

MAPLE GROVE BRIDGE AND SANITARY SEWER REPLACEMENT PROJECT – FEASIBILITY STUDY

FINAL REPORT



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SECTION 1 – INTRODUCTION, EXISTING STRUCTURE AND PROJECT GOALS

Introduction

The Forest Preserve District of DuPage County (FPD) is proposing to replace the existing bridge that crosses St. Joseph Creek located in the Maple Grove Forest Preserve in Downers Grove, IL. The structure serves as a pedestrian bridge and also carries a 24” Downers Grove Sanitary District (DGSD) overflow sewer across the creek. See Appendix A for location map. The purpose of this feasibility study is to analyze the bridge and sewer crossing, develop alternatives for replacement and make recommendations on the most feasible alternative.

A preliminary report was submitted on May 14, 2024. The preliminary study investigated various truss and press brake formed tub girder configurations. The press brake tub girder solutions offered several advantages of the truss, and it was recommended that the press brake tub girder options be analyzed further.

Since the completion of the preliminary study, CBBEL refined the configuration of the structure and modeled the structure in the DuPage County Stormwater Regulatory FEQ model. Based on the modeling, it was determined that a single 75 ft span structure is the optimal configuration. This project was recently selected for funding as part of the Community Project Funding Program (CPFP). The recommendations in this report form the basis for the completion of Phase I and Phase II Engineering in accordance with IDOT Bureau of Local Roads and Streets (IDOT-BLRS) requirements.

Existing Structure - Bridge

The existing bridge was built in phases and consists of a nine-span reinforced concrete superstructure. The bottom half of the superstructure was constructed in the early 1900s, is u-shaped and supports a DGSD 24” sanitary sewer supported on reinforced concrete piers. The sewer was then encased in concrete in the 1980’s when the structure was modified to accommodate pedestrian traffic. The structure is approximately 122 feet long, has a clear width between railings of 3 ½ feet and has an overall structural depth of 43” from top of deck to bottom of superstructure. See photo and cross section below.

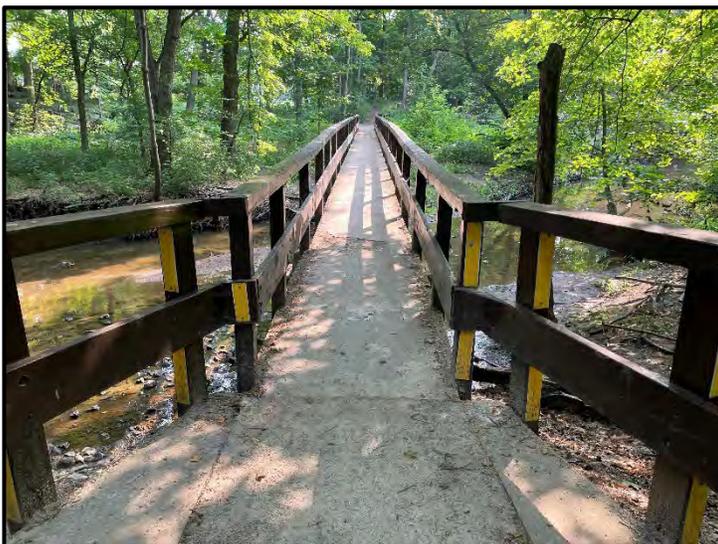
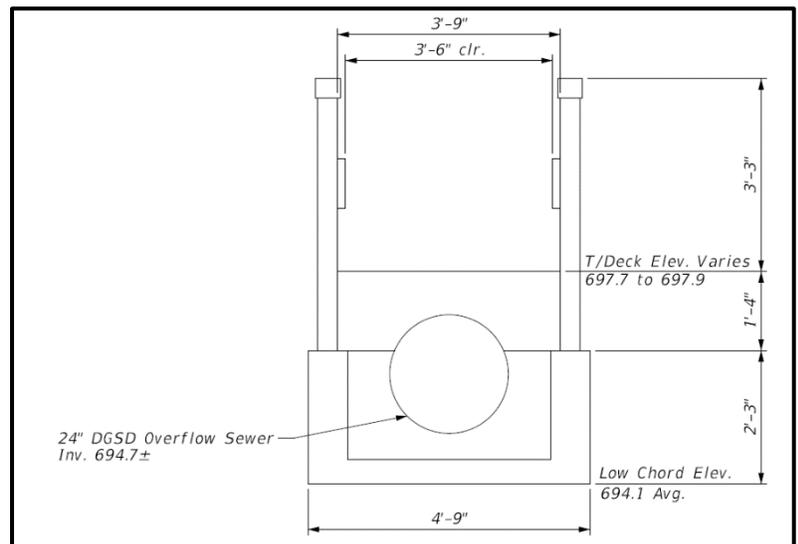


