack of good drainage. Likewise, freeze thaw cycles during the fall, winter, and spring exacerbate the situation and increase movement as well as instability in the pavement structure.

3.0 FIELD INVESTIGATION PROGRAM

3.1 Field Investigation Description

A total of twenty-nine (29) SPT borings and six (6) hand auger borings were performed within the project areas as listed in the following tables. The approximate locations of the SPT borings and hand augers borings are shown on the attached Boring Location Plans. The SPT and hand auger boring logs are attached to this report. Please see below tables for a summary of our field investigation.

Marie Avenue

Project Description	No. of Borings	Boring/Hand Auger Reference No.	Planned Drilling Depth (ft.)	Actual Drilling Depth (ft.)
Pavement Reclamation (1)	13	B1 – B6, B8 - B14	5	6
Retaining Walls	1	B7	5	6
Pedestrian Underpass	2	B15, B16	30	31 to 33
Water Main Replacement	3	B18 - B20	10	8 to10
Trail Reclamation (Lexington Ave.)	1	B17	10	10
Stormwater Ponds (2)	6 (3 per Pond)	HA1 - HA6	<5	1½-3½

(1) Marie Avenue

Wesley Neighborhood

Project Description	No. of Borings	Boring Reference No.	Planned Drilling Depth (ft.)	Actual Drilling Depth (ft.)
Pavement Reclamation (1)	7	B21 – B-27	5	6
Storm Sewer Extension (Dodd Road)	2	B28, B29	10	10

(1) Spring Creek Circle, Mager Court, Wesley Court, Wesley Lane, and South Lane

Through conversations between TKDA and Element boring locations were determined. The boring locations were marked in the field by Element based upon a project sketch prepared by Element and approved by TKDA. At the SPT boring locations the ground surface elevations were to be measured by TKDA during the project survey and provided at a later date.

The SPT borings were drilled at the project areas between August 27 and August 30, 2018. The hand auger borings were drilled on September 5, 2018.

Standard Penetration Test (SPT) borings were drilled using a truck mounted rotary drill rig using split-barrel sampling procedures. Water level observations were made in the boreholes during and upon completion of the drilling and sampling operations. During the field

operations, the drill crew maintained logs of the subsurface conditions including changes in stratigraphy and the observed groundwater levels. The SPT boring logs are attached.

After completion of the drilling operations the boreholes were backfilled with auger cuttings to the existing surface in general conformance with MDH requirements. The pavement boreholes were then capped at the surface with bituminous cold patch matching the profile of the existing pavement. The boreholes which extended deeper than 15' (B15 and B16) were backfilled using a cement/bentonite grout mixture per the MDH guidelines.

The hand auger borings (HA1 though HA6) were drilled in the stormwater water basins at the approximately locations shown on the attached Marie Avenue Boring Location Plan. The hand augers borings were manually drilled by an Element technician using a solid stem hand auger device. The hand augers were drilled to depths ranging from approximately 1½' to 3½'. Sediment samples were recovered from the auger holes at depths ranging from approximately 1' to 1½' and taken to an MPCA approved testing laboratory (Legend Technical Services, Inc.) for chemical testing including extended PAH, copper and arsenic.

Sampling and classification of soils were performed in general accordance with American Standards for Testing and Materials (ASTM) procedures, and are described on an attached sheet.

3.2 Subsurface Conditions

The subsurface conditions encountered at the test boring locations are shown on the attached boring logs. The boring logs also indicate the possible geologic origin of the materials encountered. We wish to point out that the subsurface conditions at other times and locations on the site may differ from those found at our test locations. If different conditions are encountered during construction, it is necessary that you contact us so that our recommendations can be reviewed.

Based on normal human sensing, product odors were not detected within the soil samples collected at the site. This does not eliminate the possibility that petroleum based products may be present in the future or at other locations within the reconstruction project area away from our boring locations. Environmental screening and laboratory tests were not included in our work scope for this project. If environmentally impacted soils are encountered during construction we recommend additional testing be performed and the soils are properly handled and if needed disposed of.

3.2.1 General Soil Stratigraphy - Marie Avenue

Soil borings B1 through B20 were performed in the Marie Avenue project area. The borings were drilled to depths ranging from approximately 6' to 33'. With the exception of boring B17, all the borings were drilled within the roadway of Marie Avenue. Boring B17 was drilled in the existing bituminous trail adjacent to Lexington Avenue. The approximate locations of the borings are shown on the attached Marie Avenue Boring Location Plan.

The bituminous pavement was measured to be approximately 9" to 12" thick at the borings drilled within Marie Avenue roadway. At boring B17 the bituminous pavement was measured to be approximately 5" thick. Underlying the bituminous pavement was approximately 6" to 14" of silty sand and gravel aggregate base. At boring B14 the aggregate base layer was not detected during drilling, rather a mixture of silty sand and sandy lean clay with various amounts of gravel was noted below the bituminous pavement. At boring B17, approximately 3" of crushed limestone aggregate base was detected below the pavement section. The attached Table 1 presents the bituminous and aggregate base thickness measured at each boring location.

With the exception at borings B15 and B16, fill soils were generally encountered beneath pavement and aggregate base sections to depths ranging from approximately 2' to 8' or to the borings termination depth. The fill soils generally consisted of a mixture of sand, silty sand, sandy lean clay and clayey sand with varying amounts of gravel and cobbles. At borings B15 and B16, fill soil was present to depths of approximately 29½' and 24', respectively. Beneath

the fill soils at borings B15 and B16 a 1' to 1½' thick buried topsoil layer consisting of Organic Silty Sand (SM-OL) was encountered to depths of approximately 31' and 25', respectively. Generally beneath the fill and the buried topsoil layers was coarse alluvium consisting of Sand (SP), Sand with Silt (SP-SM) and Silty Sand (SM) with varying amounts of gravel and cobbles. The relative density of the sand deposits based upon the blow counts (N-values) ranged from very loose to medium dense. It should be noted the natural occurring sand deposits were not encountered in the shallow borings where fill extended to the maximum depth explored.

3.2.2 General Soil Stratigraphy – Wesley Neighborhood

Soil borings B21 through B29 were performed in the Wesley Neighborhood project area. The borings were drilled to depths ranging from approximately 6' to 10'. The approximate locations of the borings are shown on the attached Wesley Neighborhood Boring Location Plan.

With the exception of borings B28 and B29, the borings were drilled within the existing bituminous roadways. Borings B28 and B29 were drilled off the shoulder of Dodd Road. At borings B21 through B27 the existing bituminous pavement was measured to be approximately 3" thick. Underlying the pavement was generally 5" to 8" of crushed limestone aggregate base. The attached Table 1 presents the bituminous and aggregate base thickness measured at each boring location. At borings B28 and B29, drilled beyond the pavement sections, the ground surface was mantled by approximately 1' to 2' of topsoil consisting of Organic Silty Sand (SM-OL).

Generally beneath the pavement sections was fill soil consisting of a mixture of silty sand, sand with silt, and sandy lean clay with varying amounts of gravel and cobbles. At borings B28 and B29 beneath the fill soil and extending to the maximum depth explored (10') was coarse alluvium consisting of Sand with Silt (SP-SM) and Sand (SP) with various amounts of gravel. The relative density of the sand deposits based upon blow counts (N-values) was generally medium dense. A relatively thin stratum of Sandy Lean Clay (CL) was encountered in boring B29 from approximately 8' to 9'.

3.2.3 Stormwater Sedimentation Ponds

Six (6) hand auger borings (HA1 – HA6) were put down in two stormwater basins at the approximate locations shown on the attached Marie Avenue Boring Location Plan. The hand auger borings were extended to depths ranging from approximately 1½' to 3½'. The soils encountered in the hand auger borings generally consisted of approximately 1' to 3' of Organic Sandy Silt (SM-OL) underlain by Sandy Lean Clay (CL) encountered in the deeper borings (HA4 and HA6).

As noted in Section 3.1, six (6) sediment samples were collected from the stormwater basins and tested for extended PAH, copper and arsenic as listed in MPCA Stormwater Sediment Best Management Practices Guidance, Appendix A. The sediment test results will be submitted to TKDA under a separate report.

3.3 Water Level Observations

Water level observations were made during and after completion of the boring drilling operations. Groundwater was observed in borings B16, B19, and B22 at approximately depths of 29½', 8½', and 6', respectively. Perched groundwater was encountered in boring B15 at a depth of 15½'.

It should be noted that clayey and silty soils encountered in some of the borings are relatively impervious or slow draining, it may take several days for groundwater in a borehole to rise to its hydrostatic level. If more accurate water level determinations are required, piezometers should be installed and the water level monitored over a period of time.

In general, water levels may fluctuate throughout the year depending on variations in the amount of precipitation, degree of evaporation, surface run-off characteristics and other related hydrogeological factors.

4.0 LABORATORY REVIEW AND TESTING

The soil samples obtained during the drilling operations were logged, labeled, sealed and delivered to our laboratory for further review. An Element geotechnical engineer classified the soil samples in general conformance with ASTM standards. Representative soils samples were submitted to the laboratory for moisture content and gradation testing and the results are attached or shown on the boring logs.

A total of thirteen (13) soil samples were tested for moisture content and gradation analysis. Of these, eight (8) samples were collected from the pavement base aggregates and tested which to compare gradation to Mn/DOT 3138 Class 5 Specifications. The test results show these samples do not conform to the Class 5 gradation specifications mostly due to higher fine (p200) content and lack of aggregate. The sample gradation test reports compared to Mn/DOT Class 5 gradation specifications are attached to this report.

5.0 REVIEW AND RECOMMENDATIONS

Based on the information obtained from our geotechnical work and our understanding or assumptions of the project data, we made our engineering review which resulted in recommendations which are presented in the following sections. If any of our understanding or assumptions are not correct, or if conditions observed during construction are significantly different than those encountered in our geotechnical work, we should be contacted immediately so we may review our recommendations.

5.1 Project Description

Although we were not provided details of the project designs, we understand the project description includes the following:

- Full depth pavement reclamation for Marie Avenue, Spring Creek Court, Mager Court, Wesley Court, and Wesley Lane.

- 9-ton pavement section design standard for Marie Avenue and 7-ton pavement section design standard for Wesley Neighborhood project areas.
- Approximately 30% curb replacement within designated roadways.
- Water main replacement along Marie Avenue from Sutton Lane to Dodd Road.
- New pedestrian bridge underpass near Valley Park.
- Trail rehabilitation along Lexington Avenue and Marie Avenue.
- Retaining wall replacement along Marie Avenue near Victoria Road.
- Storm sewer extension along Todd Road, south of Wesley Lane.

Our following pavement recommendations are based on a 20-year pavement design life with associated routine maintenance being performed as applicable to the types of pavements being constructed. Although not specified, we have assumed the new water main and storm sewer extensions would be constructed below frost grade using conventional cut and fill construction methods. We have assumed the new pedestrian underpass below Marie Avenue would be constructed using RCP or concrete box culvert segments installed below the roadway using conventional cut and fill methods. Traffic and overburden loads were not specified to us at the time of this report. We understand the existing retaining walls will be replaced along Marie Avenue near Victoria Road. We have assumed the road profile will not change in the vicinity of the existing retaining walls as such, the retaining walls will be similar in height and extend to the existing wall lengths.

5.2 Pavement Subgrade Preparation

We understand the project road surfaces will undergo a reclamation process, which will include removal of the existing bituminous pavement and portions of underlying aggregate base (Marie Avenue) and all of the aggregate base within the Wesley Neighborhood. Due to the relatively thin existing bituminous and aggregate base sections encountered within the Wesley Neighborhood we anticipate that additional subcuts will be required to place the new pavement section at those locations. The aggregate base should be removed and stockpiled, exposing the roadway subgrade in these areas. We have assumed the reconstructed road profiles will

remain similar to current conditions with slight changes to correct for proper road grade alignment.

Based upon the laboratory testing, the existing pavement base course material generally does not meet Mn/DOT 3138 Class 5 Reclaimed base specifications due to high fine (p200) content and lack of aggregate observed within the tested samples. However, gradation modification could be performed by adding more coarse aggregate to develop a good base material. A base mix testing program at the time of construction would need to be conducted to determine the appropriate amount of additional aggregate in order to attain the base specification. For preliminary planning purposes only, based on the gradations performed approximately 15% to 20% additional aggregate (+#4 material) would be needed. However, this may vary considerably and should be determined in the field at the time of construction.

Additional aggregate base meeting Mn/DOT Class 5 Specification 3138 may also be required in street areas where reclaimed bituminous and underlying aggregate base thicknesses are insufficient to allow for the proposed new aggregate base section. Based on the soil borings from the Wesley Neighborhood additional aggregate most likely will be required for these street locations. Additional aggregate may also need to be added and blended to the reclaimed material to meet current gradation specifications. Larger bituminous pieces of the reclaimed material, if encountered, should be removed or screened from the roadway base material prior to paving operations. Samples of reclaimed base aggregate should be collected during construction and tested to verify design and project requirements have been achieved.

After removal of the existing pavement and underlying base material we recommend conducting a proofroll test on the exposed subgrade surface prior to fill placement to detect any unstable zones that may require further subcutting. The proofroll should be performed with a heavy, rubber tired vehicle traveling at walking speed over the subgrade. If excessive yielding or rutting is noticed, additional soil corrections below subgrade should be performed. Any organic and soft/loose soils where encountered within the upper 3' of existing road grade should also be excavated.

We recommend where additional fill is required within the upper 3' of subgrade to establish the pavement subgrade elevation be granular soils meeting Mn/DOT Specification 3149.2B Select Granular Borrow having no greater than 12% fines passing the #200 sieve and preferably no greater than 50% passing the #40 sieve and compacted to 100% Standard Proctor maximum dry density (ASTM D: 698). The moisture content of the compacted fill should be within 2% of the optimum as determined by the Standard Proctor tests.

The subgrade surface, as well as the pavement surface, should be uniformly sloped to facilitate drainage of the base and granular subgrade material within the pavement system, and to avoid any ponding of water beneath the pavement.

Based upon the geotechnical investigation the existing soils within the upper 3' of the pavement subgrade predominately are fill soils consisting of a mixture of silty sand, clayey sand, sand, and sandy lean clay with various amounts of gravel and cobbles. The fill generally was observed to be in loose to medium dense state. Considering the variability of the fill soil composition and density present in the upper 3' of the pavement subgrade, we recommend an R-value of 35 be used for Wesley Neighborhood and an R-value of 45 be used for Marie Avenue for the pavement design. Higher R-Values may be obtained by performing soil replacement of subgrade soil with improved and less frost susceptible soil. An R-Value of 70 can be attained by performing a soil correction with removal of the existing upper 3' subgrade soil and replacing with a clean sand meeting Mn/DOT "Select Granular Borrow" Specification 3149.2b.

Proper draintile systems would need to be incorporated into the design where more granular fill was placed/encountered at the surface underlain by relatively impervious soil types. The draintile should be placed at the bottom of the sand section, encapsulated with pea-gravel surrounded by geotextile fabric and properly connected to the storm sewer system and/or suitable outfalls. Any contaminated soils encountered during construction should be properly tested and disposed of under standard construction practices per the Minnesota Department of Health (MDH) and Minnesota Pollution Control Agency (MPCA) guidelines.

A regular, conscientious maintenance program should be performed on all pavements. It is possible that seal coating may somewhat extend the pavement life somewhat. We caution that reduced minimum pavement thicknesses and lack of pavement maintenance may result in a reduced service life and increased maintenance.

We understand that approximately 70% of the existing curbs will remain in-place. Care should be provided by the contractor as to not to damage and/or undermine the curbs. We would recommend leaving the existing aggregate base and/or reclaimed material in-place at the curb line extending out a distance of approximately 10" to 12" from the curb edge in an effort to minimize undermining the curb. Then once the contractor completes the subcuts and reclaimed material placement in the middle portion of the street then they could subcut as needed at the curb lines to place the new pavement section. They could do this as they go so they do not undermine the curb line.

5.3 Pavement Thickness Design

Assuming the pavement subgrade preparation is performed as recommended in the preceding section and the subgrade soils are judged suitable based on a proof-roll test, we recommend the following pavement design be used:

Pavement Section Profile	Street Section Thickness 7-ton (Wesley Neighborhood)	Street Section Thickness 9-ton (Marie Avenue)	Bituminous Trail
Mn/DOT Spec. 2360 Type SP9.5 Bituminous Wear Course	2"	2"	3"
Mn/DOT Spec. 2360 Type SP12.5 Bituminous Non-wear Binder Course	--	2"	--
Mn/DOT Spec. 2360 Type SP12.5 Bituminous Non-wear Base Course	2"	2"	--
Mn/DOT Spec. 3138 Reclaimed Aggregate Base Meeting Class 5 Specifications	10"	12"	6"
Approved Subgrade(1)	Yes	Yes	Yes

(1) **If granular soil meeting MnDOT Specification 3149.2B is present the need for additional excavation and replacement is not required.** Based on the soil borings additional excavations to remove and replace weaker clayey subgrade soils would most likely be required at boring locations B14, B15, B17, B18, B23, B26, B28, and B29. We recommend an additional 12" subcut for the Wesley Neighborhood and 18" subcut for Marie Avenue where applicable. The excavated soil should be replaced with select granular sand meeting MnDOT Specification 3149.2B. Alternatives to the subcut may be to increase the reclaimed aggregate base section at these locations by 6" and/or place geotextile separating fabric beneath the reclaimed aggregate base section. The subgrade needs to meet minimum requirements as detailed by MnDOT Specifications 2111 Test Rolling and 2112 Subgrade Preparation.

The above recommended street section thicknesses are based on a minimum 20 year pavement life, site soil conditions and assumed traffic loads. For superior pavement performance we recommend placing geotextile separating fabric beneath the aggregate base section to provide additional support during freeze thaw cycles occurring typically in the fall and in spring of the year. The fabric aids in maintaining the integrity of the aggregate base section that supports the pavement. The geotextile fabric should meet Mn/DOT Specification 3733 Type V and should be placed beneath the aggregate base and lapped a minimum of 2' at all splices or sewn per Mn/DOT requirements. Construction traffic other than foot traffic should not be allowed over the fabric as to not damage the fabric during construction. Aggregate base should be placed and compacted in such a manner as to also not damage the fabric.

Transition zone tapers should be constructed where reconstructed pavement connects to existing construction and where pavement section thicknesses vary to minimize differential movement between different pavement sections. The transition tapers should begin at the bottom of the lowest section and transition to the higher section at a grade of 20 horizontal to 1 vertical (20:1). Depending on the actual site conditions at the time of construction the transition zones may need to be adjusted to properly support the new pavement.

By reducing the sand section somewhat it is more likely that during periods of freezing and thawing that expansion and contraction of the subgrade soils may occur in a manner that may affect overall pavement performance. The City should be made aware that additional maintenance may likely be needed to sustain the pavement life with this option.

The pavement design section specifications listed above assumes the reclaimed aggregate base will be compacted to a minimum of 100% of the Standard Proctor density and the bituminous pavement placed and compacted to a minimum of 92% of the maximum specific gravity. The pavement design also assumes that a regular, conscientious maintenance program is performed. It is possible that seal coating may extend the pavement life somewhat. We caution that reduced pavement section thicknesses may result in a reduced service life and increased maintenance. Alternative pavement designs are available upon request depending on the City needs and budget.

5.4 Utility Installation

Utility plans were not available at the time of this report. Based upon our understand of the project, a storm sewer extension is planned along Dodd Road (Wesley Neighborhood) and a new water main is planned along Marie Avenue from Sutton Lane to Dodd Road. We assume the new services would be installed within the upper 10' of the soil subgrade. The soils encountered within this zone during the drilling program were predominately fill underlain by coarse alluvium sand deposits. The natural occurring sand deposits were generally observed to be in a medium dense state.

If very loose or soft soils are encountered at the pipe invert elevations, these soils may not be suitable for pipe support. Any organic materials found during construction should also be removed. We recommend very loose or soft natural soil be over excavated by a minimum of 1' and replaced with a suitable foundation or bedding for pipe support. Additional aggregate bedding material may be required if very soft wet conditions are encountered at the time of construction at the bottom of pipes/manholes, etc. Manholes or utility structures may require a minimum of 2' to 3' of aggregate bedding materials.

The foundation of utilities should be of coarse granular material or pea gravel and/or approved aggregate equivalent. The granular or aggregate materials may be separated from the subgrade by geotextile fabric, especially in loose/wet conditions. We recommend at a

minimum that the exposed soils in the utility trenches be recompacted prior to new utility placement unless groundwater is present.

After the foundation bedding and pipe placement, fill should be placed to attain final grades. Where pavement may be placed, the fill should be compacted to at least 95% of the Standard Proctor density (ASTM D: 698). Fill placed in the top 3 feet of subgrade for pavement areas should be compacted to at least 100% of the Standard Proctor density. In addition, the moisture content of the fill should be within +/-3% of the optimum as determined by the Standard Proctor test. Backfilling operations should be performed uniformly around structures as to not to damage them during construction. We recommend the fill soils consist of clean sand having less than 12% passing the #200 sieve and less than 50% passing the #40 sieve. Clayey and silty soils should not be used for as engineered fill due to their high moisture content resulting in poor compaction during backfilling operations. On-site existing sandy fill soils may be suitable for utility backfill provided good compaction can be attained as described above. Reworking, scarifying, drying of these soils may be required to obtain proper soil compaction.

Proper shoring or sloping of the excavation for utility placements per OSHA guidelines should be provided for at all times. Care should be provided by the contractor as to not to damage surrounding structures/properties and/or pavements.

If exposed soils supporting the utilities are disturbed or become saturated they may no longer be able to support the utility. Care should be provided by the contractor as to not to disturb supporting soils otherwise additional corrective measures may be necessary.

5.5 Retaining Wall Foundation Preparation

We understand new retaining walls would be constructed along Marie Avenue near the intersection of Victoria Road. We were not provided design information at this time of this report and it is our understanding that the retaining walls will be designed by others. We have assumed for the purposes of our review the retaining wall structures would be of similar height

to the existing walls and constructed of modular pre-cast concrete blocks. Typical of such low to moderate height retaining wall structures, we have assumed a subgrade bearing pressure of 2,000 pounds per square foot (psf).

We recommend the foundation for the retaining walls be constructed at least 48" below adjacent grades to limit frost heave of the foundation during winter months. Based upon a nearby boring (B7) soils at the assumed wall foundation depth will consist of loosely compacted sand. The foundation subgrade should be inspected by a qualified geotechnical engineer to determine suitability of the foundation soils. If unsuitable soils are detected at the subgrade, subcutting should performed to establish a competent subgrade condition. Fill should then be placed and compacted to re-establish the foundation subgrade elevation, if required. We recommend the foundation subgrade be compacted to 100% of the Standard Proctor maximum dry density (ASTM D 698) having an in-place moisture content +/-3% of optimum. We further recommend that a minimum of 6" of aggregate base be placed and compacted beneath the wall system. The aggregate base should be compacted to 100% of the Standard Proctor maximum dry density (ASTM D 698). Following these procedures a subgrade allowable bearing capacity of 2,000 psf can be used for the retaining wall construction.

We recommend appropriate drainage aggregates and geotextiles are placed behind the wall to aid in supporting the wall system. Draintile should also be installed behind the wall and connected to the storm sewer system or day-lighted to appropriate outfalls. We should be contacted to provide additional recommendations as needed once more final plans become available.

5.6 Below Grade/Tunnel Walls and Lateral Earth Pressure

Backfill placed against the below-grade pedestrian underpass tunnel walls will exert lateral loads against these walls. The lateral loads could be minimized if free-draining granular soils are used as backfill immediately against the walls. This would include sand classified as SP or SP-SM, containing no more than 12% material passing the #200 sieve, and preferably no more

than 50% passing the #40 sieve. The granular backfill should extend at least two feet laterally from the bottom of the foundation walls and extend outward at a 45-degree angle from the horizontal to the ground surface. In areas that will support structures such as sidewalks or slabs, the exterior fill should be compacted to 95% of Standard Proctor density. Backfill under paved areas supporting vehicle traffic should be compacted to 100% of the Standard Proctor in the upper three feet.

Using the free-draining backfill, it is our opinion the sands may transmit a lateral pressure to the foundation wall equivalent to that of a fluid having a density of 40 pounds per cubic foot (pcf) and 55 pcf in the active and at-rest pressure conditions, respectively. Usage of clay backfill, is not recommended, however when utilized the soils may result in lateral earth pressures of 80 pcf or more, in the at-rest condition.

In addition to the soil pressure, water entering behind the walls may exert more pressures. Therefore, we recommend exterior drain tile be installed at tunnel wall invert where applicable. The drain tile system should be installed below floor of the tunnel on the outside of the wall and should be surrounded by at least six inches of washed, coarse aggregate material which is enveloped in a geotextile fabric. The drain tile should be connected to a suitable outfall or sump where water can be discharged from the system. We recommend the tunnel wall include appropriate water-proofing to minimize water accumulation onto the tunnel floor. In addition, the tunnel floor should be properly sloped to allow seepage water to drain from the tunnel interior to the exterior.

5.7 General Soil Design Parameters – Retaining Structures/Below Grade and Tunnel Walls - Drained Conditions

To aid the design team we have estimated earth pressure coefficients for active, at-rest and passive conditions for the anticipated soil types that may be encountered and/or imported to the site in the following table:

Soil Type	N-value	Unit Wet Weight (pcf)	Active Earth Pressure Coefficient (K_a)	At-Rest Earth Pressure Coefficient (K_o)	Passive Earth Pressure Coefficient (K_p)	Coefficient of Sliding Friction
Sand (SP) to Sand with Silt (SP-SM)	4-14	115	0.31	0.47	3.2	0.45
	14+	120	0.27	0.43	3.7	0.45
Silty Sand (SM)	< 10	120	0.38	0.55	2.7	0.35
	10-25	125	0.35	0.52	2.9	0.40
	> 25	125	0.31	0.47	3.2	0.40

The values in the preceding table do not include a factor of safety. The design engineer should also determine the appropriate surcharge if applicable to use in the design depending on the type of structure and what it is retaining. Again, we recommend performing the soil correction as outlined above and utilizing clean granular sandy soils and/or approved aggregate equivalents within these areas of construction. These values were provided for informational purposes to aid the design team.

We recommend that the soils exposed at the bottom of below grade structures and retaining walls and the supportive fill behind/below the walls be observed and tested by the project soil engineer or their representatives to verify soil bearing capacity, soil types, and soil density for the intended wall design. This includes that the appropriate aggregate drainage layers, draintile, weeps, and geotextile reinforcement behind the walls, if applicable. It should be noted that If limited rotation/movement of the walls cannot be tolerated, then we recommend the design be based on the at-rest earth pressure conditions.

The construction documents should state what soils should be used for the backfill of walls or what soil type was assumed in the retaining/retention wall design. If wall backfill is planned we recommend using clean sand or approved aggregate equivalent. The retaining/retention walls should also be designed to withstand lateral loads that surrounding construction/groundwater may impose on them. We should be contacted if retaining/retention walls are planned so as to provide additional recommendations as needed.

5.8 Groundwater Control

As stated in Section 3.3, groundwater was observed in borings B16, B19, and B22 at depths ranging from approximately 6' to 29½' during or after drilling operations. We don't expect groundwater to significantly affect the planned construction. We should note however, perched ground water was encountered in boring B15 during drilling. Given the nature of the fill soils encountered within the project areas, being predominately a mixture of silty sands, clayey sands and sands, other undetected zones of perched groundwater could be present. The contractor should be aware of these conditions and have available potable pumps to manage groundwater seepage into open excavations, if needed. The City should consider placing all new services above the high groundwater.

If the utility subgrade becomes disturbed and soft due to groundwater inflow, the soft soil should be over excavated and replaced with aggregate material or other suitable stone product and tamped into the subbase to establish a firm subgrade.

6.0 CONSTRUCTION CONSIDERATIONS

6.1 Excavation Safety

All excavations should comply with the requirements of O.S.H.A. 29 CFR, Part 1926, Subpart P, "Excavation and Trenches". This document states that excavation safety is the responsibility of the contractor. Reference to these O.S.H.A. requirements should be included in the project specifications.

6.2 Quality Control Testing

We recommend that all geotechnical related work, including subgrade preparation, and engineered fill placement, be observed by the project geotechnical engineer or their representatives. The geotechnical engineer will perform appropriate testing to verify the geotechnical conditions that have been anticipated during preparation of this report.

As variations in soil conditions may exist at locations and elevations other than those of our borings, we recommend the geotechnical engineer be retained to observe the soil conditions during site preparation. We recommend in-place field density testing be performed in the compacted new fill as needed for this project.

6.3 Cold Weather Conditions

Construction during cold weather should be exercised with care. We have included a sheet entitled "Precautions for Excavating and Refilling During Cold Weather." Please refer to this Attached sheet for specific details.

6.4 Soil Sensitivity

The silty and clayey soils are susceptible to disturbance from construction traffic, especially in wet conditions. If the soils become disturbed, additional excavation may be required. Therefore, proper excavation equipment during construction should be used to minimize the potential for disturbance.

7.0 REMARKS

This report is for the exclusive use of the parties to which it is addressed. The soil testing and geotechnical engineering services performed by Element Materials Technology St. Paul Inc. for this project have been conducted in a manner with the level of skill and care ordinarily exercised by other members of the profession currently practicing in this area under similar budgetary and time constraints. No warranty, express or implied, is made.

Attachments:

-Soil Boring/Hand Auger Location Plans (3 pages)
-Soil Boring Logs, B1 – B29 (29 pages)
-Hand Auger Boring Logs, HA1 – HA6 (6 pages)
-Pavement and Base Thickness – Table 1 (1 page)
-Soil Laboratory Test Results (13 pages)
-Symbols and Terminology on Test Boring Logs (1 page)
-Classification of Soils for Engineering Purposes (1 page)
-Field Exploration Procedures (1 page)
-Prerequisites for Sound Engineering Practice (1 page)
-Construction Observations and Testing (1 page)
-Cold Weather Precautions (1 page)

Boring Location Plan - Marie Avenue

Approximate Soil Boring Location (20)

Approximate Hand Auger Location (6)

Base Maps/Utility Drawings Provided by TKDA/City of Mendota Heights

N W E S

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Client: City of Mendota Heights c/o TKDA

Project No: ESPO29130P
Date: 9/21/2018

Boring Location Plan - Wesley Neighborhood

Approximate Soil Boring Location (9)

Base Maps/Utility Drawings Provided by TKDA/City of Mendota Heights

N
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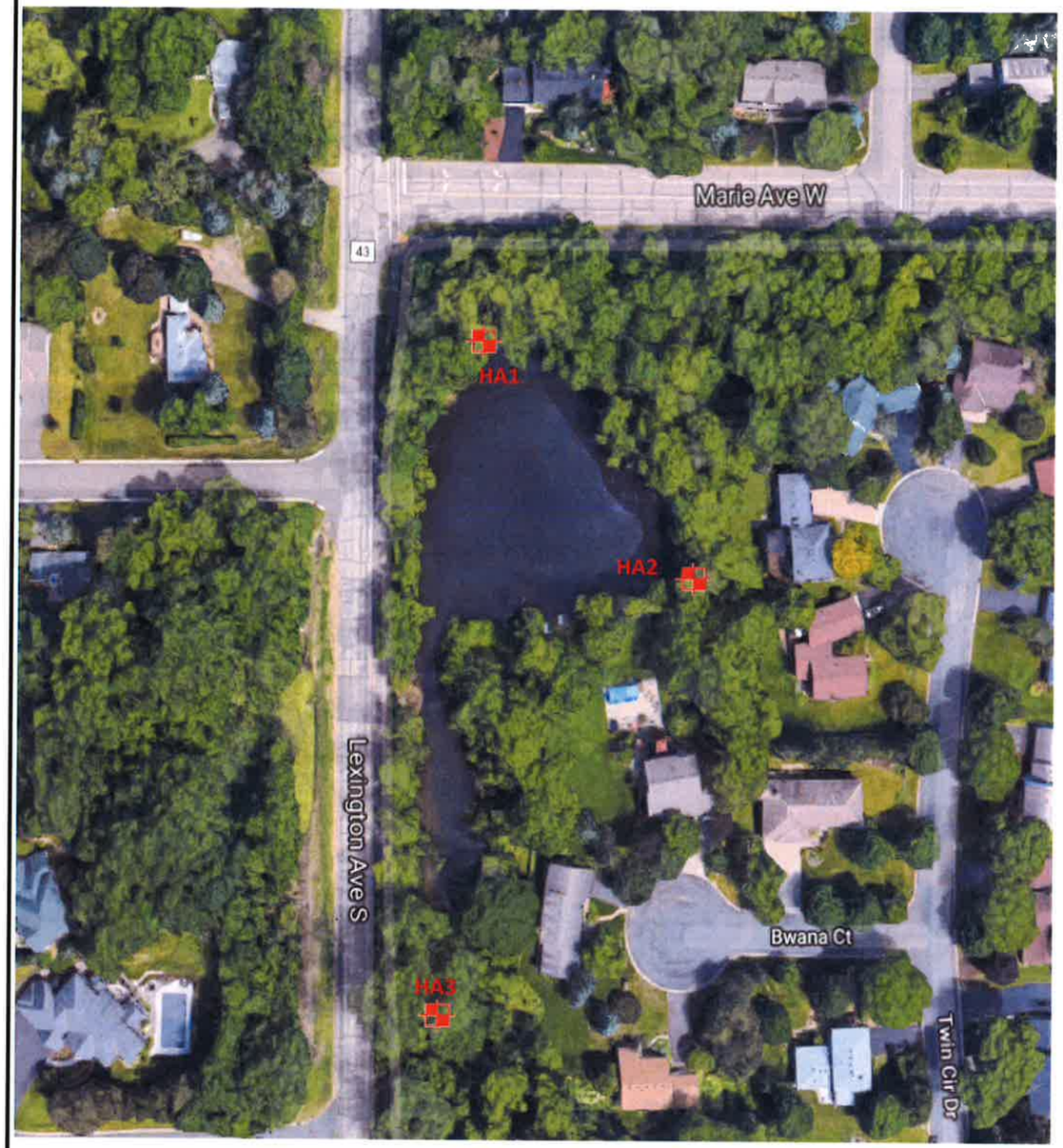
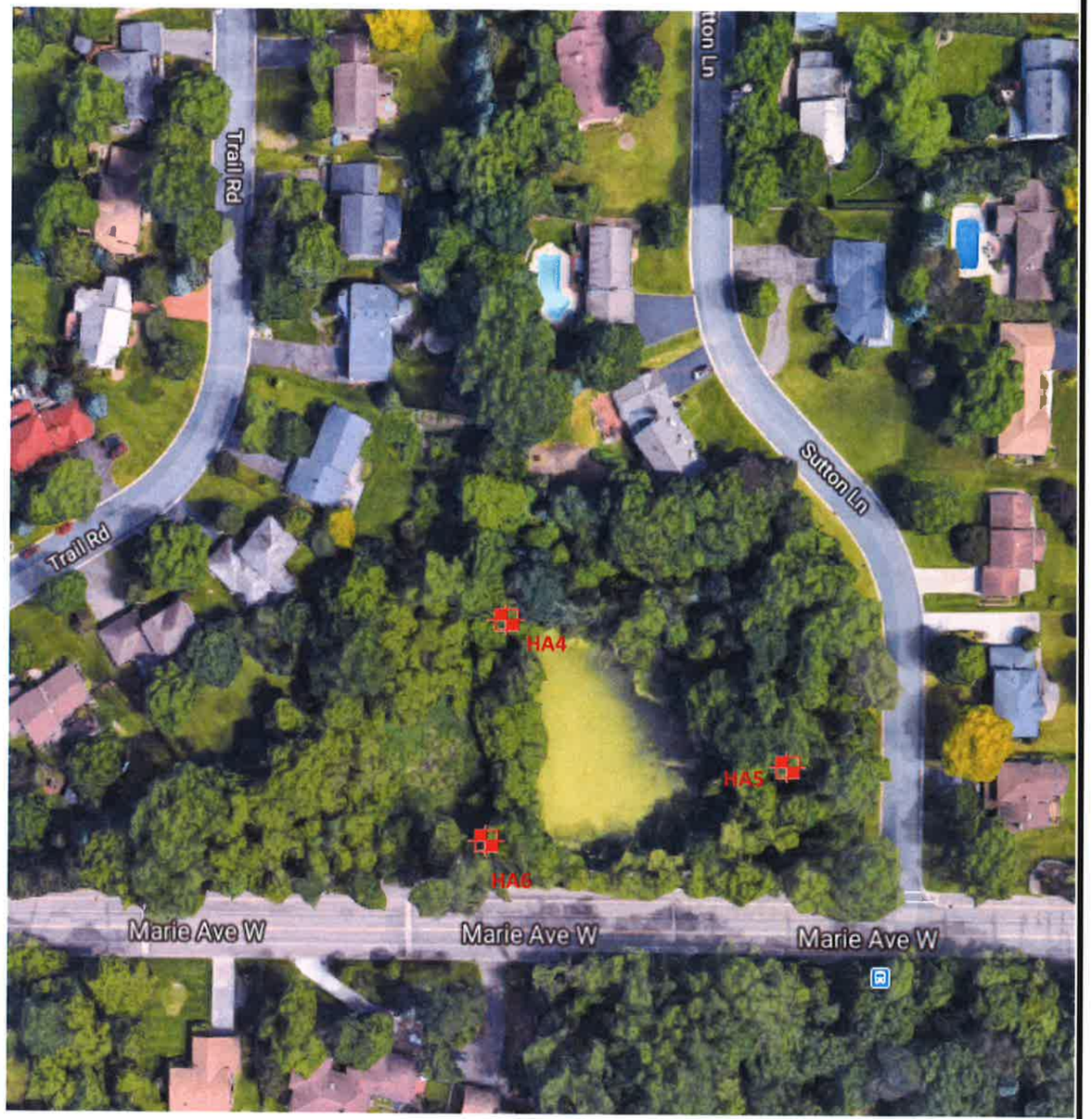
Date: 9/21/2018

