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City of Shorewood, MN

# Birch Bluff Road Reconstruction Project Scoping Document

City Project No. 21-01

February 2022



**Submitted by:**

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# Scoping Study

For

Birch Bluff Road Reconstruction Project

City of Shorewood  
Hennepin County  
City Project No. 21-01  
BMI Project No. 0c1.123686

Draft – February 23, 2022

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

By: \_\_\_\_\_

Andrew Budde, P.E.

License No. 46585

Date: \_\_\_\_\_ DRAFT – 2/23/2022

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## I. EXECUTIVE SUMMARY

### A. Background and Introduction.

As requested by the City of Shorewood, Bolton & Menk, Inc. has completed a Scoping Study for the proposed Birch Bluff Road Reconstruction Project. The Scoping study was authorized to be prepared by the City Council on June 14, 2021. The project includes reconstructing Birch Bluff Road and Lee Circle. Reconstruction of these streets will have watermain, storm sewer, stormwater treatment, sanitary sewer adjustments, and potential pedestrian improvements. The preparation of the Scoping Study was to evaluate the construction of Birch Bluff Road and Lee Circle to the city standard street width of 26-foot-wide (as measured from face of curbs), minimize easement needs throughout the project, limit the amount of tree impacts, evaluate watermain construction and sizing, review stormwater treatment locations and impacts, and evaluate multiple options for the construction of a trail system or a sidewalk that connects Eureka Road to Crescent Beach, which would satisfy a piece of the City's Master Trail Plan.

Birch Bluff Road from Grant Lorenz Road to Eureka Road is a Municipal State-Aid (MSA) Route and does qualify to receive state funding for street improvements. To utilize MSA funds the road would need to be constructed to a 30 MPH speed limit and 28-foot-wide if on street parking on Birch Bluff were to be permitted. This is 2 feet wider than the current city standard that allows for on street parking. Also, constructing Birch Bluff Road to a 30 MPH speed limit will require flatter crest and sag vertical curves and larger horizontal curves. Figure 6 shows what the horizontal curve and sight lines would be at the west end of the project at 30 MPH and what the need for Right of Way would be for the curve. These design requirements will have additional negative impacts on how steep multiple driveways can be constructed and increase the amount of retaining walls needed. The City could apply for a variance that would allow the City to construct the road to a 25 MPH design limit and still utilize MSA funding. Approval of the variance is not guaranteed and would need to be approved at the next quarterly meeting held on March 3, 2022 or July XX, 2022. Constructing the curve to 25 MPH would still require the City to acquire some Right-of-Way. After discussion with City staff, it was determined that utilizing MSA funds for Birch Bluff Road would not be in the City's or the public's best interest and would be better used on other MSA routes scheduled for upcoming construction. The city would not lose these funds, they would simply be directed towards other projects.

### B. Proposed Improvements

All improvements addressed within this report are feasible from a technical standpoint. This study addresses issues with aging, substandard, or non-existent infrastructure including street pavement, watermain, storm sewer, stormwater treatment, sanitary sewer, and pedestrian facilities. The improvements discussed in this report are necessary to provide safe and adequate infrastructure and represent cost effective solutions for doing so. Figure 12 in Appendix A indicates the all the proposed improvements along the corridor.

#### 1. Street Improvements

The proposed street improvements on Birch Bluff Road and Lee Circle will consist of full depth reconstruction. The proposed residential street section will include 4-inches of bituminous pavement, 8-inches of aggregate base, 24-inches of select granular borrow, drain tile and geotextile fabric placed on compacted subgrade.

The reconstructed street sections will include barrier type concrete curb and gutter. Birch Bluff Road will be designed to a 25 MPH speed limit to match the existing speed limits while accommodating driveways, yards, existing lift station, and reduce the total need for retaining walls.

2. Water System Improvements

Proposed water system improvements include the installation of a new 8-inch or 12-inch watermain (The 12-inch watermain had been proposed in the City's ultimate water supply plan) extending from the existing watermain at the intersection of Eureka Road and Birch Bluff Road both east to the Tonka Bay City limits and to the west to the intersection of Grant Lorenz Road and Edgewood Road. Watermain will also be installed down Lee Circle. New hydrants, valves, and water services will also be installed, which will allow residents the ability to connect to Municipal water.

3. Storm Sewer Improvements

Storm sewer structures and piping within the roadway will be installed to complement the curb & gutter and the new street layout. The storm sewer under the roadway will be installed to accommodate flow from adjacent properties and alleviate existing drainage concerns around Birch Bluff Road and its surrounding watersheds. The storm sewer will outlet into a proposed new Stormwater Pond. Additional pretreatment will be accomplished with sump manholes with sediment removal baffles that will treat the storm water prior to draining into the Stormwater Pond. The proposed improvements include stormwater treatment items required by the Minnehaha Creek Watershed District (MCWD).

4. Pedestrian Facility Improvements

Three options are highlighted in this study and are intended to satisfy the City's Master Trail plan to connect residents along Eureka Road, Birch Bluff Road, and surrounding neighborhoods to Crescent Beach and the Lake Minnetonka Regional Trail. Options consist of a new 8-foot wide bituminous trail and a 6-foot wide concrete sidewalk at the back of curb that extends from the intersection of Eureka Road and Birch Bluff Road east down Birch Bluff Road to the Tonka Bay city limits where it will turn north and terminate at Crescent Beach. If approved additional discussion will need to be had with the City of Tonka Bay prior to approval of any pedestrian facilities within the Tonka Bay City limits.

C. Permitting Requirements

Permits will be required from Minnehaha Creek Watershed District (MCWD), Board of Water & Soil Resources (BWSR), the Minnesota Pollution Control Agency (MPCA), Minnesota Department of Health (MDH), Department of Natural Resources (DNR), and if the pedestrian facilities are approved the Army Corps of Engineers (ACOE). The project will need to comply with water supply, erosion control, stormwater runoff management, and potential wetland and waterbody crossing requirements of the listed agencies for the pedestrian facilities.

D. Wetland Mitigation

A wetland delineation was conducted as part of the project and it was determined that

existing wetlands have been identified along the corridor. It was also determined that the proposed street improvement would impact the wetlands. Additional impacts to the wetlands will be needed to construct the proposed Stormwater treatment ponds. The impacts to the wetlands will need to be mitigated for through the purchase of wetland credits from a wetland bank.

E. Right of Way Acquisition

Permanent Retaining Wall Easement and Drainage & Utility Easement acquisition will be required for this project in order to provide adequate space for construction and maintenance of the street and utilities in the proposed corridor. Approximately three parcels will require permanent easements and 20 or more are anticipated to require temporary easements or right of entry agreements. Additional permanent and temporary easements or right of entry agreements may be needed as the progression of the scoping document is refined and ultimately the final scope of the project is determined.

F. Funding/Financing

The city of Shorewood does not assess the construction costs for roadway or utility improvements. The project will be funded through a combination of Street Reconstruction Bond Funds and Utility Capital Funds for watermain, sanitary sewer, and storm sewer. If residents choose to connect to city water they are required to pay a \$10,000 connection charge and are responsible for the cost to run water services from the property line and into their home.

Birch Bluff Road is part of the MnDOT MSA route system and partial funding for the project could be utilized for street and storm sewer construction. However, the city has determined that it is in the best interest to not utilize MSA funds for this project due to the required geometrics, sight lines, and speed requirements. It is not anticipated that any grant funds would be available for this project.

G. Estimated Costs

Cost estimates have been prepared for the proposed improvements. All itemized cost estimates are provided in Appendix B and one option is summarized below in Table 1.

| Estimated Project Costs          |                              |
|----------------------------------|------------------------------|
| Proposed Improvements            | Total Estimated Project Cost |
| Street Improvements              | \$3,631,898.17               |
| Water System Improvements        | \$864,139.72                 |
| Storm Sewer Improvements         | \$615,017.18                 |
| Sanitary Sewer Improvements      | \$140,039.09                 |
| Pedestrian Facility Improvements | \$201,501.30                 |
| Right of Way Acquisition         | \$250,000.00                 |
| Wetland Mitigation               | \$50,000.00                  |

|   |                       |
|---|-----------------------|
| <b>Total Estimated Project Cost</b>   | <b>\$5,752,595.46</b> |
| Note: All costs have been inflated by 10% to account for inflation from 2021 to 2023. |                       |

## II. BACKGROUND AND INTRODUCTION

The impetus for this report is a request by the City of Shorewood to scope and evaluate the of improvements to roadway, utilities, and pedestrian facilities on Birch Bluff Road and Lee Circle. In addition to improve or resolve multiple drainage issues along the corridor.

Birch Bluff Road is currently a 22-foot wide, rural street section. The overall pavement condition was identified as a 4 out of 10 in 2018 prior to the mill & overlay in 2019. The pavement was overlaid in 2019 to improve the deteriorated pavement with the intention of reconstructing the roadway within several years. On-street parking is typically allowed but has segments signed as no parking. The street does not have curb and gutter, stormwater drains generally down small ditches on each side to adjacent low properties and ultimately drains to Lake Minnetonka. The road has no existing pedestrian facilities along it. There is watermain extended under Eureka Road that terminates at the intersection of Birch Bluff Road. Birch Bluff Road has sanitary sewer that serves each resident and an existing lift station that has been previously upgraded. The corridor has many trees on both sides of the roadway along with retaining walls to accommodate undulating topography. Overhead power and communication lines are generally located on the north side of the roadway and two existing gas lines are buried along the roadway corridor.

Lee Circle is currently a 22-foot wide, rural street section. The street does not have curb and gutter, water drains generally to the southeast to the existing wetland between the City of Shorewood and Tonka Bay and eventually to Lake Minnetonka. There is no existing watermain on Lee Circle and there is sanitary sewer that service each resident.

## III. PROPOSED IMPROVEMENTS

### A. Street Improvements

Figure 1 in Appendix A indicates the proposed project area. Figure 5 in Appendix A indicates the proposed street typical sections.

#### 1. Birch Bluff Road and Lee Circle

The proposed project includes reconstruction of the entire street section due to the amount of proposed utility work and the historic condition of the pavement. The proposed street widths will be modified to match the standard city section of 26-foot face to face. The proposed full reconstruction method consists of complete removal of the existing street structural section. A full new street section of select granular, aggregate base, draintile, and pavement is then installed with new concrete curb and gutter. Adjacent driveways are also reconstructed as necessary to match the new roadway. The proposed residential street section will include 4-inches of bituminous pavement, 8-inches of aggregate base, 24-inches of select granular borrow, draintile, and geotextile fabric placed on compacted subgrade. Additional excavation will occur and be replaced with stabilizing aggregate if poor subgrade soils are encountered. Birch Bluff Road will be constructed to a 25 MPH speed limit design to accommodate driveways, yards, the existing lift station, and reduce the total need for retaining

walls. The centerline grade of Birch Bluff Road will match the existing street grade in most areas in order to provide adequate tie-ins to existing driveways and drain some adjacent properties, there will be locations that the centerline grade will be lowered or raised to reduce impacts to trees, driveways, and reduce the need for retaining walls. This is due to the added width of the street. Lowering or raising the street grade will require adjustments to the sanitary manholes in the existing roadway. On street parking is being recommended on the south side of Birch Bluff Road to accommodate as much parking on the road without interfering with driveway access.

The total project cost for the proposed street reconstruction, is estimated to be **\$3,799,473.17**, which includes Right of Way Acquisition. Itemized cost estimates are included in Appendix B.

#### B. Water System Improvements

Figure 3 in Appendix A indicates the proposed water system improvements.