Photo – Bridge Looking East



Existing Bridge Cross Section

CBBEL performed a site survey of the structure in January of 2024. It is notable that the survey indicated that the piers are different widths and different orientations (some are parallel to the creek as opposed to orthogonal to the bridge). This could be an indication that the piers were not all constructed at the same time. Additionally, the survey shows that the two easternmost spans are nearly completely buried. A wall was constructed at some point in the westernmost span, and this span is completely obstructed. See photo below.



Photo – North Elevation of Bridge – Westernmost Span Closed Off, Two Easternmost Spans Obstructed

Per the site survey, the average low chord of the structure is 694.1, and the top of bridge deck varies between 697.7 and 697.9. The average DGSD sewer invert across the structure is 694.7. See Drawing A-1 in Appendix C.

The structure was last inspected on August 22, 2022, by Lochner. The inspection report indicates that the superstructure is in serious condition with significant spalling and with up to 50% section loss of the primary reinforcing steel. The substructure is in poor condition with moderate spalling and between 10% to 30% section loss in the piers. The bridge has a 39 inch tall wooden railing on both sides of the structure, which does not meet current American Association of State Highway and Transportation Officials (AASHTO) guidelines. Additionally, the spacing between the horizontal rail elements does not comply with current AASHTO guidelines. CBBEL concurs with the assessments in the bridge inspection report.

The structure is located entirely within the floodplain and mostly within the floodway. See FEMA National Flood Hazard Layer FIRMette in Appendix A. Note that the 100-yr Zone AE floodplain extends almost entirely across adjacent Gibert Park located northeast of the structure. The DuPage County PVSTATS (“peak to volume”) 10-yr elevation just downstream of bridge is 696.27, and the PVSTATS 100-yr elevation just downstream of the bridge is 699.12. The PVSTATS 2-yr elevation just downstream of the of the structure is 694.17. Note that even the 2-yr event is higher than the low chord of the structure. The structure completely overtops at event between the 10-yr and 50-yr events. Note that St. Joseph Creek is approximately 40ft wide as it passes under the structure, and it passes under the western part of the structure. The creek flows from north to south.

Existing Structure – Sanitary Sewer

The existing sanitary sewer line is an overflow sewer for the Gilbert Avenue trunk line sewer. Per a sewer atlas provided by the DGSD, the overflow line begins at the west end of Gilbert Avenue. The line starts as an 18" diameter sewer and then shortly transitions to a 24" sewer. The pipe runs in a southwesterly direction across the Maple Grove Forest Preserve. After exiting the forest preserve, the pipe transitions to a 30" sewer and heads west, where it connects to a trunk line on Lee Avenue. As stated above, the intention of the original bridge structure was to support this overflow line. The sewer is currently located within a 20 ft wide easement across the FPD property. The easement is documented in Easement Agreement R2009-130164. See Appendix B for sewer atlas and easement agreement.