Sediment Sample Location Plan





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Approximate Sediment Sample Location (6)

*Aerial Map provided by Google Earth Maps

**Map is not to Scale

N W E S

Project No. ESP029130P	LOG OF BORING NO. B1	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 10" of bituminous pavement underlain by 12" of silty sand, with a little gravel aggregate base at the surface underlain by silty sand and sand with silt, with a trace of gravel, mostly fine grained, dark brown, dry to moist (FILL)		FILL	AS	1	AUGER	24			p200=16.5%
			8	2	SS	24			
4.0 SAND, with a little gravel, fine to medium grained, brown, moist, very loose (SP)		COARSE ALLUVIUM	4	3	SS	24			
5									
6.0 End of Boring									

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B2	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
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SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
		FILL	AS	1	AUGER	24			p200=12.1%
FILL, 8" of bituminous pavement underlain by 10" of silty sand, with a trace of gravel base aggregate at the surface underlain by sand with silt with a little gravel, dark brown to brown, dry to moist (FILL)									
2.5			12	2	SS	24			
SAND, with a little gravel, fine to medium grained, brown, moist, medium dense to loose (SP)		COARSE ALLUVIUM							
			7	3	SS	24			
5									
6.0									
End of Boring									

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B3	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
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Surface Elev.: Datum: **MSL**

GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
	FILL, 10" bituminous pavement underlain by 12" of sand with silt, with a trace of gravel base aggregate at the surface underlain by sand with silt, with a little gravel, fine to medium grained, dark brown to brown, moist (FILL)		AS	1	AUGER	24			
			16	2	SS	24			
	4.0								
	SAND, with a little gravel, fine to medium grained, brown, moist, loose (SP)	COARSE ALLUVIUM	9	3	SS	24			
		5							
	6.0								
	End of Boring								

WATER LEVEL OBSERVATIONS	
WL	None

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CLIENT	ARCHITECT/ENGINEER
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SITE	**PROJECT**
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Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 11" of bituminous pavement underlain by 12" of sand and gravel base aggregate at the surface underlain by sand with silt, with a little gravel, fine to medium grained, dark brown to brown, moist (FILL)		FILL	AS	1	AUGER	24			
			14	2	SS	24			
4.0									
SAND, with a little gravel, fine to medium grained, brown, moist, loose (SP)		COARSE ALLUVIUM	7	3	SS	24			
5									
6.0									
End of Boring									

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B5	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
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Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 11" of bituminous pavement underlain by 12" of sand with silt, with a trace of gravel base aggregate at the surface underlain by sand with silt, with a little gravel, fine to medium grained, dark brown to brown, dry to moist (FILL)		FILL	AS	1	AUGER	24			
			21	2	SS	24	4		p200=10.1%
4.0 FILL, silty sand, with gravel and cobbles, fine to medium grained, brown, moist (FILL)			27*	3	SS	24			*N-value influenced by cobbles at 4'.
5									
6.0 End of Boring									

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B6	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
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SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
		FILL, 9" of bituminous pavement underlain by 13" of sand and gravel aggregate base at the surface underlain by a mixture of sand with silt and silty sand, with gravel, fine to medium grained, occasional cobbles, dark brown to brown, dry to moist (FILL)	AS	1	AUGER	24			
			17	2	SS	24			
5			25*	3	SS	24			* N-value influenced by cobbles.
6.0		End of Boring							

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B7	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 11" of bituminous pavement underlain by 13" of silty sand, with a little gravel aggregate base at the surface underlain by sand with silt, with a little gravel, fine to medium grained, dark brown to brown, dry to moist (FILL)		FILL	AS	1	AUGER	24			p200=17.6%
			12	2	SS	24			
4.0 SAND, with a little gravel, fine to medium grained, brown, moist, loose (SP)		COARSE ALLUVIUM	9	3	SS	24			
5									
6.0 End of Boring									

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B8	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
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SITE	**PROJECT**
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Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 12" of bituminous pavement underlain by 12" of sand and gravel aggregate base at the surface underlain by silty sand and sand with silt, with gravel, fine to medium grained, brown, dry to moist (FILL)		FILL	AS	1	AUGER	24			
			17	2	SS	24			
4.0									
SAND, with a little gravel, fine to medium grained, brown, moist, medium dense (SP)		COARSE ALLUVIUM	16	3	SS	24			
5									
6.0									
End of Boring									

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B9	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
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SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 11" of bituminous pavement underlain by 10" of sand and gravel base aggregate at the surface underlain by sand with a little gravel, fine to medium grained, dark brown to brown, moist (FILL)		FILL		AS	1	AUGER	24			
2.5				14	2	SS	24			
SAND, with a trace of gravel, mostly fine grained, brown, moist, medium dense to loose (SP)		COARSE ALLUVIUM		8	3	SS	24	3		p200=5.0%
			5							
6.0										
End of Boring										

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B10	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
			AS	1	AUGER	24			p200=19.5%
		FILL							
FILL, 11" of bituminous pavement underlain by 6" of silty sand, with a little gravel base aggregate at the surface underlain by sand, with a trace of gravel, mostly fine grained, dark brown to brown, moist (FILL)									
2.5			22	2	SS	24			
SAND, with a little gravel, fine to medium grained, brown, moist, medium dense to loose (SP)		COARSE ALLUVIUM							
			7	3	SS	24			
5									
6.0									
End of Boring									

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B11	Sheet 1 of 1

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Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
		FILL, 11" of bituminous pavement underlain by 13" of sand and gravel base aggregate at the surface, dark brown, moist (FILL)	AS	1	AUGER	24			
2.0		COARSE ALLUVIUM: SAND, with a little gravel, fine to medium grained, brown, moist, medium dense to loose (SP)	16	2	SS	24			
5			6	3	SS	24			
6.0		End of Boring							

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B12	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
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SITE	**PROJECT**
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Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 11" of bituminous pavement underlain by 13" of silty sand, with a little gravel base aggregate at the surface underlain by sand with silt, with a little gravel, fine to medium grained, dark brown, moist (FILL)		FILL	AS	1	AUGER	24			p200=21.9%
			30*	2	SS	24			*N-value influenced by cobbles. p200=5.4%
4.0 SAND WITH SILT, with gravel and cobbles, fine to medium grained, brown, moist, dense (SP-SM)		COARSE ALLUVIUM	42*	3	SS	24			*N-value influenced by cobbles.
5									
6.0 End of Boring									

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B13	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
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SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 10" of bituminous pavement underlain by 14" of sand and gravel base aggregate at the surface underlain by silty sand and sand with silt, with gravel, fine to medium grained, dark brown, moist (FILL)		FILL	AS	1	AUGER	24			
			30	2	SS	24			
4.0									
SAND, with a little gravel, mostly fine grained, brown, moist, medium dense (SP)		COARSE ALLUVIUM	29	3	SS	24			
5									
6.0									
End of Boring									

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B14	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
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SITE	**PROJECT**
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Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 11" of bituminous pavement at the surface underlain by a mixture of silty sand and sandy lean clay, with a little gravel, dark brown, moist (FILL)		FILL	AS	1	AUGER	24			No defined aggregate base layer encountered.
			21	2	SS	24			
4.0 SLIGHLY ORGANIC SANDY LEAN CLAY, with a little gravel, dark brown to gray mottled, occasional organic black lenses, moist (CL-OL)		TOPSOIL	8	3	SS	24			
5 6.0 End of Boring									

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B15	Sheet 1 of 2

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Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
		FILL	AS	1	AUGER	12			
			AS	2	AUGER	12			
			19	3	SS	24			
			18	4	SS	24			
5									
			14	5	SS	24			
10			15	6	SS	18			
			11	7	SS	18			
			7	8	SS	18			
15									
			12	9	SS	18			
20									

FILL, 12" of bituminous pavement underlain by 6" of sand and gravel base aggregate at the surface underlain by a mixture of sandy lean clay and clayey sand, with a little gravel, dark brown and gray mottled to gray, iron oxide staining present at 4', moist to wet, perched water at 15.5' (FILL)

▽

Continued Next Page

WATER LEVEL OBSERVATIONS	
WL	▽ 15.5

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DRILL CO.	Element	DRILL RIG	367
DRILLER	KK	ASS'T DRILLER	CA
LOGGED BY	CA	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. B15	Sheet 2 of 2

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

(continued)	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 12" of bituminous pavement underlain by 6" of sand and gravel base aggregate at the surface underlain by a mixture of sandy lean clay and clayey sand, with a little gravel, dark brown and gray mottled to gray, iron oxide staining present at 4', moist to wet, perched water at 15.5' (FILL) *(continued)*										
			25	24	10	SS	18			
29.5 ORGANIC SANDY SILT, black, wet (ML-OL)		TOPSOIL	30	8	11	SS	18			
31.0 (Buried topsoil) SANDY SILT, with a little gravel, fine to medium grained, a few rootlets, dark brown to dark gray, wet, loose (SM)		COARSE ALLUVIUM		9	12	SS	24			
33.0 End of Boring										

WATER LEVEL OBSERVATIONS	
WL	▽ 15.5

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LOGGED BY	CA	APPROVED	MAS

Project No. ESP029130P

LOG OF BORING NO. B16

Sheet 1 of 2

CLIENT: City of Mendota Heights

ARCHITECT/ENGINEER: TKDA

SITE: Mendota Heights, Minnesota

PROJECT: Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
		FILL	AS	1	AUGER	24			
			14	3	SS	24			
5			21	4	SS	24			
			14	5	SS	24			
10			9	6	SS	24			
12.0			8	7	SS	24			
15			11	8	SS	18			
20			20	9	SS	18			

FILL, 10" of bituminous pavement underlain by 6" of silty sand with gravel aggregate base at the surface underlain by sand with silt, with a little gravel, fine to medium grained, dark brown to brown, moist (FILL)

FILL, a mixture of clayey sand and sandy lean clay, with a little gravel, brown to gray, moist to wet, preched water at 12' (FILL)

Continued Next Page

WATER LEVEL OBSERVATIONS	
WL	▽ 29.5

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DRILLER	KK	ASS'T DRILLER	CA
LOGGED BY	CA	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. B16	Sheet 2 of 2

CLIENT: City of Mendota Heights

ARCHITECT/ENGINEER: TKDA

SITE: Mendota Heights, Minnesota

PROJECT: Marie Avenue and Wesley Street Rehabilitation

(continued)	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, a mixture of clayey sand and sandy lean clay, with a little gravel, brown to gray, moist to wet, preched water at 12' (FILL) *(continued)*										
24.0 ORGANIC SILTY SAND, with a little gravel, black, moist, few rootlets, (SM-OL)		TOPSOIL								
25.0 (Buried Topsoil) SANDY SILT, with a little gravel, fine to medium grained, brown, wet, medium dense (SM)		COARSE ALLUVIUM	25	16	10	SS	18			
▽			30	18	11	SS	18			
31.0 End of Boring										

WATER LEVEL OBSERVATIONS	
WL	▽ 29.5

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ELEMENT LOG ESP029130P - CITY OF MENDOTA HEIGHTS.GPJ LOG A GNNN08.GDT 10/3/18

Project No. ESP029130P	LOG OF BORING NO. B17	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 5" of bituminous pavement underlain by 3" of crushed limestone aggregate base at the surface underlain by a mixture of silty sand and sandy lean clay, brown, moist (FILL)		FILL	AS	1	AUGER	24			
			5	2	SS	24			
			7	3	SS	24			
5									
6.0 SLIGHLY ORGANIC LEAN CLAY, with a little sand, black, moist, very soft (CL-OL)		TOPSOIL	4	4	SS	24			
8.0 (Buried Topsoil) SILTY SAND, with a little gravel, fine to medium grained, gray, wet, very loose (SM)		COARSE ALLUVIUM	4	5	SS	24			
10.0 End of boring									
10									

WATER LEVEL OBSERVATIONS	
WL	None

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STARTED	8/30/18	FINISHED	8/30/18
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DRILLER	KK	ASS'T DRILLER	CA
LOGGED BY	CA	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. B18	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
		FILL, 10" of bituminous pavement underlain by 1" of sand and gravel base aggregate at the surface underlain by a mixture of sandy lean clay and clayey sand, with a little gravel, brown, moist (FILL)	AS	1	AUGER	24			
			18	2	SS	24			
			9	3	SS	24			
5									
6.0		FILL							
		SAND WITH SILT, with a little gravel, fine to medium grained, brown, moist, loose to medium dense (SP-SM)	30	4	SS	24			
			24	5	SS	24			
10									
10.0		COARSE ALLUVIUM							
		End of Boring							

WATER LEVEL OBSERVATIONS	
WL	None

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STARTED	8/29/18	FINISHED	8/29/18
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Project No. ESP029130P

LOG OF BORING NO. B19

Sheet 1 of 1

CLIENT: City of Mendota Heights

ARCHITECT/ENGINEER: TKDA

SITE: Mendota Heights, Minnesota

PROJECT: Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: MSL

Depth (Ft.)	Graphic Log	Geology	Samples: Blows/12" N-Value RQD	Samples: Number	Samples: Type	Samples: In. Recovered In. Driven	Tests: Moisture, %	Tests: Dry Density PCF	Additional Data/ Remarks
		FILL	AS	1	AUGER	24			
		FILL	17	2	SS	24			
4.0									
		COARSE ALLUVIUM	14	3	SS	24			
5									
			20	4	SS	24			
8.0									
			14	5	SS	24			
9.5									
10.0		FINE ALLUVIUM							
10									

FILL, 10" of bituminous pavement underlain by 14" of silty sand with a little gravel base aggregate underlain by silty sand and sand with silt, with gravel and cobbles, fine to coarse grained, dark brown to brown, moist (FILL)

CLAYEY SAND, with a little gravel, fine to medium grained, brown, wet, medium dense (SC)

SAND, with a little gravel, fine to medium grained, gray, wet to water bearing, medium dense (SP) ▽

SANDY LEAN CLAY, with a little gravel, gray, wet, firm (CL)

End of Boring

WATER LEVEL OBSERVATIONS	
WL	▽ 8.5

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Project No. ESP029130P	LOG OF BORING NO. B20	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
		FILL, 10" of bituminous pavement at the surface underlain by a mixture of silty sand and sand with silt, with a little gravel and cobbles, fine to medium grained, dark brown to brown, moist (FILL)	AS	1	AUGER	24			No defined aggregate base layer encountered.
			26*	2	SS	24			*N-value influenced by cobbles. p200=7.8%
5			36*	3	SS	24			*N-value influenced by cobbles.
			44*	4	SS	24			*N-value influenced by cobbles.
8.1		End of Boring	*	5	SS	2			*Encountered boulder at 8'. Boring terminated upon boulder at 8.1.

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P	LOG OF BORING NO. B21	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: MSL	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 3" of bituminous pavement underlain by 5" of crushed limestone aggregate base at the surface underlain by silty sand and sand with silt, with gravel and cobbles, fine to medium grained, tan to brown, moist (FILL)		FILL		AS	1	AUGER	24			
				30*	2	SS	24			*N-value influenced by cobbles.
			5	8	3	SS	24			
6.0 End of Boring										

WATER LEVEL OBSERVATIONS	
WL	None

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LOGGED BY	XL	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. B22	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 3" of bituminous pavement underlain by 5" of crushed limestone aggregate base at the surface underlain by silty sand and sand with silt, with gravel and cobbles, fine to medium grained, brown, moist (FILL)	FILL		AS	1	AUGER	24			
			50*	3	SS	24			*N-value influenced by cobbles.
			20	4	SS	24			
		5							
6.0 ▽ End of Boring									

WATER LEVEL OBSERVATIONS	
WL	▽ 6

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ELEMENT LOG ESP029130P - CITY OF MENDOTA HEIGHTS.GPJ LOG A GNNN08.GDT 10/3/18

Project No. ESP029130P	LOG OF BORING NO. B23	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 3" of bituminous pavement underlain by 6" of crushed limestone aggregate base at the surface underlain by a mixture of sandy lean clay and silty sand, with a little gravel, brown, moist (FILL)		FILL	AS	1	AUGER	12			p200=13.1%
			AS	2	AUGER	12			
			9	3	SS	24			
5			8	4	SS	24			
6.0 End of Boring									

WATER LEVEL OBSERVATIONS	
WL	None

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ELEMENT LOG ESP029130P - CITY OF MENDOTA HEIGHTS.GPJ LOG A GNNN08.GDT 10/3/18

Project No. ESP029130P	LOG OF BORING NO. B24	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
	FILL		AS	1	AUGER	12			p200=12.4%
			AS	2	AUGER	12			
			26*	3	SS	24			*N-value influenced by cobbles.
		5	15	4	SS	24			

FILL, 3" of bituminous pavement underlain by 7" of crushed limestone aggregate base at the surface underlain by silty sand and sand with silt, with a little gravel, occasional cobbles, fine to medium grained, brown, moist (FILL)

6.0 End of Boring

WATER LEVEL OBSERVATIONS	
WL	None

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Project No. ESP029130P

LOG OF BORING NO. B25

Sheet 1 of 1

CLIENT: City of Mendota Heights

ARCHITECT/ENGINEER: TKDA

SITE: Mendota Heights, Minnesota

PROJECT: Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
		FILL, 3" of bituminous pavement underlain by 5" of crushed limestone aggregate base at the surface underlain by sand with silt, with a little gravel, fine to medium grained, brown, moist (FILL)	AS	1	AUGER	12			p200=12.4%
			AS	2	AUGER	12			
2.0		FILL, silty sand, with gravel, fine to medium grained, brown, moist (FILL)	17	3	SS	24			
			5	4	SS	24			
5									
6.0									

WATER LEVEL OBSERVATIONS	
WL	None

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DRILLER	KK	ASS'T DRILLER	XL
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ELEMENT LOG ESP029130P - CITY OF MENDOTA HEIGHTS.GPJ LOG A GNNN08.GDT 10/3/18

Project No. ESP029130P

LOG OF BORING NO. B26

Sheet 1 of 1

CLIENT: City of Mendota Heights

ARCHITECT/ENGINEER: TKDA

SITE: Mendota Heights, Minnesota

PROJECT: Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 3" of bituminous pavement underlain by 7" of crushed limestone aggregate base at the surface underlain by a mixture of sandy lean clay and lean clay, with a little gravel, brown to dark brown, moist, (FILL)		FILL	AS	1	AUGER	12	5		p200=12.5%
			AS	2	AUGER	12			
			10	3	SS	24			
4.0 FILL, silty sand, with a little gravel, fine to medium grained, brown, moist (FILL)			14	4	SS	24			
5									
6.0 End of Boring									

WATER LEVEL OBSERVATIONS

WL	None

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DRILLER	KK	ASS'T DRILLER	XL
LOGGED BY	XL	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. B27	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: MSL	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
FILL, 3" of bituminous pavement underlain by 8" of crushed limestone aggregate base at the surface underlain by sand with silt, with a little gravel, fine to medium grained, brown, moist (FILL)		FILL		AS	1	AUGER	12			
				AS	2	AUGER	12			
				9	3	SS	24			
				10	4	SS	24			
			5							
6.0 End of Boring										

WATER LEVEL OBSERVATIONS	
WL	None

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STARTED	8/27/18	FINISHED	8/27/18
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DRILLER	KK	ASS'T DRILLER	XL
LOGGED BY	XL	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. B28	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

Depth (Ft.)	Graphic Log	Geology	Samples: Blows/12" N-Value RQD	Number	Type	In. Recovered In. Driven	Tests: Moisture, %	Dry Density PCF	Additional Data/ Remarks
0.0 ORGANIC SILTY SAND TOPSOIL, occasional rootlets, black, moist (SM-OL)		TOPSOIL	AS	1	AUGER	12			
1.0 FILL, mixture of silty sand and sand with silt, with a little gravel, fine to medium grained, dark brown, moist (FILL)		FILL	AS	2	AUGER	12			
			14	3	SS	24			
			14	4	SS	24			
5									
6.0 SILTY SAND, with a little gravel, fine to medium grained, brown, moist, medium dense (SM)		COARSE ALLUVIUM	14	5	SS	24	9		p200=23.3%
			15	6	SS	24			
10.0 End of Boring									
10									

WATER LEVEL OBSERVATIONS	
WL	None

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STARTED	8/27/18	FINISHED	8/27/18
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DRILLER	KK	ASS'T DRILLER	XL
LOGGED BY	XL	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. B29	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

Depth (Ft.)	Graphic Log	Geology	Description	Samples: Blows/12" N-Value RQD	Samples: Number	Samples: Type	Samples: In. Recovered In. Driven	Tests: Moisture, %	Tests: Dry Density PCF	Additional Data/ Remarks
0		TOPSOIL	ORGANIC SILTY SAND TOPSOIL, occasional rootlets, black, moist (SM-OL)	AS	1	AUGER	12			
				AS	2	AUGER	12			
2.0		FILL	FILL, a mixture of sandy lean clay and clayey sand, with a little gravel, dark brown, most (FILL)	6	3	SS	24			
				6	4	SS	24			
5										
6.0		COARSE ALLUVIUM	SAND WITH SILT, with a little gravel, fine to medium grained, brown, moist, medium dense (SP-SM)	14	5	SPT	24			
8.0		FINE ALLUVIUM	SANDY LEAN CLAY, with a trace of gravel, brown, moist, firm (CL)	13	6	SS	24			
9.0		COARSE ALLUVIUM	SAND, with a little gravel, fine to medium grained, brown, moist, medium dense (SP)							
10.0			End of Boring							
10										

WATER LEVEL OBSERVATIONS	
WL	None

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STARTED	8/27/18	FINISHED	8/27/18
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LOGGED BY	XL	APPROVED	MAS

Project No. ESP029130P

LOG OF BORING NO. HA1

Sheet 1 of 1

CLIENT: City of Mendota Heights

ARCHITECT/ENGINEER: TKDA

SITE: Mendota Heights, Minnesota

PROJECT: Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
ORGANIC SANDY SILT, black, moist to wet, very soft to firm (OL-ML) ▽		SWAMP DEPOSIT		1	AUGER	24			
				2	AUGER	12			
3.0 End of Hand Auger									

WATER LEVEL OBSERVATIONS

WL	▽	2

element™ materials technology
662 Cromwell Ave.
St. Paul, MN 55114
Telephone: 651-645-3601

STARTED	9/5/18	FINISHED	9/5/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	
LOGGED BY	JK	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. HA2	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
ORGANIC SILT, black to dark brown, moist to wet, very soft to firm (OL-ML) ▽		SWAMP DEPOSIT		1	AUGER	24			
				2	AUGER	18			
3.5 End of Hand Auger									

WATER LEVEL OBSERVATIONS	
WL	▽ 2

element™ materials technology
662 Cromwell Ave.
St. Paul, MN 55114
Telephone: 651-645-3601

STARTED	9/5/18	FINISHED	9/5/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	
LOGGED BY	JK	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. HA3	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: MSL	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
ORGANIC SILT, black to dark brown, saturated, very soft to firm (OL-ML)		SWAMP DEPOSIT			1	AUGER	18			
1.5 ▽ End of Hand Auger										

WATER LEVEL OBSERVATIONS	
WL	▽ 1.5

element™ materials technology
662 Cromwell Ave.
St. Paul, MN 55114
Telephone: 651-645-3601

STARTED	9/5/18	FINISHED	9/5/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	
LOGGED BY	JK	APPROVED	MAS

Project No. ESP029130P

LOG OF BORING NO. HA4

CLIENT: **City of Mendota Heights**

ARCHITECT/ENGINEER: **TKDA**

SITE: **Mendota Heights, Minnesota**

PROJECT: **Marie Avenue and Wesley Street Rehabilitation**

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
SLIGHTLY ORGANIC SANDY LEAN CLAY, brown to dark brown, moist to wet, very soft to soft (CL-OL)		SWAMP DEPOSIT		1	AUGER	12			
1.5 ▽				2	AUGER	12			
SANDY LEAN CLAY, with a trace of gravel, brown to dark brown, moist to wet, soft to firm (CL)		FINE ALLUVIUM		3	AUGER	12			
3.0 End of Hand Auger									

WATER LEVEL OBSERVATIONS

WL	▽ 1.5

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St. Paul, MN 55114
Telephone: 651-645-3601

STARTED	9/5/18	FINISHED	9/5/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	
LOGGED BY	JK	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. HA5	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: MSL	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
ORGANIC SILT, black to dark brown, moist to wet, very soft to firm (OL-ML)		SWAMP DEPOSIT			1	AUGER	12			
					2	AUGER	12			
▽					3	AUGER	12			
3.0 End of Hand Auger										

WATER LEVEL OBSERVATIONS	
WL	▽ 2.5

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St. Paul, MN 55114
Telephone: 651-645-3601

STARTED	9/5/18	FINISHED	9/5/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	
LOGGED BY	JK	APPROVED	MAS

ELEMENT LOG ESP029130P - CITY OF MENDOTA HEIGHTS.GPJ LOG A GNNN08.GDT 10/3/18

Project No. ESP029130P

LOG OF BORING NO. HA6

Sheet 1 of 1

CLIENT: City of Mendota Heights

ARCHITECT/ENGINEER: TKDA

SITE: Mendota Heights, Minnesota

PROJECT: Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: **MSL**

DEPTH (FT.)	GRAPHIC LOG	GEOLOGY	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
SLIGHTLY ORGANIC SANDY LEAN CLAY, black to dark brown, moist to wet, very soft (CL-OL)		FINE ALLUVIUM		1	AUGER	12			
1.5 ▽ SANDY LEAN CLAY, brown, moist to wet, soft to firm (CL)				2	AUGER	12			
3.0 End of Hand Auger				3	AUGER	12			

WATER LEVEL OBSERVATIONS

WL	▽ 1.5

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662 Cromwell Ave.
St. Paul, MN 55114
Telephone: 651-645-3601

STARTED	9/5/18	FINISHED	9/5/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	
LOGGED BY	JK	APPROVED	MAS

element

Element Materials Technology
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City of Mendota Heights Marie Avenue and Wesley Neighborhood Projects
Table 1 - Pavement and Base Thickness

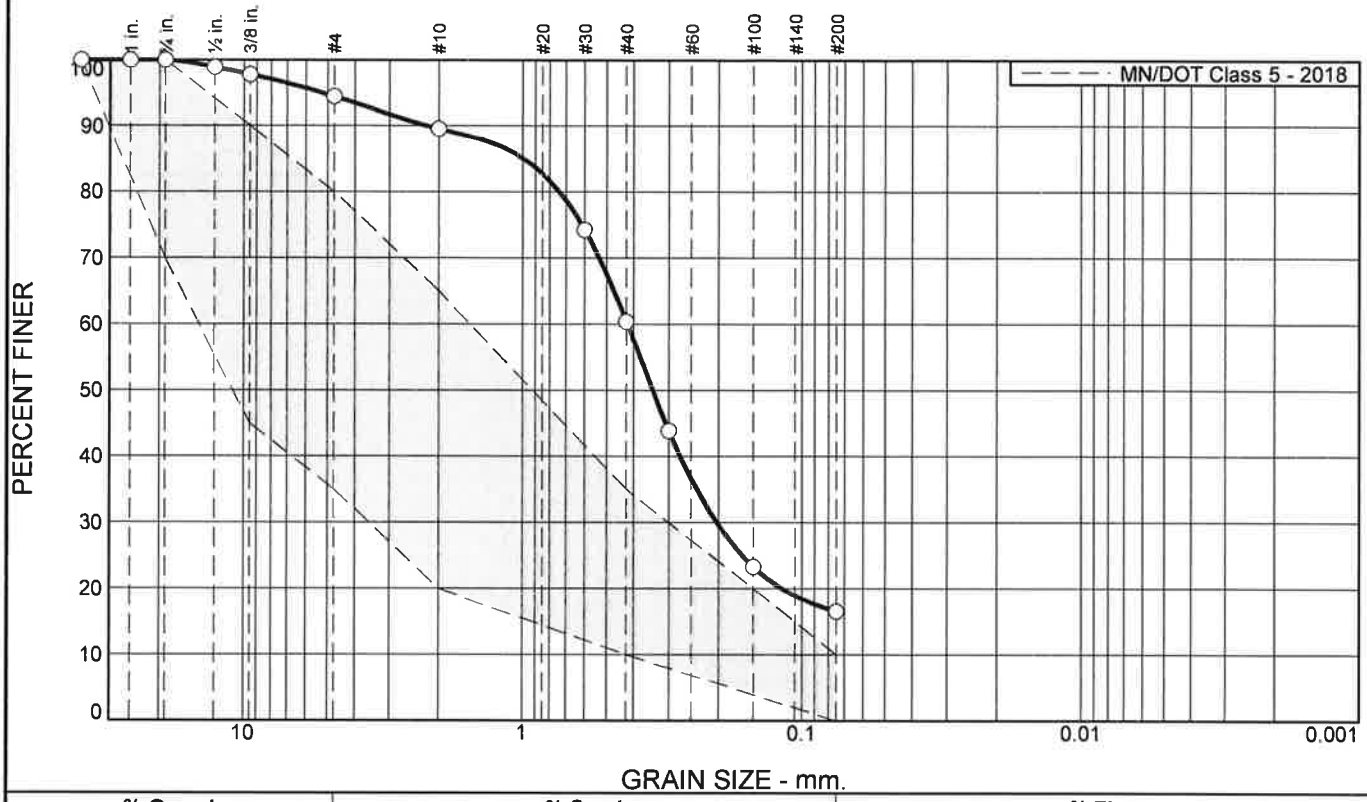
Element Materials Technology St. Paul Inc. Project. No. ESP029130P

Project Area	Boring Number	Bituminous Thickness (inches)[1]	Base Course Thickness (inches)	Base Material Description[2]	Results of field "smell test" for Hazardous Substances [3]
Marie Avenue	B1	10	12	Silty Sand w/a little gravel	No Detection
	B2	8	10	Silty Sand w/trace gravel	No Detection
	B3	10	12	Sand with Silt w/trace gravel	No Detection
	B4	11	12	Sand and Gravel	No Detection
	B5	11	12	Sand with Silt w/trace gravel	No Detection
	B6	9	13	Sand and Gravel	No Detection
	B7	11	13	Silty Sand w/gravel	No Detection
	B8	12	12	Sand and Gravel	No Detection
	B9	11	10	Sand and Gravel	No Detection
	B10	11	6	Silty Sand w/a little gravel	No Detection
	B11	11	13	Sand and Gravel	No Detection
	B12	11	13	Silty Sand w/gravel	No Detection
	B13	10	14	Sand and Gravel	No Detection
	B14	11	Not Observed	-	No Detection
	B15	12	6	Sand and Gravel	No Detection
	B16	10	6	Silty Sand w/gravel	No Detection
	B17	5	3	Crushed Limestone	No Detection
	B18	10	1	Sand and Gravel	No Detection
	B19	10	14	Silty Sand w/a little gravel	No Detection
	B20	10	Not Observed	-	No Detection
Wesley Neighborhood	B21	3	5	Crushed Limestone	No Detection
	B22	3	5	Crushed Limestone	No Detection
	B23	3	6	Crushed Limestone	No Detection
	B24	3	7	Crushed Limestone	No Detection
	B25	3	5	Crushed Limestone	No Detection
	B26	3	7	Crushed Limestone	No Detection
	B27	3	8	Crushed Limestone	No Detection
	B28[4]	-	-	-	No Detection
	B29[4]	-	-	-	No Detection

[1] Bituminous thickness measured in the borehole.
[2] Base material encountered may not meet current MnDOT Specifications for aggregate base material.
[3] Product odor is noted where detected through normal human sensing at the time of drilling activities. Environmental lab tests were not performed on the samples collected and not part of our scope of services.
[4] Borings drilled along roadway shoulder

Date: 9/17/2018

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.5	5.0	29.1	43.9	16.5	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0	100.0	
1"	100.0		
3/4"	100.0	70.0 - 100.0	
1/2"	98.9		
3/8"	97.8	45.0 - 90.0	X
#4	94.5	35.0 - 80.0	X
#10	89.5	20.0 - 65.0	X
#30	74.2		
#40	60.4	10.0 - 35.0	X
#50	43.9		
#100	23.3		
#200	16.5	0.0 - 10.0	X

* MN/DOT Class 5 - 2018

Material Description

SILTY SAND, with a little gravel, fine to medium grained, dark brown to brown (SM)

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)=

Coefficients

D_{90}= 2.2122 D_{85}= 0.9933 D_{60}= 0.4215
D_{50}= 0.3424 D_{30}= 0.2031 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample discarded after completion of testing. The sample does not meet project specification 2018 MnDOT 3138 Class 5 for Aggregate Base.