The proposed water system includes a new 8-inch watermain extending from the Eureka Road east to the Tonka Bay City limits and to the west to the intersection of Grant Lorenz and Edgewood Road. This proposed watermain connection will provide adequate service, looping, and fire protection to the adjacent properties for the life of the system. Lee Circle will also have new 8-inch watermains installed. The proposed pipe material is Ductile Iron Pipe. Isolation valves and hydrants will be installed to bring the system up to current standards. One inch or larger service lines will be constructed, and curb stops will be installed at the right-of-way line. At this location residents will then have the option to connect to the city watermain as part of their own improvements. Constructing watermain in these streets will provide residents the opportunity to connect to the city's water system and receive access to a safer, cleaner, and more reliable water source.

To protect the watermain against corrosion, the following items will be included with the design and installed during construction:

1. All hydrants and valves will be manufactured and secured using stainless steel bolts.
2. All fittings will be coated with fusion bonded epoxy.
3. All fittings, valves, valve boxes, and hydrants will be wrapped in polyethylene encasement material.
4. All fittings, hydrants, and service line connections shall be provided with cathodic protection (sacrificial anodes).

A 12-inch watermain had been proposed in the City's ultimate water supply plan. After recent water modeling it was determined that an 8-inch watermain would satisfy the City's ultimate need for water in the area.

There are three properties on the east end of the project that are currently hooked up to Tonka Bays water supply. These property owners could stay on Tonka Bays water supply or the City of Shorewood could disconnect those properties from Tonka Bay and connect them back up to the City of Shorewood's water supply. Figure 8 in Appendix A shows three different options for the water service connections. Further discussion and evaluation will need to be done prior to determining the best approach for the property owners and the City.

The total project cost for the proposed 8-inch water system improvements, is estimated to

be **\$913,064.72**, which includes an estimate for Right of Way Acquisition, which includes an estimate for Right of Way Acquisition. Itemized cost estimates are included in Appendix B.

C. Storm Sewer Improvements

Figure 4 in Appendix A indicates the proposed storm sewer improvements.

The proposed storm sewer improvements include the construction of storm sewer facilities to convey street and area runoff to a proposed Stormwater Pond near the low areas along the corridor. Figure 9 in Appendix A shows the cross-section of the Stormwater Pond and its outlet. City Staff is currently in discussion with property owners to acquire rights to property to construct the Stormwater Pond. There are many low points on properties adjacent to Birch Bluff Road and Lee Circle that will be connected to the trunk storm sewer under the street to help resolve known flooding and prolonged inundation during wet periods.

The total project cost for the proposed storm sewer improvements, is estimated to be **\$643,392.18**, which includes an estimate for Right of Way Acquisition and Wetland Mitigation. Itemized cost estimates are included in Appendix B. Figure 10 and 11 in Appendix A indicates the existing and proposed drainage maps. The Figure 11 indicates the proposed conditions based on the storm sewer layout in Figure 4 and the Stormwater Pond in Figure 12.

D. Sanitary Sewer Improvements

The proposed sanitary sewer improvements include the adjustment of the existing sanitary sewer castings and the adjustment and realignment of the existing sanitary sewer services to accommodate the proposed watermain construction. The existing sanitary sewer system has been inspected via televising the existing main and has been found to be in good working condition with minor defects that will be addressed with a future lining project. The existing sanitary sewer manholes have also been reviewed for structural integrity as well as for inflow and infiltration from groundwater and were found to be in good condition with minor to no inflow or infiltration.

The total project cost for the proposed sanitary sewer improvements, is estimated to be **\$145,164.09**, which includes an estimate for Right of Way Acquisition. Itemized cost estimates are included in Appendix B.

E. Pedestrian Facility Improvements

There are three options that have been scoped and included in this study and overview figures are shown in Figure 2 in the appendix.

1. Option 1: A new 8-foot-wide bituminous trail at the back of curb from the intersection of Eureka Road and Birch Bluff Road to the Tonka Bay city limits. Then the trail would extend north along the west side of the existing road and terminate at the Crescent Beach parking lot. The existing road on the north-south portion of Birch Bluff Road is not proposed to be reconstructed, but construction of concrete curb and gutter is recommended to provide separation from vehicles and the 8-foot-wide bituminous trail. The north-south portion of the trail that is being proposed is partially within the City of Tonka Bays city limits and further discussion will need to be had if this option is to proceed. The proposed trail section will include 3-inches of bituminous pavement and 6-inches of aggregate base. All intersections will be constructed to meet all ADA standards including

truncated domes. There is an existing ditch and wetland along the west side of the north-south portion of the proposed trail. If the trail is proposed wetland mitigation will be required and the ditch will need to be moved west 5-feet, both of which can add significant permitting efforts. Four additional trees will need to be removed if this option is approved. Retaining walls or grading easements will be needed along Birch Bluff Road if this option is pursued.

2. Option 2: A new 6-foot-wide concrete sidewalk at the back of curb from the intersection of Eureka Road and Birch Bluff Road to the Tonka Bay city limits. Then the sidewalk would extend north along the west side of the existing road and terminate at Crescent Beach parking lot. The existing road on the north-south portion of Birch Bluff Road is not proposed to be reconstructed, but construction of concrete curb and gutter is recommended to provide separation from vehicles and the 6-foot-wide concrete sidewalk. The north-south portion of the sidewalk that is being proposed is within the City of Tonka Bays city limits and further discussion will need to be had if this option is to proceed. The proposed sidewalk section will include 4-inches of concrete sidewalk and 6-inches of aggregate base. All intersections will be constructed to meet ADA standards including truncated domes. There is an existing ditch and wetland along the west side of the north-south portion of the proposed sidewalk. If the sidewalk is proposed wetland mitigation will be required and the ditch will need to be moved west 3-feet, both of which can add significant permitting efforts. Four additional trees will need to be removed if this option is approved. Retaining walls or grading easements will be needed along Birch Bluff Road if this option is pursued.
3. Option 3: A new 6-foot-wide concrete sidewalk at the back of curb from the intersection of Eureka Road and Birch Bluff Road to the Tonka Bay city limits. Then the sidewalk would extend north and located 2-feet off of the existing Right-of-Way and terminate at the Crescent Beach parking lot. This segment of sidewalk is largely within the right of way of the City of Shorewood and less coordination would be required with the City of Tonka Bay. The proposed sidewalk section will include 4-inches of concrete sidewalk and 6-inches of aggregate base. All intersections will be constructed to meet ADA standards including truncated domes. There is an existing ditch and wetland along the east side of the north-south portion of the proposed sidewalk. If the sidewalk is proposed wetland mitigation will be required but the ditch will not need to be moved, both of which can add significant permitting efforts. Thirteen additional trees will need to be removed if this option is approved. Retaining walls or grading easements will be needed along Birch Bluff Road if this option is pursued.

The total project cost for the proposed 8-foot-wide bituminous trail improvements, is estimated to be **\$198,716.31**. The total project cost for the proposed 6-foot-wide concrete sidewalk improvements at the back of curb, is estimated to be **\$198,260.08** and the proposed 6-foot-wide concrete sidewalk improvements 2-feet off the Existing Right-of-Way is estimated to be **\$201,501.30**. Itemized cost estimates are included in Appendix B. Additional options of including a boulevard could be further reviewed, but would have greater impacts to trees, driveways, and the overall height of retaining walls or grading limits.

F. Wetland Mitigation

The need for impacts to the delineated wetlands have been identified to construct both the street improvements and the Stormwater Treatment improvements. The wetlands that will be impacted have been identified as low-quality wetlands, which means the wetlands have low species diversity, are dominated by non-native invasive species or managed vegetation, and receive stormwater runoff. Impacts to the wetlands will need to be mitigated for at a 2:1 ratio (0.17 acres of impact @ \$130,000/acre). Mitigation of the impacted wetlands will include the purchasing of Wetland Credits from a private banker.

The total project cost for the proposed Wetland Mitigation, is estimated to be **\$50,000.00**.

G. Retaining Walls

Due to the undulating topography proposed improvements include the construction of retaining walls to reduce grading limits, erosion concerns, acquisition of property, and the total number of impacted trees. Areas along the corridor will require the removal of existing retaining walls within the City owned Right-of Way. Other areas along the corridor will require newly constructed walls to reduce grading limits on private property. City Staff is currently in discussion with property owners to acquire rights to property to construct the proposed retaining walls.

The City is also reviewing options to grade out areas at a 2:1 slope to avoid the need for retaining walls. There are existing slopes along the corridor that are greater than a 2:1. These slopes, if approved, will have be stabilized with plantings and heavy duty erosion control blanket to protect the slopes from erosion.

H. Tree Impacts

Many tree impacts are unavoidable when constructing street and utility projects. In addition to the street section itself, additional room is required to construct the project safely and properly tie into existing yards and driveways with reasonable grades. Also, utility trenches can have significant impacts to root systems. In advance of the final plan set and reconstruction of Birch Bluff Road, a tree inventory will be completed along the corridor. The inventory will tag each tree with a unique number, catalog the size, species, health, and other unique characteristics of each tree. When discussing tree impacts on this project, the criteria used for quantifying a tree as impacted is if the construction limits extend into any amount of the tree's dripline. Not all trees designated as impacted will be cut down and removed. Some will have their root system cleanly cut or include soil additives during construction that promote root growth. However, in some cases the entire tree will be removed where it is determined that it would be unable to survive if left in place, is in poor health, is an ash tree, or a potential liability to the city or adjacent residents. The goal of the project is to minimize the number of healthy trees that are removed. The number of trees impacted are approximately 435 trees, which includes large shrubs and small diameter trees.

## IV. PERMITTING REQUIREMENTS

A. Minnehaha Creek Watershed District (MCWD)

The MCWD permit will address the districts rules including Erosion Control, Wetland Protection, Waterbody Crossings, Floodplain Alterations, and Stormwater Management for Birch Bluff area improvements. All proposed construction meets District requirements so no

variances to their rules are necessary.

The Minnesota Department of Natural Resources (MnDNR) and the Board of Water & Soil Resources (BWSR) have delegated their permitting requirements for wetland and lake impacts to the MCWD to help expedite and streamline permitting process. Coordination may be required with the MnDNR and BWSR if there are unique characteristics to the project.

As part of the permitting process, a public notice will be required for all properties within 600 feet of the project. The timeframe for obtaining a MCWD permit is 21 days from submittal of a complete application.

B. Minnesota Pollution Control Agency (MPCA)

A construction stormwater permit will be required for this project prior to initiation of construction activities. The timeframe for obtaining a NPDES Permit is 1 day from submittal of a complete application.

C. Minnesota Department of Health (MDH)

With the installation of new watermain, the MDH must review all plans to verify that they are design with appropriate engineering standards to ensure the water system remains safe. This is standard for any watermain installed on any project and this project's watermain will be designed in accordance with 10-State Standards.

D. Army Corps of Engineers (ACOE)

The Wetland Delineation application may need to be submitted to the American Corps of Engineers if one of the three pedestrian facilities is pursued.

## V. RIGHT OF WAY ACQUISITION

A. Permanent Right of Way (ROW), Drainage & Utility Easements (DUE), & Retaining Wall Easements

The existing right of way width along Birch Bluff Road ranges from 50' to 66' and 50' wide along Lee Circle. Due to the narrow corridor, it is anticipated that right of way and/or easement acquisition will be required at various locations along the corridor to construct and properly maintain the proposed street, utilities, and retaining walls. This acquisition will ideally be negotiated with property owners. If the city cannot come to an amicable agreement with property owners as needed to meet the needs of the project, then the City may need to utilize eminent domain. This process is not desired by the City but would be used as a last resort if mutual agreement is not met during negotiations. This process can take 9 to 12 months for local projects and must be initiated early enough to avoid delays on construction.