The proposed project will require the replacement of the sanitary sewer between the manholes located just upstream and downstream of the bridge. These structures were surveyed in January and February of 2024. Note that the upstream manhole appears to be located on Park District property. See Drawing B-3 in Appendix C for existing and proposed sewer layouts. The total run of sanitary sewer between these structures is approximately 400 ft. The downstream manhole, referred to as Ex. Sanitary Manhole A in the drawings, is located approximately 127 ft west of the bridge. This structure has a rim elevation of 700.57 and an east and west invert elevation of 694.53. Both the entrance and exit pipe were noted as RCP in the survey. The upstream manhole, referred to as Ex. Sanitary Manhole B in the drawings, is located approximately 150 ft east of the bridge. This structure has a rim elevation of 701.73 and an east and west invert elevation of 694.88. Both the entrance and exit pipe were noted as RCP. The existing pipe has a slope of 0.088% between these manholes. This results in roughly a 0.1ft drop across the length of the bridge.

Project Goals

The goals of this project are as follows:

- Provide the FPD a structure that is wider and meets current design standards, improves the path geometry, and in-turn provides a safer and smoother experience for path users.
- Support the DGSD sanitary sewer at its current elevation and size while keeping the existing sewer functional during construction.
- Minimize impacts to the natural area within the project limits.

SECTION 2 – EXISTING AND PROPOSED GEOMETRY

Existing Geometry

Refer to Drawing B-3 in Appendix C for existing and proposed path layout.

The eastern approach to the structure begins at Gilbert Park and is approximately 150' long. On this approach, the path consists of a 4 ft HMA path. The existing ground at the start of the path is at approximately elevation 699.0 and has a less than 1.5% grade down towards the existing bridge. Horizontally, the path is on a 95' tangent from the park, and then there is a short, sharp curve to the south (approx. 40' R) and then a 90-degree bend to the west at the structure.

On the western approach, the existing path approaches the bridge from the south. The path begins at Turvey Road and merges with a separate path that begins at Memorial Park before reaching the bridge. The path consists of an 8 ft wide gravel path on the western approach. Within 300 ft of the bridge to approximately 35 west of the bridge, the path begins a downgrade between 3% to 5% towards the bridge. Within 35ft of the bridge, the grade steepens to a 10% downgrade until it meets the bridge. Horizontally, after the paths merge, south of the bridge, the path has gentle curves (approximately 800' R). Within 300ft of the structure, there appears to be a tangent section. Within 90 ft of the bridge, there is an approximate 70' R curve.

As stated in Section 1, the bridge itself is relatively flat and is only 3'-6" wide between the side rails. The bridge deck surface varied between 697.7 and 697.9. The DGSD sewer controls the profile of the structure as the pipe is sloped at 0.088% in this reach.

Proposed Geometry

The proposed geometry should comply, to the extent practical, with current design standards. When laying out the proposed path and bridge, the following references were consulted:

- AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (2012) (AASHTO Guide)
- Illinois Department of Transportation (IDOT) Bureau of Local Roads and Streets Manual – Chapter 42 Bicycle Facilities (LR Manual)

Two main bridge types, a prefabricated steel truss superstructure and a press brake formed steel tub girder superstructure, with various span lengths were studied. These alternatives are discussed in greater detail in Section 4. For all options studied, the proposed horizontal alignment is identical. The proposed profile varies due to the attachment of the sanitary sewer to the structure, and its impact on the overall structure depth.

In order to keep the DGSD sewer functional at all times, it is necessary to build the new structure on a parallel alignment with the existing bridge. The edge of the proposed structure will be placed approximately 10ft from the edge of the existing structure. This will place the proposed sanitary sewer approximately 19'-9" to the north of its current location as it crosses the bridge.

For the approach paths, CBBEL recommends utilizing an 8' wide HMA path. The 8' path will match in well with the gravel path to the west of the structure, and the path can terminate at the Gilbert Park path on the east. Note that a small section of this path is located on Park District property. This complies with LR Manual Figure 42-3A, which requires an 8 ft wide path for two-way traffic with less

than 100 users per peak hour. A 2 ft wide turf or gravel shoulder would be required on each side of the path. The bridge will have a clear width of 12 ft, which satisfies section 42-3.02(h) of the LR Manual.