Date Received: 8-30-18 **Date Tested:** 9-13-18

Tested By: L. Tran

Checked By: J. Starke, P.E.

Title: Sr. Project Engineer

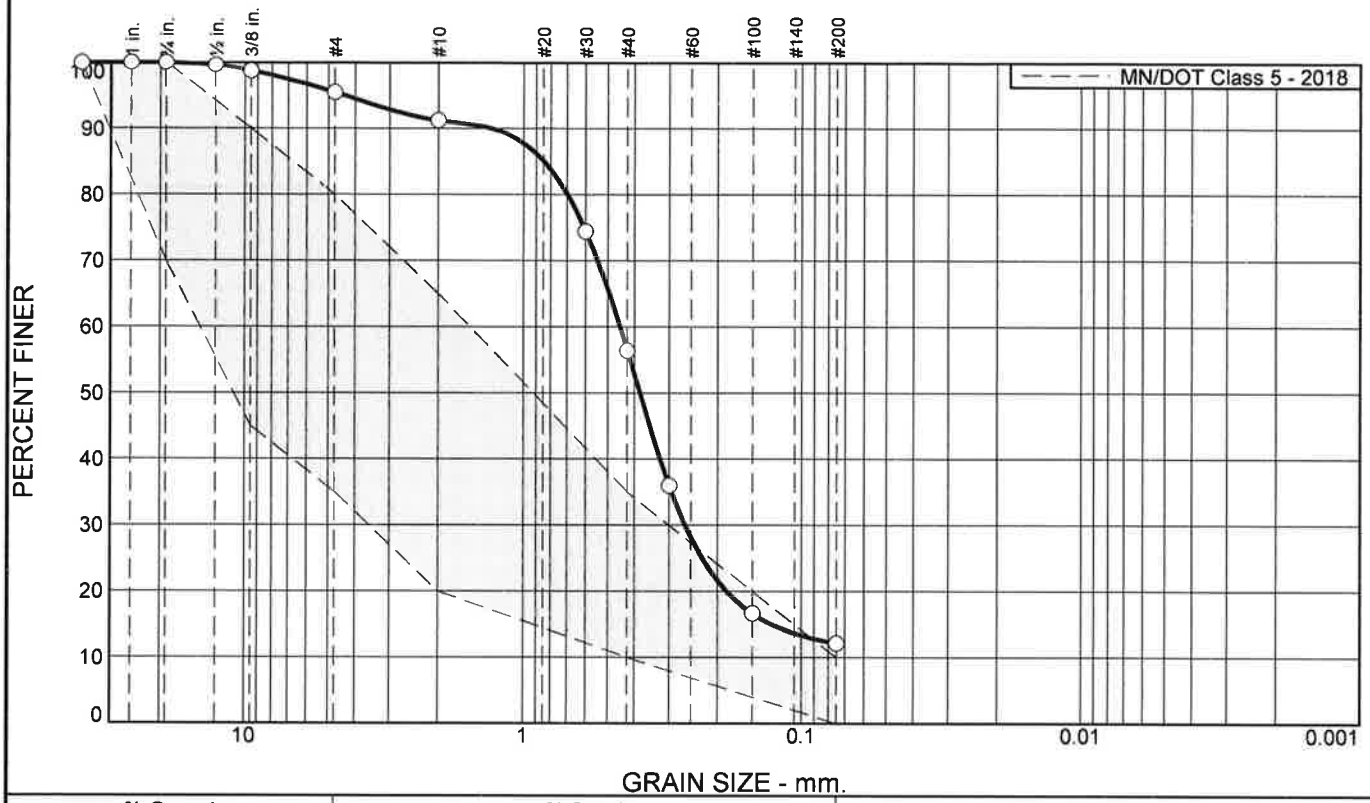
Location: Soil Boring 1 **Date Sampled:** 8-30-18
Sample Number: S011609 **Depth:** 10"-24"

Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA
Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS
Project No: ESP029130P **Figure**

EAR-CONTROLLED DATA

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.5	4.3	34.8	44.3	12.1	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0	100.0	
1"	100.0		
3/4"	100.0	70.0 - 100.0	
1/2"	99.6		
3/8"	98.8	45.0 - 90.0	X
#4	95.5	35.0 - 80.0	X
#10	91.2	20.0 - 65.0	X
#30	74.4		
#40	56.4	10.0 - 35.0	X
#50	36.0		
#100	16.7		
#200	12.1	0.0 - 10.0	X

* MN/DOT Class 5 - 2018

Material Description

SILTY SAND, with a trace of gravel, fine to medium grained, dark brown to brown (SM)

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 1.2947 D_{85}= 0.8475 D_{60}= 0.4520
D_{50}= 0.3829 D_{30}= 0.2626 D_{15}= 0.1278
D_{10}= C_u= C_c=

Remarks

Sample discarded after completion of testing. The sample does not meet project specification 2018 MnDOT 3138 Class 5 for Aggregate Base.

Date Received: 8-30-18 **Date Tested:** 9-13-18

Tested By: L. Tran

Checked By: J. Starke, P.E.

Title: Sr. Project Engineer

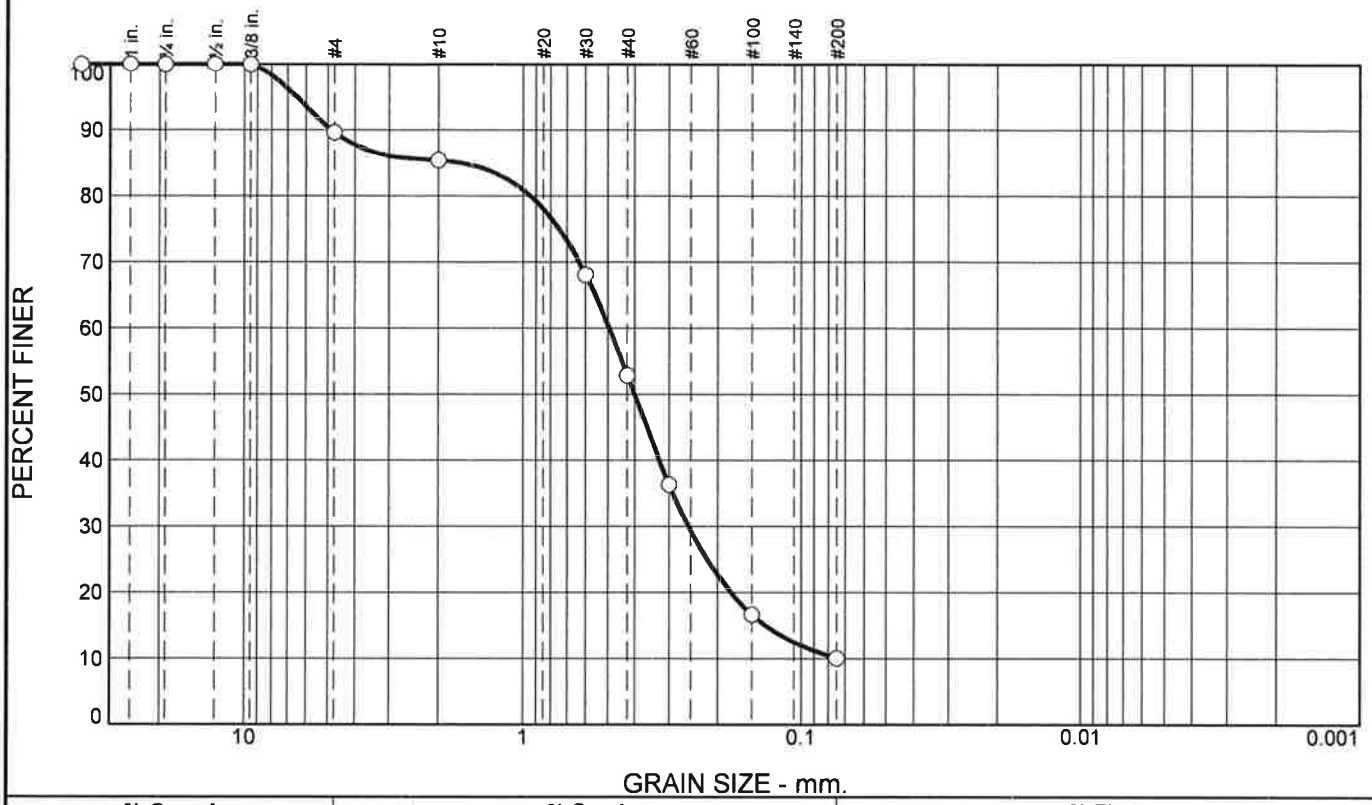
Location: Soil Boring 2 **Date Sampled:** 8-30-18
Sample Number: S011610 **Depth:** 12"-24"

EAR-CONTROLLED DATA

Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA
Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS
Project No: ESP029130P **Figure**

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.3	4.2	32.6	42.8	10.1	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	89.7		
#10	85.5		
#30	68.1		
#40	52.9		
#50	36.3		
#100	16.6		
#200	10.1		

* (no specification provided)

Material Description

SAND WITH SILT, with a little gravel, fine to medium grained, brown (SP-SM)

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)=

Coefficients

D_{90}= 4.8678 D_{85}= 1.6403 D_{60}= 0.4943
D_{50}= 0.4010 D_{30}= 0.2551 D_{15}= 0.1340
D_{10}= C_u= C_c=

Remarks

Sample was returned to the container after completion of test.
Moisture Content: 4.3%

Date Received: 8-30-18 **Date Tested:** 9-13-18

Tested By: L.Tran

Checked By: J. Starke, P.E.

Title: Sr. Geotechnical Engineer

Location: Soil Boring 5
Sample Number: 3, S011620 **Depth:** 2'-4'

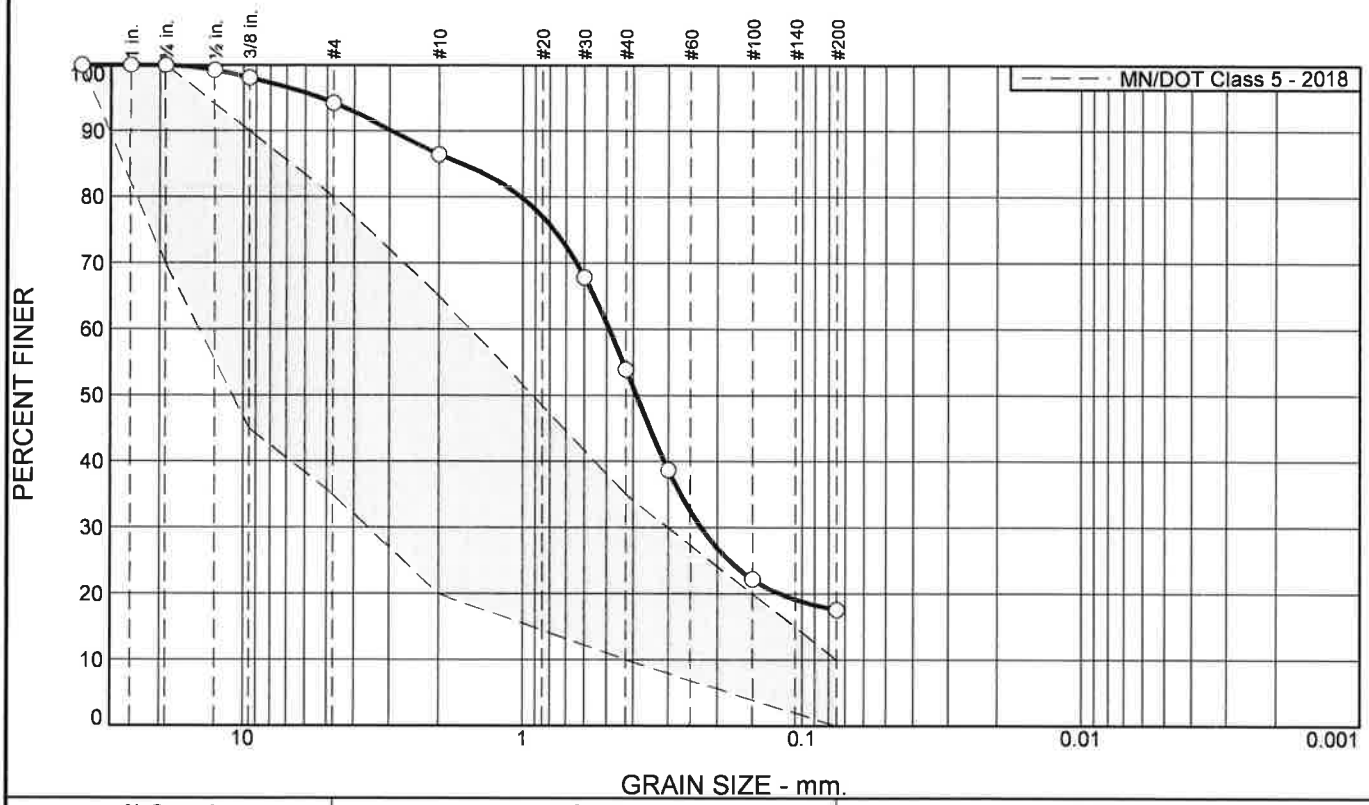
Date Sampled: 8-30-18

Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA
Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS
Project No: ESP029130P **Figure**

EAR-CONTROLLED DATA

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.7	7.9	32.5	36.3	17.6	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0	100.0	
1"	100.0		
3/4"	100.0	70.0 - 100.0	
1/2"	99.2		
3/8"	98.1	45.0 - 90.0	X
#4	94.3	35.0 - 80.0	X
#10	86.4	20.0 - 65.0	X
#30	67.8		
#40	53.9	10.0 - 35.0	X
#50	38.7		
#100	22.2		
#200	17.6	0.0 - 10.0	X

* MN/DOT Class 5 - 2018

Material Description

SILTY SAND, with a little gravel, fine to medium grained, dark brown to brown (SM)

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM **AASHTO (M 145)=**

Coefficients

D_{90}= 2.9510 D_{85}= 1.6702 D_{60}= 0.4892
D_{50}= 0.3902 D_{30}= 0.2286 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample discarded after completion of testing. The sample does not meet project specification 2018 MnDOT 3138 Class 5 for Aggregate Base.

Date Received: 8-30-18 **Date Tested:** 9-13-18

Tested By: L. Tran

Checked By: J. Starke, P.E.

Title: Sr. Project Engineer

Location: Soil Boring 7
Sample Number: S011612 **Depth:** 12"-24"

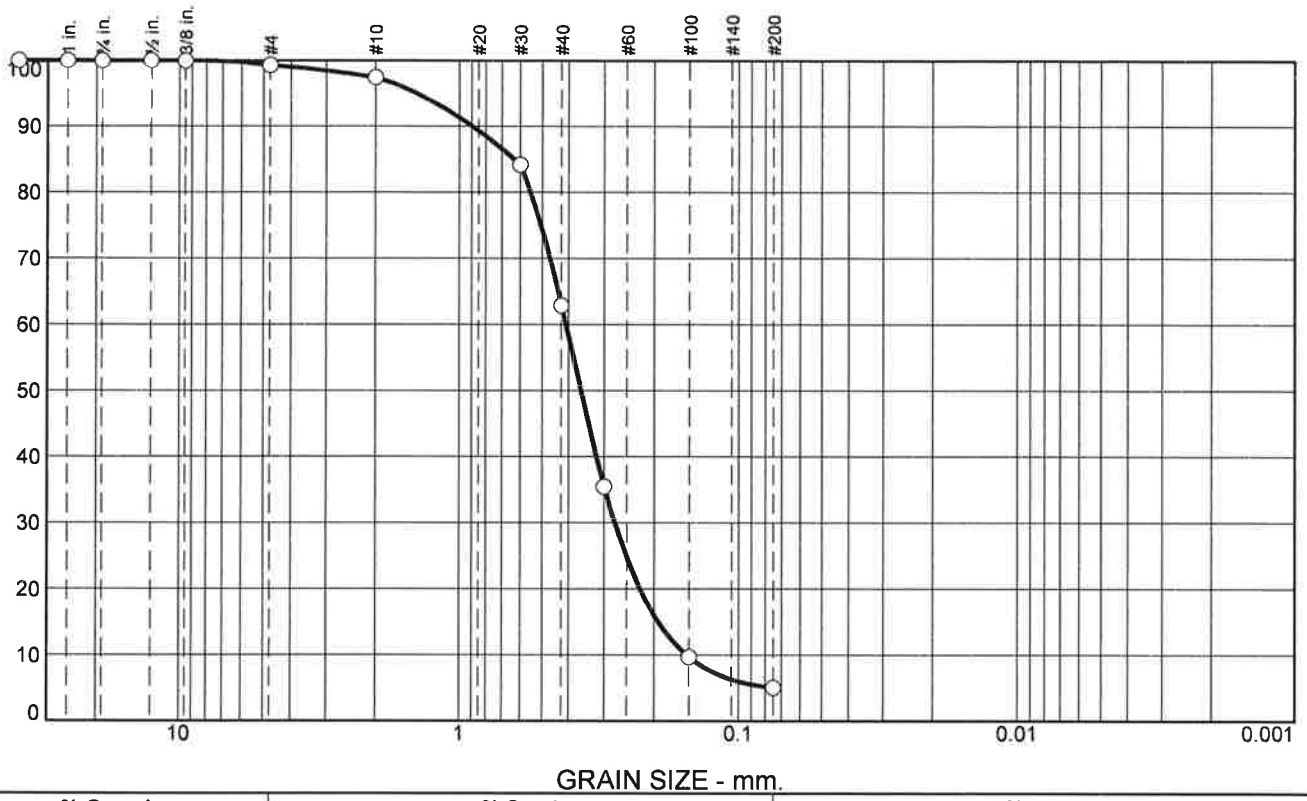
Date Sampled: 8-30-18

Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA
Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS
Project No: ESP029130P **Figure**

EAR-CONTROLLED DATA

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.7	1.8	34.6	57.9	5.0	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.3		
#10	97.5		
#30	84.2		
#40	62.9		
#50	35.5		
#100	9.7		
#200	5.0		

* (no specification provided)

Material Description

SAND, with a trace of gravel, mostly fine grained, brown (SP)

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SP AASHTO (M 145)=

Coefficients

D_{90}= 0.8965 D_{85}= 0.6314 D_{60}= 0.4097
D_{50}= 0.3622 D_{30}= 0.2756 D_{15}= 0.1936
D_{10}= 0.1532 C_u= 2.67 C_c= 1.21

Remarks

Sample was returned to the container after completion of test.
Moisture Content: 2.6%

Date Received: 8-29-18 **Date Tested:** 9-13-18

Tested By: L.Tran

Checked By: J. Starke, P.E.

Title: Sr. Geotechnical Engineer

Location: Soil Boring 9
Sample Number: 3, S011621 **Depth:** 4'-6'

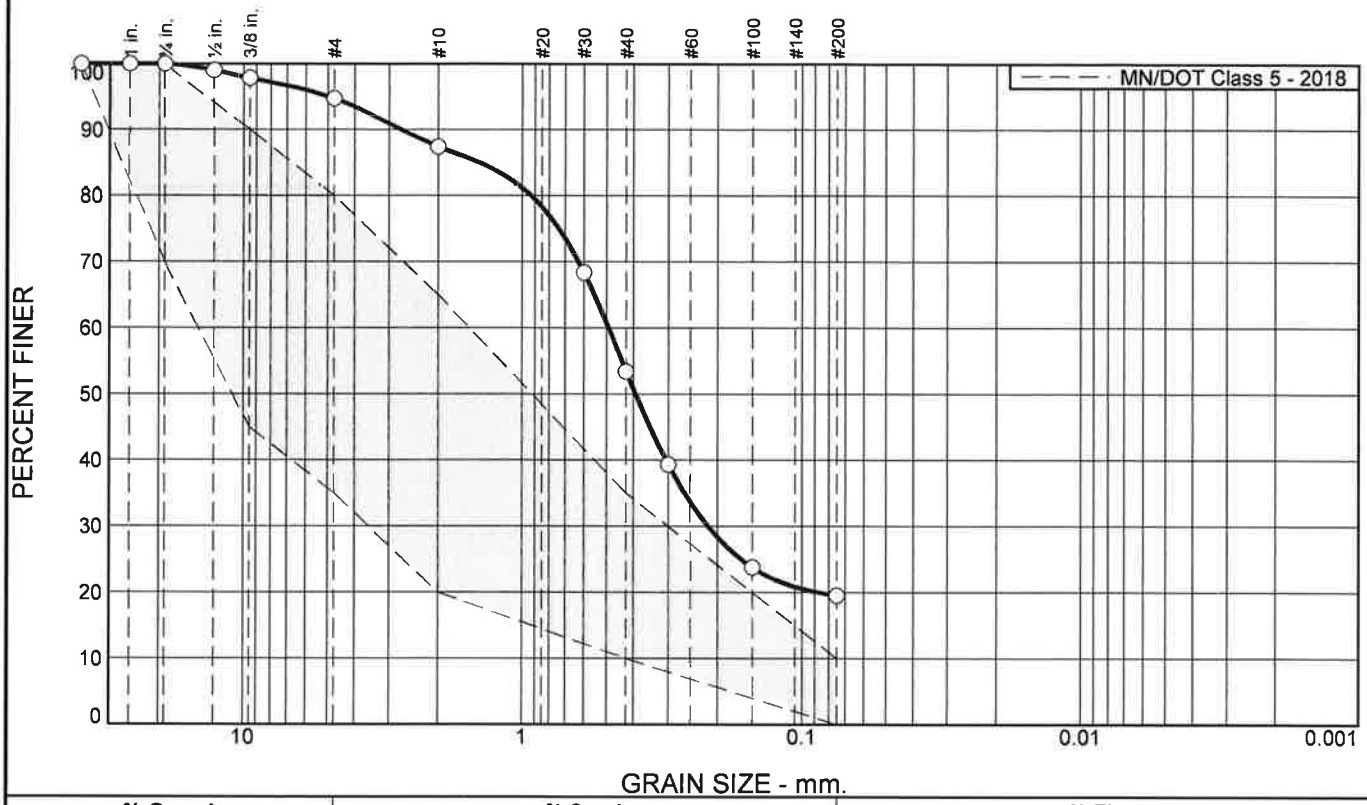
Date Sampled: 8-29-18

Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA
Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS
Project No: ESP029130P **Figure**

EAR-CONTROLLED DATA

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.3	7.3	34.0	33.9	19.5	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0	100.0	
1"	100.0		
3/4"	100.0	70.0 - 100.0	
1/2"	99.0		
3/8"	97.9	45.0 - 90.0	X
#4	94.7	35.0 - 80.0	X
#10	87.4	20.0 - 65.0	X
#30	68.3		
#40	53.4	10.0 - 35.0	X
#50	39.3		
#100	23.8		
#200	19.5	0.0 - 10.0	X

* MN/DOT Class 5 - 2018

Material Description

SILTY SAND, with a little gravel, fine to medium grained, dark brown to brown (SM)

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)=

Coefficients

D_{90}= 2.7104 D_{85}= 1.4280 D_{60}= 0.4918
D_{50}= 0.3933 D_{30}= 0.2161 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample discarded after completion of testing. The sample does not meet project specification 2018 MnDOT 3138 Class 5 for Aggregate Base.

Date Received: 8-29-18 **Date Tested:** 9-13-18

Tested By: L. Tran

Checked By: J. Starke, P.E.

Title: Sr. Project Engineer

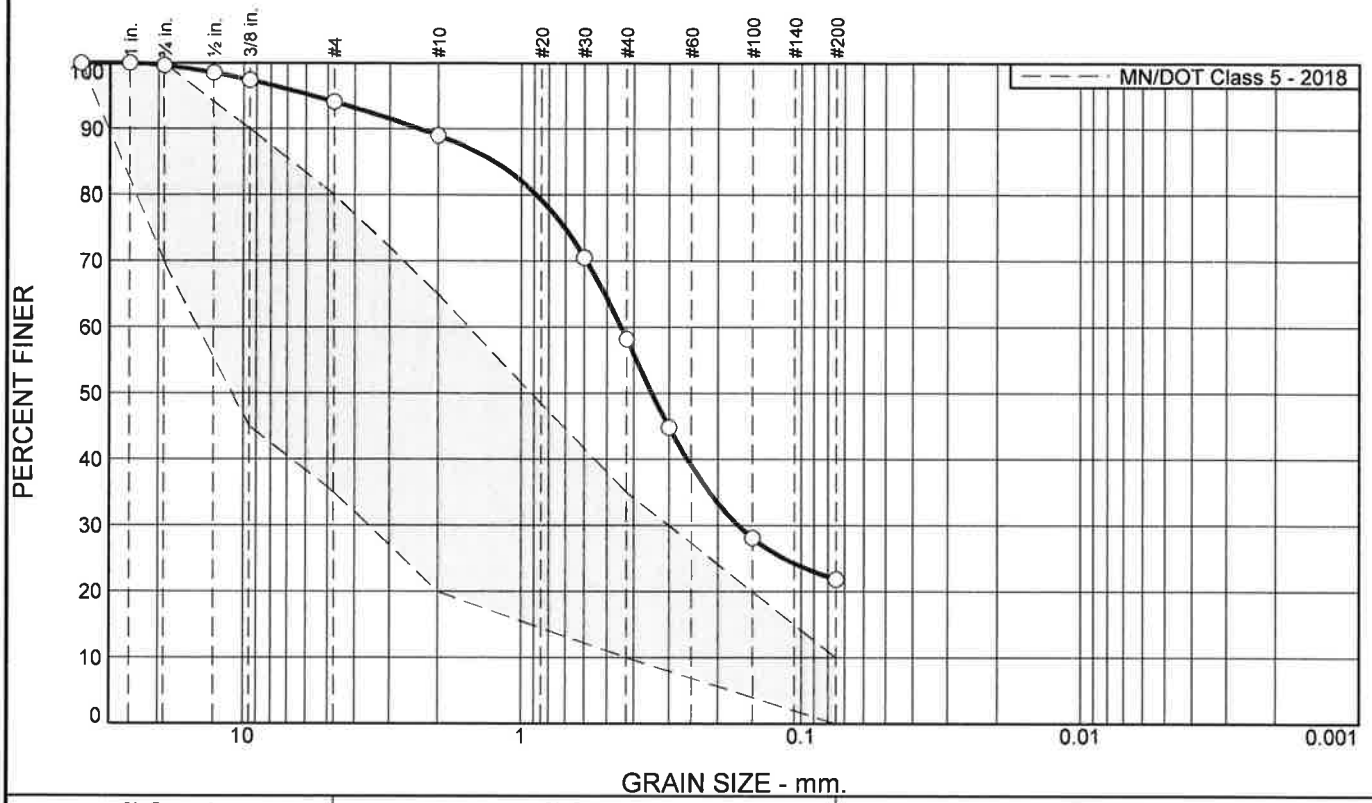
Location: Soil Boring 10 **Date Sampled:** 8-29-18
Sample Number: S011613 **Depth:** 11"-21"

Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA
Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS
Project No: ESP029130P **Figure**

EAR-CONTROLLED DATA

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.4	5.5	5.1	30.9	36.2	21.9	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0	100.0	
1"	100.0		
3/4"	99.6	70.0 - 100.0	
1/2"	98.5		
3/8"	97.4	45.0 - 90.0	X
#4	94.1	35.0 - 80.0	X
#10	89.0	20.0 - 65.0	X
#30	70.5		
#40	58.1	10.0 - 35.0	X
#50	44.8		
#100	28.1		
#200	21.9	0.0 - 10.0	X

* MN/DOT Class 5 - 2018

Material Description

SILTY SAND, with a little of gravel, fine to medium grained, dark brown to brown (SM)

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)=

Coefficients

D_{90}= 2.3282 D_{85}= 1.2480 D_{60}= 0.4458
D_{50}= 0.3452 D_{30}= 0.1688 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample discarded after completion of testing. The sample does not meet project specification 2018 MnDOT 3138 Class 5 for Aggregate Base.

Date Received: 8-29-18 **Date Tested:** 9-13-18

Tested By: L. Tran

Checked By: J. Starke, P.E.

Title: Sr. Project Engineer

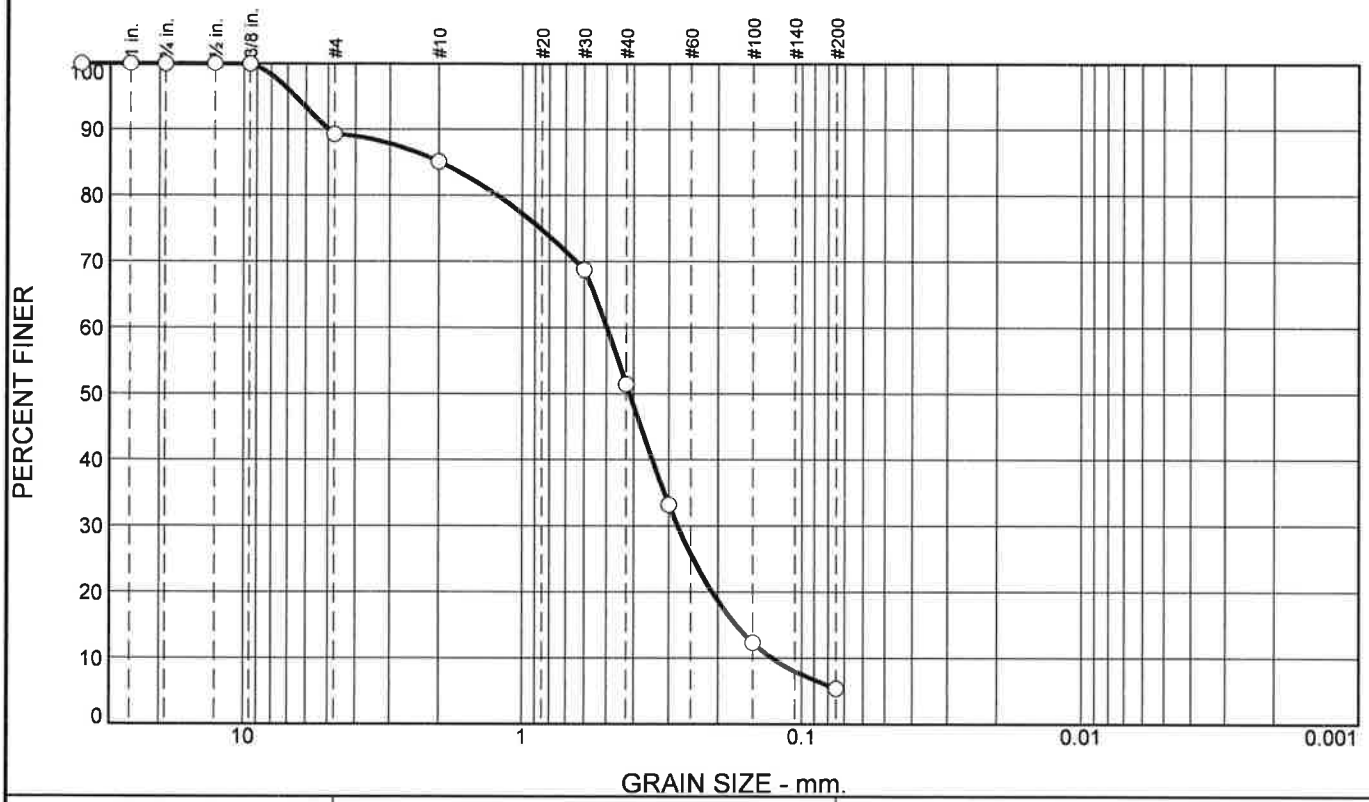
Location: Soil Boring 12 **Date Sampled:** 8-29-18
Sample Number: S011611 **Depth:** 12"-24"

Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA
Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS
Project No: ESP029130P **Figure**

EAR-CONTROLLED DATA

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.7	4.2	33.6	46.1	5.4	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	89.3		
#10	85.1		
#30	68.7		
#40	51.5		
#50	33.2		
#100	12.4		
#200	5.4		

* (no specification provided)

Material Description

SAND WITH SILT, a little gravel, fine to medium grained, brown (SP-SM)

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)=

Coefficients

D_{90}= 4.9729 D_{85}= 1.9728 D_{60}= 0.4985
D_{50}= 0.4139 D_{30}= 0.2788 D_{15}= 0.1720
D_{10}= 0.1274 C_u= 3.91 C_c= 1.22

Remarks

Sample was returned to the container after completion of test.
Moisture Content: 5.2%

Date Received: 8-29-18 **Date Tested:** 9-13-18

Tested By: L.Tran

Checked By: J. Starke, P.E.

Title: Sr. Geotechnical Engineer

Location: Soil Boring 12
Sample Number: 3, S011622 **Depth:** 2'-4'

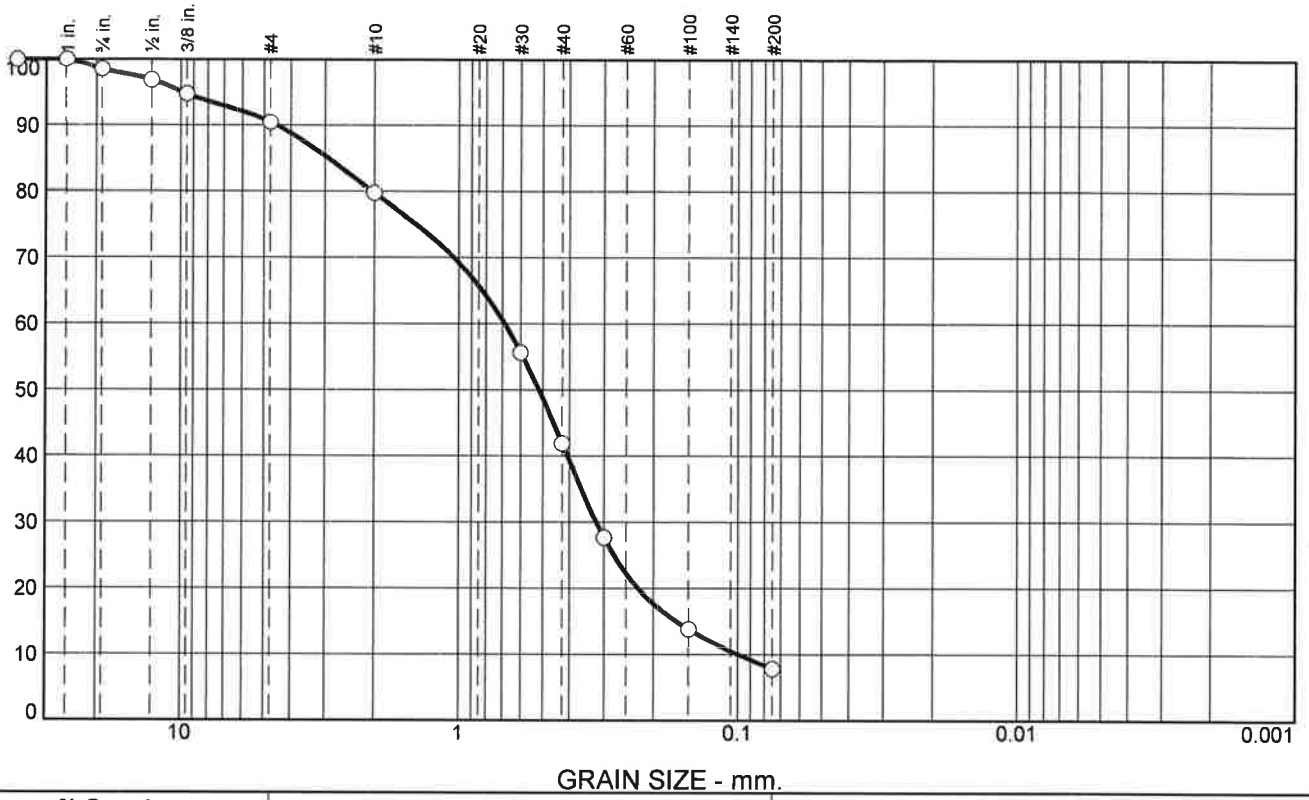
Date Sampled: 8-29-18

Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA
Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS
Project No: ESP029130P **Figure**

EAR-CONTROLLED DATA

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
1.5	8.0	10.7	37.9	34.1	7.8	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	100.0		
3/4"	98.5		
1/2"	96.8		
3/8"	94.8		
#4	90.5		
#10	79.8		
#30	55.6		
#40	41.9		
#50	27.7		
#100	13.8		
#200	7.8		

* (no specification provided)

Material Description

SAND with SILT, with a little gravel, fine to medium grained, brown (SP)

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)=

Coefficients

D_{90}= 4.4964 D_{85}= 2.9257 D_{60}= 0.6872
D_{50}= 0.5160 D_{30}= 0.3197 D_{15}= 0.1670
D_{10}= 0.1000 C_u= 6.87 C_c= 1.49

Remarks

The sample was discarded after completion of test.