There are locations along the proposed corridor where permanent drainage & utility easements or retaining wall easements will be necessary. These will be needed to construct and maintain utilities, typically drainage facilities and retaining walls that are outside of the available right of way. These are also critical for the maintenance of the retaining walls and surface water inlet locations where surface water drains before entering the storm sewer system.

B. Temporary Construction Easements/Grading Easements/Right of Entries

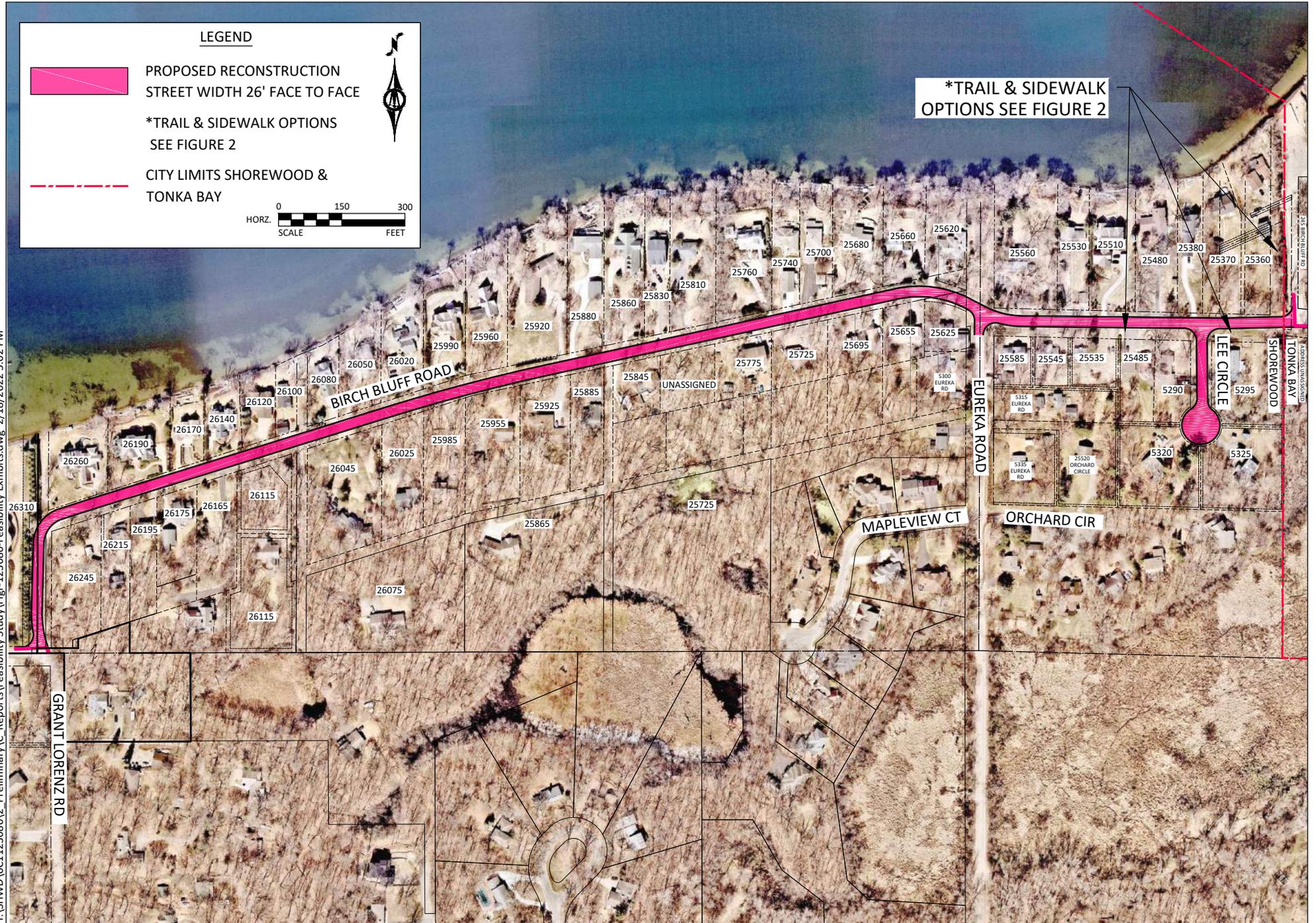
Temporary construction easements, Grading Easements, or Right of Entries will be needed to access and construct the project. These will be minimized to the extent possible but can significantly aid in the efficiency and constructability of the project such as when used for a construction staging area. Also, as staff meet with residents along the corridor it is likely that minor encroachments into private property will be mutually beneficial to both parties in addressing construction concerns related to grading, driveways, tree impacts, and others.

## **VI. FUNDING/FINANCING**

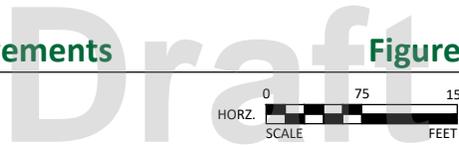
The proposed method of funding or financing the street portion of the project is by Street Reconstruction Bonds. Most of the roadway project costs are eligible since the existing streets will be reconstructed. Utility improvements will also be funded through the various Capital Improvements Funds: Street Reconstruction Fund, Water Fund, Sanitary Sewer Fund, and Stormwater Management Fund. There is an opportunity to receive MSA funding, but at this time City staff believes that these funds can be better utilized on other upcoming projects due to the geometric and speed related requirements associated with meeting the MSA requirements.

## Appendix A: Figures

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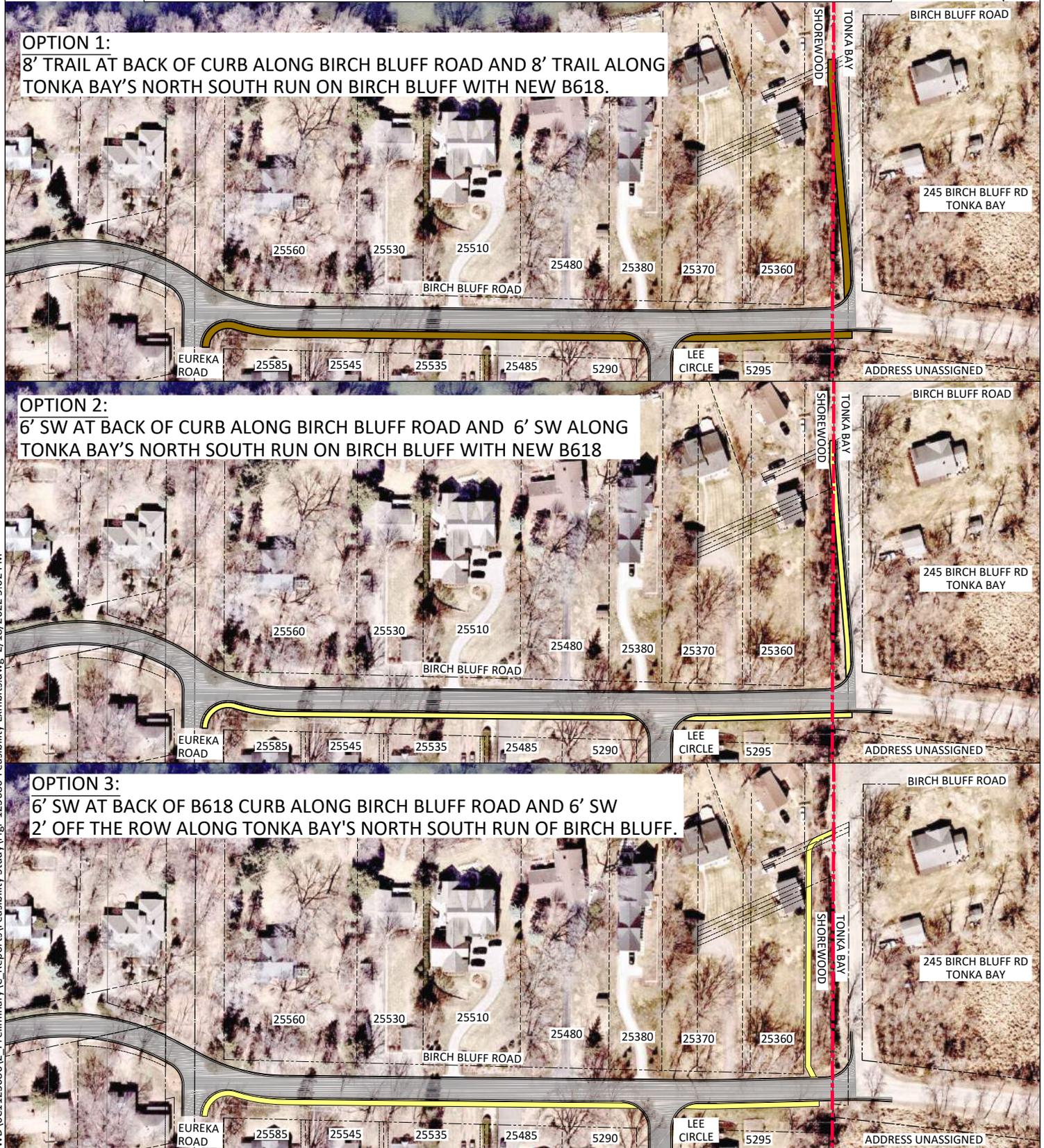


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**LEGEND**

|   |   |  |                   |
|---|---|--|-------------------|
|  | PROPOSED RECONSTRUCTION B618 CURB STREET WIDTH 26' FACE TO FACE |  | CONCRETE SIDEWALK |
|  | CITY LIMITS SHOREWOOD & TONKA BAY                               |  | BITUMINOUS TRAIL  |



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# Birch Bluff Street & Utility Improvements