Section 42-3.02(e) of the LR Manual recommends a design speed of 18 mph for grades less than 4%. The existing and proposed grades west of the structure are over 4%; however, the LR Manual allows for reduced design speeds when the path is gravel. Given that the proposed path will tie into the existing gravel path and the proposed grades will be less than 5%, CBEL is proposing a design speed of 20 mph for this project.

Utilizing a 20 mph design speed and a 15° lean angle, Figure 42-3D gives a minimum radius of 100 ft, and a minimum length of curve of 26 ft. The proposed curves on the east and west sides of the structure satisfy these criteria. An argument could be made to use a tighter radius; however, doing so will not have significant benefits. See Tree Impact Exhibit (Drawing E-2 in Appendix C).

On the east approach to the structure, the south edge of pavement will be held to minimize disturbance of the hill area south of the path. After a 39 ft long, 100' R horizontal curve on the east side of the bridge, the path will be on a tangent section, and it will end at the Gilbert Park Path.

On the west approach to the structure, after a 93 ft long, 100' R horizontal curve on the west side of the bridge, the path will be on a tangent section and will tie back into the existing gravel path approximately 200' west of the structure.

As stated above, the vertical profile of the path and bridge varies depending on the superstructure type. The use of a prefabricated steel truss superstructure would require an increase in the top of bridge deck elevation of roughly 9 inches. This is discussed in greater detail in Section 4. This results in a top of deck elevation of 698.65. Note that for the truss alternates, the bottom of the pipe will extend below the low chord of the truss; however, the bottom of the proposed pipe will not be lower than the low chord of the existing structure. On the west approach to the structure, the path will tie into the existing path at elevation 705.17 and will have a downgrade of 4.07% as it approaches the bridge. A 60 ft vertical curve (3 x design speed) will be placed just west of the bridge. East of the bridge, the path would tie into the Gilbert Park part at elevation 699.00.

The use of a press brake formed steel tub girder superstructure will allow for the top of deck elevation to remain the same as the existing structure at 697.9. The low chord elevation of the tub girders will not be lower than the low chord of the existing structure. This is discussed in greater detail in Section 4. On the west approach to the structure, the path will tie into the existing path at elevation 705.17 and will have a slightly steeper downgrade than the truss at 4.54% as it approaches the bridge. A 60 ft vertical curve (3 x design speed) will be placed just west of the bridge. Since the preliminary investigation, it was determined that in order to minimize fill in the flood plain, a sag vertical curve is needed approximately 90 ft east of the proposed bridge. Just east of the bridge, a 0.5% downgrade will begin. As this change in grade is less than 1%, it should not be perceptible to path users. A 60 ft vertical curve will be used to transition to a 1.69% upgrade, and the proposed path will tie into the Gilbert Park part at elevation 699.00.

Note that the layout of the proposed sewer will be discussed in Section 4.

SECTION 3 – PERMITTING/ENVIRONMENTAL SUMMARY

Refer to Appendix E for Environmental documentation.

Environmental – Waters of the U.S./Wetlands

Existing Conditions: On January 5, 2024, Christopher B. Burke Engineering, Ltd. (CBBEL) Environmental Resources staff completed a dormant season Waters of the U.S./wetland field investigation of the subject site to determine on-site wetland and Waters of the U.S. boundaries. As required, the identified wetland and Waters of the U.S. boundaries were delineated using the U.S. Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (August 2010).

One Waters of the U.S./wetland area consisting of an on-site portion of St. Joseph Creek with vegetated wetland edges was identified and flagged at the time of our site visit. The Waters of the U.S./wetland area consists of an on-site portion of St. Joseph Creek containing a narrow, well-defined channel with sparsely vegetated lower channel banks. The sparsely vegetated portions of the Waters of the U.S./wetland area are dominated by a limited mixture of primarily invasive and pioneer, woody and herbaceous wetland vegetation. The vegetation was comprised of primarily facultative and facultative wetland plant species. The lower channel banks were also eroded in many locations with undercut slopes and exposed tree roots, The sparse vegetative dominants included box elder (*Acer negundo*), common beggar's ticks (*Bidens frondosa*), heartsease (*Polygonum lapathifolium*), elderberry (*Sambucus canadensis*), rough avens (*Geum laciniatum*), riverbank grape (*Vitis riparia*), fowl manna grass (*Glyceria striata*) and silver maple (*Acer saccharinum*).