Date Received: 8-29-18 **Date Tested:** 9-13-18

Tested By: L. Tran

Checked By: J. Starke, P.E.

Title: Sr. Project Engineer

Location: Soil Boring 20
Sample Number: S011614 **Depth:** 3'-5'

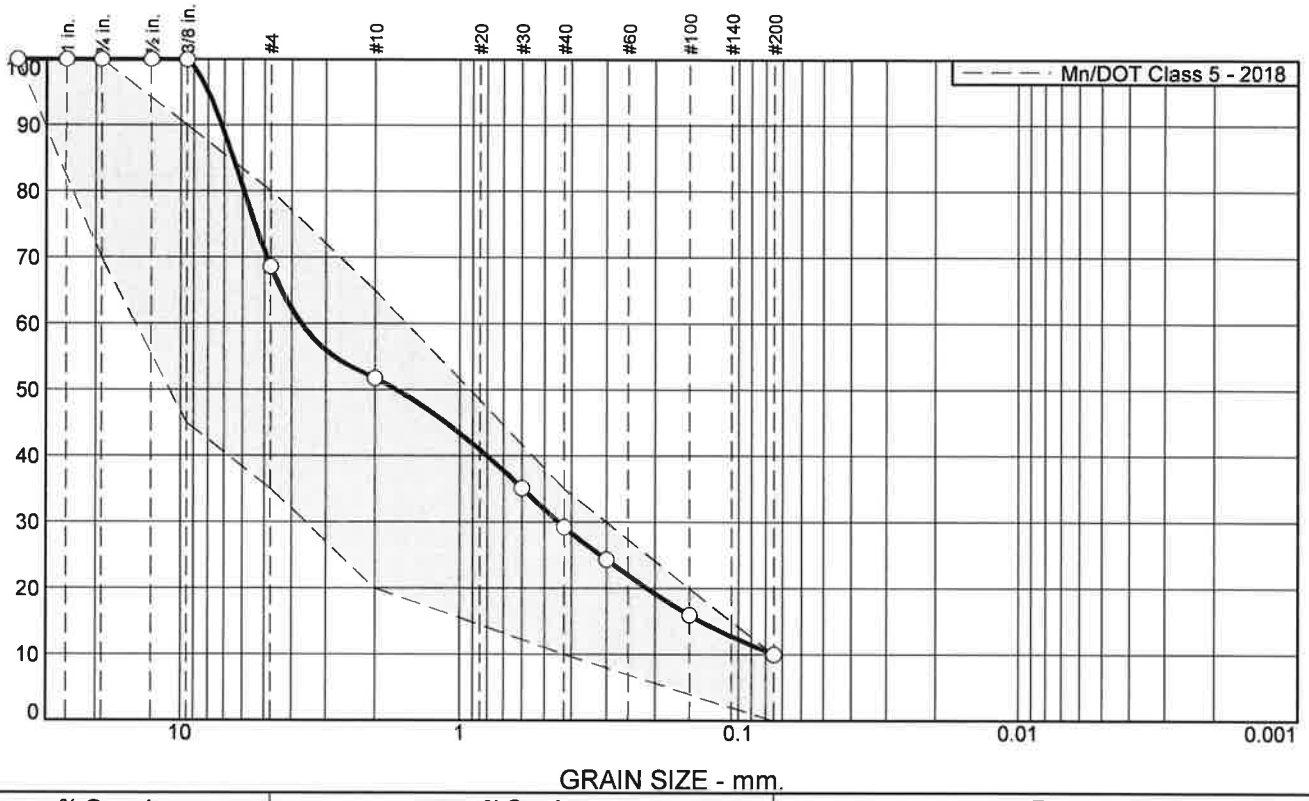
Date Sampled: 8-29-18

Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA
Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS
Project No: ESP029130P **Figure**

EAR-CONTROLLED DATA

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	31.4	16.9	22.5	19.2	10.0	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0	100.0	
1"	100.0		
3/4"	100.0	70.0 - 100.0	
1/2"	100.0		
3/8"	100.0	45.0 - 90.0	X
#4	68.6	35.0 - 80.0	
#10	51.7	20.0 - 65.0	
#30	35.1		
#40	29.2	10.0 - 35.0	
#50	24.3		
#100	16.0		
#200	10.0	0.0 - 10.0	

* Mn/DOT Class 5 - 2018

Material Description

Crushed Limestone Aggregate Base

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 7.1505 D_{85}= 6.4965 D_{60}= 3.6931
D_{50}= 1.6811 D_{30}= 0.4460 D_{15}= 0.1361
D_{10}= C_u= C_c=

Remarks

Sample was returned to the container after completion of test. The sample does not meet MnDOT Spec. 3138 for Class 5 Aggregate base. Moisture Content: 9.0%

Date Received: 8-27-18 **Date Tested:** 9-13-18

Tested By: L.Tran

Checked By: J. Starke, P.E.

Title: Sr. Geotechnical Engineer

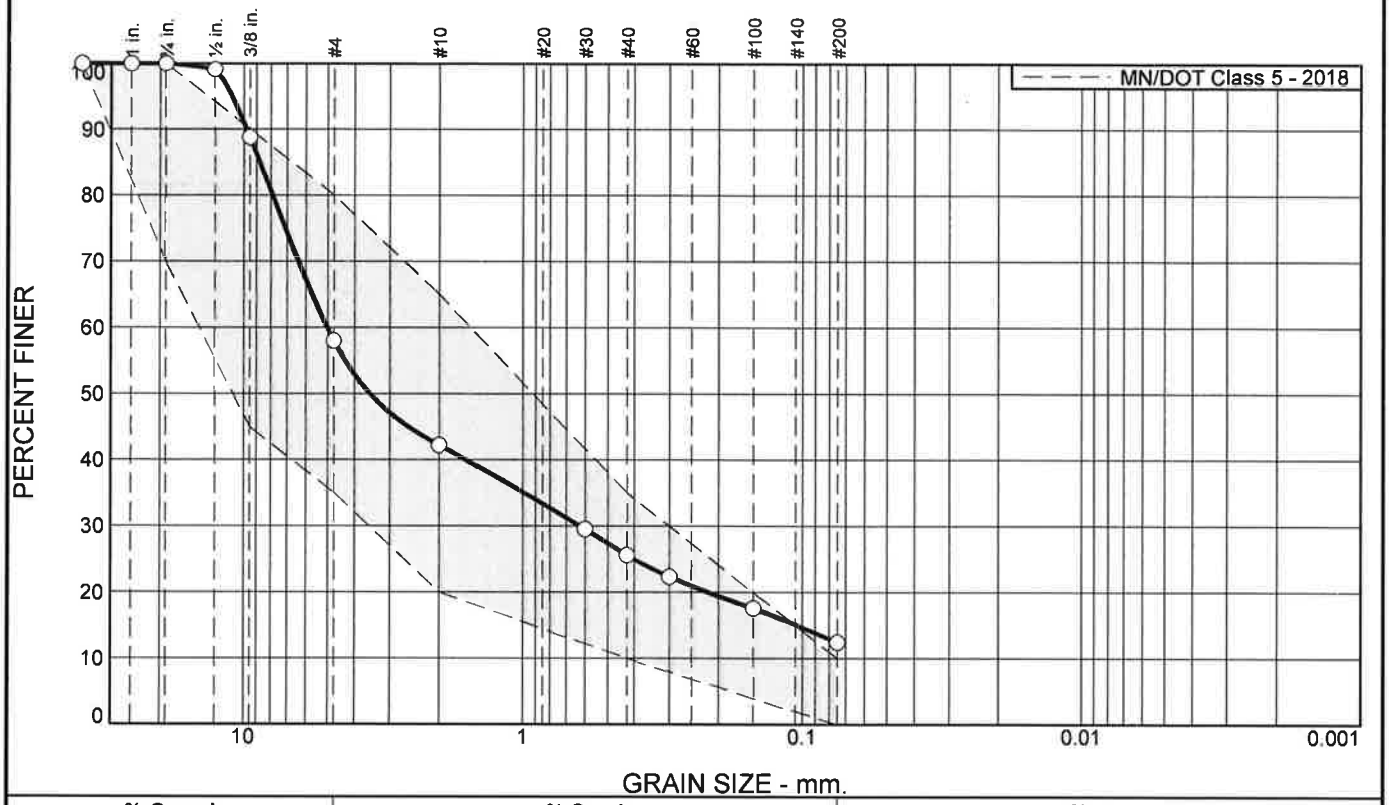
Location: Soil Boring 23 **Date Sampled:** 8-27-18
Sample Number: 1, S011623 **Depth:** 4"-9"

Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA
Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS
Project No: ESP029130P **Figure**

EAR-CONTROLLED DATA

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	42.1	15.7	16.6	13.2	12.4	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0	100.0	
1"	100.0		
3/4"	100.0	70.0 - 100.0	
1/2"	99.1		
3/8"	88.8	45.0 - 90.0	
#4	57.9	35.0 - 80.0	
#10	42.2	20.0 - 65.0	
#30	29.5		
#40	25.6	10.0 - 35.0	
#50	22.3		
#100	17.6		
#200	12.4	0.0 - 10.0	X

* MN/DOT Class 5 - 2018

Material Description

Crushed Limestone Aggregate Base

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 9.7866 D_{85}= 8.7739 D_{60}= 5.0313
D_{50}= 3.5370 D_{30}= 0.6263 D_{15}= 0.1050
D_{10}= C_u= C_c=

Remarks

Sample discarded after completion of testing. The sample does not meet project specification 2018 MnDOT 3138 Class 5 for Aggregate Base.

Date Received: 8-30-18 **Date Tested:** 9-12-18

Tested By: L. Tran

Checked By: J. Starke, P.E.

Title: Sr. Project Engineer

Location: Soil Boring 25 **Date Sampled:** 8-30-18

Sample Number: S011608 **Depth:** 8"-18"

EAR-CONTROLLED DATA

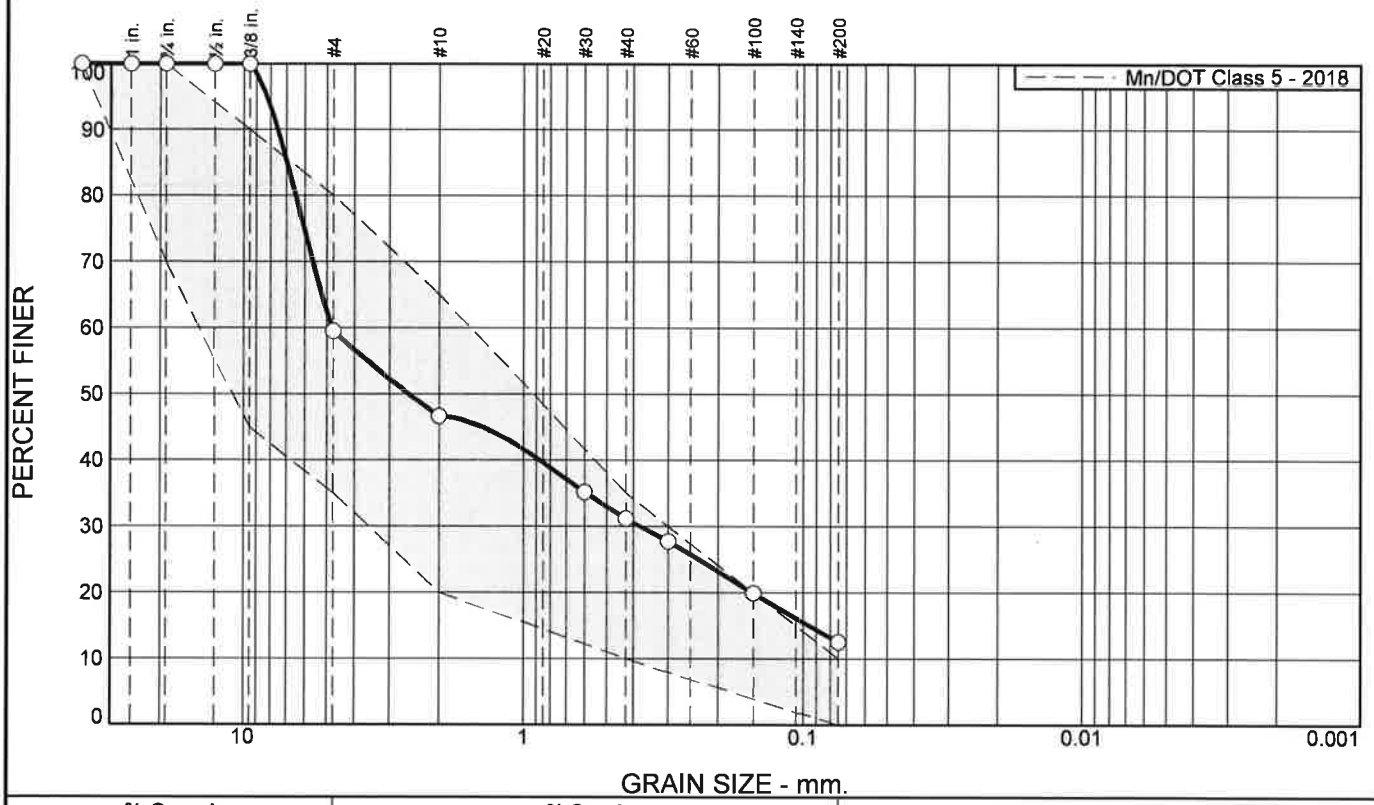
Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA

Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS

Project No: ESP029130P **Figure**

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	40.5	12.9	15.4	18.7	12.5	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0	100.0	
1"	100.0		
3/4"	100.0	70.0 - 100.0	
1/2"	100.0		
3/8"	100.0	45.0 - 90.0	X
#4	59.5	35.0 - 80.0	
#10	46.6	20.0 - 65.0	
#30	35.2		
#40	31.2	10.0 - 35.0	
#50	27.7		
#100	19.9		
#200	12.5	0.0 - 10.0	X

* MN/DOT Class 5 - 2018

Material Description

Crushed Limestone Aggregate Base

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 7.5343 D_{85}= 6.9681 D_{60}= 4.7923
D_{50}= 2.5755 D_{30}= 0.3778 D_{15}= 0.0954
D_{10}= C_u= C_c=

Remarks

Sample was returned to the container after completion of test. The sample does not meet MnDOT Spec. 3138 for Class 5 Aggregate Base. Moisture Content: 4.9%

Date Received: 8-27-18 **Date Tested:** 9-13-18

Tested By: L.Tran

Checked By: J. Starke, P.E.

Title: Sr. Geotechnical Engineer

Location: Soil Boring 26
Sample Number: 1, S011624 **Depth:** 6"-10"

Date Sampled: 8-27-18

EAR-CONTROLLED DATA

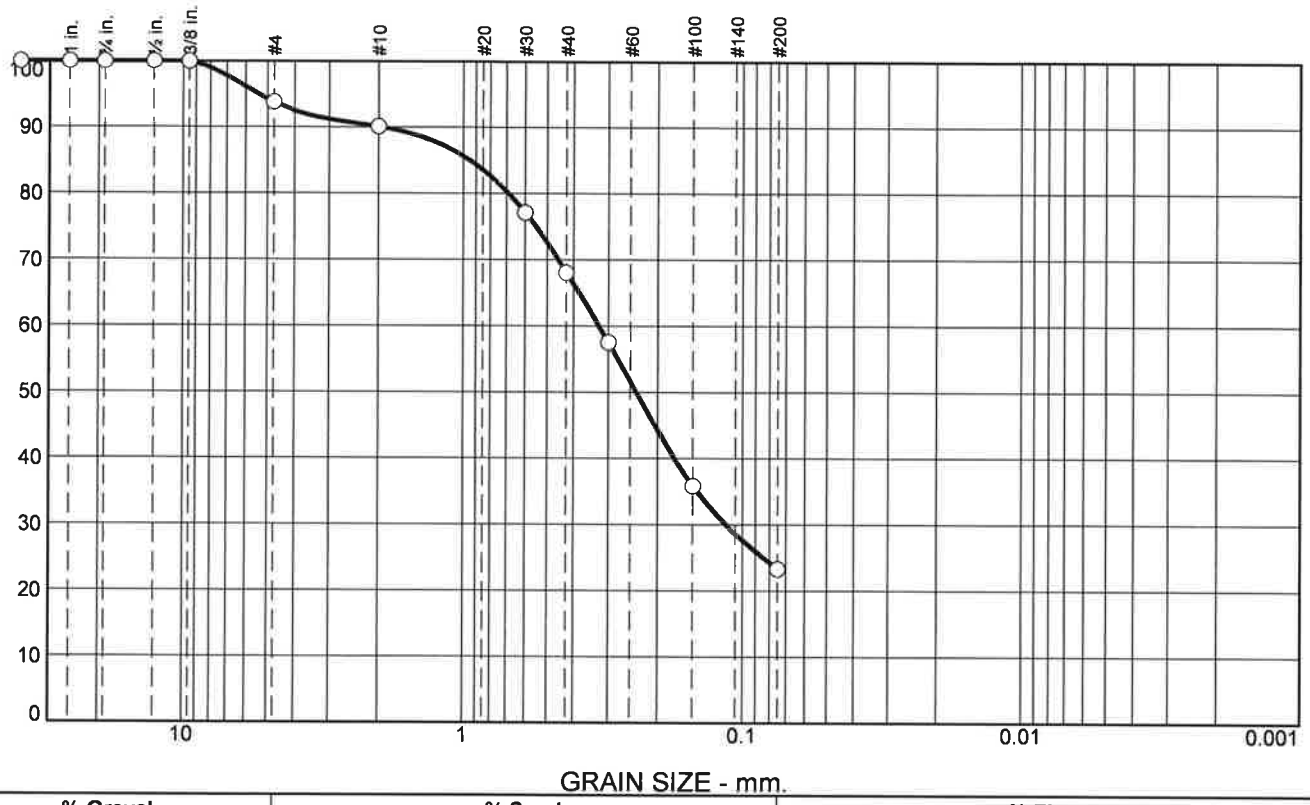
Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA

Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS

Project No: ESP029130P **Figure**

Particle Size Distribution Report



% Gravel		% Sand			% Fines	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.2	3.7	22.1	44.7	23.3	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	93.8		
#10	90.1		
#30	77.1		
#40	68.0		
#50	57.5		
#100	35.8		
#200	23.3		

* (no specification provided)

Material Description

SILTY SAND, with a little gravel, fine to medium grained, brown (SM)

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SM AASHTO (M 145)=

Coefficients

D_{90}= 1.9272 D_{85}= 0.9484 D_{60}= 0.3247
D_{50}= 0.2388 D_{30}= 0.1146 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample was returned to the container after completion of test.
Moisture Content: 8.7%

Date Received: 8-27-18 **Date Tested:** 9-13-18

Tested By: L.Tran

Checked By: J. Starke, P.E.

Title: Sr. Geotechnical Engineer

Location: Soil Boring 28
Sample Number: 5, S011625 **Depth:** 6'-8'

Date Sampled: 8-27-18

Element Materials Technology St. Paul, MN

Client: City of Mendota Heights c/o TKDA
Project: MARIE AVENUE AND WESLEY NEIGHBORHOOD STREET REHABILITATION PROJECTS
Project No: ESP029130P **Figure**

EAR-CONTROLLED DATA

SYMBOLS AND TERMINOLOGY ON TEST BORING LOGS

SYMBOLS

Drilling and Sampling

Symbol	Description
HSA	3-1/4" I.D. hollow stem auger
_FA	4", 6" or 10" diameter flight auger
_HA	2", 4" or 6" hand auger
_DC	2-1/2", 4", 5" or 6" steel drive casing
_RC	Size A, B or N rotary casing
PD	Pipe drill or cleanout tube
CS	Continuous split barrel sampling
DM	Drilling mud
JW	Jetting water
SB	2" O.D. split barrel sampling
_L	2-1/2" or 3-1/2" O.D. SB liner sample
_T	2" or 3" thin walled tube sample
3TP	3" thin walled tube using pitcher sampler
_TO	2" or 3" thin walled tube suing Osterberg sampler
W	Wash sample
B	Bag sample
P	Test pit sample
_Q	BQ, NQ, or PQ wireline system
_X	AX, BX, or NX double tube barrel
N	Standard penetration test, blows per foot
CR	Core recovery, percent
WL	Water level
▼	Water level
NMR	No measurement recorded, primarily due to the presence of drilling or coring fluid

Laboratory Testing

Symbol	Description
W	Water content, % (ASTM:D2216)**
D	Dry density, pcf
LL	Liquid limit (ASTM:D4318)
PL	Plastic limit (ASTM:D4318)
	--- Inserts in Last Column (Qu or RQD) ---
Qu	Unconfined compressive strength, psf (ASTM:D2166)
Pq	Penetrometer reading, tsf (ASTM:D1558)
Ts	Torvane reading, tsf
G	Specific gravity (ASTM:D854)
SL	Shrinkage limits (ASTM:D427)
OC	Organic content – Combustion method (ASTM:D2974)
SP	Swell pressure, tsf (ASTM:D4546)
PS	Percent swell under pressure (ASTM:D4546)
FS	Free swell, % (ASTM:D4546)
SS	Shrink swell, % (ASTM:D4546)
pH	Hydrogen ion content – Meter Method (ASTM:D4972)
SC	Sulfate content, parts/million or mg/l
CC	Chloride content, parts/million, or mg/l
C*	One dimensional consolidation (ASTM:D2435)
Qc*	Triaxial compression (ASTM:D2850 and D4767)
D.S.*	Direct shear (ASTM:D3080)
K*	Coefficient of permeability, cm/sec (ASTM:D2434)
P*	Pinhole test (ASTM:D4647)
DH*	Double hydrometer (ASTM:D4221)
MA*	Particle size analysis (ASTM:D422)
R	Laboratory electrical resistivity, ohm-cm (ASTM:G57)
E*	Pressuremeter deformation modulus, tsf (ASTM:D4719)
PM*	Pressuremeter test (ASTM:D4719)
VS*	Field vane shear (ASTM:D2573)
IR*	Infiltrometer test (ASTM:D3385)
RQD	Rock quality designation, percent

* Results shown on attached data sheet or graph
** ASTM designates American Society for Testing and Materials

TERMINOLOGY

Particle Sizes

Type	Size Range
Boulders	> 12"
Cobbles	3" – 12"
Coarse gravel	3/4" – 3"
Fine gravel	#4 sieve – 3/4"
Coarse sand	#4 - #10 sieve
Medium sand	#10 - #40 sieve
Fine sand	#40 - #200 sieve
Silt	100% passing #200 sieve and > 0.005 mm
Clay	100% passing #200 sieve and < 0.005 mm

Soil Layering and Moisture

Term	Visual Observation
Lamination	Up to 1/4" thick stratum
Varved	Alternating laminations of any combination of clay, silt, fine sand, or colors
Lenses	Small pockets of different soils in a soil mass
Stratified	Alternating layers of varying materials or colors
Layer	1/4" to 12" thick stratum
Dry	Powdery, no noticeable water
Moist	Damp, below saturation
Waterbearing	Pervious soil below water
Wet	Saturated, above liquid limit

Gravel Content

Coarse-Grained Soils

% Gravel	Description
2 – 15	A little gravel
16 – 49	With gravel

Fine-Grained Soils

% Gravel	Description
< 5	Trace of gravel
5 – 15	A little gravel
16 – 30	With gravel
31 – 49	Gravelly

Standard Penetration Resistance

Cohesionless Soils

N-Value	Relative Density
0 – 4	Very loose
5 – 10	Loose
11 – 30	Medium dense
31 – 50	Dense
> 50	Very dense

Cohesive Soils

N-Value	Consistency
0 – 4	Very soft
5 – 8	Soft
9 – 15	Firm
16 – 30	Hard
> 30	Very hard

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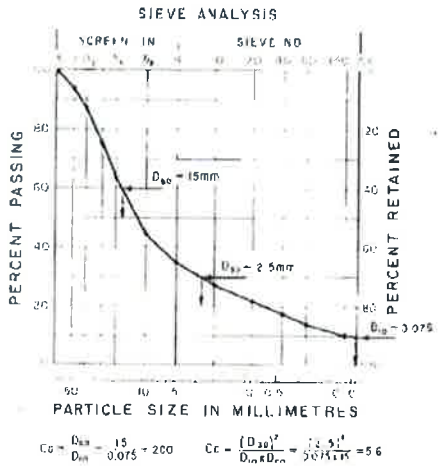
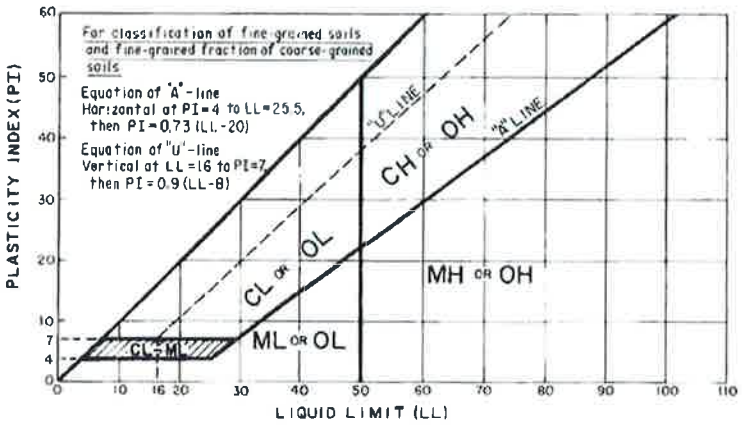
CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM D2487 (Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
COARSE-GRAINED SOILS	Gravels (More than 50 % of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5 % fines[C])	Cu ≥ 4 and 1 ≤ Cc ≤ 3[D]	GW	Well-graded gravel[E]
			Cu < 4 and/or [Cc < 1 or Cc > 3][D]	GP	Poorly graded gravel[E]
		Gravels with Fines (More than 12 % fines[C])	Fines classify as ML or MH	GM	Silty gravel[E,F,G]
More than 50 % retained on No. 200 sieve			Fines classify as CL or CH	GC	Clayey gravel[E,F,G]
	Sands (50 % or more of coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5 % fines[H])	Cu ≥ 6 and 1 ≤ Cc ≤ 3[D]	SW	Well-graded sand[I]
			Cu < 6 and/or [Cc < 1 or Cc > 3][D]	SP	Poorly graded sand[I]
		Sands with Fines (More than 12 % fines[H])	Fines classify as ML or MH	SM	Silty sand[F,G,I]
			Fines classify as CL or CH	SC	Clayey sand[F,G,I]
FINE-GRAINED SOILS	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	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OL	Organic clay[K,L,M,N] / Organic silt[K,L,M,O]
50 % or more passes the No. 200 sieve	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	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OH	Organic clay[K,L,M,P] / Organic silt[K,L,M,O]
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12 % fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
[D] $Cu = D_{60}/D_{10}$ $Cc = (D_{30})^2 / D_{10} \times D_{60}$
[E] If soil contains ≥15 % sand, add "with sand" to group name.
[F] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[G] If fines are organic, add "with organic fines" to group name.
[H] Sands with 5 to 12 % fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay
[I] If soil contains ≥15 % gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to <30 % plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥30 % plus No. 200, predominantly sand, add "sand " to group name.
[M] If soil contains ≥30 % plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.





FIELD EXPLORATION PROCEDURES

Soil Sampling

Soil sampling was performed in accordance with ASTM D 1586. Using this procedure, a 2" O.D. split barrel sampler is driven into the soil by a 140 pound weight falling 30". After an initial set of 6", the number of blows required to drive the sampler an additional 12" is known as the penetration resistance, or N value. The N value is an index of the relative density of cohesionless soils and the consistency of cohesive soils. Thin wall tube samples were obtained according to ASTM D 1587 where indicated by the appropriate symbol on the boring logs. Rock core samples, if taken, were obtained by rotary drilling in accordance with ASTM D 2113. Power auger borings, if performed, were done in general accordance with ASTM D 1452.

Soil Classification

As the samples were obtained in the field, they were visually and manually classified by the crew chief in accordance with ASTM D 2488. Representative portions of the samples were then returned to the laboratory for further examination and for verification of the field classification. Logs of the borings indicating the depth and identification of the various strata, the N value, the laboratory test data, water level information and pertinent information regarding the method of maintaining and advancing the drill holes are attached. The descriptive terminology and symbols used on the boring logs are also attached.

PREREQUISITES FOR SOUND ENGINEERING PRACTICE

In order to properly evaluate the foundation soils at a building site, it is imperative for our firm to know exactly where the building will be placed, its size, and the elevation of the foundation elements. Without this information, a judgment regarding the adequacy of the preparatory foundation earthwork is not possible.

This project data is especially critical in situations when the excavation extends below the footing grade and compacted fill is required to attain building elevations. In these situations, the excavation would require lateral oversizing to provide suitable lateral distribution of the footing loads.

Offset batter boards of the building lines stakes provide the best on-site verification of the building location and size. It must be recognized that Element St. Paul does not practice in the field of surveying. Therefore, we must rely on staking by others. If Element St. Paul is required to perform the survey, we will retain a licensed surveyor and invoice our client for the amount per our current fee schedule. Provision of the building foundation plans is also important so that we may properly perform our engineering judgments.

If the construction is redesigned or otherwise moved subsequent to our work, we should be informed so our firm can assess if additional engineering observation is required or suggest sound engineering alternatives. We cannot be responsible for any soil foundation system if the structure has been relocated with respect to the excavation subsequent to our observations.

CONSTRUCTION OBSERVATIONS AND TESTING

The recommendations made in this report have been made based on the subsurface conditions found in the borings. It is possible that there are soil and water conditions on site that were not represented by the borings. Consequently, on-site observation during construction is considered integral to the successful implementation of the recommendations. We believe that qualified field personnel need to be on site at the times outlined below to observe the site conditions and effectiveness of the construction.

We recommend that the completed excavation and prepared subgrade be observed and tested by a soils engineer/technician prior to fill placement or construction of any foundation elements. These observations would be necessary to judge if all unsuitable materials have been removed from within the planned construction area and that an appropriate degree of lateral oversize has been provided for in those areas where fill will be placed below the bottom of foundation grade.

We recommend a representative number of field density tests be taken in all engineered fill placed to aid in judging its suitability. We suggest that at least one density test be performed for at least every 2,500 square feet of engineered fill placed for every 2' of fill depth. Additional tests should be taken where confined areas are compacted. Any proposed fill material should be submitted to the laboratory for tests to check compliance with our recommendations and project specifications.

PRECAUTIONS FOR EXCAVATING AND REFILLING DURING COLD WEATHER

The winter season in this area presents specific problems for foundation construction. Soils that are allowed to freeze undergo a moisture volume expansion, resulting in loss of density. These frost-expanded soils will consolidate upon thawing, causing settlement of any structure supported on them. To prevent this settlement, frost should not be allowed to penetrate into the soils below any proposed structure.

Ideally, winter excavation should be limited to areas small enough to be refilled to grade higher than footing grade on the same day. Typically, these areas should be filled to floor grade. Trenching back down to unfrozen soils for foundation construction can then be performed just prior to footing placement. The excavated trenches should be protected from freezing by means of insulating or heating during foundation construction. Backfilling of the foundation trenches should be performed immediately after the below-grade foundation construction is finished. In addition, any interior footings or footings designed without frost protection should be extended below frost depth, unless adequate precautions are taken to prevent frost intrusion until the building can be enclosed and heated.

In many cases, final grade cannot be attained in one day's time, even though small areas are worked. In the event final grade cannot be attained in one day's time, frost can be expected to develop overnight. Leaving a layer of loose soil on top of the compacted material overnight can minimize the depth of frost penetration. However, any frost that forms in this loose layer, or snow that accumulates, should be completely removed from the fill area prior to compaction and additional soil placement. Frozen soils or soils containing frozen material or snow should never be used as fill material.

After the structure has been enclosed, all floor slab areas should be subjected to ample periods of heating to allow thawing of the soil system. Alternatively, the frozen soil can be completely removed and be replaced with an engineered fill. The floor slab areas should be checked at random and representative locations for remnant areas of frost and density tests should be performed to document fill compaction to slab placement.

Due to the potential problems associated with fill placement during cold weather, a full-time, on-site soils technician should monitor any filling operations. Full-time monitoring aids in detecting areas of frozen material, or potential problems with frozen material within the fill, so the appropriate measures can be taken. The choice of fill material is particularly important during cold weather, since clean granular fill material can be placed and compacted more efficiently than silty and clayey soils. In addition, greater magnitudes of heaving can be expected with freezing of the more frost susceptible silts and clays.

If more specific frost information or cold weather data concerning other construction materials is required, please contact us.

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October 17, 2018

City of Mendota Heights
c/o TKDA
Attn: Mr. Larry Poppler, P.E.
Group Manager, Municipal Services
444 Cedar Street, Suite 1500
Saint Paul, MN 55101

RE: Addendum #1 to Geotechnical Exploration Program
City of Mendota Heights Marie Avenue and Wesley Neighborhood
Rehabilitation Projects
Mendota Heights, Minnesota
Element Materials Technology St. Paul Inc. Project No. ESP029130P

Dear Mr. Poppler:

Per our discussions we were requested to review the previously prepared geotechnical report for the project and provide additional analysis and recommendations as to the feasibility of the following pavement rehabilitation options as a means of minimizing overall project costs:

- Reduce the pavement section thicknesses of the Wesley Neighborhood street rehabilitation project and/or forego performing additional subgrade excavation and subsequent sand replacement in lieu of just placing the proposed reclaimed aggregate base section.
- Reduce the pavement section thicknesses of Marie Avenue project and/or forego performing additional subgrade excavation and subsequent sand replacement in lieu of just placing the proposed reclaimed aggregate base section.
- Mill off and/or remove existing bituminous pavement within trail rehabilitation areas and repave with 3” of bituminous without replacing aggregate base section. Bituminous trail areas adjacent to concrete curb would be reclaimed, reshaped, surface compacted and repaved with 3” of bituminous without replacing aggregate base section.