City of Shorewood

# Draft

### Figure 3: Watermain



February 2022



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**LEGEND**

- PROPOSED WATERMAIN
- ★ PROPOSED HYDRANT & GATE VALVE
- CITY LIMITS SHOREWOOD & TONKA BAY

# Birch Bluff Street & Utility Improvements

City of Shorewood

# Draft

## Figure 4: Storm Sewer



February 2022



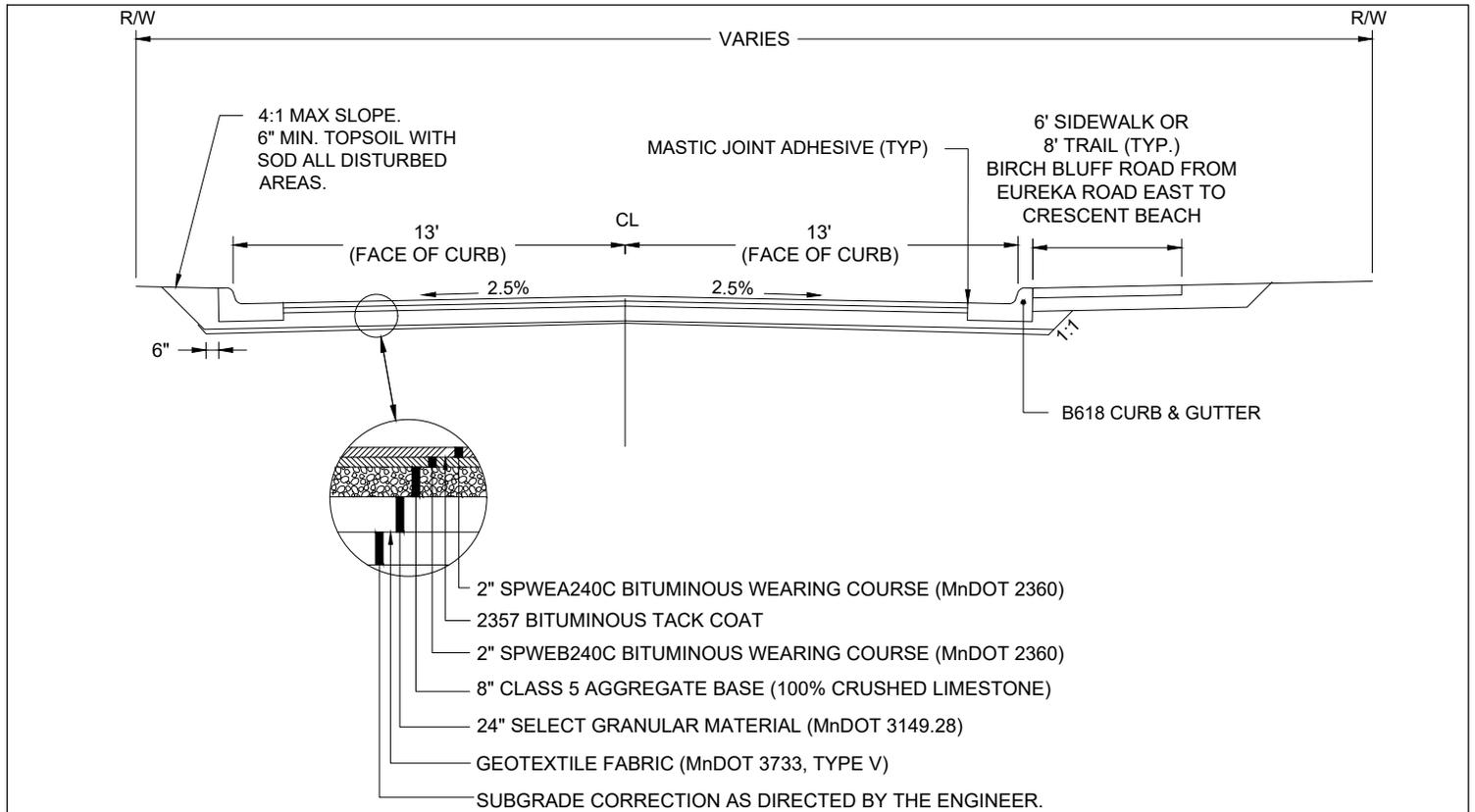
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### LEGEND

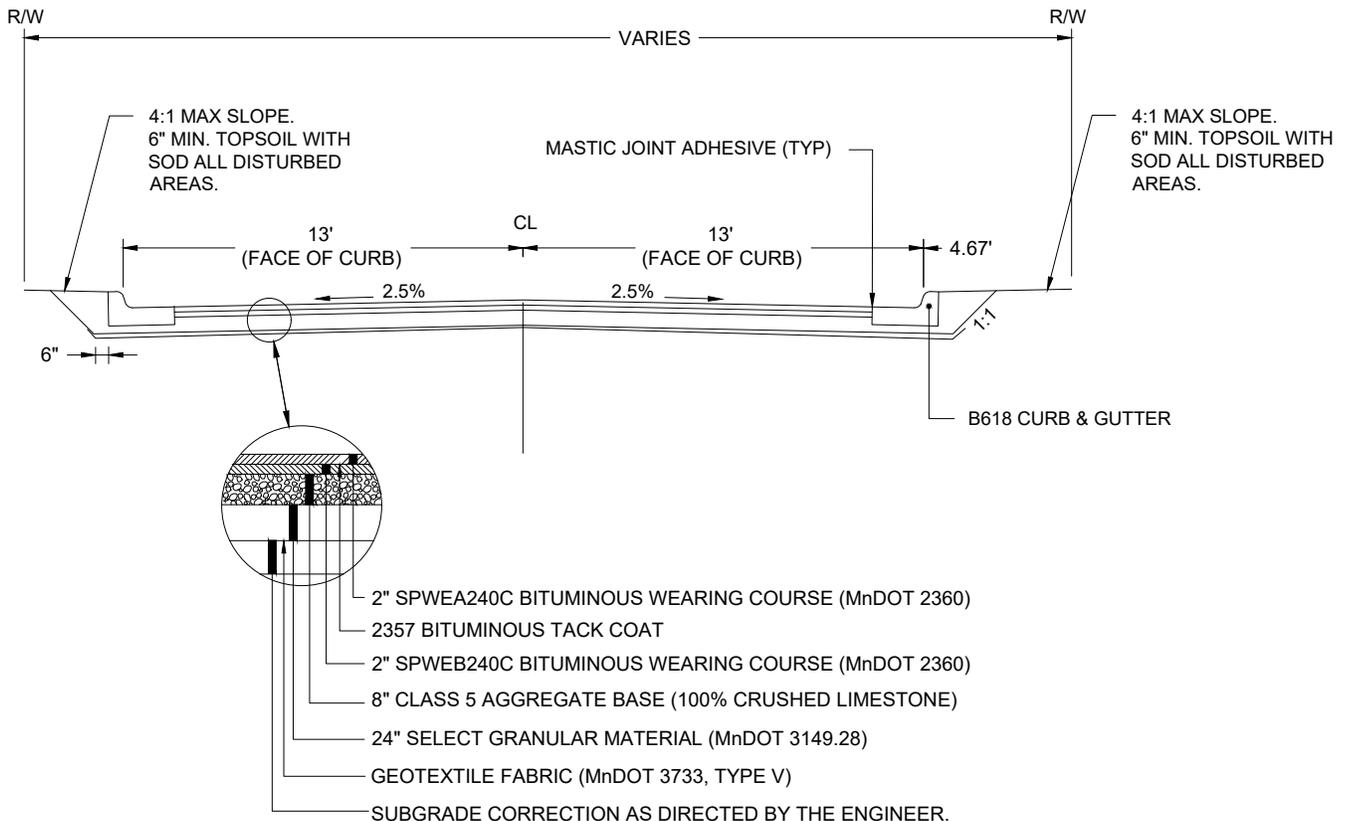
-  PROPOSED STORM SEWER
-  STORM SEWER MANHOLE
-  STORM SEWER CATCH BASIN
-  STORM SEWER FLARED END SECTION
-  CITY LIMITS SHOREWOOD & TONKA BAY