On February 9, 2024, Ms. Angela Levernier, a wetland specialist for the DuPage County Stormwater Management Department, visited the subject site and confirmed the Waters of the U.S./wetland boundaries.

Waters of the U.S. and wetlands with direct hydrologic connections to navigable waterways are federally regulated by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. In DuPage County, all wetlands and adjacent upland buffers are regulated by the DuPage County Stormwater Management Department under the DuPage County Countywide Stormwater and Flood Plain Ordinance (Ordinance). The Waters of the U.S./wetland area, consisting of an on-site portion of St. Joseph Creek, contains a direct hydrologic connection with navigable Waters of the U.S. and will be regulated by the U.S. Army Corps of Engineers, therefore any impacts to the regulated Waters of the U.S./wetland area will require a permit under Section 404 of the Clean Water Act. As previously noted, all wetlands and adjacent upland buffers are regulated as Special Management Areas by DuPage County under the Ordinance.

The Waters of the U.S./Wetland Delineation Report, containing the GPS sub-meter accuracy Waters of the U.S./wetland limits is included in Appendix E.

Waters of the U.S./Wetland Permitting: Based on proposed project improvements in areas classified as a Waters of the U.S./wetland area and associated upland buffers for the alternates studied, permitting will be required with the U.S. Army Corps of Engineers, DuPage County and potentially Downers Grove to meet Waters of the U.S./wetland and upland buffer requirements. These permits will also require meeting Illinois Department of Natural Resources (IDNR), Illinois Environmental Protection Agency (IEPA), Kane-DuPage County Soil and Water Conservation District (SWCD) and U.S. Fish and Wildlife (USFWS) regulations. At this time, it does not appear that the preferred alternate will require the placement of permanent fill or structures into Waters of the U.S./wetland area, thus there are no permanent Waters of the U.S./wetland impacts proposed. However, construction will require temporary Waters of the U.S./wetland impacts and impacts to regulated upland buffer areas. This is due to the construction of the substructure, grading as well

as the removal of the existing structure. In addition, impacts to Waters of the U.S./wetland and upland buffers will require compensatory mitigation under the Ordinance.

The U.S. Army Corps of Engineers typically issues permits to impact regulated Waters of the U.S. and wetlands under the Nationwide Permit Program and Individual Permit process. Nationwide permits are issued for projects that have minimal impacts to regulated Waters of the U.S. and wetlands while Individual Permits typically authorize significant impacts to aquatic resources or high quality aquatic habitat. It is expected that the minor temporary Waters of the U.S./wetland impacts associated with the preferred alternate for temporary construction access and implementation of sediment and erosion control can be authorized under existing Nationwide Permit 33. Due to the small and temporary nature of the proposed Waters of the U.S./wetland impacts, no compensatory wetland mitigation is required under Nationwide Permit 33. The required exhibits, reports and supporting materials, including IDNR, USFWS and SWCD documentation, will be prepared and submitted in accordance with agency requirements.

The DuPage County Stormwater Department and Downers Grove, as a full waiver community, also regulate Waters of the U.S./wetland impacts and disturbances to associated upland buffers under the Ordinance as part of the full stormwater permit application process. Although the preferred alternate does not propose permanent Waters of the U.S./wetland impacts, temporary wetland impacts are regulated and will require compensatory wetland mitigation at a 1.5:1.0 replacement ratio. Due to the small nature of the proposed temporary wetland impact, and because there are no DuPage County approved wetland mitigation banks within DuPage County, we recommend purchasing fee-in-lieu credits from DuPage County to meet the compensatory wetland mitigation requirement.