Based on our review of the project pavement areas, existing in-situ soil conditions as depicted by the soil boring logs, apparent density of the soil profile based on the standard penetration tests (N-values) obtained during drilling activities, reviewing gravel equivalencies for pavement design, and our experience with similar projects we have provided below additional comments and recommendations regarding the proposed pavement options by the City.

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Comments/Recommendations:

- We do not recommend reducing the pavement section thickness design for the Wesley Neighborhood. The Gravel Equivalencies (GE) of the proposed pavement (GE=19) based on an R-value of 35 and design 20-year ESALs of 325,000 is just slightly larger than the required GE of 18.6 needed. However, to save costs it may be feasible to forego performing additional subgrade excavation and subsequent sand replacement at boring locations B23, B26, B28, and B29 provided extensive proof-rolling is performed to verify that a stable and compacted subgrade is present within these areas. Please see below for additional recommendations.
- In an effort to save costs it may be feasible to slightly reduce the pavement section thicknesses for Marie Avenue based on the provided Annual Average Daily Traffic (AADT) counts ranging from 3,200 to 3,800 and anticipated growth rate. Specifically, lowering the reclaimed aggregate base thickness from 12" to 10" is possible. Also, it may be feasible to forego performing additional subgrade excavation and subsequent sand replacement at boring locations B14, B15, B17, and B18 provided extensive proof-rolling is performed to verify that a stable and compacted subgrade is present within these areas. Due to the soil profile as depicted by the soil boring logs we further recommend lowering the R-value to 35 for Marie Avenue for the analysis due to leaving in-place potential more frost susceptible soils for a more highly trafficked roadway. The Gravel Equivalencies (GE) of the proposed new pavement (GE=23.5) based on an R-value of 35 and design 20-year ESALs of 670,000 is just slightly larger than the required GE of 23 needed.
- In an effort to save costs trail areas should be evaluated and proof-rolled once existing bituminous is milled off and/or removed. In our opinion, at a minimum, additional MnDOT Class 5 base aggregate will most likely be required to be placed to aid in re-grading and stabilizing existing base grade of trail areas prior to pavement operations. This is especially apparent near existing wetland areas where obvious pavement settlement and surface distress has been observed. In trail areas adjacent to existing roadways where the City would like to reclaim in-place pavements and cap with 3" of new bituminous we recommend proof-rolls are performed to verify stability of the reclaimed material prior to pavement operations. Areas that fail proof-rolling or have settled should be corrected prior to continued construction.
- Summary of Proposed New Pavement Sections

Pavement Section Profile	Street Section Thickness 7-ton (Wesley Neighborhood)	Street Section Thickness 9-ton (Marie Avenue)	Bituminous Trail
Mn/DOT Spec. 2360 Type SP9.5 Bituminous Wear Course	2"	2"	3"
Mn/DOT Spec. 2360 Type SP12.5 Bituminous Non-wear Binder Course	--	2"	--
Mn/DOT Spec. 2360 Type SP12.5 Bituminous Non-wear Base Course	2"	2"	--
Mn/DOT Spec. 3138 Reclaimed Aggregate Base Meeting Class 5 Specifications	10"	10"	6" (1)
Approved Subgrade Per MNDOT Specifications 2111 Test Rolling and 2112 Subgrade Preparation	Yes	Yes	Yes

(1) Thickness measurements of the in-place base aggregate should be performed to verify minimum thickness requirements have been achieved. Additional aggregate base should be added where needed to meet minimum thickness requirements.

General Pavement Comments/Recommendations:

- Pavement reclamation where performed should conform to MnDOT Specification 2215 Reclamation.
- In areas where unstable subgrade is determined to be present additional excavation should be performed and these areas should be replaced with either 3" minus crushed clear rock aggregate or additional reclaimed aggregate base for stabilization. We recommend that line item bid quantities and costs should be placed within the project budget for these items and used on an as needed basis.
- In areas where reclaimed aggregate base is failing to meet MnDOT aggregate base requirements we recommend placing additional 1" minus crushed clear rock aggregate at the surface. The aggregate can then be bladed and mixed in the upper 3" to 4" during tolerancing of the aggregate base section and compacted in-place. In our opinion the additional aggregate will help lock together and stabilize the aggregate base section supporting the roadways and save costs of removing, remixing, and blending the entire reclaimed section.
- Bid items for use of additional Class 5 base aggregate, 1" and 3" minus crushed clear rock, where needed should be placed in the project documents.
- By reducing the sand section somewhat it is more likely that during periods of freezing and thawing that expansion and contraction of the subgrade soils may occur in a manner that may affect overall pavement performance. The City should be made aware that additional maintenance may likely be needed to sustain the pavement life when less cleaner granular sands are present within the upper 3' of subgrade.
- The pavement design section assumes the reclaimed aggregate base will be compacted to a minimum of 100% of the Standard Proctor density and the bituminous pavement placed and compacted to a minimum of 92% of the maximum specific gravity.
- The pavement design also assumes that a regular, conscientious maintenance program is performed. It is possible that seal coating may extend the pavement life somewhat. We caution that reduced pavement section thicknesses may result in a reduced service life and increased maintenance.

Remarks:

This addendum report is intended as a supplement to our original geotechnical report dated September 28, 2018, for this project and not a standalone report. Please see original geotechnical report for additional recommendations.

We are pleased to be of service to you in this important phase of the project. If there are any questions regarding the information contained in this report or if we can be of further service to you, please contact John Starke at (651) 645-7429, email: john.starke@element.com or Mark Straight at (651) 659-7447, email: at mark.straight@element.com.

Respectfully Submitted,

ELEMENT MATERIALS TECHNOLOGY ST. PAUL INC.

John Starke, P.E.
Senior Geotechnical Engineer
MN Reg. No. 23546

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Senior Project Engineer
MN Reg. No. 41658

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TKDA
Attn: Mr. Larry Poppler, P.E.
Group Manager, Municipal Services
444 Cedar Street, Suite 1500
Saint Paul, MN 55101

2018 STORMWATER BASIN SEDIMENT TESTING
Basins at Intersections of Marie/Lexington and Marie/Sutton
City of Mendota Heights, Minnesota

Date: October 25, 2018
Project Number: ESP029130P

This letter presents the results of environmental chemical testing and analysis preformed on six (6) sediment samples collected from two stormwater basins located near the above referenced road intersections in the City of Mendota Heights, Minnesota. The testing was performed to aid the City with sediment removal best management practices. The sediment samples were obtained and analyzed in general accordance with Minnesota Pollution Control Agency (MPCA) Managing Storm Water Sediment Best Management Practices Guidelines. A total of six (6) test specimens (HA7 through HA12) were collected from the two stormwater basins and submitted to an MPCA approved testing laboratory (Pace Analytical) for chemical analysis including extended Polycyclic Aromatic Hydrocarbons PAH's, Copper, and Arsenic.

The stromwater basins are located in a historically "residential" setting, having private residences surrounding the basins. Generally the edges around the basins were overgrown with trees and shrubs. Sample locations were selected based upon accessibility to the basins and to provide good spatial representation of sediments within the basins. The approximate location of the sediment collection points are shown on the attached Sediment Sample Location Plan.

At the time of our sampling and testing, additional information regarding the proposed depth and volume of the sediment removal was not defined. As such, samples were selected at depths ranging from approximately 1' to 2' below the mudline which is expected to encompass the sediment removal zone. The soft sediment encountered in the hand auger borings ranged in thickness from approximately 1' to 2' based upon penetration of a 3/8" diameter steel rod. The sediment encountered at these locations predominately consisted of either organic Sandy Lean Clay (CL-OL) or organic Silty Sand (SM-OL). The hand auger boring logs are attached.

Results of the chemical analysis (extended PAH's, Copper, and Arsenic) conducted on the six (6) sediment samples are summarized in the attached Table 1. This table also presents the MPCA Soil Reference Value (SRV) based upon "Residential" and "Industrial" land use. The test results show all non-carcinogenic PAHs are below Industrial and Residential SRV limits. The calculated B[a]P's for all carcinogenic PAH's are also below Industrial and Residential limits. The Pace Analytical test reports for the tested samples are attached.

Additional chemical and physical laboratory test work and analysis could be required should more information on the volume of excavated sediments and land use setting for the dredged materials becomes further defined by the City.

Thank you for the opportunity to be of service to you in this important phase of the project. If you have any questions, please contact me at 651-659-7429.

ELEMENT MATERIALS TECHNOLOGY ST. PAUL INC.

This report was:

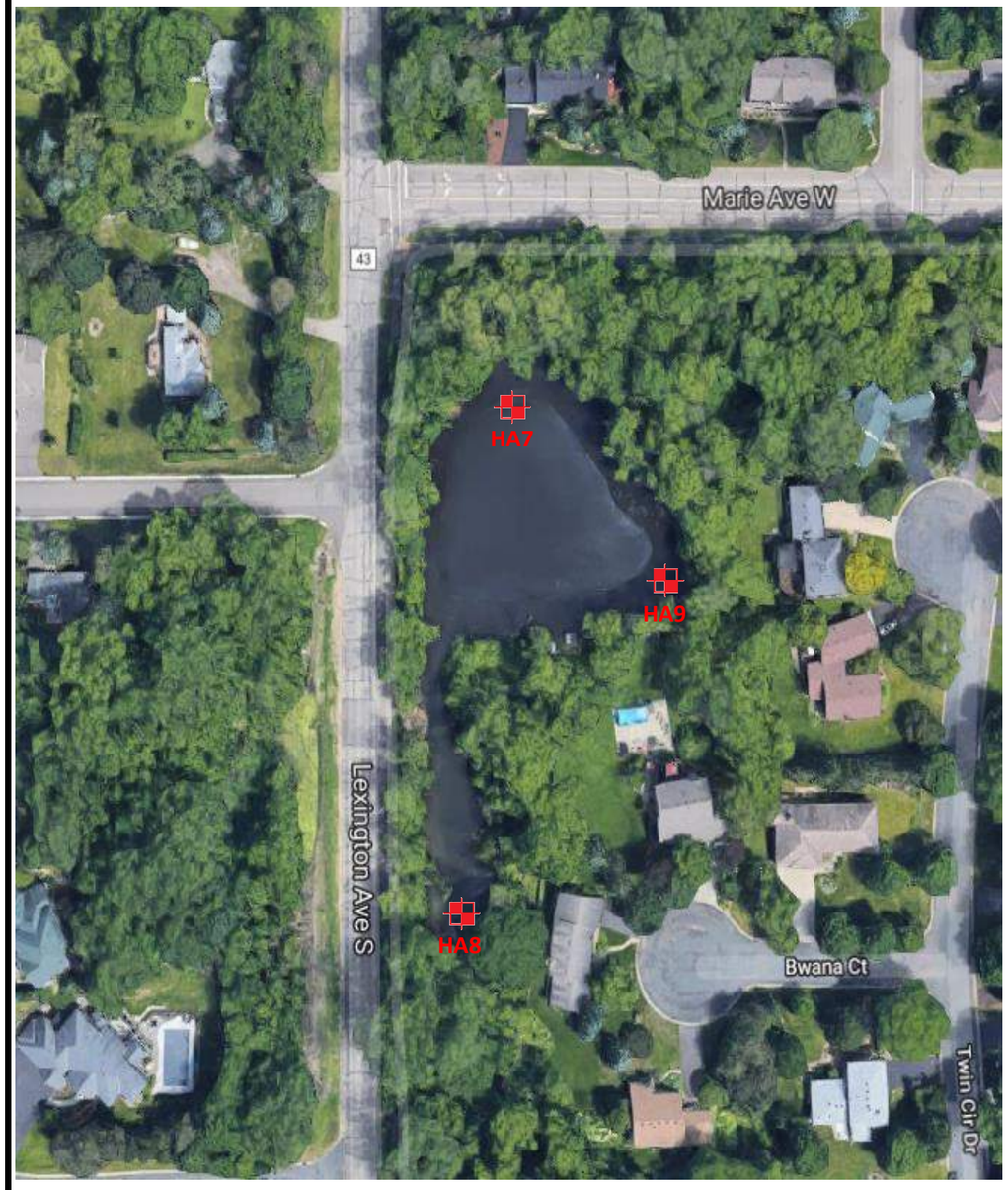
Prepared by: _____

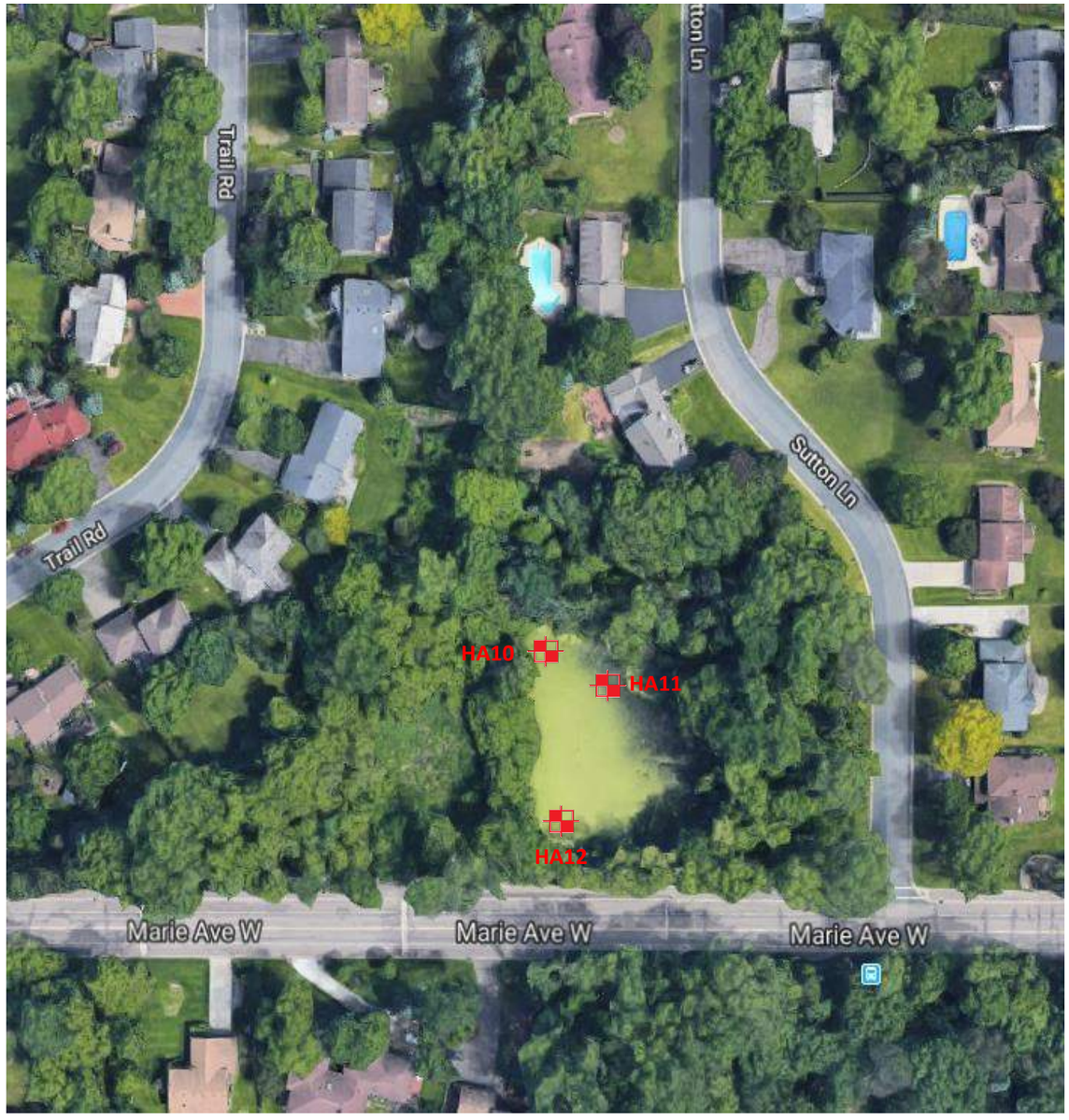
John Starke, P.E
Senior Geotechnical Engineering

Attachments:
-Sediment Sample Location Plan (1 page)
-Hand Auger Boring Logs (6 pages)
-Table 1 – Summary of Stormwater Basin Sediment Testing Results (1 page)
-Pace Analytical Test Report (20 pages)

F:\2018 Projects\CME GEO\GEO\ESP029130P - TKDA for City of Mendota Heights Marie Wesley Neighborhood Improvements\Sediment analysis\2018 Pond Testing Letter.doc

Pond Sediment Sample Location Plan





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Phone: 651-645-3601

Project: Marie Avenue Wesley Neighborhood Rehabilitation Projects

Client: City Of Mendota Heights c/o TKDA

Project No. ESP029130P

Approximate Sediment Sample Location (6)

N W E S

*Aerial Map provided by Google Earth Maps

**Map is not to Scale

Project No. ESP029130P	LOG OF BORING NO. HA7	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: MSL ▽	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
Pond Water										
1.5										
ORGANIC SANDY LEAN CLAY, with root fibers, dark brown, wet, very soft, (CL-OL).		LACUSTRINE			1	AUGER	24			
3.5										
Steel Probe Refusal										

WATER LEVEL OBSERVATIONS	
WL	▽ 0

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STARTED	10/12/18	FINISHED	10/12/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	JS
LOGGED BY	JK	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. HA8	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: MSL ▽	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
Pond Water										
1.5 ORGANIC SILTY SAND, with root fibers, brown, wet, very loose, (SM-OL).		LACUSTRINE			1	AUGER	18			
3.0 Steel Probe Refusal										

WATER LEVEL OBSERVATIONS		
WL	▽	0

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STARTED	10/12/18	FINISHED	10/12/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	JS
LOGGED BY	JK	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. HA9	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: MSL ▽	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
Pond Water										
1.5 ORGANIC LEAN CLAY, with root fibers, black, wet, very soft (CL-OL).		LACUSTRINE			1	AUGER	24			
3.5 Steel Probe Refusal										

WATER LEVEL OBSERVATIONS	
WL	▽ 0

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STARTED	10/12/18	FINISHED	10/12/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	JS
LOGGED BY	JK	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. HA10	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: MSL ▽	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
Pond Water										
1.0										
ORGANIC SILTY SAND, with gravel, with root fibers, mixed dark brown and black, wet, very loose (SM-OL).		LACUSTRINE			1	AUGER	24			
3.0										
Steel Probe Refusal										

WATER LEVEL OBSERVATIONS	
WL	▽ 0

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STARTED	10/12/18	FINISHED	10/12/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	JS
LOGGED BY	JK	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. HA11	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: MSL ▽	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
Pond Water										
1.5										
ORGANIC SANDY LEAN CLAY, with root fibers, black, wet, very soft (CL-OL).		LACUSTRINE			1	AUGER	18			
3.0										
Steel Probe Refusal										

WATER LEVEL OBSERVATIONS	
WL	▽ 0

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Telephone: 651-645-3601

STARTED	10/12/18	FINISHED	10/12/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	JS
LOGGED BY	JK	APPROVED	MAS

Project No. ESP029130P	LOG OF BORING NO. HA12	Sheet 1 of 1

CLIENT	ARCHITECT/ENGINEER
City of Mendota Heights	TKDA
SITE	**PROJECT**
Mendota Heights, Minnesota	Marie Avenue and Wesley Street Rehabilitation

Surface Elev.: Datum: MSL ▽	GRAPHIC LOG	GEOLOGY	DEPTH (FT.)	SAMPLES: BLOWS/12" N - VALUE RQD	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: IN. RECOVERED IN. DRIVEN	TESTS: MOISTURE, %	TESTS: DRY DENSITY PCF	ADDITIONAL DATA/ REMARKS
Pond Water										
2.5										
MIXTURE OF ORGANIC SILTY SAND AND SANDY LEAN CLAY, with a little gravel, dark brown to black, wet, very soft and loose (CL-OL/SM-OL).		LACUSTRINE			1	AUGER	12			
3.5 Steel Probe Refusal										

WATER LEVEL OBSERVATIONS	
WL	▽ 0

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Telephone: 651-645-3601

STARTED	10/12/18	FINISHED	10/12/18
DRILL CO.	Element	DRILL RIG	HA
DRILLER	JK	ASS'T DRILLER	JS
LOGGED BY	JK	APPROVED	MAS

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Table 1 - Summary of Stormwater Basin Sediment Testing Results

Project Name: 2018 Storm Water Basin Sediment Testing, City of Mendota Heights

Sample Date: October 12, 2018

Element Projcet No. ESP029130P

Parameters	Insert Reporting Limit*	Residential SRV Values	Industrial SRV Values	Sample Locations and Depths											
				HA7		HA8		HA9		HA10		HA11		HA12	
		mg/kg	mg/kg	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Metals	**mg/kg**														
Arsenic	1.4	9	20	3.1		2.1		4		2.7		3.1		2.8	
Copper	0.72	100	9000	15.8		8.4		14.2		11.0		10.2		15.6	
Noncarcinogenic PAHs	**mg/kg**														
Acenapthene	0.010	1,200	5,260	0.0152		0.0125		0.0136		0.0118		0.012		0.0151	
Acenapthylene	0.010	na	na	0.0152		0.0125		0.0136		0.0118		0.012		0.0151	
Anthracene	0.010	7,880	45,400	0.0152		0.0125		0.0136		0.0118		0.012		0.0151	
Benzo(g,h,i)perlyene	0.010	na	na	0.0152		0.0125		0.0136		0.0118		0.258		0.0151	
Fluoranthene	0.010	1,080	6,800	0.0152		0.0125		0.0193		0.0155		0.0843		0.0151	
Fluorene	0.010	850	4,120	0.0152		0.0125		0.0136		0.0118		0.012		0.0151	
2-Methylnapthalene	0.010	100	369	0.0152		0.0125		0.0136		0.0118		0.012		0.0151	
Naphthalene	0.010	10	28	0.0152		0.0125		0.0136		0.0118		0.012		0.0151	
Phenanthrene	0.010	na	na	0.0152		0.0125		0.0136		0.0118		0.028		0.0151	
Pyrene	0.010	890	5,800	0.0152		0.0125		0.0136		0.0118		0.0672		0.0151	
Carcinogenic PAHs & Total B[a]P Equivalents	**Insert Reporting Limit* mg/kg**	**Potency Equiv. Factor (PEF)**		Site Conc.	BaP Equiv.	Site Conc.	BaP Equiv.	Site Conc.	BaP Equiv.	Site Conc.	BaP Equiv.	Site Conc.	BaP Equiv.	Site Conc.	BaP Equiv.
Benzo[a]anthracene	0.010	0.10		0.008	**0.001**	0.006	**0.001**	0.007	**0.001**	0.006	**0.000**	0.006	**0.001**	0.076	**0.008**
Benzo[b,k &j]fluoranthene	0.030	0.10		0.023	**0.002**	0.019	**0.002**	0.020	**0.002**	0.006	**0.001**	0.077	**0.008**	0.076	**0.008**
Benzo[a]pyrene	0.010	1.00		0.008	**0.008**	0.006	**0.006**	0.007	**0.007**	0.006	**0.006**	0.032	**0.032**	0.076	**0.076**
Chrysene	0.010	0.01		0.008	**0.000**	0.006	**0.000**	0.007	**0.000**	0.013	**0.000**	0.043	**0.000**	0.076	**0.001**
Dibenz[a,h]acridine	0.010	0.10		0.008	**0.001**	0.006	**0.001**	0.007	**0.001**	0.006	**0.001**	0.006	**0.001**	0.076	**0.000**
Dibenz[a,h]anthracene	0.010	0.56		0.008	**0.004**	0.006	**0.004**	0.007	**0.004**	0.006	**0.003**	0.006	**0.003**	0.076	**0.000**
7H-Dibenzo[c,g]carbazole	0.010	1.00		0.008	**0.008**	0.006	**0.006**	0.007	**0.007**	0.006	**0.006**	0.006	**0.006**	0.076	**0.000**
Dibenzo[a,e]pyrene	0.010	1.00		0.008	**0.008**	0.006	**0.006**	0.007	**0.007**	0.006	**0.006**	0.014	**0.014**	0.076	**0.000**
Dibenzo[a,h]pyrene	0.010	10.00		0.008	**0.076**	0.006	**0.063**	0.007	**0.068**	0.006	**0.059**	0.006	**0.060**	0.076	**0.005**
Dibenzo[a,i]pyrene	0.010	10.00		0.008	**0.076**	0.006	**0.063**	0.007	**0.068**	0.006	**0.059**	0.006	**0.060**	0.076	**0.005**
Dibenzo[a,l]pyrene	0.010	10.00		0.008	**0.076**	0.006	**0.063**	0.007	**0.068**	0.006	**0.059**	0.006	**0.060**	0.076	**0.005**
7,12 Dimethylbenz-anthracene	0.010	34.00		0.008	**0.258**	0.006	**0.213**	0.007	**0.231**	0.006	**0.201**	0.006	**0.204**	0.076	**0.016**
Indeno[1,2,3,-c,d]pyrene	0.010	0.10		0.008	**0.001**	0.006	**0.001**	0.007	**0.001**	0.006	**0.001**	0.006	**0.001**	0.076	**0.000**
3-Methylcholanthrene	0.010	3.00		0.008	**0.023**	0.006	**0.019**	0.007	**0.020**	0.006	**0.018**	0.006	**0.018**	0.076	**0.001**
5-Methylchrysene	0.010	1.00		0.008	**0.008**	0.006	**0.006**	0.007	**0.007**	0.006	**0.006**	0.006	**0.006**	0.076	**0.000**
Total B[a]P Equivalent		2	3		0.548		0.451		0.491		0.424		0.473		0.125
Total B[a]P Equivalents - Kaplan Meier		2	3		0.548		0.451		0.491		0.424		0.473		0.125

Residential SRV (suitable for residential land use)

Industrial SRV (suitable for industrial land use)

Highlight value for "J" flagged data - sample concentration is above Method Detection Level but is below Reporting Limit

SRV = soil reference value

PAHs = polycyclic aromatic hydrocarbons

B[a]P = benzo[a]pyrene

*** Reporting Limits**- insert reporting limits in this column from the lab analytical results reports (converting to mg/kg if necessary)

B[a]P Equivalent - Each contaminant sample concentration is multiplied by it's Potency Equivalency Factor (PEF) to obtain a B[a]P equivalent concentration. All B[a]P equivalent concentrations are summed to calculate the total B[a]P equivalent concentration. For nondetect data, use the procedures outlined in Appendix B of "Managing Stormwater Sediment BMP Guidance For Municipalities".

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

October 23, 2018

John Starke
Element Materials Technology
662 Cromwell Avenue
Saint Paul, MN 55114

RE: Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

Dear John Starke:
Enclosed are the analytical results for sample(s) received by the laboratory on October 12, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This workorder was revised October 23, 2018 to add results for anthracene.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jared Dickinson
jared.dickinson@pacelabs.com
(612)607-1700
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10451544001	**HA-7A-C**	Solid	10/12/18 08:40	10/12/18 12:28
10451544002	**HA-8A-C**	Solid	10/12/18 09:00	10/12/18 12:28
10451544003	**HA-9A-C**	Solid	10/12/18 09:30	10/12/18 12:28
10451544004	**HA-10A-C**	Solid	10/12/18 09:50	10/12/18 12:28
10451544005	**HA-11A-C**	Solid	10/12/18 10:20	10/12/18 12:28
10451544006	**HA-12A-C**	Solid	10/12/18 10:40	10/12/18 12:28

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10451544001	**HA-7A-C**	EPA 6010D	IP	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	AT1	27	PASI-M
10451544002	**HA-8A-C**	EPA 6010D	IP	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	AT1	27	PASI-M
10451544003	**HA-9A-C**	EPA 6010D	IP	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	AT1	27	PASI-M
10451544004	**HA-10A-C**	EPA 6010D	IP	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	AT1	27	PASI-M
10451544005	**HA-11A-C**	EPA 6010D	IP	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	AT1	27	PASI-M
10451544006	**HA-12A-C**	EPA 6010D	IP	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	AT1	27	PASI-M

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

Sample: HA-7A-C **Lab ID: 10451544001** Collected: 10/12/18 08:40 Received: 10/12/18 12:28 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050							
Arsenic	**3.1**	mg/kg	1.4	1	10/15/18 06:47	10/18/18 14:49	7440-38-2	
Copper	**15.8**	mg/kg	0.72	1	10/15/18 06:47	10/18/18 14:49	7440-50-8	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974							
Percent Moisture	**34.1**	%	0.10	1		10/17/18 15:07		
8270D MSSV CPAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	83-32-9	
Acenaphthylene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	208-96-8	
Anthracene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	120-12-7	
Benzo(a)anthracene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	56-55-3	
Benzo(a)pyrene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	50-32-8	
Benzo(g,h,i)perylene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	191-24-2	
Benzofluoranthenes (Total)	ND	ug/kg	45.5	1	10/16/18 08:14	10/20/18 19:47		N2
Chrysene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	218-01-9	
Dibenz(a,h)acridine	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	226-36-8	N2
Dibenz(a,h)anthracene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	53-70-3	
Dibenzo(a,e)pyrene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	192-65-4	N2
Dibenzo(a,h)pyrene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	189-64-0	N2
Dibenzo(a,i)pyrene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	189-55-9	N2
Dibenzo(a,l)pyrene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	191-30-0	N2
7H-Dibenzo(c,g)carbazole	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	194-59-2	N2
7,12-Dimethylbenz(a)anthracene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	57-97-6	N2
Fluoranthene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	206-44-0	
Fluorene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	193-39-5	
3-Methylcholanthrene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	56-49-5	N2
5-Methylchrysene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	3697-24-3	N2
2-Methylnaphthalene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	91-57-6	
Naphthalene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	91-20-3	
Phenanthrene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	85-01-8	
Pyrene	ND	ug/kg	15.2	1	10/16/18 08:14	10/20/18 19:47	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	76	%.	30-125	1	10/16/18 08:14	10/20/18 19:47	321-60-8	
p-Terphenyl-d14 (S)	83	%.	30-150	1	10/16/18 08:14	10/20/18 19:47	1718-51-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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(612)607-1700

ANALYTICAL RESULTS

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

Sample: HA-8A-C **Lab ID: 10451544002** Collected: 10/12/18 09:00 Received: 10/12/18 12:28 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050							
Arsenic	**2.1**	mg/kg	1.2	1	10/15/18 06:47	10/18/18 15:06	7440-38-2	
Copper	**8.4**	mg/kg	0.61	1	10/15/18 06:47	10/18/18 15:06	7440-50-8	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974							
Percent Moisture	**20.0**	%	0.10	1		10/17/18 15:35		
8270D MSSV CPAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	83-32-9	
Acenaphthylene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	208-96-8	
Anthracene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	120-12-7	
Benzo(a)anthracene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	56-55-3	
Benzo(a)pyrene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	50-32-8	
Benzo(g,h,i)perylene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	191-24-2	
Benzofluoranthenes (Total)	ND	ug/kg	37.4	1	10/16/18 08:14	10/20/18 20:16		N2
Chrysene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	218-01-9	
Dibenz(a,h)acridine	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	226-36-8	N2
Dibenz(a,h)anthracene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	53-70-3	
Dibenzo(a,e)pyrene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	192-65-4	N2
Dibenzo(a,h)pyrene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	189-64-0	N2
Dibenzo(a,i)pyrene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	189-55-9	N2
Dibenzo(a,l)pyrene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	191-30-0	N2
7H-Dibenzo(c,g)carbazole	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	194-59-2	N2
7,12-Dimethylbenz(a)anthracene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	57-97-6	N2
Fluoranthene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	206-44-0	
Fluorene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	193-39-5	
3-Methylcholanthrene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	56-49-5	N2
5-Methylchrysene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	3697-24-3	N2
2-Methylnaphthalene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	91-57-6	
Naphthalene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	91-20-3	
Phenanthrene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	85-01-8	
Pyrene	ND	ug/kg	12.5	1	10/16/18 08:14	10/20/18 20:16	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	78	%.	30-125	1	10/16/18 08:14	10/20/18 20:16	321-60-8	
p-Terphenyl-d14 (S)	81	%.	30-150	1	10/16/18 08:14	10/20/18 20:16	1718-51-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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ANALYTICAL RESULTS

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

Sample: HA-9A-C **Lab ID: 10451544003** Collected: 10/12/18 09:30 Received: 10/12/18 12:28 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050							
Arsenic	**4.0**	mg/kg	1.3	1	10/15/18 06:47	10/18/18 15:09	7440-38-2	
Copper	**14.2**	mg/kg	0.66	1	10/15/18 06:47	10/18/18 15:09	7440-50-8	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974							
Percent Moisture	**26.5**	%	0.10	1		10/17/18 15:36		
8270D MSSV CPAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	83-32-9	
Acenaphthylene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	208-96-8	
Anthracene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	120-12-7	
Benzo(a)anthracene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	56-55-3	
Benzo(a)pyrene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	50-32-8	
Benzo(g,h,i)perylene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	191-24-2	
Benzofluoranthenes (Total)	ND	ug/kg	40.7	1	10/16/18 08:14	10/20/18 20:44		N2
Chrysene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	218-01-9	
Dibenz(a,h)acridine	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	226-36-8	N2
Dibenz(a,h)anthracene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	53-70-3	
Dibenzo(a,e)pyrene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	192-65-4	N2
Dibenzo(a,h)pyrene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	189-64-0	N2
Dibenzo(a,i)pyrene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	189-55-9	N2
Dibenzo(a,l)pyrene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	191-30-0	N2
7H-Dibenzo(c,g)carbazole	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	194-59-2	N2
7,12-Dimethylbenz(a)anthracene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	57-97-6	N2
Fluoranthene	**19.3**	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	206-44-0	
Fluorene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	193-39-5	
3-Methylcholanthrene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	56-49-5	N2
5-Methylchrysene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	3697-24-3	N2
2-Methylnaphthalene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	91-57-6	
Naphthalene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	91-20-3	
Phenanthrene	ND	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	85-01-8	
Pyrene	**16.0**	ug/kg	13.6	1	10/16/18 08:14	10/20/18 20:44	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	75	%.	30-125	1	10/16/18 08:14	10/20/18 20:44	321-60-8	
p-Terphenyl-d14 (S)	85	%.	30-150	1	10/16/18 08:14	10/20/18 20:44	1718-51-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