Draft



**RECONSTRUCTION TYPICAL SECTION-BIRCH BLUFF ROAD & LEE CIRCLE  
WITH 6' CONCRETE SIDEWALK OR 8' BITUMINOUS TRAIL**



**RECONSTRUCTION TYPICAL SECTION-BIRCH BLUFF ROAD & LEE CIRCLE**



$R_{min} = V^2 / (15(e_{max} + f_{max}))$

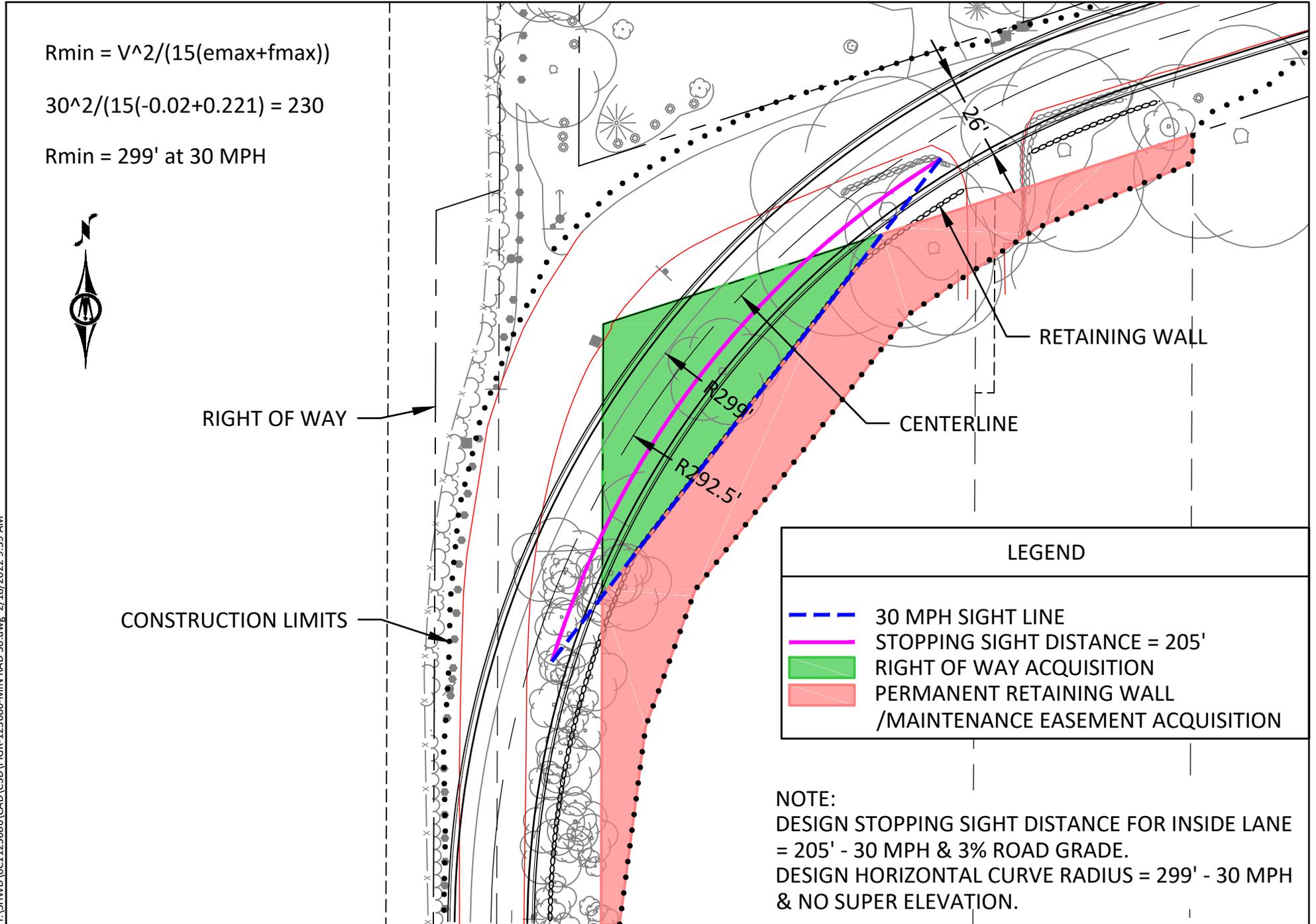
$30^2 / (15(-0.02 + 0.221)) = 230$

Rmin = 299' at 30 MPH



RIGHT OF WAY

CONSTRUCTION LIMITS



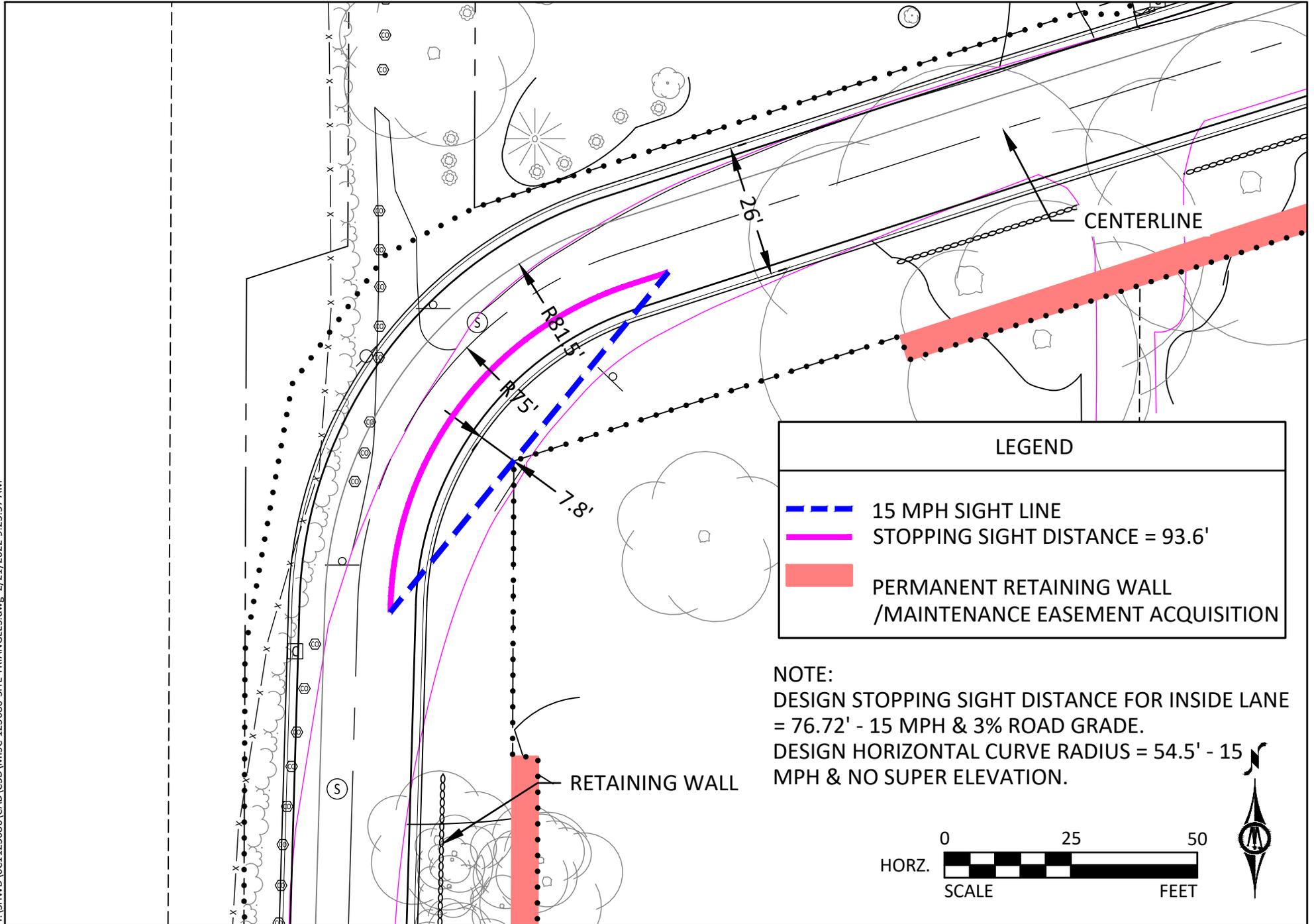
RETAINING WALL

CENTERLINE

LEGEND

- 30 MPH SIGHT LINE
- STOPPING SIGHT DISTANCE = 205'
- RIGHT OF WAY ACQUISITION
- PERMANENT RETAINING WALL / MAINTENANCE EASEMENT ACQUISITION

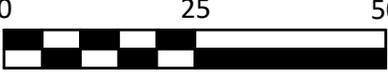
NOTE:  
 DESIGN STOPPING SIGHT DISTANCE FOR INSIDE LANE = 205' - 30 MPH & 3% ROAD GRADE.  
 DESIGN HORIZONTAL CURVE RADIUS = 299' - 30 MPH & NO SUPER ELEVATION.



**LEGEND**

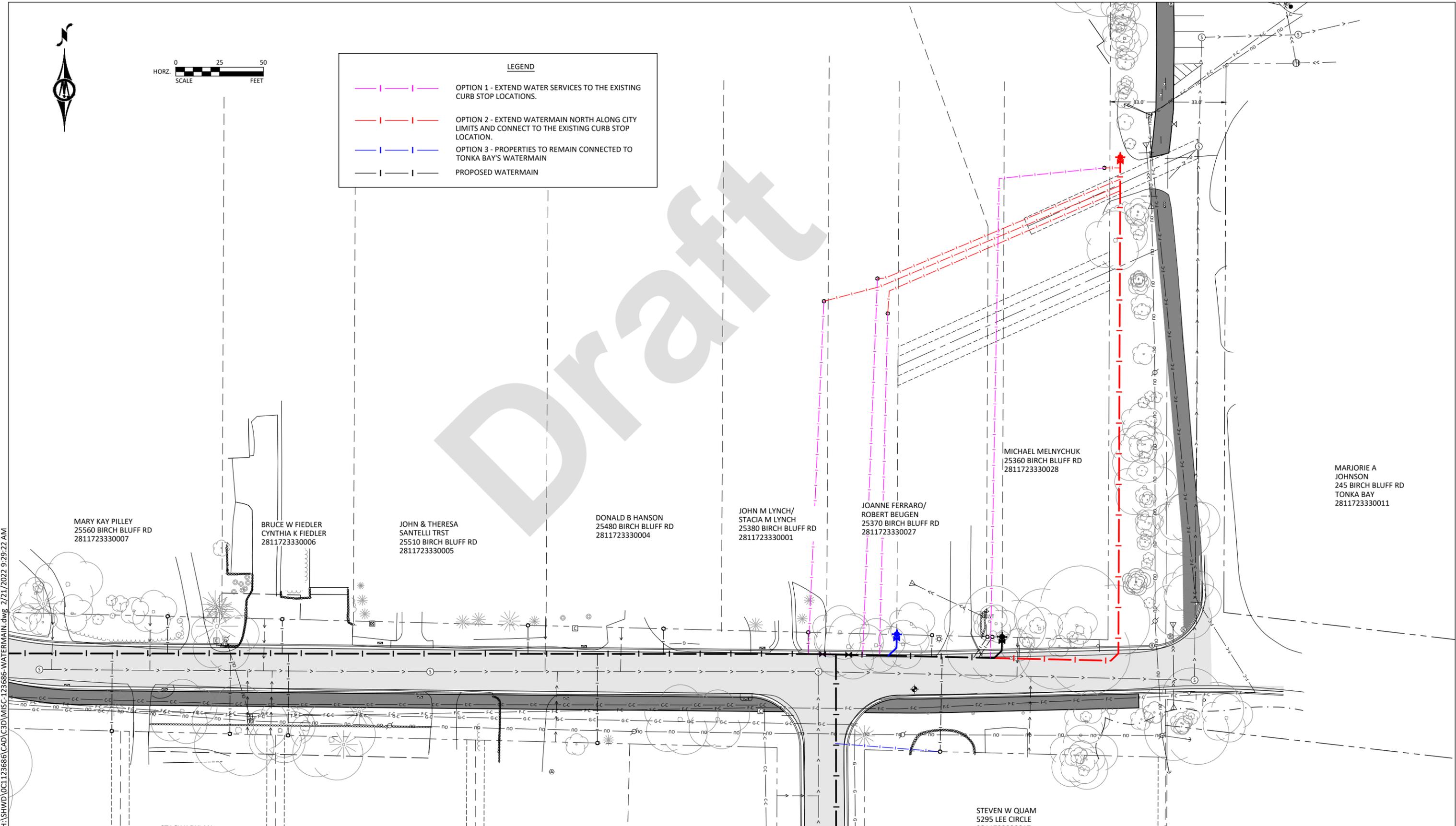
|   |   |
|---|---|
|    | 15 MPH SIGHT LINE   |
|   | STOPPING SIGHT DISTANCE = 93.6'                               |
|  | PERMANENT RETAINING WALL<br>/MAINTENANCE EASEMENT ACQUISITION |

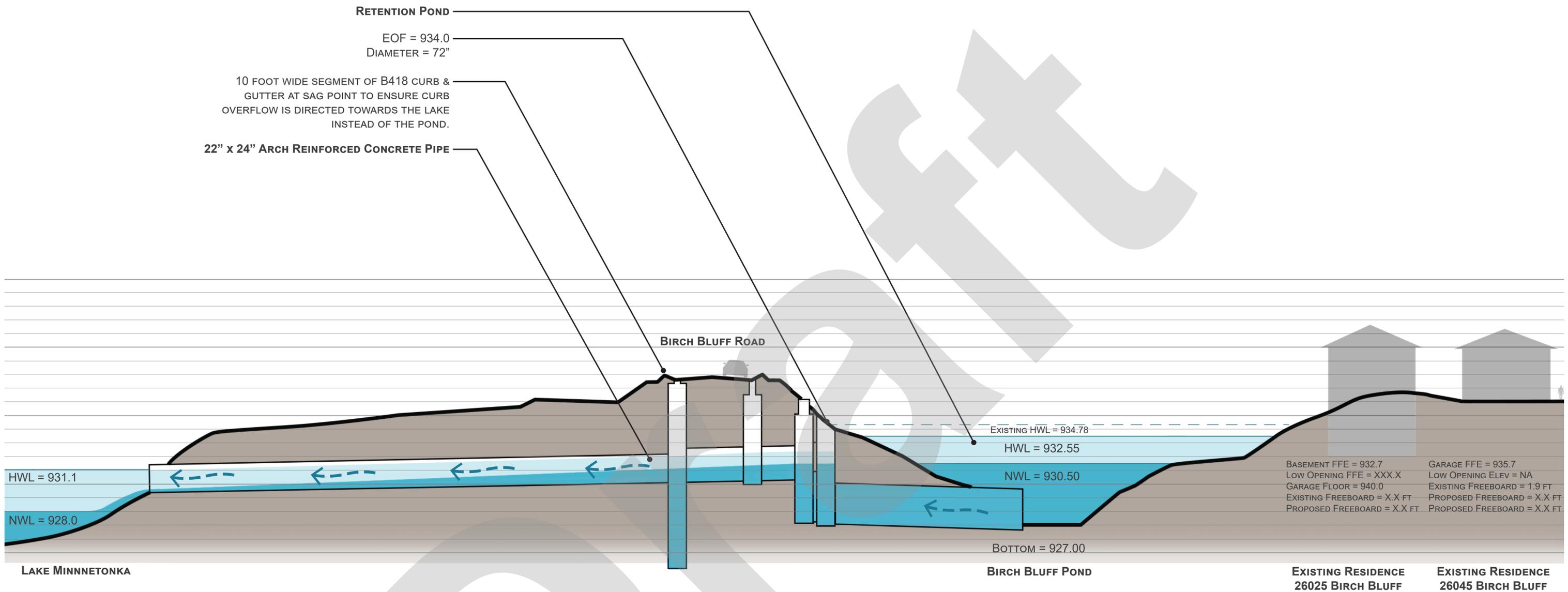
**NOTE:**  
 DESIGN STOPPING SIGHT DISTANCE FOR INSIDE LANE = 76.72' - 15 MPH & 3% ROAD GRADE.  
 DESIGN HORIZONTAL CURVE RADIUS = 54.5' - 15 MPH & NO SUPER ELEVATION.