As previously noted, the Ordinance also regulates associated upland buffers that are within 50' of the regulated Waters of the U.S./wetland area. The proposed preferred alternate will impact regulated upland buffers and permitting will require a compensatory upland buffer mitigation plan including revegetation, management, monitoring and performance standards. During Phase I/II engineering, we recommend development of a landscape plan which compensates for lost trees and disturbance to upland buffers by installing higher quality, native trees, shrubs and herbaceous vegetation. The required exhibits, reports and supporting materials will be prepared and submitted in accordance with Ordinance requirements. Note that tree replacements have not been included in the project cost estimate as we assume these services would be performed by the FPD.

Environmental – Woodland Resources and Trees

On April 5, 2024, CBBEL Environmental Resources staff completed a tree inventory to identify woodland resources within and immediately adjacent to the proposed project improvements and to document potential project tree impacts. Based on the tree study, the identified trees and woody perennial vegetation identified within the project limits are characterized as a closed woodland on an upland terrace that consists of mapped regulatory floodplain associated with St. Joseph Creek. The tree inventory included tagging all trees 4" and greater in diameter at breast height in the immediate vicinity of the proposed improvements. CBBEL staff also identified smaller stems of 2" and 3" for informative purposes but did not tag them due to their small sizes. The identified trees were located with a handheld submeter accuracy GPS unit and a plot of the tree locations is included in the preferred alternate plan view. The tree inventory included a listing of sizes, species, condition, form and general comments regarding the quality of the identified trees. A cursory evaluation of each tree was performed, and each tree was assigned a number rating from 1 – 5 based on general observations at the time of the dormant season inventory. A rating of 1 (excellent) has the highest value in terms of protection or preservation. A rating of 5 (poor) has the lowest value and represents lower quality individuals.

See Appendix E for complete tree inventory summary, and see Tree Impact Exhibit (Drawing E-2) in Appendix C. Impacts are due to conflicts with the proposed bridge and path geometry and the proposed sanitary sewer installation. Additionally, several trees will likely need to be removed for crane access.

The following summarizes the tree inventory results:

Table 1. Tree Inventory Results by Species and Size Class

Notes: 1. Multiple stems were added for cumulative DBH of trees
2. Staff could not confirm Sugar Maple were not Norway Maple due to dormant conditions

American Elm Size Class (DBH)	Total # of Trees	Impacted # of Trees
2 – 3	0	0
4 – 12.9	2	0
13 – 29.9	1	0
≥ 30	0	0
Subtotal	3	0

Box Elder Size Class (DBH)	Total # of Trees	Impacted # of Trees
2 – 3	0	0
4 – 12.9	4	2
13 – 29.9	1	0
≥ 30	0	0
Subtotal	5	2

Basswood Size Class (DBH)	Total # of Trees	Impacted # of Trees
2 – 3	0	0
4 – 12.9	0	0
13 – 29.9	1	0
≥ 30	0	0
Subtotal	1	0

Catalpa Size Class (DBH)	Total # of Trees	Impacted # of Trees
2 – 3	0	0
4 – 12.9	1	0
13 – 29.9	0	0
≥ 30	0	0
Subtotal	1	0

Black Cherry Size Class (DBH)	Total # of Trees	Impacted # of Trees
2 – 3	0	0
4 – 12.9	1	0
13 – 29.9	0	0
≥ 30	0	0
Subtotal	1	0

Hackberry Size Class (DBH)	Total # of Trees	Impacted # of Trees
2 – 3	1	0
4 – 12.9	1	1
13 – 29.9	0	0
≥ 30	0	0
Subtotal	2	1

Blue Beech Size Class (DBH)	Total # of Trees	Impacted # of Trees
2 – 3	0	0
4 – 12.9	1	0
13 – 29.9	0	0
≥ 30	0	0
Subtotal	1	0

Silver Maple Size Class (DBH)	Total # of Trees	Impacted # of Trees
2 – 3	0	0
4 – 12.9	0	0
13 – 29.9	1	1
≥ 30	0	0
Subtotal	1	1

Sugar Maple Size Class (DBH)	Total # of Trees	Impacted # of Trees
2 – 3	15	12
4 – 12.9	63	33
13 – 29.9	26	6
> 30	3	0
Subtotal	107	51