Sample: HA-10A-C **Lab ID: 10451544004** Collected: 10/12/18 09:50 Received: 10/12/18 12:28 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050							
Arsenic	**2.7**	mg/kg	1.2	1	10/15/18 06:47	10/18/18 15:12	7440-38-2	
Copper	**11.0**	mg/kg	0.59	1	10/15/18 06:47	10/18/18 15:12	7440-50-8	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974							
Percent Moisture	**15.5**	%	0.10	1		10/17/18 15:36		
8270D MSSV CPAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	83-32-9	
Acenaphthylene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	208-96-8	
Anthracene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	120-12-7	
Benzo(a)anthracene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	56-55-3	
Benzo(a)pyrene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	50-32-8	
Benzo(g,h,i)perylene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	191-24-2	
Benzofluoranthenes (Total)	ND	ug/kg	35.3	1	10/16/18 08:14	10/20/18 22:10		N2
Chrysene	**12.9**	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	218-01-9	
Dibenz(a,h)acridine	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	226-36-8	N2
Dibenz(a,h)anthracene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	53-70-3	
Dibenzo(a,e)pyrene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	192-65-4	N2
Dibenzo(a,h)pyrene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	189-64-0	N2
Dibenzo(a,i)pyrene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	189-55-9	N2
Dibenzo(a,l)pyrene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	191-30-0	N2
7H-Dibenzo(c,g)carbazole	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	194-59-2	N2
7,12-Dimethylbenz(a)anthracene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	57-97-6	N2
Fluoranthene	**15.5**	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	206-44-0	
Fluorene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	193-39-5	
3-Methylcholanthrene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	56-49-5	N2
5-Methylchrysene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	3697-24-3	N2
2-Methylnaphthalene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	91-57-6	
Naphthalene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	91-20-3	
Phenanthrene	ND	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	85-01-8	
Pyrene	**12.3**	ug/kg	11.8	1	10/16/18 08:14	10/20/18 22:10	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	60	%.	30-125	1	10/16/18 08:14	10/20/18 22:10	321-60-8	
p-Terphenyl-d14 (S)	82	%.	30-150	1	10/16/18 08:14	10/20/18 22:10	1718-51-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

Sample: HA-11A-C **Lab ID: 10451544005** Collected: 10/12/18 10:20 Received: 10/12/18 12:28 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050							
Arsenic	**3.1**	mg/kg	1.1	1	10/15/18 06:47	10/18/18 15:15	7440-38-2	
Copper	**10.2**	mg/kg	0.56	1	10/15/18 06:47	10/18/18 15:15	7440-50-8	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974							
Percent Moisture	**16.6**	%	0.10	1		10/17/18 15:36		
8270D MSSV CPAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	83-32-9	
Acenaphthylene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	208-96-8	
Anthracene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	120-12-7	
Benzo(a)anthracene	**27.6**	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	56-55-3	
Benzo(a)pyrene	**32.3**	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	50-32-8	
Benzo(g,h,i)perylene	**25.8**	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	191-24-2	
Benzofluoranthenes (Total)	**76.7**	ug/kg	35.9	1	10/16/18 08:14	10/20/18 22:38		N2
Chrysene	**42.9**	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	218-01-9	
Dibenz(a,h)acridine	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	226-36-8	N2
Dibenz(a,h)anthracene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	53-70-3	
Dibenzo(a,e)pyrene	**13.5**	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	192-65-4	N2
Dibenzo(a,h)pyrene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	189-64-0	N2
Dibenzo(a,i)pyrene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	189-55-9	N2
Dibenzo(a,l)pyrene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	191-30-0	N2
7H-Dibenzo(c,g)carbazole	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	194-59-2	N2
7,12-Dimethylbenz(a)anthracene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	57-97-6	N2
Fluoranthene	**84.3**	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	206-44-0	
Fluorene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	86-73-7	
Indeno(1,2,3-cd)pyrene	**22.0**	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	193-39-5	
3-Methylcholanthrene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	56-49-5	N2
5-Methylchrysene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	3697-24-3	N2
2-Methylnaphthalene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	91-57-6	
Naphthalene	ND	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	91-20-3	
Phenanthrene	**28.0**	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	85-01-8	
Pyrene	**67.2**	ug/kg	12.0	1	10/16/18 08:14	10/20/18 22:38	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	75	%.	30-125	1	10/16/18 08:14	10/20/18 22:38	321-60-8	
p-Terphenyl-d14 (S)	84	%.	30-150	1	10/16/18 08:14	10/20/18 22:38	1718-51-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

Sample: HA-12A-C **Lab ID: 10451544006** Collected: 10/12/18 10:40 Received: 10/12/18 12:28 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050							
Arsenic	**2.8**	mg/kg	1.5	1	10/15/18 06:47	10/18/18 15:18	7440-38-2	
Copper	**15.6**	mg/kg	0.75	1	10/15/18 06:47	10/18/18 15:18	7440-50-8	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974							
Percent Moisture	**34.2**	%	0.10	1		10/17/18 15:36		
8270D MSSV CPAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	83-32-9	
Acenaphthylene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	208-96-8	
Anthracene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	120-12-7	
Benzo(a)anthracene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	56-55-3	
Benzo(a)pyrene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	50-32-8	
Benzo(g,h,i)perylene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	191-24-2	
Benzofluoranthenes (Total)	ND	ug/kg	45.4	1	10/16/18 08:14	10/20/18 23:07		N2
Chrysene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	218-01-9	
Dibenz(a,h)acridine	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	226-36-8	N2
Dibenz(a,h)anthracene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	53-70-3	
Dibenzo(a,e)pyrene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	192-65-4	N2
Dibenzo(a,h)pyrene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	189-64-0	N2
Dibenzo(a,i)pyrene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	189-55-9	N2
Dibenzo(a,l)pyrene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	191-30-0	N2
7H-Dibenzo(c,g)carbazole	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	194-59-2	N2
7,12-Dimethylbenz(a)anthracene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	57-97-6	N2
Fluoranthene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	206-44-0	
Fluorene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	193-39-5	
3-Methylcholanthrene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	56-49-5	N2
5-Methylchrysene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	3697-24-3	N2
2-Methylnaphthalene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	91-57-6	
Naphthalene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	91-20-3	
Phenanthrene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	85-01-8	
Pyrene	ND	ug/kg	15.1	1	10/16/18 08:14	10/20/18 23:07	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	71	%.	30-125	1	10/16/18 08:14	10/20/18 23:07	321-60-8	
p-Terphenyl-d14 (S)	82	%.	30-150	1	10/16/18 08:14	10/20/18 23:07	1718-51-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
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(612)607-1700

QUALITY CONTROL DATA

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

QC Batch: 569116 Analysis Method: EPA 6010D
QC Batch Method: EPA 3050 Analysis Description: 6010D Solids
Associated Lab Samples: 10451544001, 10451544002, 10451544003, 10451544004, 10451544005, 10451544006

METHOD BLANK: 3088555 Matrix: Solid
Associated Lab Samples: 10451544001, 10451544002, 10451544003, 10451544004, 10451544005, 10451544006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	ND	0.98	10/18/18 14:34	
Copper	mg/kg	ND	0.49	10/18/18 14:34	

LABORATORY CONTROL SAMPLE: 3088556

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	46.7	47.9	102	80-120	
Copper	mg/kg	46.7	47.7	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3088557 3088558

Parameter	Units	10451544001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	3.1	70.2	72.2	66.3	66.3	90	87	75-125	0	20	
Copper	mg/kg	15.8	70.2	72.2	79.1	79.0	90	88	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

QC Batch: 569828
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight / %M by ASTM D2974
Associated Lab Samples: 10451544001

SAMPLE DUPLICATE: 3091867

Parameter	Units	10451544001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	34.1	34.5	1	30	

SAMPLE DUPLICATE: 3092342

Parameter	Units	2610156002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.9	16.1	1	30	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(612)607-1700

QUALITY CONTROL DATA

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

QC Batch: 569832 Analysis Method: ASTM D2974
QC Batch Method: ASTM D2974 Analysis Description: Dry Weight / %M by ASTM D2974
Associated Lab Samples: 10451544002, 10451544003, 10451544004, 10451544005, 10451544006

SAMPLE DUPLICATE: 3091883

Parameter	Units	10451544002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	20.0	20.7	4	30	

SAMPLE DUPLICATE: 3091884

Parameter	Units	10451569005 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.8	10.2	6	30	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

QC Batch: 569402 Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 Analysis Description: 8270D CPAH by SIM MSSV
Associated Lab Samples: 10451544001, 10451544002, 10451544003, 10451544004, 10451544005, 10451544006

METHOD BLANK: 3089821 Matrix: Solid
Associated Lab Samples: 10451544001, 10451544002, 10451544003, 10451544004, 10451544005, 10451544006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
2-Methylnaphthalene	ug/kg	ND	10.0	10/20/18 16:56	
3-Methylcholanthrene	ug/kg	ND	10.0	10/20/18 16:56	N2
5-Methylchrysene	ug/kg	ND	10.0	10/20/18 16:56	N2
7,12-Dimethylbenz(a)anthracene	ug/kg	ND	10.0	10/20/18 16:56	N2
7H-Dibenzo(c,g)carbazole	ug/kg	ND	10.0	10/20/18 16:56	N2
Acenaphthene	ug/kg	ND	10.0	10/20/18 16:56	
Acenaphthylene	ug/kg	ND	10.0	10/20/18 16:56	
Anthracene	ug/kg	ND	10.0	10/20/18 16:56	
Benzo(a)anthracene	ug/kg	ND	10.0	10/20/18 16:56	
Benzo(a)pyrene	ug/kg	ND	10.0	10/20/18 16:56	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	10/20/18 16:56	
Benzofluoranthenes (Total)	ug/kg	ND	30.0	10/20/18 16:56	N2
Chrysene	ug/kg	ND	10.0	10/20/18 16:56	
Dibenz(a,h)acridine	ug/kg	ND	10.0	10/20/18 16:56	N2
Dibenz(a,h)anthracene	ug/kg	ND	10.0	10/20/18 16:56	
Dibenzo(a,e)pyrene	ug/kg	ND	10.0	10/20/18 16:56	N2
Dibenzo(a,h)pyrene	ug/kg	ND	10.0	10/20/18 16:56	N2
Dibenzo(a,i)pyrene	ug/kg	ND	10.0	10/20/18 16:56	N2
Dibenzo(a,l)pyrene	ug/kg	ND	10.0	10/20/18 16:56	N2
Fluoranthene	ug/kg	ND	10.0	10/20/18 16:56	
Fluorene	ug/kg	ND	10.0	10/20/18 16:56	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	10/20/18 16:56	
Naphthalene	ug/kg	ND	10.0	10/20/18 16:56	
Phenanthrene	ug/kg	ND	10.0	10/20/18 16:56	
Pyrene	ug/kg	ND	10.0	10/20/18 16:56	
2-Fluorobiphenyl (S)	%.	81	30-125	10/20/18 16:56	
p-Terphenyl-d14 (S)	%.	85	30-150	10/20/18 16:56	

LABORATORY CONTROL SAMPLE: 3089822

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Methylnaphthalene	ug/kg	100	79.0	79	45-125	
3-Methylcholanthrene	ug/kg	100	73.8	74	32-125	N2
5-Methylchrysene	ug/kg	100	78.9	79	63-125	N2
7,12-Dimethylbenz(a)anthracene	ug/kg	100	76.8	77	30-125	N2,SS
7H-Dibenzo(c,g)carbazole	ug/kg	100	74.2	74	56-125	N2
Acenaphthene	ug/kg	100	77.3	77	45-125	
Acenaphthylene	ug/kg	100	77.9	78	41-125	
Anthracene	ug/kg	100	82.7	83	56-125	
Benzo(a)anthracene	ug/kg	100	73.9	74	58-125	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

LABORATORY CONTROL SAMPLE: 3089822

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzo(a)pyrene	ug/kg	100	78.4	78	59-125	
Benzo(g,h,i)perylene	ug/kg	100	74.5	75	54-125	
Benzofluoranthenes (Total)	ug/kg	300	239	80	58-125	N2
Chrysene	ug/kg	100	75.6	76	62-125	
Dibenz(a,h)acridine	ug/kg	100	80.2	80	56-125	N2
Dibenz(a,h)anthracene	ug/kg	100	77.0	77	54-125	
Dibenzo(a,e)pyrene	ug/kg	100	76.7	77	53-125	N2
Dibenzo(a,h)pyrene	ug/kg	100	78.9	79	52-125	N2
Dibenzo(a,i)pyrene	ug/kg	100	75.3	75	46-125	N2
Dibenzo(a,l)pyrene	ug/kg	100	66.3	66	30-125	N2
Fluoranthene	ug/kg	100	78.7	79	61-125	
Fluorene	ug/kg	100	78.4	78	51-125	
Indeno(1,2,3-cd)pyrene	ug/kg	100	77.0	77	54-125	
Naphthalene	ug/kg	100	77.8	78	41-125	
Phenanthrene	ug/kg	100	81.3	81	58-125	
Pyrene	ug/kg	100	81.2	81	60-125	
2-Fluorobiphenyl (S)	%.			80	30-125	
p-Terphenyl-d14 (S)	%.			83	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3089823 3089824

Parameter	Units	10451366001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
2-Methylnaphthalene	ug/kg	ND	158	158	102	125	64	78	44-125	21	30	
3-Methylcholanthrene	ug/kg	ND	158	158	106	144	57	81	32-125	31	30	N2,R1
5-Methylchrysene	ug/kg	ND	158	158	115	167	60	93	43-132	37	30	N2,R1
7,12-Dimethylbenz(a)anthracene	ug/kg	ND	158	158	89.0	119	56	75	30-125	29	30	N2,SS
7H-Dibenzo(c,g)carbazole	ug/kg	ND	158	158	105	128	67	81	30-135	20	30	N2
Acenaphthene	ug/kg	ND	158	158	111	152	62	88	30-150	31	30	R1
Acenaphthylene	ug/kg	ND	158	158	110	143	60	80	30-125	26	30	
Anthracene	ug/kg	ND	158	158	128	268	46	134	30-150	70	30	R1
Benzo(a)anthracene	ug/kg	435	158	158	309	842	-80	257	30-150	93	30	M1,R1
Benzo(a)pyrene	ug/kg	603	158	158	393	994	-132	247	30-150	87	30	M1,R1
Benzo(g,h,i)perylene	ug/kg	562	158	158	359	823	-128	165	30-150	78	30	M1,R1
Benzofluoranthenes (Total)	ug/kg	1450	475	475	1010	2330	-93	185	30-150	79	30	M1,N2,R1
Chrysene	ug/kg	694	158	158	441	1140	-160	284	30-150	89	30	M1,R1
Dibenz(a,h)acridine	ug/kg	ND	158	158	124	177	78	112	30-148	36	30	N2,R1
Dibenz(a,h)anthracene	ug/kg	137	158	158	172	305	22	106	30-150	56	30	M1,R1
Dibenzo(a,e)pyrene	ug/kg	291	158	158	237	484	-34	122	30-150	69	30	M1,N2,R1
Dibenzo(a,h)pyrene	ug/kg	147	158	158	175	308	18	102	30-150	55	30	M1,N2,R1
Dibenzo(a,i)pyrene	ug/kg	ND	158	158	128	173	81	109	30-125	30	30	N2
Dibenzo(a,l)pyrene	ug/kg	ND	158	158	96.2	133	61	84	30-125	32	30	N2,R1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3089823 3089824

Parameter	Units	10451366001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoranthene	ug/kg	1270	158	158	694	2330	-363	667	30-150	108	30	M1,R1
Fluorene	ug/kg	ND	158	158	114	168	61	95	30-150	38	30	R1
Indeno(1,2,3-cd)pyrene	ug/kg	477	158	158	320	748	-100	171	30-150	80	30	M1,R1
Naphthalene	ug/kg	ND	158	158	94.1	112	59	71	31-125	18	30	
Phenanthrene	ug/kg	419	158	158	303	1110	-73	437	30-150	114	30	M1,R1
Pyrene	ug/kg	1010	158	158	593	1890	-265	556	30-150	105	30	M1,R1
2-Fluorobiphenyl (S)	%.						65	81	30-125			D3
p-Terphenyl-d14 (S)	%.						69	85	30-150			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
R1	RPD value was outside control limits.
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: ESP029130P Mendota Heights Sed-Revised Report
Pace Project No.: 10451544

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10451544001	**HA-7A-C**	EPA 3050	569116	EPA 6010D	569241
10451544002	**HA-8A-C**	EPA 3050	569116	EPA 6010D	569241
10451544003	**HA-9A-C**	EPA 3050	569116	EPA 6010D	569241
10451544004	**HA-10A-C**	EPA 3050	569116	EPA 6010D	569241
10451544005	**HA-11A-C**	EPA 3050	569116	EPA 6010D	569241
10451544006	**HA-12A-C**	EPA 3050	569116	EPA 6010D	569241
10451544001	**HA-7A-C**	ASTM D2974	569828		
10451544002	**HA-8A-C**	ASTM D2974	569832		
10451544003	**HA-9A-C**	ASTM D2974	569832		
10451544004	**HA-10A-C**	ASTM D2974	569832		
10451544005	**HA-11A-C**	ASTM D2974	569832		
10451544006	**HA-12A-C**	ASTM D2974	569832		
10451544001	**HA-7A-C**	EPA 3550	569402	EPA 8270D by SIM	570217
10451544002	**HA-8A-C**	EPA 3550	569402	EPA 8270D by SIM	570217
10451544003	**HA-9A-C**	EPA 3550	569402	EPA 8270D by SIM	570217
10451544004	**HA-10A-C**	EPA 3550	569402	EPA 8270D by SIM	570217
10451544005	**HA-11A-C**	EPA 3550	569402	EPA 8270D by SIM	570217
10451544006	**HA-12A-C**	EPA 3550	569402	EPA 8270D by SIM	570217

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accur

WO# : 10451544

10451544

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Element Materials Technology	Report To: John Starke, P.E	Attention:
Address: 662 Cromwell Ave	Copy To:	Company Name:
St. Paul, MN		Address:
Email To: john.starke@element.com	Purchase Order No.: ESP0508018PO	Pace Quote Reference:
Phone: 651-756-9164 Fax:	Project Name: Medota Heights Sediment Testing	Pace Project Manager:
Requested Due Date/TAT:	Project Number: ESP0291308P	Pace Profile #: see JDD

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

ITEM #	Sample ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analysis Test: Arsenic	Copper	Extend PAH as attached	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	HA-7A-C		G	10-12	8:30	10-12	8:40		3										✓	✓	✓		001
2	HA-8A-C		G	10-12	8:50	10-12	9:00		3										✓	✓	✓		002
3	HA-9A-C		G	10-12	9:20	10-12	9:30		3										✓	✓	✓		003
4	HA-10A-C		G	10-12	9:40	10-12	9:50		3										✓	✓	✓		004
5	HA-11A-C		G	10-12	10:10	10-12	10:20		3										✓	✓	✓		005
6	~~HA-12~~ HA-12A-C		G	10-12	10:30	10-12	10:40		3										✓	✓	✓		006
7			G	10-12	10:50	10-12	11:00		3										✓	✓	✓		
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Maximum MDL limits as attached		10-12-18	12:34 P		10/12/18	1229	22	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: John Kesler

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10-12-18

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 1 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Element Materials **Project #:** **WO#: 10451544**

PM: JDD **Due Date: 10/19/18**

CLIENT: Element M.T.

Courier: ☐Fed Ex ☐UPS ☐USPS ☑Client ☐Commercial ☐Pace ☐SpeeDee ☐Other:

Tracking Number:

Custody Seal on Cooler/Box Present? ☐Yes ☑No **Seals Intact?** ☐Yes ☑No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☑Bubble Wrap ☑Bubble Bags ☐None ☐Other: **Temp Blank?** ☑Yes ☐No

Thermometer Used: ☑G87A9170600254 ☐G87A9155100842 **Type of Ice:** ☑Wet ☐Blue ☐None ☐Dry ☐Melted

Cooler Temp Read (°C): 2.0 **Cooler Temp Corrected (°C):** 2.2 **Biological Tissue Frozen?** ☐Yes ☐No ☑N/A

Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** AS 10/12/18

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐Yes ☑No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☑No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑Yes	☐No		1.
Chain of Custody Filled Out?	☑Yes	☐No		2.
Chain of Custody Relinquished?	☑Yes	☐No		3.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time?	☑Yes	☐No		5.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No		6.
Rush Turn Around Time Requested?	☐Yes	☑No		7.
Sufficient Volume?	☑Yes	☐No		8.
Correct Containers Used?	☑Yes	☐No		9.
-Pace Containers Used?	☑Yes	☐No		
Containers Intact?	☑Yes	☐No		10.
Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☑N/A	11. Note if sediment is visible in the dissolved container
Is sufficient information available to reconcile the samples to the COC? Matrix: SL	☑Yes	☐No		12. Some labels on containers are smeared a bit hard to read
All containers needing acid/base preservation have been checked?	☐Yes	☐No	☑N/A	13. ☐HNO_3 ☐H_2SO_4 ☑NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide)	☐Yes	☐No	☑N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes	☐No	☑N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐Yes	☐No	☑N/A	14.
Trip Blank Present?	☐Yes	☐No	☑N/A	15.
Trip Blank Custody Seals Present?	☐Yes	☐No	☑N/A	
Pace Trip Blank Lot # (if purchased): N/A				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: John Starke Date/Time: 10/12/18

Comments/Resolution: contacted client to confirm sample state

Project Manager Review: Date: 10/12/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labels by AS

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Exhibit 8

Land Bridge Evaluation

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Marie Avenue Land Bridge Evaluation for the City of Mendota Heights

Mendota Heights, Minnesota

DRAFT

TKDA No. 16948.000

November 7, 2018

TKDA

444 Cedar Street, Suite 1500
Saint Paul, MN 55101
651.292.4400
tkda.com

Marie Avenue Land Bridge Evaluation for the City of Mendota Heights

Mendota Heights, Minnesota

TKDA No. 16948.000

November 7, 2018

Work performed by TKDA in completing this report is based on our field observations and review of existing data made available by the Owner. TKDA has performed its work in a manner consistent with the care and skill ordinarily exercised by members of the engineering profession under similar circumstances. Within this context, TKDA assumes responsibility for its observations, calculations, and interpretation of information provided. No other warranty, expressed or implied, is made.

Owners of bridges need to monitor their structures and foundations on an ongoing basis, under favorable weather conditions, for changes that could affect structure stability. This is particularly the case when load conditions change and/or during flood events or during the accumulation of ice or debris at the structure.

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.

Matthew A Volz
Professional Engineer

Date: November 7, 2018 Lic. No.: 53067

Reviewed By: Lindsey J Lawrence Date: November 7, 2018

TKDA
444 Cedar Street - Suite 1500
Saint Paul, MN 55101

TKDA

Executive Summary

Marie Avenue Bridge

TKDA has been retained by the City of Mendota Heights to evaluate the Marie Avenue Bridge and develop repair recommendations for the bridge. On September 12, 2018, TKDA completed a visual review on-site to gather data of the bridge. Using this data, a partial-condition evaluation of the bridge was completed. The partial condition evaluation was conducted by a MnDOT-Certified Team Leader for Bridge Inspection and addresses only those portions of the structure visible from the bridge deck. The findings are documented in photos and the report below.

Originally constructed in 1974, the Marie Avenue Bridge is a cast-in-place pile-bent concrete slab-span land bridge as shown in Figure 1. The bridge consists of two 14-span segments with an expansion joint at each approach panel, and one expansion joint in the middle of the bridge. Each span is 15'-0" long. The total out-to-out bridge length is 420'-0" and carries local Marie Avenue West traffic over unstable soil. The haunched slab is 11 inches thick at mid-span, and two feet and 1/2-inch at bents with a two and 1/2-inch-thick bituminous wear course installed at the original time of construction. The structure has plain reinforcement. The deck width is 45'-4" with 44'-0" of roadway between integral curb and gutter cast with the bridge slab. The bridge structure is supported on pile bents with four 10" diameter cast-in-place piles that are cast integrally with the bridge slab. The bridge has a design speed of 30 MPH.

The major work recommended to be done includes replacing the east approach panel, replacing the wearing course, replacing all expansion joints, and sounding the bridge deck to check for delamination.

Figure 1 – Marie Avenue Bridge – Looking West

Table of Contents

List of Figures

List of Appendices

Marie Avenue Land Bridge Evaluation for the City of Mendota Heights

Prepared for City of Mendota Heights

1.0 Condition Evaluation and Repair Recommendations

There are longitudinal cracks in both traffic lanes of the bituminous wearing course, as shown in Figure 2. Some of these cracks have been patched with bituminous, as shown in Figure 3. Due to the nature of the cracking and patching, the bituminous wearing course is rated as condition state 2. Based on the Bridge Preservation and Improvement Guidelines (BPIG), replacement of the wearing surface is not required. Although the BPIG does not require replacement of the wearing surface, it is recommended to replace the bituminous wear surface with a concrete wear surface to prolong the life of the bridge. Concrete wear surfaces are a dense concrete mix that trap chlorides and protect the structural portion of the deck. After the bituminous wear course in removed, it is recommended that deck be sounded to check for any delamination. If any delamination is found, it is recommended that the area be removed and patched.

Figure 2 – Cracking in Bituminous Wear Course

Figure 3 – Patching of Bituminous Wear Course

The expansion joints at the west approach panel and middle of the bridge are filled with debris as shown in Figures 4 and 5. The contract plans from 1974 show a compression seal joint at the approach panels and an elastomeric expansion assembly at mid-span of the bridge. During the site inspection, it appears that the joints at the west approach panel and mid-span of the deck have been replaced with strip seal expansion joints. No records of this work have been received. These joints are filled with debris but show no indication of significant wear. The cover plates at the curbs show minor signs of rust and wear as shown in Figure 5. The condition of the strip seal expansion joints are rated as condition state 2. It is recommended to replace the strip seal expansion joints due to the age being greater than ten years which leads to difficulty in replacing the glands of the joint.

Figure 4 – Strip-seal expansion joint

Figure 5 – Curb cover plate

Significant settlement of the east approach panel is evident at the expansion joint. The joint is completely closed and filled with bituminous patches as shown in Figure 6. Based on the settlement of the approach panel at the expansion joint, it appears that the ledge supporting the approach panel may have failed. See Figure 7 for detail of ledge. Due to the nature of the settlement, the approach panel is rated as condition state 3. It is recommended that the approach panel be removed and replaced. During removal of the approach panel, the condition of the ledge supporting the approach panel should be investigated. If the ledge has failed, it is recommended that it be reconstructed. Also, due to the condition of the expansion joint, it is recommended that the joint be replaced with a strip-seal joint.

Figure 6 – East approach panel settlement and failed expansion joint

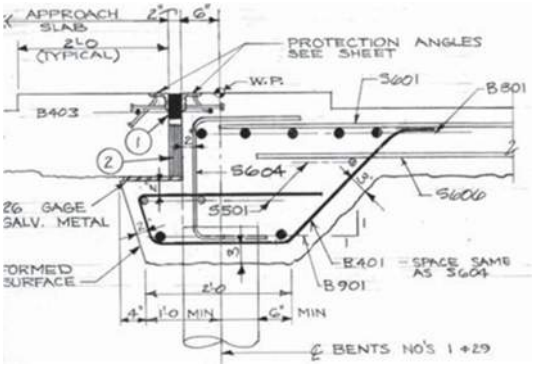

Figure 7 – Ledge detail at approach panel

Settlement of the trail north of the bridge was observed as shown in Figure 8. It is recommended that the trail be replaced. During replacement, it is recommended that corrective measures be taken to reduce future settlement of the soil backfill. Possible corrective measures may include placing engineered fill under the trail, placing geotextile fabric under the trail or removing all the unstable material. A geotechnical engineer should be retained to provide recommendation for the site.

2.0 Summary of Repair Recommendations

B-1) Remove existing bituminous wearing course from the bridge. Use pay item 2433.618 “REMOVE BITUMINOUS WEARING COURSE.”

B-2) New concrete overlay is to be placed on the bridge. Use pay item 2404.518 “CONCRETE WEARING COURSE (3U17A).”

B-3) After bituminous wear course is removed, sound the exposed deck surface to check for delamination. If any delamination is found, remove and patch the slab. Use pay items 2433.618 “REMOVE AND PATCH SLAB TYPE A”, 2433.618 “REMOVE AND PATCH SLAB TYPE B”, and 2433.618 “REMOVE AND PATCH SLAB TYPE C”. The nature of the patch is determined by the condition of the slab.

B-4) Reconstruct all expansion joints. Use pay item 2433.603 “RECONSTRUCT EXPANSION JOINT TYPE A.”

B-5) Remove and reconstruct settled approach panel on east end of bridge. Use pay item 2433.618 “RECONSTRUCT APPROACH PANEL”.

3.0 Other Comments

During evaluation of the Marie Avenue Bridge, it was discovered that the bridge does not have a bridge number and there are no records of inspection or repair. MnDOT defines any structure that carries public traffic and has a span of 10’-0” or greater as a bridge. To become compliant with Minnesota statutes and laws, it is recommended that the City of Mendota Heights enroll the structure in MnDOT’s Bridge Management Program.

Evaluation of the Marie Avenue Bridge was limited to visual inspection of the bridge surface due to the nature of the structure type.

All new and existing bridges that carry public traffic in Minnesota are load rated by either MnDOT or the owner. The purpose of load rating is to determine the load-carrying capacity of primary members of bridges for a variety of routine and permit vehicles. Bridges are rated for two different stress levels, inventory and operation, and these values are reported on the rating form. The inventory rating corresponds to that load which can safely utilize an existing bridge for an indefinite period of time. The operating rating is the absolute maximum permissible load to which a structure should be subjected. The Marie Avenue Bridge was designed using the 1973 AASTHO Design Specifications which used Allowable Stress Design. Over time, the design live-load vehicles and design methodologies have evolved. The bridge was rated using Load and Resistance Factor Rating with the HL-93 (25-Ton) design vehicle. Originally, the bridge was designed using a lighter HS-20 (20-Ton) design vehicle. The Marie Avenue Bridge is unique in that it has many continuous short spans. Based on the rating analysis in the attached rating form, the tandem truck-plus-lane load governs the inventory and operating ratings because of the tight axle spacing. The bridge does not require posting because the posting vehicles receive a much higher rating due to the larger axle spacing. The HL-93 design vehicle can be assumed equivalent to an HS-25 truck. The inventory rating (0.637) then equates to 63.7% of the 25-ton truck or 15.9 tons. Similarly, the operating rating (0.826) equates to 82.6% of the 25-ton truck or 20.6 tons. MnDOT requires an HL-93 operating rating of greater than 0.9 for bridge rehabilitations. Due to the unique bridge geometry and the expected traffic on the bridge, an exception for a lower bridge operating rating may be requested from MnDOT to rehabilitate the bridge without increasing the structural capacity.

Appendix A - Bridge Rating

FORM RC-CL
Revised Aug. 2017

MnDOT BRIDGE RATING AND LOAD POSTING REPORT FOR COUNTY AND LOCAL AGENCIES

Bridge Location and Description

Hwy. No. Marie Ave | Over ☒ / Under ☐ Land | **Bridge No.**

Year Built 1974 | Year Remodeled | Replaces Br.

Type 209 | County Dakota | Ref. Pt.

Description 28 span land bridge with 2 sets of 14 continuous spans, 15ft spans, roadway is 44ft GL-to-GL; varied thickness concrete slab, haunched over supports.

Location Mendota Heights 1000ft west of Dodd Rd.

Data for Basis of Report (Check all that apply)

- ☐ Bridge Inventory File
- ☐ Previous Bridge Rating and Load Posting Report
- ☒ Bridge Plans
  - ☒ New ☐ Overlay
  - ☐ Repair/Reconstruction
  - ☐ Other Dead Load Modifications
- ☒ Bridge Inspected by MAV Date 9/12/18
  - ☐ Damaged Component
  - ☐ Deteriorated Component

Types of Analysis:

☐ Manual ☐ AASHTOWare BrR, V.6.8.2 ☐ Computer* ☐ Other*

*

NBI Condition Ratings

Deck

Superstructure

Substructure

HCAADT <100

Method of Rating (Check appropriate box)

- ☐ Load Factor (LFR) ☐ Assigned LFR
- ☐ Allowable Stress (ASR) ☐ Assigned LRFR
- ☒ Load & Resistance Factor (LRFR)
- ☐ Load Testing
- ☐ Field Eval./Doc. Engineering Judgment

Design Load HS20

Design Method ASD - 1973 AASHO Design Spec.

Summary of Rating and Load Posting Analysis

Load Posting

Required ☐
Not Required ☒

Sign	TONS		
R12-1a ☐			
R12-5a ☐			
R12-5 ☐	M3	M3S2-40	M3S3
R12-X11 ☐		45	
R11-2a ☐	**BRIDGE CLOSED**		

Bridge Rating

Inventory	Operating
HS ☐ RF ☒ 0.637	HS ☐ RF ☒ 0.826

Overweight Permit Codes

A 1 B 1 C 1

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.

Signature: Date: 9/21/18

(Typed or Printed) Name: Lindsey Lawrence License No. 48298

(Typed or Printed) Employed by (☐Agency/☒Firm): TKDA

My signature below indicates that I have read and fully agreed with the load rating report.

Program Administrator's Signature: Date:

FORM RD-CL
Revised Dec. 2017

BRIDGE RATING DETAILS

Bridge Type 209
Bridge No.
Rating Method LRFR
Design Load: HS20
Roadway Width 44'-0"
Inventory Rating: 0.637
☐ Curved ☐ Tapered
Operating Rating: 0.826
Beam Spacing N/A
Rated LJL Checked MAV
☒ Live Load Distribution Factor
Date 9/21/18
Single 0.103 Multiple 0.099
Sheet 2 of 3
☐ Finite/Grid Element Analysis

BEAM ELEVATION [1]

Show span lengths, structure/beam depths.