HORZ.  SCALE FEET



H:\SHWD\0C1123686\CAD\C3D\MISC-123686-SITE TRIANGLES.dwg 2/21/2022 9:25:57 AM





**FIGURE 9: BIRCH BLUFF POND - SYSTEM FUNCTION DIAGRAM**





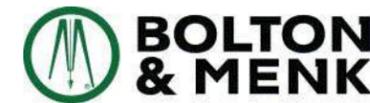
# Birch Bluff Street & Utility Improvements

City of Shorewood, Minnesota

# Draft

## Figure 10: Existing Drainage Map

February 2022



Real People. Real Solutions.

| Node  | Storm Event | Existing        | Proposed        | Rate Change |
|---|-------------|-----------------|-----------------|-------------|
| Outlet-1<br>Edgewood Road                         | 1-Yr        | 0.0             | 0.0             | 0.0         |
|   | 10-Yr       | 0.1             | 0.1             | 0.0         |
|   | 100-Yr      | 0.2             | 0.2             | 0.0         |
| Outlet-2<br>End of Grant Lorenz Road              | 1-Yr        | 1.1             | 1.1             | 0.0         |
|   | 10-Yr       | 4.0             | 4.0             | 0.0         |
|   | 100-Yr      | 5.7             | 5.9             | 0.2         |
| Outlet-3<br>Storm Sewer From<br>26045 Birch Bluff | 1-Yr        | 2.0             | 0.9             | -1.2        |
|   | 10-Yr       | 6.2             | 5.0             | -1.3        |
|   | 100-Yr      | 15.4            | 13.7            | -1.7        |
| Outlet-4<br>Crescent Beach                        | 1-Yr        | 0.9             | 1.9             | 1.0         |
|   | 10-Yr       | 4.8             | 6.1             | 1.3         |
|   | 100-Yr      | 14.6            | 13.5            | -1.2        |
| <b>100-Yr High Water Level</b>                    |             | <b>Existing</b> | <b>Proposed</b> |             |
| Ex/Pr-26045BirchBluff                             |             | 934.8           | 932.6           |             |
| Wetland-1   |             | 939.8           | 939.8           |             |
| Wetland-2   |             | 933.3           | 933.3           |             |
| Wetland-3   |             | 941.4           | 941.4           |             |
| Wetland-4   |             | 933.3           | 933.3           |             |
| Wetland-5   |             | 931.5           | 931.5           |             |

**OUTLET 3:**  
STORM SEWER FROM  
26045 BIRCH BLUFF  
100yr Peak Discharge  
Existing - 15.4 cfs  
Proposed - 13.7 cfs

**OUTLET 4:**  
CRESCENT BEACH  
100yr Peak Discharge  
Existing - 14.6 cfs  
Proposed - 13.5 cfs

**OUTLET 2:**  
END OF GRANT LORENZ ROAD  
100yr Peak Discharge  
Existing - 5.7 cfs  
Proposed - 5.9 cfs

**OUTLET 1:**  
EDGEWOOD ROAD  
100yr Peak Discharge  
Existing - 0.2 cfs  
Proposed - 0.2 cfs



**Legend**

- Stm CB/MH
- Stm Pipe
- DrainageArrow
- Delineated Wetland
- Existing Subbasin
- 2ft\_Contours\_Clipped
- CityLimits
- Wetland

0 200 Feet

Map Document: H:\SHHW\0\123686\GIS\ESR\IMXD\Drainage\_Map - Existing Overview.mxd | Date Saved: 2/15/2022 5:19:56 PM



| Node  | Storm Event | Existing        | Proposed        | Rate Change |
|---|-------------|-----------------|-----------------|-------------|
| Outlet-1<br>Edgewood Road                         | 1-Yr        | 0.0             | 0.0             | 0.0         |
|   | 10-Yr       | 0.1             | 0.1             | 0.0         |
|   | 100-Yr      | 0.2             | 0.2             | 0.0         |
| Outlet-2<br>End of Grant Lorenz Road              | 1-Yr        | 1.1             | 1.1             | 0.0         |
|   | 10-Yr       | 4.0             | 4.0             | 0.0         |
|   | 100-Yr      | 5.7             | 5.9             | 0.2         |
| Outlet-3<br>Storm Sewer From<br>26045 Birch Bluff | 1-Yr        | 2.0             | 0.9             | -1.2        |
|   | 10-Yr       | 6.2             | 5.0             | -1.3        |
|   | 100-Yr      | 15.4            | 13.7            | -1.7        |
| Outlet-4<br>Crescent Beach                        | 1-Yr        | 0.9             | 1.9             | 1.0         |
|   | 10-Yr       | 4.8             | 6.1             | 1.3         |
|   | 100-Yr      | 14.6            | 13.5            | -1.2        |
| <b>100-Yr High Water Level</b>                    |             | <b>Existing</b> | <b>Proposed</b> |             |
| Ex/Pr-26045BirchBluff                             |             | 934.8           | 932.6           |             |
| Wetland-1   |             | 939.8           | 939.8           |             |
| Wetland-2   |             | 933.3           | 933.3           |             |
| Wetland-3   |             | 941.4           | 941.4           |             |
| Wetland-4   |             | 933.3           | 933.3           |             |
| Wetland-5   |             | 931.5           | 931.5           |             |

**OUTLET 3:**  
STORM SEWER FROM  
26045 BIRCH BLUFF  
100yr Peak Discharge  
Existing - 15.4 cfs  
Proposed - 13.7 cfs

**OUTLET 4:**  
CRESCENT BEACH  
100yr Peak Discharge  
Existing - 14.6 cfs  
Proposed - 13.5 cfs

**OUTLET 2:**  
END OF GRANT LORENZ ROAD  
100yr Peak Discharge  
Existing - 5.7 cfs  
Proposed - 5.9 cfs

**OUTLET 1:**  
EDGEWOOD ROAD  
100yr Peak Discharge  
Existing - 0.2 cfs  
Proposed - 0.2 cfs

Map Document: H:\SHW\0\123686\GIS\ESRI\MXD\Drainage Map - Proposed Overview.mxd | Date Saved: 2/15/2022 5:18:48 PM

## Appendix B: Preliminary Cost Estimates

**BIRCH BLUFF ROAD RECONSTRUCTION**  
**PRELIMINARY COST ESTIMATE**  
**CITY OF SHOREWOOD**  
**STREET, STORM, & AND SANITARY IMPROVEMENT ESTIMATE**  
**DATE: 2/22/2022**



| ITEM NO. | BID ITEM                                    | UNIT     | UNIT COST    | STREET QUANTITY | STREET COST  | STORM QUANTITY | STORM COST  | SANITARY QUANTITY | SANITARY COST |
|----------|---|----------|--------------|-----------------|--------------|----------------|-------------|-------------------|---------------|
| 1        | MOBILIZATION                                | LUMP SUM | \$185,000.00 | 0.670           | \$124,005.50 | 0.114          | \$20,997.50 | 0.021             | \$3,792.50    |
| 2        | CLEARING                                    | TREE     | \$300.00     | 310             | \$93,000.00  |                |             |                   |               |
| 3        | CLEAN ROOT CUTTING                          | TREE     | \$100.00     | 200             | \$20,000.00  |                |             |                   |               |
| 4        | GRUBBING                                    | TREE     | \$300.00     | 330             | \$99,000.00  |                |             |                   |               |
| 5        | REMOVE DRAINAGE STRUCTURE                   | EACH     | \$725.00     |                 |              | 6              | \$4,350.00  |                   |               |
| 6        | REMOVE SIGN & POST                          | EACH     | \$50.00      | 29              | \$1,450.00   |                |             |                   |               |
| 7        | REMOVE SEWER PIPE (STORM)                   | LIN FT   | \$15.00      |                 |              | 185            | \$2,775.00  |                   |               |
| 8        | REMOVE BITUMINOUS PAVEMENT                  | SQ YD    | \$3.75       | 1340            | \$5,025.00   |                |             |                   |               |
| 9        | REMOVE CONCRETE DRIVEWAY PAVEMENT           | SQ FT    | \$2.00       | 1425            | \$2,850.00   |                |             |                   |               |
| 10       | REMOVE BITUMINOUS DRIVEWAY PAVEMENT         | SQ FT    | \$1.25       | 12300           | \$15,375.00  |                |             |                   |               |
| 11       | SALVAGE & REINSTALL CONCRETE BRICK DRIVEWAY | SQ FT    | 40.00        | 1950            | \$78,000.00  |                |             |                   |               |
| 12       | SALVAGE & REINSTALL FENCE                   | LIN FT   | \$40.00      | 115             | \$4,600.00   |                |             |                   |               |
| 13       | SALVAGE & REINSTALL MAILBOX                 | EACH     | 150.00       | 45              | \$6,750.00   |                |             |                   |               |
| 14       | SALVAGE & REINSTALL RETAINING WALL          | LIN FT   | \$75.00      | 250             | \$18,750.00  |                |             |                   |               |
| 15       | GEOTEXTILE FABRIC TYPE 5                    | SQ YD    | \$2.35       | 12900           | \$30,315.00  |                |             |                   |               |
| 16       | COMMON EXCAVATION (EV)                      | CU YD    | \$22.00      | 11000           | \$242,000.00 |                |             |                   |               |
| 17       | SUBGRADE EXCAVATION (EV)                    | CU YD    | \$24.00      | 850             | \$20,400.00  |                |             |                   |               |
| 18       | STABILIZING AGGREGATE 3" MINUS (CV)         | CU YD    | \$47.00      | 850             | \$39,950.00  |                |             |                   |               |
| 19       | SELECT GRANULAR BORROW                      | CU YD    | \$31.00      | 8450            | \$261,950.00 |                |             |                   |               |
| 20       | SUBGRADE PREPARATION                        | SQ YD    | \$2.00       | 12700           | \$25,400.00  |                |             |                   |               |
| 21       | DEWATERING                                  | LUMP SUM | \$4,500.00   | 1               | \$4,500.00   |                |             |                   |               |
| 22       | AGGREGATE SURFACING CLASS 2                 | TON      | \$100.00     | 15              | \$1,500.00   |                |             |                   |               |
| 23       | STREET SWEEPER (WITH PICKUP BROOM)          | HR       | \$175.00     | 100             | \$17,500.00  |                |             |                   |               |
| 24       | WATER (DUST CONTROL)                        | MGAL     | \$75.00      | 100             | \$7,500.00   |                |             |                   |               |
| 25       | EXPLORATORY DIGGING                         | HR       | \$540.00     | 15              | \$8,100.00   |                |             | 15                | \$8,100.00    |
| 26       | AGGREGATE BASE (CV) CLASS 5                 | CU YD    | \$42.00      | 2825            | \$118,650.00 |                |             |                   |               |
| 27       | DRILL & GROUT REINF BARS (EPOXY COATED)     | EACH     | \$17.00      | 212             | \$3,604.00   |                |             |                   |               |
| 28       | JOINT ADHESIVE - MASTIC                     | LIN FT   | \$1.00       | 22305           | \$22,305.00  |                |             |                   |               |
| 29       | TYPE SP 9.5 WEARING COURSE MIX (2,C)        | TON      | \$80.00      | 1250            | \$100,000.00 |                |             |                   |               |
| 30       | TYPE SP 12.5 NON WEAR COURSE MIX (2,C)      | TON      | \$77.00      | 1250            | \$96,250.00  |                |             |                   |               |
| 31       | BITUMINOUS RAMP CURB EDGE                   | LIN FT   | \$3.50       | 7450            | \$26,075.00  |                |             |                   |               |
| 32       | MILL OUT BITUMINOUS RAMP CURB EDGE          | LIN FT   | \$1.75       | 7450            | \$13,037.50  |                |             |                   |               |