White Pine Size Class (DBH)	Total # of Trees	Impacted # of Trees
2 – 3	0	0
4 – 12.9	0	0
13 – 29.9	1	0
> 30	0	0
Subtotal	1	0

Note: Growing season inventory may find these trees are Norway Maple

White Mulberry Size Class (DBH)	Total # of Trees	Impacted # of Trees
2 – 3	0	0
4 – 12.9	1	0
13 – 29.9	1	0
> 30	0	0
Subtotal	2	0

Proposed impacts to existing trees and woody perennial vegetation as a result of the project will consist of primarily common, moderate and lower quality tree species in smaller size classes. As shown in the above tree inventory results, forty-five (45) trees will be impacted during construction of the preferred alternate. The proposed tree impacts will include primarily sugar maple with fifty-one (51) stems removed consisting of twelve (12) saplings of 2" and 3", thirty three (33) smaller trees of 4" – 12.9" and six (6) larger trees of 13" – 29.9". There are no sugar maples of 30" or larger to be removed. It should be noted that two (2) larger sugar maples and two (2) smaller sugar maples to be removed are of poor form and are in very poor condition containing crowns with significant deadwood, sweep and stem rot. In addition, as previously noted, the tree inventory was completed during the dormant season and a growing season evaluation may indicate that the majority of the identified sugar maples are invasive Norway maples instead.

Impacts to higher quality trees and woody perennial vegetation such as oaks and hickories or higher quality, native shrubs will not occur because these tree and shrub species are not located within or adjacent to the project limits.

Additional woodland impacts associated with the proposed project will include minimal herbaceous vegetation removal and may include potential impacts due to root zone encroachment and soil compaction. Although the Waters of the U.S./wetland assessment and tree inventory were completed during the dormant season, the woodland understory appeared sparsely vegetated which is common in floodplain forested areas. Although direct woodland impacts will result from the construction and installation of infrastructure improvements, indirect impacts that could result from root zone encroachment due to adjacent construction activities and soil compaction will be minimized with the use of tree protection measures and construction zone exclusion fencing.

Due to the adaptability and hardiness of adjacent, lower and moderate quality tree species, remaining trees not directly impacted by the proposed project are likely to survive and continue to provide woodland functions and values in the post-construction condition. It should also be noted that the removal of any noxious and invasive woodland and scrub-shrub species such as honeysuckle and buckthorn can have a net beneficial environmental affect by reducing noxious seed dispersal and subsequent spread into the adjacent natural area and forest preserve.

Tree and shrub replacements, including herbaceous understory enhancements, should occur as compensatory upland buffer mitigation to meet DuPage County Stormwater Ordinance requirements where

practicable and determined by existing infrastructure, topography, remaining tree density and tree and shrub species selection.

Guidelines for replacement of tree, shrub and woodland perennial vegetation should include, but not be limited to, the following:

- Replace lost stems with tree and shrub plantings that are intended to provide enhanced and higher quality woodland functions and values within the forest preserve.
- Use higher quality, native trees and shrubs.
- Plant replacement trees in suitable locations as close as practical to the removal site while protecting the long-term integrity of the constructed infrastructure.
- Plant no ash trees or non-native, invasive plant species within the project limits to help control the spread of the emerald ash borer and promote native woodland habitat.
- Restore disturbed understory area with native, herbaceous, woodland grasses and forbs as appropriate.
- Encourage contractors to use locally produced (within 200 miles) planting materials.
- Plant vegetation that has low maintenance requirements.
- Coordinate with local officials, as necessary, regarding proposed plant species.

As the design process progresses, a landscaping plan will be developed that identifies areas where woodland trees, shrubs, grasses and forbs will be planted within the project limits.

Environmental – Threatened and Endangered Species

Threatened and Endangered Species documentation following the USFWS on-line procedures and the IDNR EcoCAT consultation correspondence is included in Appendix E.