Truck	Rating Factor	Span/ Pier	Location	Limit State [2]	Notes/Comments
HL 93 Inventory	0.637	Sp 13	81.1%	Ultimate Moment	Tandem + Lane
HL 93 Operating	0.826	Sp 13	81.1%	Ultimate Moment	Tandem + Lane
M3	1.374	Sp 13	81.1%	Ultimate Moment	LL Factor=1.3
M3S2-40	1.352	Sp 13	81.1%	Ultimate Moment	LL Factor=1.3
M3S3-40	1.426	Sp 13	81.1%	Ultimate Moment	LL Factor=1.3
SU4	1.265	Sp 13	81.1%	Ultimate Moment	LL Factor=1.3
SU5	1.258	Sp 13	81.1%	Ultimate Moment	LL Factor=1.3
SU6	1.214	Sp 13	81.1%	Ultimate Moment	LL Factor=1.3
SU7	1.331	Sp 13	81.1%	Ultimate Moment	LL Factor=1.3

Emergency[3] Vehicles	Rating Factor	Span/ Pier	Location	Limit State [2]	Notes/Comments
EV2	1.239	Sp 13	81.1%	Ultimate Moment	LL Factor=1.3
EV3	0.739	Sp 1	24.4%	Ultimate Moment	LL Factor=1.3

1 Elevation may be on back or another sheet if it won't fit here.
2 Choose from: service or ultimate; shear or moment
3 For information only

FORM RD-CL Revised Mar. 2016	**BRIDGE RATING DETAILS**

Annual/Routine Permit	No Restriction	Straddle Two Lanes	5% Impact	Notes/Comments
	Rating Factor	Rating Factor	Rating Factor	
STD. A	1.290	N/A	1.633	
STD. B	1.035	N/A	1.311	
STD. C	1.101	N/A	1.395	
6-axle, 90k-99k	1.427	N/A	1.808	
7-axle, 97k-99k	1.313	N/A	1.663	

Special/Single Permit	No Restriction	Straddle Two Lanes	5% Impact	Notes/Comments
	Rating Factor	Rating Factor	Rating Factor	
P411	1.200	N/A**	1.520	
P413	1.168	N/A**	1.480	
C152b	1.158	N/A**	1.467	
C174b	1.553	N/A**	1.968	
C214b	1.240	N/A**	1.570	
C237b	1.341	N/A**	1.699	
C256b	1.355	N/A**	1.716	
C200j	1.358	N/A**	1.720	

OVERWEIGHT PERMIT RESTRICTIONS FOR LOCAL BRIDGES

Restriction Code	Restriction Description	Special/ Single Permit	Annual/ Routine Permit	Detailed Restriction Description	Bridge Check Operation
1	None	YES	YES	No Restriction to cross bridge	Normal
2	Straddle Two Lanes	YES	YES	Drive on the centerline between two lanes, in a manner that prevents any other vehicle from occupying a part of either lane on either side of the permit vehicle. Drive in the center of a single lane bridge.	The AASHTO "Single Lane" live load distribution is used. *This operation applies to all permit vehicles when performing LFR method or only to annual permit vehicles when performing LRFR method.*
3	Maximum speed of 10 mph	YES ①	YES ①	Drive at a speed of 10 mph or less	The impact factor is reduced from the AASHTO impact to 5%
X	DENIED	YES	YES	The overweight permit vehicle is **NOT ALLOWED** on this bridge	Used when requirements for restriction 1 thru 3 are not met

① Not allowed where there is a posted minimum speed.

** "N/A", Does not apply when performing LRFR method, ref. AASHTO MBE Table 6A.4.5.4.2a-1

Exhibit 9

Wetland Delineation Report

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Marie Avenue Improvements

Mendota Heights, Dakota County, Minnesota

Wetland Delineation Report

Prepared for

City of Mendota Heights

by

Kjolhaug Environmental Services Company, Inc.
(KES Project No. 2018-145)

November 21, 2018

Marie Avenue Improvements

Mendota Heights, Dakota County, Minnesota

Wetland Delineation Report

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Marie Avenue Improvements

Mendota Heights, Dakota County, Minnesota

Wetland Delineation Report

1. WETLAND DELINEATION SUMMARY

- The 7,460-feet Marie Avenue Improvements review area was inspected on October 2, 2018 for the presence and extent of wetland.
- The National Wetlands Inventory (NWI) map showed three wetlands within the review area.
- The soil survey showed that hydric and partially hydric soil types on and near the property included Kato, Quam, and Seelyeville soils.
- The DNR Public Waters Inventory did not show any DNR Public Waters, Wetlands, or Watercourses within the review area. However, an Unnamed DNR Public Wetland (19-104W) was located approximately 200 feet north of the review area.
- The National Hydrography Dataset showed two lake/pond waterbodies, two stream/river watercourses, and one pipeline were located within the review area.
- Two wetlands delineated within the review area are summarized below.

Table 1. Wetlands delineated on the Marie Avenue review area

Wetland ID	Wetland Type			Dominant Vegetation
	Circular 39	Cowardin	Eggers and Reed	
1	3	PEM1A/Cd	Partially drained, seasonally flooded basin/shallow marsh	Cattail, reed canary grass, common buckthorn
2	2	PEM1Bd	Partially drain, fresh wet meadow	Reed canary grass

2. OVERVIEW

The 7,460-feet Marie Avenue Improvement review area was inspected on October 2, 2018 for the presence and extent of wetland. The property was located in Sections 23, 24, 26, Township 28 North, Range 23 West, City of Mendota Heights, Dakota County, Minnesota. The review area consisted of the adjacent 30 feet from the centerline of Marie Avenue between Lexington Avenue and Dodd Road and approximately 700 feet along Lexington Avenue. Four additional areas containing wetlands and stormwater ponds located to the north and south of Marie Avenue were also included in the review area (**Figure 1**).

The majority of the review area consisted of the Marie Avenue roadway and right-of-way. The right-of-way contained an asphalt walking path along with manicured lawns and planted trees from the adjacent single-family homes. Several areas containing potential wetlands or stormwater basins located adjacent to Marie Avenue were also investigated. These water bodies were typically surrounded by wooded areas dominated by boxelder, green ash, and red oak trees and common buckthorn shrubs or parkland and single-family lots dominated by manicured lawns with various planted coniferous and deciduous trees.

The review area was predominantly surrounded by single-family homes and Valley Park was located to the north.

Two wetlands were delineated within the review area. The delineated wetland boundaries and existing conditions are shown on **Figure 2**.

Appendix A of this report includes a Joint Application Form for Activities Affecting Water Resources in Minnesota, which is submitted in request for: (1) a wetland boundary and type determination under the Minnesota Wetland Conservation Act (WCA), and (2) delineation concurrence under Section 404 of the Federal Clean Water Act.

3. METHODS

Wetlands were identified using the Routine Determination method described in the Corps of Engineers Wetlands Delineation Manual (Waterways Experiment Station, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) as required under Section 404 of the Clean Water Act and the Minnesota Wetland Conservation Act.

Wetland boundaries were identified as the upper-most extent of wetland that met criteria for hydric soils, hydrophytic vegetation, and wetland hydrology. Wetland-upland boundaries were marked with pin flags that were GPS located by Kjolhaug Environmental Services using a Juno T-41 GPS device.

Soils, vegetation, and hydrology were documented at a representative location along the wetland-upland boundary. Plant species dominance was estimated based on the percent aerial or basal

coverage visually estimated within a 30-foot radius for trees and vines, a 15-foot radius for the shrub layer, and a 5-foot radius for the herbaceous layer within the community type sampled.

Soils were characterized to a minimum depth of 24 inches (unless otherwise noted) using a Munsell Soil Color Book and standard soil texturing methodology. Hydric soil indicators used are from Field Indicators of Hydric Soils in the United States (USDA Natural Resources Conservation Service (NRCS) in cooperation with the National Technical Committee for Hydric Soils, Version 8.1, 2017).

Mapped soils are separated into five classes based on the composition of hydric components and the Hydric Rating by Map Unit color classes utilized on Web Soil Survey. The five classes include Hydric (100 percent hydric components), Predominantly Hydric (66 to 99 percent hydric components), Partially Hydric (33 to 65 percent hydric components), Predominantly Non-Hydric (1 to 32 percent hydric components), and Non-Hydric (less than one percent hydric components).

Plants were identified using standard regional plant keys. Taxonomy and indicator status of plant species was taken from the 2016 National Wetland Plant List (U.S. Army Corps of Engineers 2016. National Wetland Plant List, version 3.3, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH).

4. RESULTS

4.1 Review of NWI, Soils, Public Waters and NHD Information

The National Wetlands Inventory (NWI) (Minnesota Geospatial Commons 2009-2014 and U.S. Fish and Wildlife Service) showed three wetlands within the review area (**Figure 3**).

The Soil Survey (USDA NRCS 2015) showed that hydric and partially hydric soil types on and near the property included Kato, Quam, and Seelyeville soils. Soil types mapped on the property are listed in **Table 2** (on the following page) and a map showing soil types is included in **Figure 4**.

The Minnesota DNR Public Waters Inventory (Minnesota Department of Natural Resources 2015) did not show any DNR Public Waters, Wetlands, or Watercourses within the review area (**Figure 5**). However, an Unnamed DNR Public Wetland (19-104W) was located approximately 200 feet north of the review area.

The National Hydrography Dataset (U.S. Geological Survey 2015) showed two lake/pond waterbodies, two stream/river watercourses, and one pipeline were located within the review area (**Figure 6**).

Table 2. Soil types mapped on the Marie Avenue review area

Symbol	Soil Name	Acres	% of Area	% Hydric	Hydric Category
39B2	Wadena loam, 2 to 6 percent slopes, eroded	1.55	9.4	0	Non-Hydric
155B	Chetek sandy loam, 3 to 8 percent slopes	0.06	0.4	0	Non-Hydric
155C	Chetek sandy loam, 8 to 15 percent slopes	1.11	6.7	0	Non-Hydric
155E	Chetek sandy loam, 15 to 25 percent slopes	0.0004	>0.01	0	Non-Hydric
208	Kato silty clay loam	0.003	>0.01	95	Predominantly Hydric
250	Kennebec silt loam	0.07	0.4	0	Non-Hydric
313	Spillville loam, occasionally flooded	0.85	5.2	0	Non-Hydric
344	Quam silt loam	3.32	20.2	95	Predominantly Hydric
411A	Waukegan silt loam, 0 to 1 percent slopes	0.62	3.8	0	Non-Hydric
415C	Kanaranzi loam, 6 to 12 percent slopes	3.80	23.1	0	Non-Hydric
540	Seelyeville muck	0.74	4.5	100	Hydric
611F	Hawick loamy sand, 20 to 40 percent slopes	0.87	5.3	0	Non-Hydric
857B	Urban land-Waukegan complex, 1 to 8 percent slopes	0.59	3.6	0	Non-Hydric
895C	Kingsley-Mahtomedi-Spencer complex, 8 to 15 percent slopes	1.08	6.6	0	Non-Hydric
1027	Udorthents, wet	0.26	1.6	0	Non-Hydric
1824	Quam silt loam, ponded	1.55	9.4	100	Hydric

4.2 Wetland Determinations and Delineations

Potential wetlands were evaluated during field observations on October 2, 2018. Two wetlands were identified and delineated on the property (**Figure 2**). Corresponding data forms are included in **Appendix B**. The following descriptions of the wetlands and adjacent uplands reflects conditions observed at the time of the field visit. Herbaceous vegetation was beginning to senesce at the time of the wetland delineation. Precipitation conditions were wetter than the normal range based on available 30-day rolling total precipitation and three-month antecedent precipitation (**Appendix C**) and field observations. In the week prior to the site visit 0.37 inches of precipitation was recorded at the nearest weather station.

Wetland 1 was a partially drained Type 3 (PEM1A/Cd) seasonally flooded basin/shallow marsh wetland located in the eastern portion of the review area. The wetland was dominated by cattail, sedge, and reed canary grass with a fringe of common buckthorn shrubs with lesser amounts of reed canary grass. The center of Wetland 1 was inundated with approximately 4 to 6 inches of standing water. This wetland covered 0.47 acres within the review area.

Adjacent upland consisted of woodland dominated by red oak, green ash, quaking aspen, and cottonwood trees and common buckthorn and honeysuckle shrubs. A berm along the eastern boundary separated Wetland 1 from Stormwater Pond 1. The berm was vegetated with common buckthorn shrubs, Canada goldenrod, and crown vetch. Primary and secondary hydrology indicators were not observed on the upland.

The wetland boundary corresponded to a topographic rise and a transition to an upland plant community. The wetland was shown as a PFO1A/EM1C on the NWI map and was located in an area mapped as hydric soil (Quam) on the soil survey. Wetland 1 appeared to drain into the ditch on the south side of the wetland, which eventually flowed west into a creek in Valley Park.

Wetland 2 was a partially drained Type 2 (PEM1Bd) fresh wet meadow wetland located in the center of the review area. The wetland was dominated by reed canary grass with lesser amounts of lake sedge and cattail. A creek channel was observed flowing to the northeast through the center of Wetland 2. The channel was 3 to 4 feet wide, 3 feet deep, and inundated with approximately 1 to 2 feet of flowing water. This wetland covered 0.23 acres within the review area.

Adjacent upland consisted a combination of meadow dominated by smooth brome, reed canary grass, Canada thistle, common milkweed, and burdock and woodland dominated by boxelder, American elm, and cottonwood trees, common buckthorn and honeysuckle shrubs. Primary and secondary hydrology indicators were not observed on the upland.

The wetland boundary corresponded to a topographic rise and a transition to an upland plant community. The wetland was shown as a PEM1Ad wetland and was located in an area mapped as hydric soil (Seelyeville) and non-hydric soil (Chetek) on the soil survey. Wetland 2 appeared to extend to the south of the review area.

4.3 Other Areas

Other areas were investigated because they were: (1) observed to support a hydrophytic plant community, (2) had visible wetland hydrology indicators, (3) were shown as wetland on the NWI map, or (4) were depressional and mapped as hydric soil.

Two stormwater ponds (Stormwater Pond 1 & 2) were located within the review area (**Figure 2**). Each pond was inundated with at least 3 to 4 feet of standing water near the shoreline and was dominated by duckweed with a narrow fringe of scattered red osier dogwood and willow shrubs, cattail, and lake sedge. Adjacent upland consisted of steeply sloped woodland dominated by boxelder and green ash trees with an understory of common buckthorn and honeysuckle shrubs, and burdock. According to Krista Spreiter (the LGU for the City of Mendota Heights) these ponds have been used as stormwater basins since the early 1970s. Based on this information and the onsite observations, KES determined Stormwater Ponds 1 & 2 to be non-wetland.

No other areas with hydrophytic vegetation or wetland hydrology were observed on the site. No other areas were shown as hydric soil on the soil survey or as wetland on the NWI map.

4.4 Request for Wetland Boundary and Jurisdictional Determination

Appendix A of this report includes a Joint Application Form for Activities Affecting Water Resources in Minnesota, which is submitted in request for: (1) a wetland boundary and type determination under the Minnesota Wetland Conservation Act (WCA), and (2) delineation concurrence under Section 404 of the Federal Clean Water Act.

5. CERTIFICATION OF DELINEATION

The procedures utilized in the described delineation are based on the U.S. Army Corps of Engineers 1987 Wetlands Delineation Manual as required under Section 404 of the Clean Water Act and the Minnesota Wetland Conservation Act. This wetland delineation and report were prepared in compliance with the regulatory standards in place at the time the work was performed.

Site boundaries indicated on figures within this report are approximate and do not constitute an official survey product.

Delineation completed by: Andrew Krinke, Ecologist/GIS Specialist
Minnesota Certified Wetland Delineator No. 1309

Report prepared by: Andrew Krinke, Ecologist/GIS Specialist
Minnesota Certified Wetland Delineator No. 1309

Report reviewed by: _____ Date: November 21, 2018
Mark Kjolhaug, Professional Wetland Scientist No. 000845

Wesley Neighborhood Improvements

Wetland Delineation Report

FIGURES

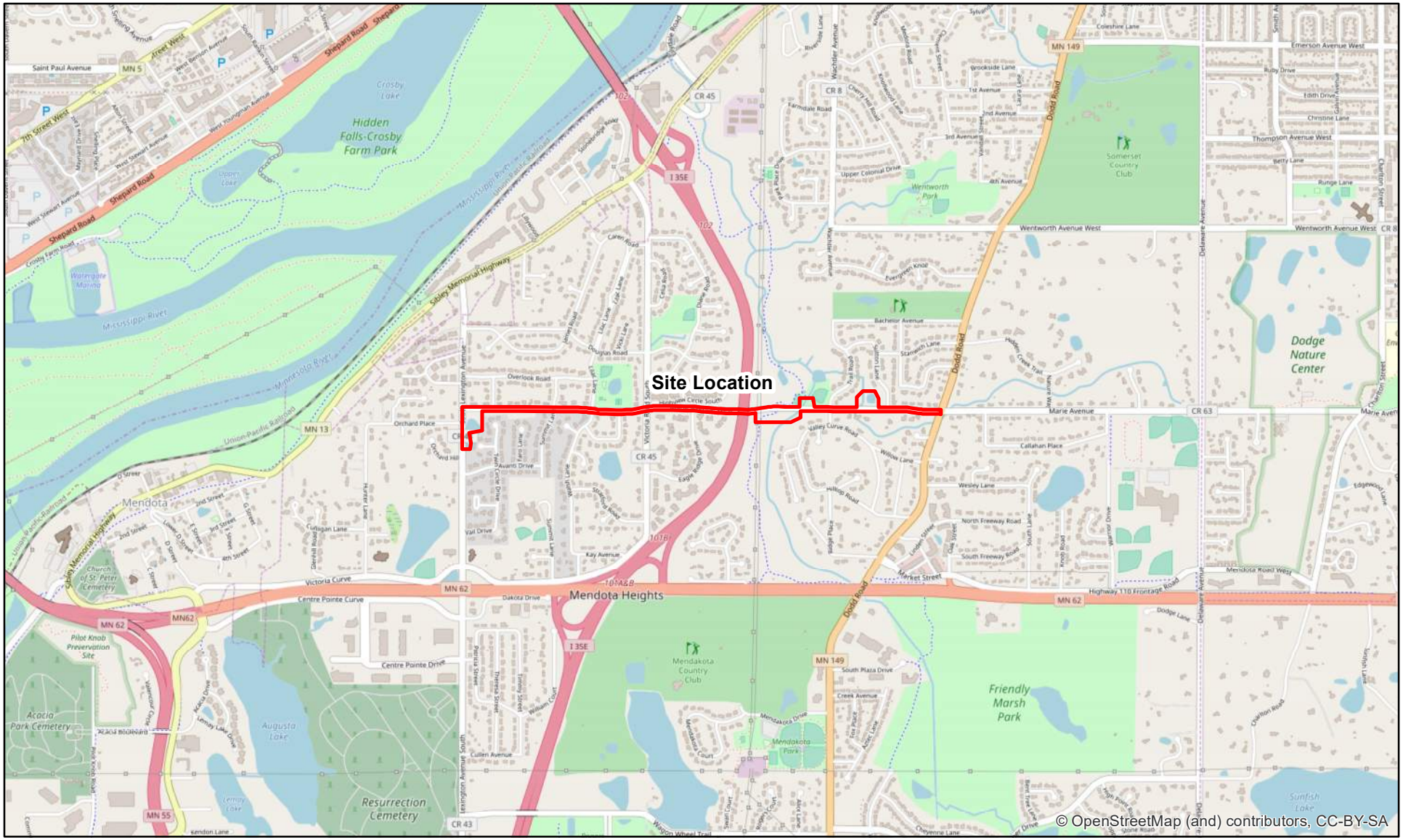


Figure 1 - Site Location

N

0 2,000 Feet

KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Source: ESRI Streets Basemap

Marie Avenue (KES 2018-145)
Mendota Heights, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.

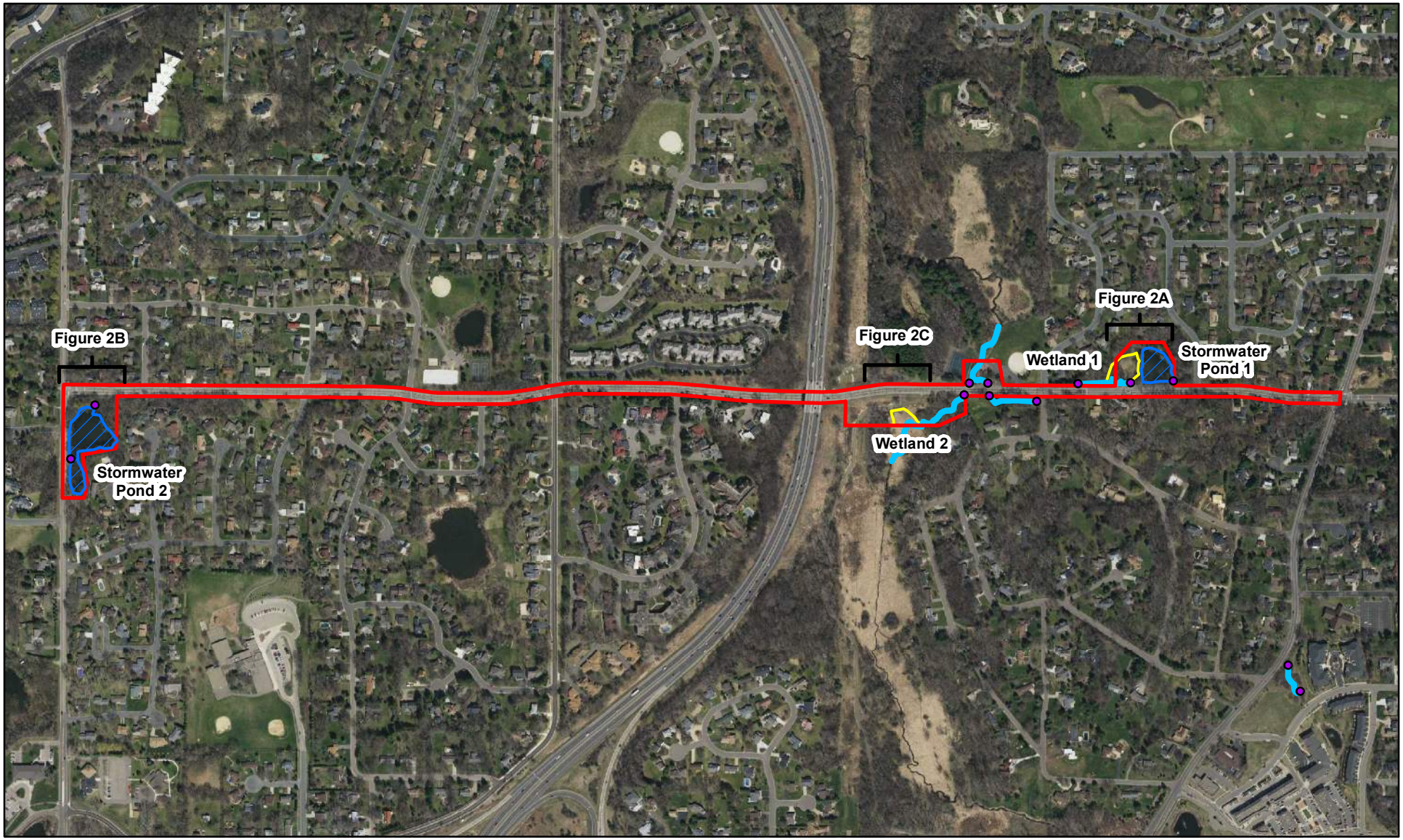


Figure 2 - Existing Conditions Overview

N

0 750 Feet

KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Source: MNGEO Spatial Commons

Culvert
Stormwater Pond
Project Boundary
Drainageway
Wetland Boundary

Marie Avenue (KES 2018-145)
Mendota Heights, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.

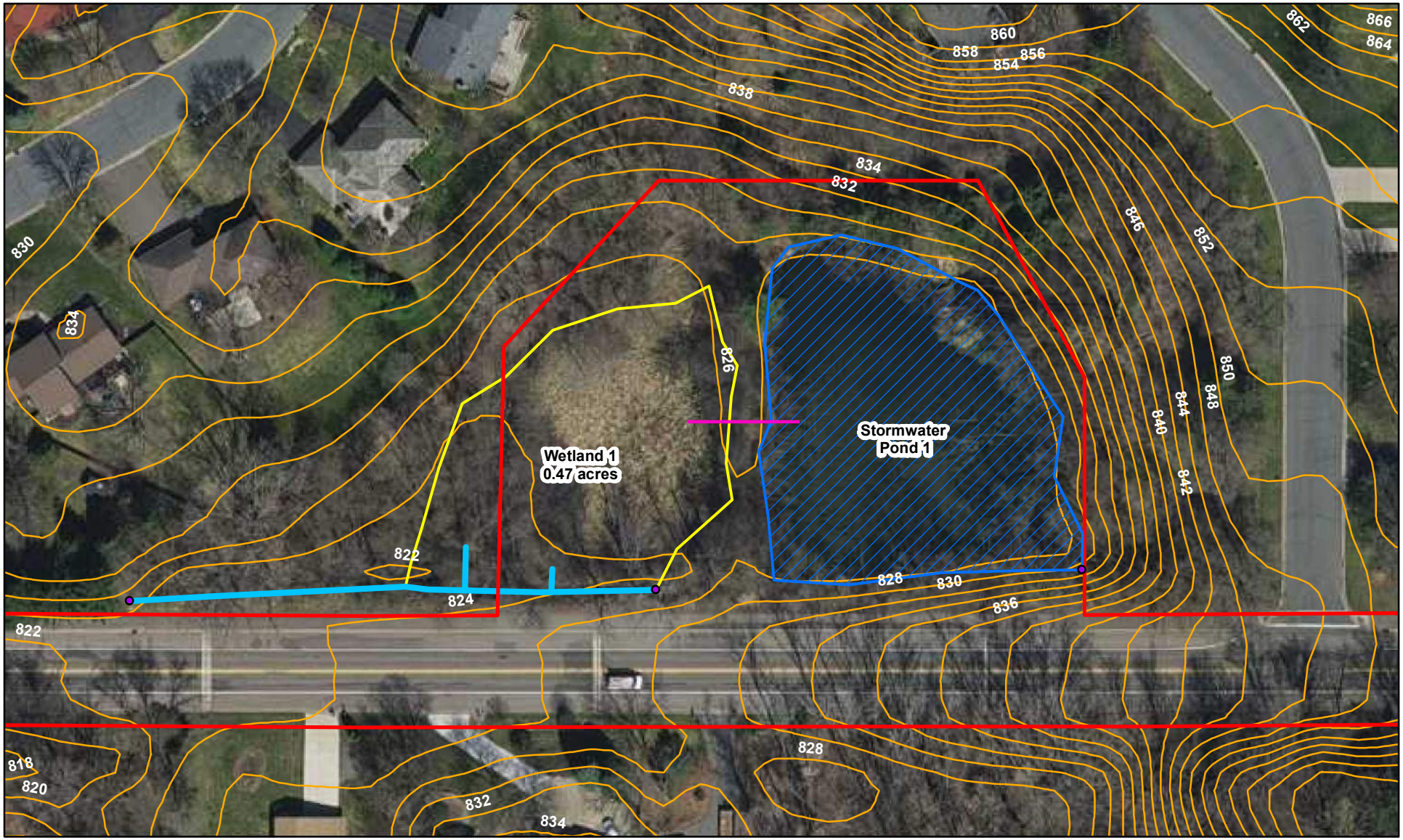


Figure 2A - Existing Conditions Overview

N

0 75 Feet

KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Source: MNGEO Spatial Commons

- Culvert
- Transect
- Drainageway
- Dakota County Lidar
- Project Boundary
- Stormwater Pond
- Wetland Boundary

Marie Avenue (KES 2018-145)
Mendota Heights, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.

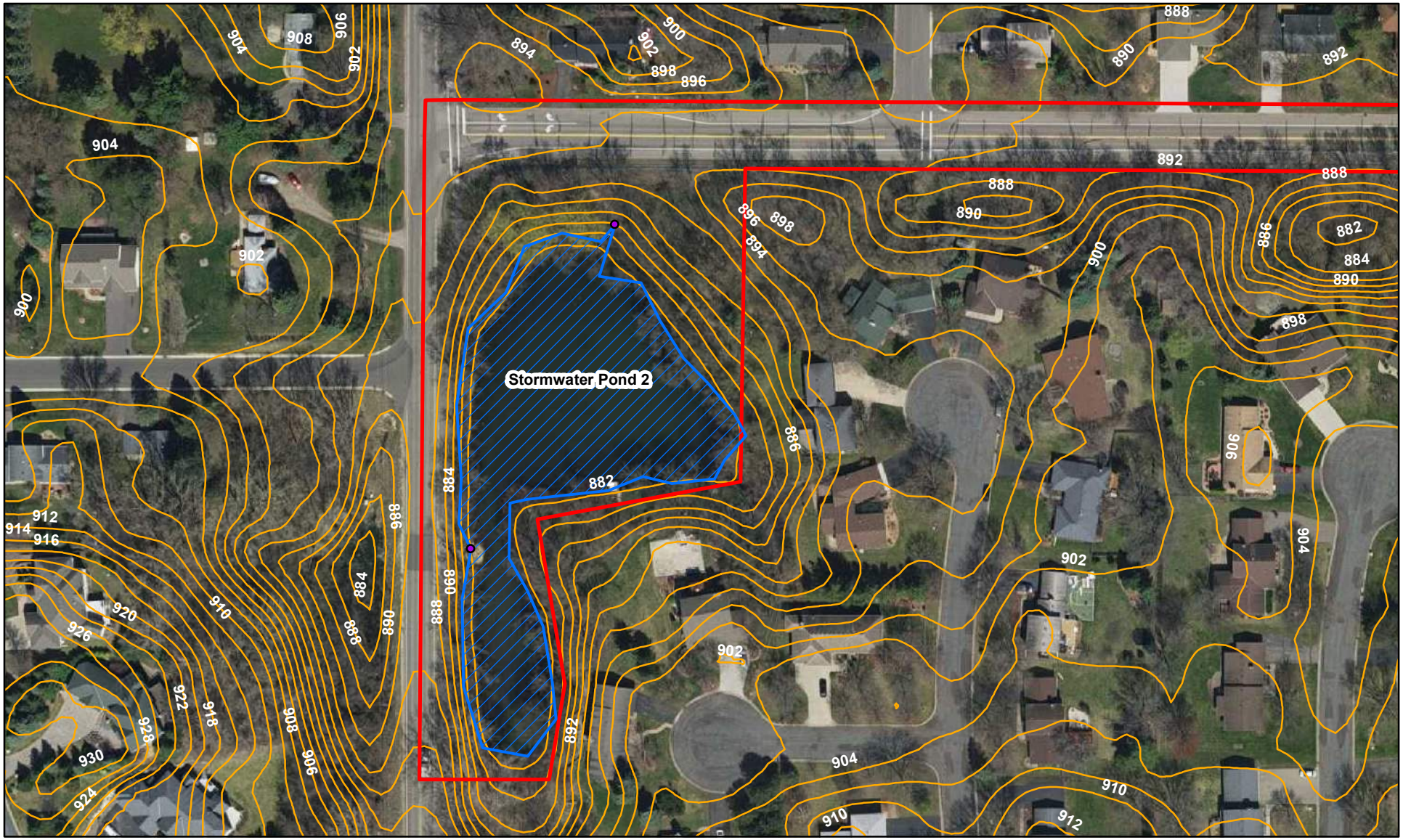


Figure 2B - Existing Conditions Overview

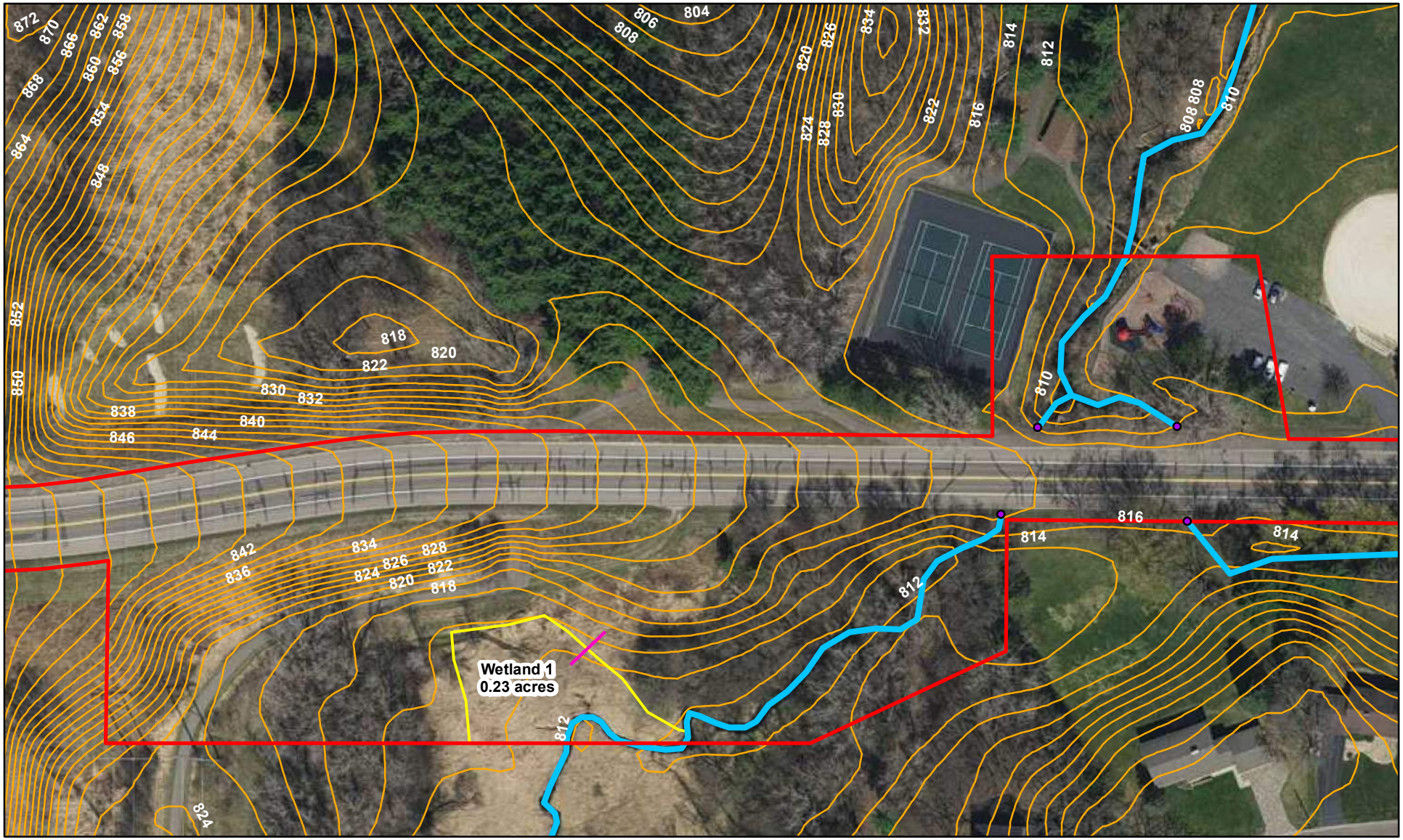


Figure 2C - Existing Conditions Overview

N

0 75 Feet

KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Source: MNGEO Spatial Commons

Culvert
Transect
Drainageway
Dakota County Lidar
Project Boundary
Stormwater Pond
Wetland Boundary

Marie Avenue (KES 2018-145)
Mendota Heights, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.

Figure 3 - National Wetlands Inventory

N

0 750 Feet

KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Source: MNGEO Spatial Commons, USFWS

PABG	PEM1C
PABGx	PEM1F
PEM1A	PFO1A
PEM1Ad	PUBG
PEM1Ax	PUBGx

Marie Avenue (KES 2018-145)
Mendota Heights, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.