**BIRCH BLUFF ROAD RECONSTRUCTION**  
**PRELIMINARY COST ESTIMATE**  
**CITY OF SHOREWOOD**  
**STREET, STORM, & AND SANITARY IMPROVEMENT ESTIMATE**  
**DATE: 2/22/2022**



| ITEM NO. | BID ITEM   | UNIT   | UNIT COST  | STREET QUANTITY | STREET COST | STORM QUANTITY | STORM COST  | SANITARY QUANTITY | SANITARY COST |
|----------|--|--------|------------|-----------------|-------------|----------------|-------------|-------------------|---------------|
| 33       | 4" PERF PVC PIPE DRAIN                               | LIN FT | \$12.00    |                 |             | 7200           | \$86,400.00 |                   |               |
| 34       | 12" PVC PIPE SEWER                                   | LIN FT | \$66.00    |                 |             | 325            | \$21,450.00 |                   |               |
| 35       | 4" PVC PIPE DRAIN CLEANOUT                           | EACH   | \$375.00   |                 |             | 25             | \$9,375.00  |                   |               |
| 36       | 6" PVC PIPE DRAIN CLEANOUT                           | EACH   | \$450.00   |                 |             | 2              | \$900.00    |                   |               |
| 37       | 12" RC PIPE SEWER DES 3006 CL V                      | LIN FT | \$53.00    |                 |             | 1200           | \$63,600.00 |                   |               |
| 38       | 15" RC PIPE SEWER DES 3006 CL V                      | LIN FT | \$56.00    |                 |             | 510            | \$28,560.00 |                   |               |
| 39       | 18" RC PIPE SEWER DES 3006 CL V                      | LIN FT | \$60.00    |                 |             | 190            | \$11,400.00 |                   |               |
| 40       | 24" RC PIPE SEWER DES 3006 CL V                      | LIN FT | \$65.00    |                 |             | 20             | \$1,300.00  |                   |               |
| 41       | 36" RC PIPE SEWER DES 3006 CL V                      | LIN FT | \$300.00   |                 |             | 8              | \$2,400.00  |                   |               |
| 42       | 24" SPAN RC PIPE ARCH                                | LIN FT | \$125.00   |                 |             | 193            | \$24,125.00 |                   |               |
| 43       | 43" SPAN RC PIPE ARCH                                | LIN FT | \$150.00   |                 |             | 72             | \$10,800.00 |                   |               |
| 44       | 12" RC PIPE APRON W/TRASH GUARD                      | EACH   | \$1,750.00 |                 |             | 1              | \$1,750.00  |                   |               |
| 45       | 15" RC PIPE APRON W/TRASH GUARD                      | EACH   | \$2,250.00 |                 |             | 1              | \$2,250.00  |                   |               |
| 46       | 18" RC PIPE APRON W/TRASH GUARD                      | EACH   | \$2,750.00 |                 |             | 1              | \$2,750.00  |                   |               |
| 47       | 24" RC PIPE APRON W/TRASH GUARD                      | EACH   | \$3,000.00 |                 |             | 1              | \$3,000.00  |                   |               |
| 48       | 36" SPAN RC PIPE APRON W/TRASH GUARD                 | EACH   | \$3,500.00 |                 |             | 1              | \$3,500.00  |                   |               |
| 49       | SANITARY SEWER SERVICE REPAIR                        | LIN FT | \$60.00    |                 |             |                |             | 300               | \$18,000.00   |
| 50       | 4" PVC PIPE SEWER SERVICE SDR-26                     | LIN FT | \$55.00    |                 |             |                |             | 200               | \$11,000.00   |
| 51       | 8" PVC PIPE SEWER SDR-35                             | LIN FT | \$120.00   |                 |             |                |             | 100               | \$12,000.00   |
| 52       | 8"X4" PVC WYE  | EACH   | \$700.00   |                 |             |                |             | 5                 | \$3,500.00    |
| 53       | RECONSTRUCT MANHOLE                                  | EACH   | \$2,500.00 |                 |             |                |             | 3                 | \$7,500.00    |
| 54       | CASTING ASSEMBLY (STORM)                             | EACH   | \$750.00   |                 |             | 19             | \$14,250.00 |                   |               |
| 55       | CASTING ASSEMBLY (SANITARY)                          | EACH   | \$750.00   |                 |             |                |             | 20                | \$15,000.00   |
| 56       | ADJUST FRAME & RING CASTING                          | EACH   | \$675.00   |                 |             |                |             | 19                | \$12,825.00   |
| 57       | SAFFLE BAFFLE  | EACH   | \$1,500.00 |                 |             | 2              | \$3,000.00  |                   |               |
| 58       | CONSTRUCT DRAINAGE STRUCTURE DESIGN 2'X3'            | LIN FT | \$500.00   |                 |             | 90             | \$45,000.00 |                   |               |
| 59       | CONSTRUCT DRAINAGE STRUCTURE DES 48-4020             | LIN FT | \$900.00   |                 |             | 14             | \$12,600.00 |                   |               |
| 60       | CONSTRUCT DRAINAGE STRUCTURE DES 48-4022             | LIN FT | \$1,200.00 |                 |             | 12             | \$14,400.00 |                   |               |
| 61       | SUMP PUMP SERVICE LINE CONNECTION                    | EACH   | \$425.00   |                 |             | 43             | \$18,275.00 |                   |               |
| 62       | CHIMNEY SEAL   | EACH   | \$260.00   |                 |             | 20             | \$5,200.00  | 19                | \$4,940.00    |
| 63       | 4" POLYSTYRENE INSULATION                            | SQ YD  | \$50.00    |                 |             | 50             | \$2,500.00  |                   |               |
| 64       | RANDOM RIPRAP  | CU YD  | \$120.00   |                 |             | 60             | \$7,200.00  |                   |               |
| 65       | 6" CONCRETE DRIVEWAY PAVEMENT (W/ 6" AGG. BASE CL 5) | SQ FT  | \$10.00    | 1575            | \$15,750.00 |                |             |                   |               |

**BIRCH BLUFF ROAD RECONSTRUCTION**  
**PRELIMINARY COST ESTIMATE**  
**CITY OF SHOREWOOD**  
**STREET, STORM, & AND SANITARY IMPROVEMENT ESTIMATE**  
**DATE: 2/22/2022**



| ITEM NO.   | BID ITEM                                      | UNIT     | UNIT COST   | STREET QUANTITY | STREET COST           | STORM QUANTITY | STORM COST          | SANITARY QUANTITY | SANITARY COST       |
|--|---|----------|-------------|-----------------|-----------------------|----------------|---------------------|-------------------|---------------------|
| 66   | 3" BITUMINOUS DRIVEWAY (W/ 6" AGG. BASE CL 5) | SQ FT    | \$5.00      | 12800           | \$64,000.00           |                |                     |                   |                     |
| 67   | RETAINING WALL                                | SQ FT    | \$65.00     | 6400            | \$416,000.00          |                |                     |                   |                     |
| 68   | CONCRETE CURB & GUTTER DESIGN B618            | LIN FT   | \$18.00     | 7600            | \$136,800.00          |                |                     |                   |                     |
| 69   | MAILBOX (TEMPORARY)                           | EACH     | \$65.00     | 45              | \$2,925.00            |                |                     |                   |                     |
| 70   | TRAFFIC CONTROL                               | LUMP SUM | \$10,000.00 | 0.670           | \$6,703.00            | 0.114          | \$1,135.00          | 0.021             | \$205.00            |
| 71   | STRUCTURE MARKER                              | EACH     | \$125.00    | 6               | \$750.00              |                |                     |                   |                     |
| 72   | SIGN PANEL TYPE C                             | SQ FT    | \$55.00     | 225             | \$12,375.00           |                |                     |                   |                     |
| 73   | SIGN PANEL TYPE SPECIAL                       | EACH     | \$240.00    | 6               | \$1,440.00            |                |                     |                   |                     |
| 74   | TREE 2.5" CAL B&B                             | TREE     | \$575.00    | 125             | \$71,875.00           |                |                     |                   |                     |
| 75   | STABILIZED CONSTRUCTION EXIT                  | LUMP SUM | \$4,500.00  | 1               | \$4,500.00            |                |                     |                   |                     |
| 76   | EROSION CONTROL SUPERVISOR                    | LUMP SUM | \$6,550.00  | 0.670           | \$4,390.47            | 0.114          | \$743.43            | 0.021             | \$134.28            |
| 77   | STORM DRAIN INLET PROTECTION                  | EACH     | \$175.00    | 26              | \$4,550.00            |                |                     |                   |                     |
| 78   | SILT FENCE, TYPE MS                           | LIN FT   | \$2.50      | 10000           | \$25,000.00           |                |                     |                   |                     |
| 79   | SEDIMENT CONTROL LOG TYPE WOOD FIBER          | LIN FT   | \$4.00      | 1200            | \$4,800.00            |                |                     |                   |                     |
| 80   | SANDBAG BARRIER                               | EACH     | \$110.00    | 25              | \$2,750.00            |                |                     |                   |                     |
| 81   | COMMON TOPSOIL BORROW (LV)                    | CU YD    | \$40.00     | 2300            | \$92,000.00           |                |                     |                   |                     |
| 82   | TURF RESTORATION                              | SQ YD    | \$6.00      | 11900           | \$71,400.00           |                |                     |                   |                     |
| 83   | RAPID STABILIZATION METHOD 3                  | MGAL     | \$650.00    | 15              | \$9,750.00            |                |                     |                   |                     |
| 84   | LANDSCAPING ALLOWANCE                         | LUMP SUM | \$40,000.00 | 1               | \$40,000.00           |                |                     |                   |                     |
| 85   | IRRIGATION ALLOWANCE                          | LUMP SUM | \$20,000.00 | 1               | \$20,000.00           |                |                     |                   |                     |
| TOTAL WITHOUT PRORATA ITEMS:   |   |          |             |                 | \$2,380,501.50        |                | \$403,110.00        |                   | \$92,865.00         |
| PRORATA ITEMS:   |   |          |             |                 | \$135,098.97          |                | \$22,875.93         |                   | \$4,131.77          |
| CONTINGENCY (5%):  |   |          |             |                 | \$125,780.02          |                | \$21,299.30         |                   | \$4,849.84          |
| INFLATION (ACCOUNTS FOR INFLATION FROM 2021 TO 2023. ASSUMED TO BE 10%): |   |          |             |                 | \$264,138.05          |                | \$44,728.52         |                   | \$10,184.66         |
| TOTAL ESTIMATED CONSTRUCTION COST:                                       |   |          |             |                 | \$2,905,518.54        |                | \$492,013.74        |                   | \$112,031.28        |
| 25% PROJECT DEVELOPMENT COSTS:   |   |          |             |                 | \$726,379.63          |                | \$123,003.44        |                   | \$28,007.82         |
| RIGHT OF WAY ACQUISITION:  |   |          |             |                 | \$167,575.00          |                | \$28,375.00         |                   | \$5,125.00          |
| <b>TOTAL ESTIMATED PROJECT COST:</b>                                     |   |          |             |                 | <b>\$3,799,473.17</b> |                | <b>\$643,392.18</b> |                   | <b>\$145,164.09</b> |