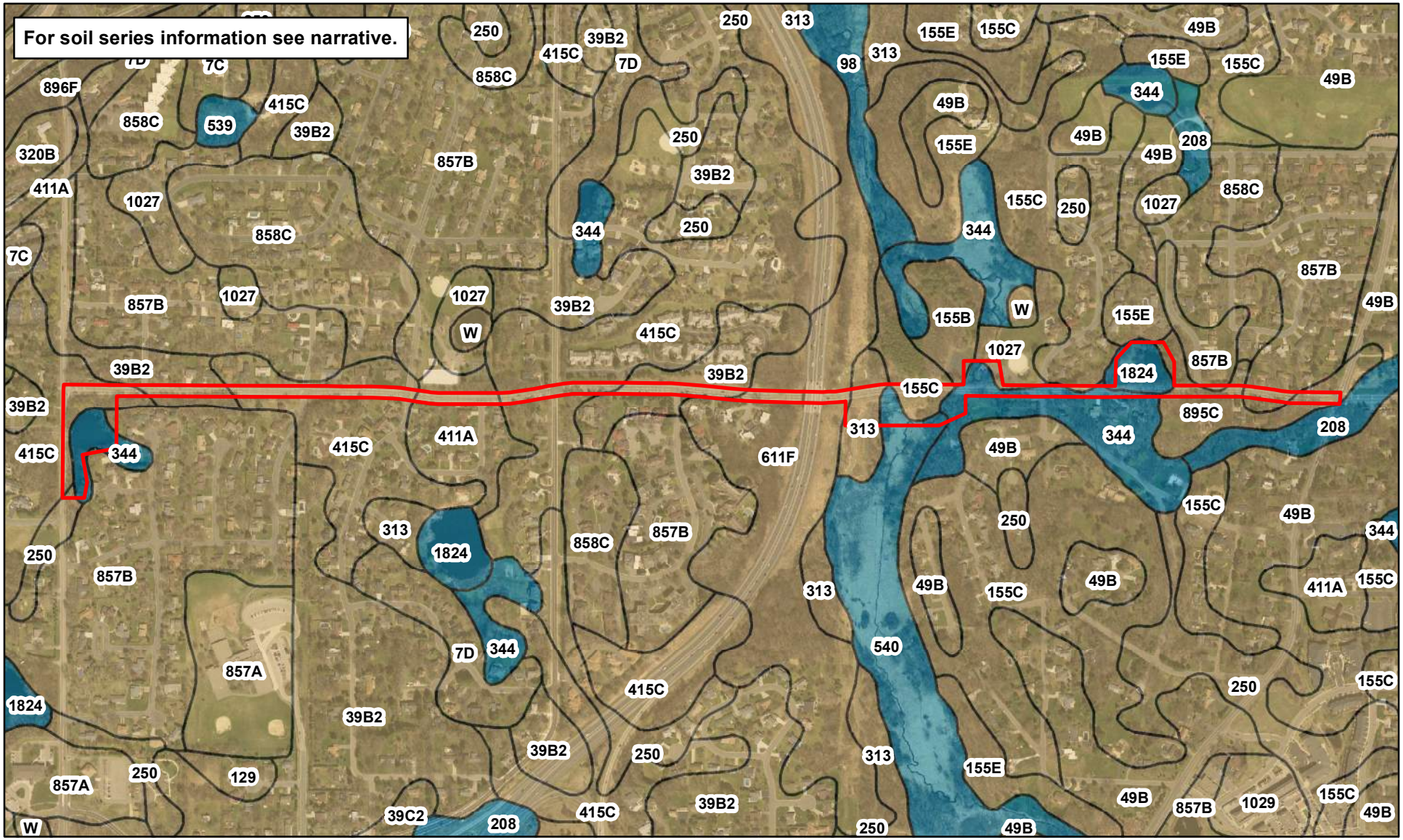


Figure 4 - Soil Survey

N

0 750 Feet

KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Source: MNGEO Spatial Commons, USDA, NRCS

Hydric/Predominantly Non-Hydric

Prdominantly Non-Hydric/Non-Hydric

Marie Avenue (KES 2018-145)
Mendota Heights, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.

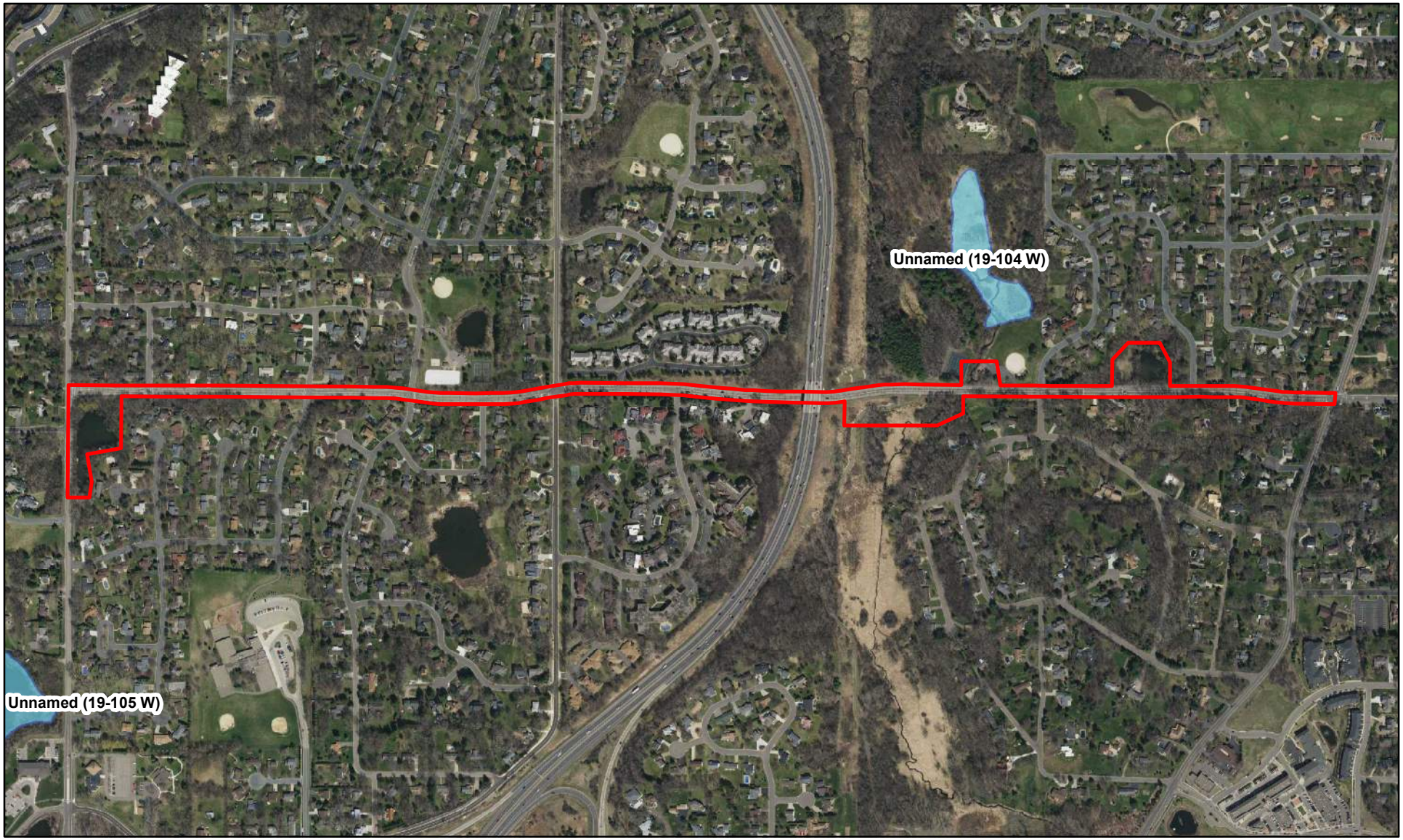


Figure 5 - DNR Public Waters Inventory

N

0 750 Feet

KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Source: MNGEO Spatial Commons, MN DNR

Public Waters

Public Ditch/Altered Natural Watercourse

Public Watercourse

Marie Avenue (KES 2018-145)
Mendota Heights, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.

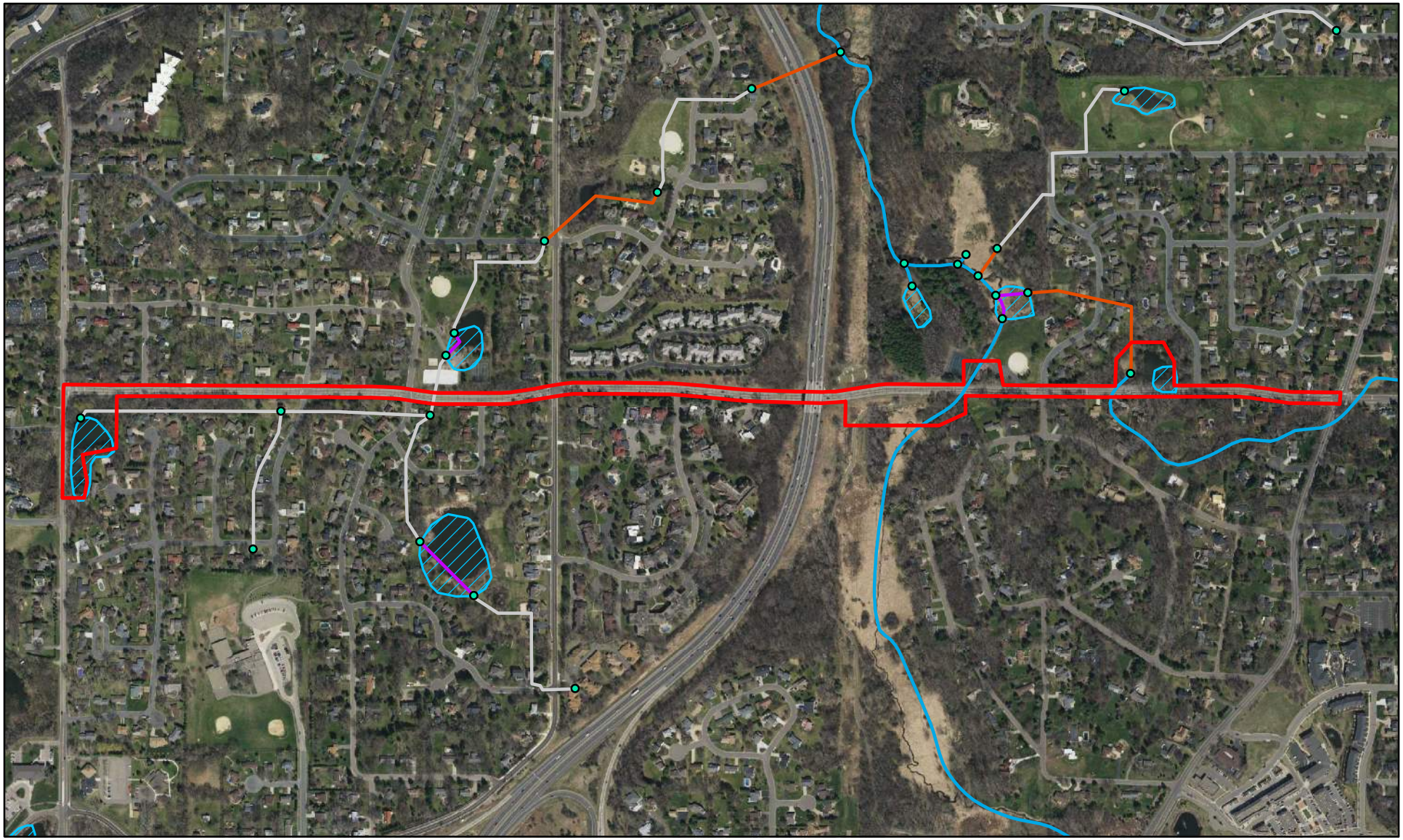


Figure 6 - National Hydrography Dataset

N

0 750 Feet

KJOLHAUG ENVIRONMENTAL SERVICES COMPANY

Source: MNGEO Spatial Commons, USGS

NHD Flowline

- Artificial Path
- Connector
- Pipeline
- Stream/River

NHD Waterbody

- Lake/Pond

Marie Avenue (KES 2018-145)
Mendota Heights, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.

Wesley Neighborhood Improvements

Wetland Delineation Report

APPENDIX A

Joint Application Form for Activities Affecting Water Resources in Minnesota

Project Name and/or Number: **Marie Avenue Improvements (KES 2018-145)**

PART ONE: Applicant Information

If applicant is an entity (company, government entity, partnership, etc.), an authorized contact person must be identified. If the applicant is using an agent (consultant, lawyer, or other third party) and has authorized them to act on their behalf, the agent's contact information must also be provided.

Applicant/Landowner Name: Larry Poppler – TKDA
Mailing Address: 444 Cedar Street Suite 1500 Saint Paul, MN 55101
Phone: (651)-292-4457
E-mail Address: Larry.poppler@tkda.com

Authorized Contact (do not complete if same as above):
Mailing Address:
Phone:
E-mail Address:

Agent Name: Andrew Krinke – Kjolhaug Environmental Services
Mailing Address: 2500 Shadywood Road, Suite 130, Orono, MN 55331
Phone: (612)-704-6743
E-mail Address: Andrew@kjolhaugenv.com

PART TWO: Site Location Information

County: Dakota **City/Township: Mendota Heights**
Parcel ID and/or Address: Marie Avenue (between Lexington Avenue and Dodd Road) and approximately 700 along Lexington Avenue south of Marie Avenue
Legal Description (Section, Township, Range): S23, 24,26 T28N R23W
Lat/Long (decimal degrees):
Attach a map showing the location of the site in relation to local streets, roads, highways.
Approximate size of site (acres) or if a linear project, length (feet): 7,460 feet

If you know that your proposal will require an individual Permit from the U.S. Army Corps of Engineers, you must provide the names and addresses of all property owners adjacent to the project site. This information may be provided by attaching a list to your application or by using block 25 of the Application for Department of the Army permit which can be obtained at:

http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/engform_4345_2012oct.pdf

PART THREE: General Project/Site Information

If this application is related to a delineation approval, exemption determination, jurisdictional determination, or other correspondence submitted ***prior to*** this application then describe that here and provide the Corps of Engineers project number.

Describe the project that is being proposed, the project purpose and need, and schedule for implementation and completion. The project description must fully describe the nature and scope of the proposed activity including a description of all project elements that effect aquatic resources (wetland, lake, tributary, etc.) and must also include plans and cross section or profile drawings showing the location, character, and dimensions of all proposed activities and aquatic resource impacts.

Project Name and/or Number: **Marie Avenue Improvements (KES 2018-145)**

PART FOUR: Aquatic Resource Impact[1] Summary

If your proposed project involves a direct or indirect impact to an aquatic resource (wetland, lake, tributary, etc.) identify each impact in the table below. Include all anticipated impacts, including those expected to be temporary. Attach an overhead view map, aerial photo, and/or drawing showing all of the aquatic resources in the project area and the location(s) of the proposed impacts. Label each aquatic resource on the map with a reference number or letter and identify the impacts in the following table.

Aquatic Resource ID (as noted on overhead view)	**Aquatic Resource Type** (wetland, lake, tributary etc.)	**Type of Impact** (fill, excavate, drain, or remove vegetation)	**Duration of Impact** Permanent (P) or Temporary (T)[1]	**Size of Impact**[2]	**Overall Size of Aquatic Resource** [3]	**Existing Plant Community Type(s)** in Impact Area[4]	**County, Major Watershed #, and Bank Service Area #** of Impact Area[5]

[1]if impacts are temporary; enter the duration of the impacts in days next to the "T". For example, a project with a temporary access fill that would be removed after 220 days would be entered "T (220)".
[2]Impacts less than 0.01 acre should be reported in square feet. Impacts 0.01 acre or greater should be reported as acres and rounded to the nearest 0.01 acre. Tributary impacts must be reported in linear feet of impact and an area of impact by indicating first the linear feet of impact along the flowline of the stream followed by the area impact in parentheses). For example, a project that impacts 50 feet of a stream that is 6 feet wide would be reported as 50 ft (300 square feet).
[3]This is generally only applicable if you are applying for a de minimis exemption under MN Rules 8420.0420 Subp. 8, otherwise enter "N/A".
[4]Use *Wetland Plants and Plant Community Types of Minnesota and Wisconsin* 3rd Ed. as modified in MN Rules 8420.0405 Subp. 2.
[5]Refer to Major Watershed and Bank Service Area maps in MN Rules 8420.0522 Subp. 7.

If any of the above identified impacts have already occurred, identify which impacts they are and the circumstances associated with each:

PART FIVE: Applicant Signature

☐ Check here if you are requesting a pre-application consultation with the Corps and LGU based on the information you have provided. Regulatory entities will not initiate a formal application review if this box is checked.

By signature below, I attest that the information in this application is complete and accurate. I further attest that I possess the authority to undertake the work described herein.

Signature: _____ Date: 11/20/2018

I hereby authorize _____ to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this application.

[1] The term "impact" as used in this joint application form is a generic term used for disclosure purposes to identify activities that may require approval from one or more regulatory agencies. For purposes of this form it is not meant to indicate whether or not those activities may require mitigation/replacement.

Project Name and/or Number: **Marie Avenue Improvements (KES 2018-145)**

Attachment A
Request for Delineation Review, Wetland Type Determination, or Jurisdictional Determination

By submission of the enclosed wetland delineation report, I am requesting that the U.S. Army Corps of Engineers, St. Paul District (Corps) and/or the Wetland Conservation Act Local Government Unit (LGU) provide me with the following (check all that apply):

☒ **Wetland Type Confirmation**

☒ **Delineation Concurrence.** Concurrence with a delineation is a written notification from the Corps and a decision from the LGU concurring, not concurring, or commenting on the boundaries of the aquatic resources delineated on the property. Delineation concurrences are generally valid for five years unless site conditions change. Under this request alone, the Corps will not address the jurisdictional status of the aquatic resources on the property, only the boundaries of the resources within the review area (including wetlands, tributaries, lakes, etc.).

☐ **Preliminary Jurisdictional Determination.** A preliminary jurisdictional determination (PJD) is a non-binding written indication from the Corps that waters, including wetlands, identified on a parcel may be waters of the United States. For purposes of computation of impacts and compensatory mitigation requirements, a permit decision made on the basis of a PJD will treat all waters and wetlands in the review area as if they are jurisdictional waters of the U.S. PJDs are advisory in nature and may not be appealed.

☐ **Approved Jurisdictional Determination.** An approved jurisdictional determination (AJD) is an official Corps determination that jurisdictional waters of the United States are either present or absent on the property. AJDs can generally be relied upon by the affected party for five years. An AJD may be appealed through the Corps administrative appeal process.

In order for the Corps and LGU to process your request, the wetland delineation must be prepared in accordance with the 1987 Corps of Engineers Wetland Delineation Manual, any approved Regional Supplements to the 1987 Manual, and the *Guidelines for Submitting Wetland Delineations in Minnesota* (2013).
http://www.mvp.usace.army.mil/Missions/Regulatory/DelineationJDGuidance.aspx

Wesley Neighborhood Improvements

Wetland Delineation Report

APPENDIX B

Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Marie Avenue Improvements | City/County: Mendota Heights | Sampling Date: 10/2/2018
Applicant/Owner: City of Mendota Heights | State: MN | Sampling Point: SP1-1U
Investigator(s): A. Krinke | Section, Township, Range: S26 T28N R23W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): None
Slope (%): 4 to 6 | Lat: | Long: | Datum:
Soil Map Unit Name: Kanaranzi loam | NWI Classification: None
Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances"
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	N
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Climatic conditions were wetter than normal based on the gridded database method (3-month antecedent) and the 30-day rolling precipitation total.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species	Indicator Staus
1 *Acer negundo*	10	Y	FAC
2 *Salix nigra*	10	Y	OBL
3			
4			
5			
	20	= Total Cover	

Sapling/Shrub stratum (Plot size: 15)			
1 *Acer negundo*	10	Y	FAC
2			
3			
4			
5			
	10	= Total Cover	

Herb stratum (Plot size: 5)			
1 *Rhamnus cathartica*	10	Y	FAC
2 *Fraxinus pennsylvanica*	5	Y	FACW
3			
4			
5			
6			
7			
8			
9			
10			
	15	= Total Cover	

Woody vine stratum (Plot size: 15)			
1 *Vitis riparia*	2		FACW
2			
	2	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across all Strata: 5 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	10	x 1 =	10
FACW species	7	x 2 =	14
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	47 (A)		114 (B)

Prevalence Index = B/A = 2.43

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** SP1-1U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18	10YR 2/1	100					SL	
18-25	10YR 2/1	95	10YR 4/4	5			SL	
25-36	10YR 2/1	90	10YR 4/4	5				
			10YR 4/6	5				
36-48	10YR 4/2	95	10YR 4/6	5				

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes	X	No		Depth (inches):	36
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	36

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Marie Avenue Improvements | City/County: Mendota Heights | Sampling Date: 10/2/2018
Applicant/Owner: City of Mendota Heights | State: MN | Sampling Point: SP1-1W
Investigator(s): A. Krinke | Section, Township, Range: S24 T28N R23W
Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave
Slope (%): 0 to 2 | Lat: | Long: | Datum:
Soil Map Unit Name: Quam silt loam | NWI Classification: PEM1C
Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes
Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y
Hydric soil present?	Y
Indicators of wetland hydrology present?	Y
Is the sampled area within a wetland?	Y
If yes, optional wetland site ID:	Wetland 1

Remarks: (Explain alternative procedures here or in a separate report.)

Climatic conditions were wetter than normal based on the gridded database method (3-month antecedent) and the 30-day rolling precipitation total.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: 15)			
1 *Cornus alba*	10	Y	FACW
2			
3			
4			
5			
	10	= Total Cover	

Herb stratum (Plot size: 5)			
1 *Typha angustifolia*	50	Y	OBL
2 *Carex lasiocarpa*	20	Y	OBL
3 *Solanum dulcamara*	15	N	FAC
4			
5			
6			
7			
8			
9			
10			
	85	= Total Cover	

Woody vine stratum (Plot size: 15)			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across all Strata: 3 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	70	x 1 =	70
FACW species	10	x 2 =	20
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	95 (A)		135 (B)

Prevalence Index = B/A = 1.42

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** SP1-1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18	N 2.5/0	100					muck	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- X Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	3
Water table present?	Yes	X	No		Depth (inches):	Surface
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	Surface

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Marie Avenue Improvements | City/County: Mendota Heights | Sampling Date: 10/2/2018
Applicant/Owner: City of Mendota Heights | State: MN | Sampling Point: SP2-1U
Investigator(s): A. Krinke | Section, Township, Range: S26 T28N R23W
Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): None
Slope (%): 4 to 6 | Lat: | Long: | Datum:
Soil Map Unit Name: Chetek sandy loam | NWI Classification: PEM1Ad
Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology X significantly disturbed? Are "normal circumstances"
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	N
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Climatic conditions were wetter than normal based on the gridded database method (3-month antecedent) and the 30-day rolling precipitation total. A ditch flowed through the center of the wetland, hence hydrology is signicantly disturbed.

VEGETATION -- Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Staus
Tree Stratum (Plot size: 30)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5)			
1 *Phalaris arundinacea*	65	Y	FACW
2 *Securigera varia*	20	Y	UPL
3 *Asclepias syriaca*	10	N	FACU
4 *Arctium minus*	5	N	FACU
5			
6			
7			
8			
9			
10			
	100 = Total Cover		
Woody vine stratum (Plot size: 15)			
1			
2			
	0 = Total Cover		

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across all Strata: 2 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:			
OBL species	0	x 1 =	0
FACW species	65	x 2 =	130
FAC species	0	x 3 =	0
FACU species	15	x 4 =	60
UPL species	20	x 5 =	100
Column totals	100 (A)		290 (B)

Prevalence Index = B/A = 2.90

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- ____ Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** SP2-1U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-14	10YR 2/1	100					CL	
14-20	10YR 2/1	95	10YR 4/4	5	C	M	CL	
20-30	10YR 4/1	90	10YR 4/6	10	C	M	CL	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Marie Avenue Improvements | City/County: Mendota Heights | Sampling Date: 10/2/2018

Applicant/Owner: City of Mendota Heights | State: MN | Sampling Point: SP2-1W

Investigator(s): A. Krinke | Section, Township, Range: S26 T28N R23W

Landform (hillslope, terrace, etc.): Depression | Local relief (concave, convex, none): Concave

Slope (%): 0 to 2 | Lat: | Long: | Datum:

Soil Map Unit Name: Seelyeville muck | NWI Classification: PEM1Ad

Are climatic/hydrologic conditions of the site typical for this time of the year? N (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology X significantly disturbed? Are "normal circumstances"

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y
Hydric soil present?	Y
Indicators of wetland hydrology present?	Y

Is the sampled area within a wetland? Y

If yes, optional wetland site ID: Wetland 2

Remarks: (Explain alternative procedures here or in a separate report.)

Climatic conditions were wetter than normal based on the gridded database method (3-month antecedent) and the 30-day rolling precipitation total. A ditch flowed through the center of the wetland, hence hydrology is signicantly disturbed.

VEGETATION -- Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Staus
Tree Stratum (Plot size: 30)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size: 15)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size: 5)			
1 *Phalaris arundinacea*	100	Y	FACW
2 *Carex lacustris*	10	N	OBL
3			
4			
5			
6			
7			
8			
9			
10			
	110 = Total Cover		
Woody vine stratum (Plot size: 15)			
1			
2			
	0 = Total Cover		

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	10	x 1 =	10
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	110 (A)		210 (B)

Prevalence Index = B/A = 1.91

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** SP2-1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-8	10YR 2/1	100					CL	
8-24	10YR 2/1	95	10YR 4/6	5	C	M	CL	
24-30	10YR 4/1	85	10YR 4/6	15	C	M	CL	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):
Water table present?	Yes	X	No		Depth (inches): 6
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches): 6

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wesley Neighborhood Improvements

Wetland Delineation Report

APPENDIX C

Precipitation Data

Wesley Neighborhood, Mendota Heights: Precipitation Summary
Source: Minnesota Climatology Working Group

Monthly Totals: 2018

Target: T28N R23W S26, Lat: 44.88359 Lon: 93.13663

mon	year	cc	tttN	rrW	ss	nnnn	oooooooo	pre
Jan	2018	19	28N	22W	31	SWCD		1.70
Feb	2018	19	28N	22W	17	SWCD		1.56
Mar	2018	19	28N	22W	31	SWCD		2.31
Apr	2018	19	28N	22W	31	SWCD		3.43
May	2018	19	28N	22W	31	SWCD		3.36
Jun	2018	19	28N	22W	31	SWCD		5.56
Jul	2018	19	28N	22W	31	SWCD		4.74
Aug	2018	19	28N	22W	17	SWCD		4.66
Sep	2018	62	28N	23W	16	SWCD		6.59
Oct	2018	62	30N	23W	36	SWCD		3.45

August/September/October Daily Records

Date	Precip.
Aug 1, 2018	0
Aug 2, 2018	.52
Aug 3, 2018	0
Aug 4, 2018	1.13
Aug 5, 2018	.08
Aug 6, 2018	0
Aug 7, 2018	0
Aug 8, 2018	0
Aug 9, 2018	0
Aug 10, 2018	0
Aug 11, 2018	0
Aug 12, 2018	0
Aug 13, 2018	0
Aug 14, 2018	0
Aug 15, 2018	0
Aug 16, 2018	0
Aug 17, 2018	0
Aug 18, 2018	0
Aug 19, 2018	0
Aug 20, 2018	0
Aug 21, 2018	.04
Aug 22, 2018	0
Aug 23, 2018	0
Aug 24, 2018	-
Aug 25, 2018	-
Aug 26, 2018	2.14
Aug 27, 2018	.06
Aug 28, 2018	.41
Aug 29, 2018	.16
Aug 30, 2018	0
Aug 31, 2018	.12

Date	Precip.
Sep 1, 2018	0
Sep 2, 2018	0
Sep 3, 2018	.31
Sep 4, 2018	.07
Sep 5, 2018	1.48
Sep 6, 2018	0
Sep 7, 2018	0
Sep 8, 2018	0
Sep 9, 2018	0
Sep 10, 2018	0
Sep 11, 2018	0
Sep 12, 2018	0
Sep 13, 2018	0
Sep 14, 2018	0
Sep 15, 2018	0
Sep 16, 2018	0
Sep 17, 2018	0
Sep 18, 2018	1.39
Sep 19, 2018	-
Sep 20, 2018	.39
Sep 21, 2018	2.58
Sep 22, 2018	0
Sep 23, 2018	0
Sep 24, 2018	0
Sep 25, 2018	-
Sep 26, 2018	-
Sep 27, 2018	-
Sep 28, 2018	.37
Sep 29, 2018	0
Sep 30, 2018	0

Date	Precip.	
Oct 1, 2018	0	
Oct 2, 2018	.27	site visit
Oct 3, 2018	.06	
Oct 4, 2018	.51	
Oct 5, 2018	.27	
Oct 6, 2018	.06	
Oct 7, 2018	0	
Oct 8, 2018	.19	
Oct 9, 2018	.34	
Oct 10, 2018	1.57	
Oct 11, 2018	.06	
Oct 12, 2018	T	
Oct 13, 2018	T	
Oct 14, 2018	0	
Oct 15, 2018	0	
Oct 16, 2018	0	
Oct 17, 2018	.12	
Oct 18, 2018	0	
Oct 19, 2018	T	
Oct 20, 2018	0	
Oct 21, 2018	0	
Oct 22, 2018	0	
Oct 23, 2018	0	
Oct 24, 2018	0	
Oct 25, 2018	0	
Oct 26, 2018	0	
Oct 27, 2018	-	
Oct 28, 2018	-	
Oct 29, 2018	-	
Oct 30, 2018	-	
Oct 31, 2018	-	

1981-2010 Summary Statistics

	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*WARM*	*ANN*	*WAT*
30%	0.57	0.48	1.43	2.16	2.84	3.43	2.75	3.47	2.13	1.34	1.16	0.58	18.77	29.64	28.13
70%	1.23	1.03	2.28	3.35	4.46	5.19	4.75	4.96	4.48	3.27	2.25	1.52	22.77	35.44	35.79
mean	0.96	0.83	1.93	2.87	3.72	4.50	4.18	4.35	3.33	2.60	1.91	1.26	20.08	32.46	32.23

EXHIBIT 9

Minnesota State Climatology Office

Precipitation Worksheet Using Gridded Database

Precipitation data for target wetland location:

county: **Ramsey**
township name: **unnamed**
nearest community: **Mendota Heights**
township number: **28N**
range number: **23W**
section number: **26**

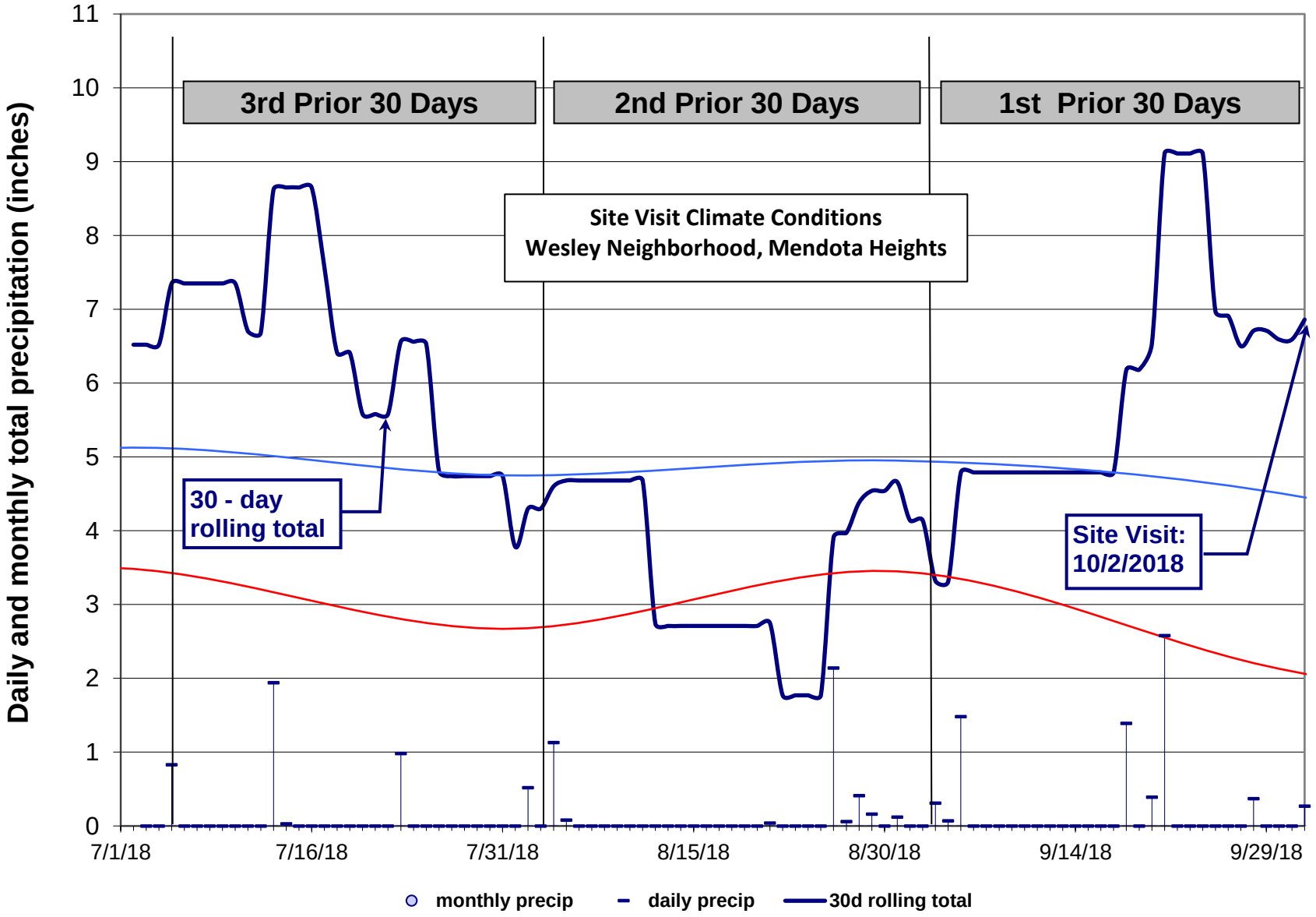
Aerial photograph or site visit date:
Monday, October 1, 2018

Score using 1981-2010 normal period

values are in inches A 'R' following a monthly total indicates a provisional value derived from radar-based estimates.	first prior month: **September 2018**	second prior month: **August 2018**	third prior month: **July 2018**
estimated precipitation total for this location:	**6.53R**	**3.60R**	**4.34**
there is a 30% chance this location will have less than:	2.13	3.47	2.75
there is a 30% chance this location will have more than:	4.48	4.96	4.75
type of month: dry normal wet	**wet**	**normal**	**normal**
monthly score	**3 * 3 = 9**	**2 * 2 = 4**	**1 * 2 = 2**
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	**15 (Wet)**		

Other Resources:

- retrieve daily precipitation data
- view radar-based precipitation estimates
- view weekly precipitation maps
- *Evaluating Antecedent Precipitation Conditions* (BWSR)


Daily and monthly total precipitation (inches)
11
10
9
8
7
6
5
4
3
2
1
0
3rd Prior 30 Days
2nd Prior 30 Days
1st Prior 30 Days
Site Visit Climate Conditions
Wesley Neighborhood, Mendota Heights
30 - day
rolling total
Site Visit:
10/2/2018
7/1/18
7/16/18
7/31/18
8/15/18
8/30/18
9/14/18
9/29/18
monthly precip
daily precip
30d rolling total