**BIRCH BLUFF ROAD RECONSTRUCTION**  
**PRELIMINARY COST ESTIMATE**  
**CITY OF SHOREWOOD**  
**WATER SYSTEM IMPROVEMENT (8-INCH) ESTIMATE**  
**DATE: 2/22/2022**



| ITEM NO.  | BID ITEM                            | UNIT     | QUANTITY | UNIT COST    | TOTAL COST          |
|---|-------------------------------------|----------|----------|--------------|---------------------|
| 1   | MOBILIZATION                        | LUMP SUM | 0.196    | \$185,000.00 | \$36,204.50         |
| 2   | TRAFFIC CONTROL                     | LUMP SUM | 0.196    | \$10,000.00  | \$1,957.00          |
| 3   | EROSION CONTROL SUPERVISOR          | LUMP SUM | 0.196    | \$6,550.00   | \$1,281.84          |
| 4   | COURSE AGGREGATE BEDDING (LV)       | CU YD    | 500      | \$60.00      | \$30,000.00         |
| 5   | CONNECT TO EXISTING WATERMAIN       | EACH     | 1        | \$2,350.00   | \$2,350.00          |
| 6   | HYDRANT                             | EACH     | 10       | \$5,825.00   | \$58,250.00         |
| 7   | HYDRANT EXTENSION                   | LIN FT   | 15       | \$1,150.00   | \$17,250.00         |
| 8   | 6" GATE VALVE & BOX                 | EACH     | 10       | \$2,700.00   | \$27,000.00         |
| 9   | 8" GATE VALVE & BOX                 | EACH     | 7        | \$3,350.00   | \$23,450.00         |
| 10  | CASTING ASSEMBLY (WATER)            | EACH     | 2        | \$1,125.00   | \$2,250.00          |
| 11  | CASTING ASSEMBLY (SPECIAL)          | EACH     | 2        | \$950.00     | \$1,900.00          |
| 12  | 1" CORPORATION STOP                 | EACH     | 58       | \$475.00     | \$27,550.00         |
| 13  | 1" CURB STOP & BOX                  | EACH     | 58       | \$550.00     | \$31,900.00         |
| 14  | 1" TYPE K COPPER PIPE               | LIN FT   | 1500     | \$45.00      | \$67,500.00         |
| 15  | 6" DIP WATERMAIN, CL 52 W/POLY WRAP | LIN FT   | 120      | \$60.00      | \$7,200.00          |
| 16  | 8" DIP WATERMAIN, CL 52 W/POLY WRAP | LIN FT   | 3775     | \$65.00      | \$245,375.00        |
| 17  | 9 LB ANODE BAG                      | EACH     | 8        | \$275.00     | \$2,200.00          |
| 18  | DUCTILE IRON FITTINGS               | POUND    | 1492     | \$10.00      | \$14,920.00         |
| TOTAL WITHOUT PRORATA ITEMS   |                                     |          |          |              | \$559,095.00        |
| PRORATA ITEMS   |                                     |          |          |              | \$39,443.34         |
| CONTINGENCY (5%)  |                                     |          |          |              | \$29,926.92         |
| INFLATION (ACCOUNTS FOR INFLATION FROM 2021 TO 2023. ASSUMED TO BE 10%) |                                     |          |          |              | \$62,846.53         |
| TOTAL ESTIMATED CONSTRUCTION COST:                                      |                                     |          |          |              | \$691,311.78        |
| 25% PROJECT DEVELOPMENT COSTS:  |                                     |          |          |              | \$172,827.94        |
| RIGHT OF WAY ACQUISITION  |                                     |          |          |              | \$48,925.00         |
| <b>TOTAL ESTIMATED PROJECT COST:</b>                                    |                                     |          |          |              | <b>\$913,064.72</b> |

**BIRCH BLUFF ROAD RECONSTRUCTION**  
**PRELIMINARY COST ESTIMATE**  
**CITY OF SHOREWOOD**  
**8-FOOT TRAIL AT BACK OF CURB ESTIMATE**  
**DATE: 2/22/2022**



Real People. Real Solutions.

| ITEM NO.  | BID ITEM                                   | UNIT   | QUANTITY | UNIT COST   | TOTAL COST          |
|---|--|--------|----------|-------------|---------------------|
| 1   | 6" CONCRETE WALK (W/ 6" AGG. BASE CL 5)    | SQ FT  | 336      | \$15.00     | \$5,040.00          |
| 2   | DRILL & GROUT REINF BARS (EPOXY COATED)    | EACH   | 32       | \$17.00     | \$544.00            |
| 3   | 3" BITUMINOUS TRAIL (W/ 6" AGG. BASE CL 5) | SQ FT  | 7620     | \$4.50      | \$34,290.00         |
| 4   | TRUNCATED DOMES                            | SQ FT  | 65       | \$65.00     | \$4,225.00          |
| 5   | CONCRETE CURB & GUTTER DESIGN B618         | LIN FT | 250      | \$18.00     | \$4,500.00          |
| 6   | RETAINING WALL                             | SQ FT  | 1000     | \$65.00     | \$65,000.00         |
| 7   | REMOVE & REPLACE BITUMINOUS PAVEMENT       | SQ FT  | 500      | \$10.00     | \$5,000.00          |
| 8   | COMMON EXCAVATION (EV)                     | CU YD  | 500      | \$22.00     | \$11,000.00         |
| 9   | TURF RESTORATION                           | SQ YD  | 550      | \$6.00      | \$3,300.00          |
| 10  | AGGREGATE BASE (CV) CLASS 5                | CU YD  | 20       | \$42.00     | \$840.00            |
| 11  | CLEAR TREE                                 | EACH   | 4.00     | \$300.00    | \$1,200.00          |
| 12  | GRUB TREE                                  | EACH   | 4        | \$300.00    | \$1,200.00          |
| 13  | WETLAND MITIGATION                         | ACRE   | 0.10     | \$15,000.00 | \$1,500.00          |
| TOTAL   |  |        |          |             | \$137,639.00        |
| CONTINGENCY (5%)  |  |        |          |             | \$6,881.95          |
| INFLATION (ACCOUNTS FOR INFLATION FROM 2021 TO 2023. ASSUMED TO BE 10%) |  |        |          |             | \$14,452.10         |
| TOTAL ESTIMATED CONSTRUCTION COST:                                      |  |        |          |             | \$158,973.05        |
| 25% PROJECT DEVELOPMENT COSTS:  |  |        |          |             | \$39,743.26         |
| <b>TOTAL ESTIMATED PROJECT COST:</b>                                    |  |        |          |             | <b>\$198,716.31</b> |

**BIRCH BLUFF ROAD RECONSTRUCTION**  
**PRELIMINARY COST ESTIMATE**  
**CITY OF SHOREWOOD**  
**6-FOOT SIDEWALK AT BACK OF CURB ESTIMATE**  
**DATE: 2/22/2022**



Real People. Real Solutions.

| ITEM NO.  | ITEM DESCRIPTION                        | UNIT   | QUANTITY | UNIT COST   | TOTAL COST          |
|---|---|--------|----------|-------------|---------------------|
| 1   | 4" CONCRETE WALK (W/ 6" AGG. BASE CL 5) | SQ FT  | 5,692    | \$9.00      | \$51,228.00         |
| 2   | 6" CONCRETE WALK (W/ 6" AGG. BASE CL 5) | SQ FT  | 288      | \$15.00     | \$4,320.00          |
| 3   | DRILL & GROUT REINF BARS (EPOXY COATED) | EACH   | 24       | \$17.00     | \$408.00            |
| 4   | TRUNCATED DOMES                         | SQ FT  | 65       | \$65.00     | \$4,225.00          |
| 5   | CONCRETE CURB & GUTTER DESIGN B618      | LIN FT | 250      | \$18.00     | \$4,500.00          |
| 6   | RETAINING WALL                          | SQ FT  | 800      | \$65.00     | \$52,000.00         |
| 7   | REMOVE & REPLACE BITUMINOUS PAVEMENT    | SQ FT  | 500      | \$10.00     | \$5,000.00          |
| 8   | COMMON EXCAVATION (EV)                  | CU YD  | 291      | \$22.00     | \$6,402.00          |
| 9   | TURF RESTORATION                        | SQ YD  | 750      | \$6.00      | \$4,500.00          |
| 10  | AGGREGATE BASE (CV) CLASS 5             | CU YD  | 20       | \$42.00     | \$840.00            |
| 11  | CLEAR TREE                              | EACH   | 4.00     | \$300.00    | \$1,200.00          |
| 12  | GRUB TREE                               | EACH   | 4        | \$300.00    | \$1,200.00          |
| 13  | WETLAND MITIGATION                      | ACRE   | 0.10     | \$15,000.00 | \$1,500.00          |
| TOTAL   |   |        |          |             | \$137,323.00        |
| CONTINGENCY (5%)  |   |        |          |             | \$6,866.15          |
| INFLATION (ACCOUNTS FOR INFLATION FROM 2021 TO 2023. ASSUMED TO BE 10%) |   |        |          |             | \$14,418.92         |
| TOTAL ESTIMATED CONSTRUCTION COST:                                      |   |        |          |             | \$158,608.07        |
| 25% PROJECT DEVELOPMENT COSTS:  |   |        |          |             | \$39,652.02         |
| <b>TOTAL ESTIMATED PROJECT COST:</b>                                    |   |        |          |             | <b>\$198,260.08</b> |

**BIRCH BLUFF ROAD RECONSTRUCTION**  
**PRELIMINARY COST ESTIMATE**  
**CITY OF SHOREWOOD**  
**6-FOOT SIDEWALK 2-FOOT OFF ROW ESTIMATE**  
**DATE: 2/22/2022**



| ITEM NO.  | ITEM DESCRIPTION                        | UNIT   | QUANTITY | UNIT COST   | TOTAL COST          |
|---|---|--------|----------|-------------|---------------------|
| 1   | 4" CONCRETE WALK (W/ 6" AGG. BASE CL 5) | SQ FT  | 5643     | \$9.00      | \$50,787.00         |
| 2   | 6" CONCRETE WALK (W/ 6" AGG. BASE CL 5) | SQ FT  | 288      | \$15.00     | \$4,320.00          |
| 3   | DRILL & GROUT REINF BARS (EPOXY COATED) | EACH   | 24       | \$17.00     | \$408.00            |
| 4   | TRUNCATED DOMES                         | SQ FT  | 65       | \$65.00     | \$4,225.00          |
| 5   | RETAINING WALL                          | SQ FT  | 800      | \$65.00     | \$52,000.00         |
| 6   | COMMON EXCAVATION (EV)                  | CU YD  | 204      | \$22.00     | \$4,488.00          |
| 7   | TURF RESTORATION                        | SQ YD  | 840      | \$6.00      | \$5,040.00          |
| 8   | CLEAR TREE                              | EACH   | 16       | \$300.00    | \$4,800.00          |
| 9   | GRUB TREE                               | EACH   | 31       | \$300.00    | \$9,300.00          |
| 10  | CULVERT                                 | LIN FT | 20       | \$60.00     | \$1,200.00          |
| 11  | WETLAND MITIGATION                      | ACRE   | 0.20     | \$15,000.00 | \$3,000.00          |
| TOTAL   |   |        |          |             | \$139,568.00        |
| CONTINGENCY (5%)  |   |        |          |             | \$6,978.40          |
| INFLATION (ACCOUNTS FOR INFLATION FROM 2021 TO 2023. ASSUMED TO BE 10%) |   |        |          |             | \$14,654.64         |
| TOTAL ESTIMATED CONSTRUCTION COST:                                      |   |        |          |             | \$161,201.04        |
| 25% PROJECT DEVELOPMENT COSTS:  |   |        |          |             | \$40,300.26         |
| <b>TOTAL ESTIMATED PROJECT COST:</b>                                    |   |        |          |             | <b>\$201,501.30</b> |