Illinois Department of Natural Resources: On January 10, 2024, an IDNR EcoCAT consultation request was submitted for the proposed project corridor. The Illinois Natural Heritage Database indicates that the project site is located within the Maple Grove Forest Preserve Illinois Natural Area Inventory Site and shows the following protected resources may be in the vicinity of the project location:

1. Northern Long-Eared Bat (*Myotis septentrionalis*)
2. Tuckerman's Sedge (*Carex tuckermani*)

Continued consultation by IDNR staff reviewed the initial submittal results and closed IDNR Threatened and Endangered Species consultation with the following recommendations:

1. To protect for the potential presence of the state-listed northern long-eared bat in the vicinity of the project area, IDNR recommends that no tree clearing occur between the dates of April 1 and October 31.

2. To protect for the potential presence of the state-listed Tuckerman’s Sedge, IDNR recommends that prior to the start of work, the plant be searched for, flagged and avoided if possible. If avoidance is not possible, seed collection and planting, translocation and surface soil conservation measures are recommended to promote the continued existence of this plant in the area.

Given the above recommendations are adopted, the IDNR has determined that impacts to these protected resources are unlikely and impacts to other protected resources in the vicinity of the project location are also unlikely.

U.S. Fish and Wildlife Service: The USFWS on-line procedures identify the Northern long-eared bat (*Myotis septentrionalis*), Tricolored bat (*Perimyotis subflavus*), monarch butterfly (*Danaus plexippus*), Hine's emerald dragonfly (*Somatochlora hineana*), Eastern prairie fringed orchid (*Platanthera leucophaea*) and leafy-prairie clover (*Dalea foliosa*) as either threatened, endangered or candidate species within DuPage County, Illinois. The USFWS documentation also states that there are no critical habitats within the project site at the time of on-line consultation on April 29, 2024.

No species of concern or suitable habitat for the listed species were noted within the project site or limits of the improvements during the site visits completed by CBBEL on January 5 and April 5, 2024.

As previously noted, the proposed project, including temporary impacts to federally regulated Waters of the U.S./wetland area, will require permits from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act and the DuPage County Stormwater Department under the Ordinance. Both of those agencies will review the proposed project with respect to threatened and endangered species and their authorizations will include coverage under these requirements.

Floodway Construction Permitting

The existing pedestrian bridge is located within the floodway and floodplain of St. Joseph Creek. The regulatory model is the FEQ unsteady flow hydraulic model and the PVSTATS statistical model used to generate the 100-year recurrence interval floodplain for the St. Joseph Creek watershed. The models were obtained from DuPage County. The existing pedestrian bridge is simulated in the FEQ model using another hydraulic program called WSPRO. WSPRO is typically used for larger bridge crossings, so CBBEL staff contacted DuPage County and asked if it would be possible to simulate the pedestrian crossing using the more flexible CULVERT command. Christine Klepp from DuPage County concurred that it would be an improvement to use the CULVERT command to simulate the existing and proposed pedestrian bridge. The survey completed by CBBEL was used to generate a representation of the existing bridge using the CULVERT command.

Based on the results of the preliminary feasibility study, CBBEL modified the baseline St. Joseph Creek FEQ hydraulic model to develop the proposed conditions FEQ model. The existing structure was changed to a single span, 75 ft press brake formed tub girder structure with no piers. The results of the baseline and proposed FEQ hydraulic analysis indicate that the proposed conditions will not cause the downstream or upstream flood elevation increases greater than 0.1 ft. Therefore, the proposed 75 ft span pedestrian bridge complies with the DuPage County Ordinance requirements. A memorandum summarizing the results of CBBEL’s FEQ hydraulic analysis is presented in Appendix G.

As previously discussed, the crossing is located within the regulatory floodway of St. Joseph Creek. Any construction activity within the regulatory floodway will require a floodway construction permit from the Illinois Department of Natural Resources – Office of Water Resources (IDNR-OWR). IDNR-OWR has delegated review authority to DuPage County, but a formal permit application and review fee will still need to be

submitted to IDNR-OWR. If IDNR-OWR delegates review, then the floodway construction permit will be completed by DuPage County. DuPage County also has more restrictive regulations than IDNR-OWR and will require that the proposed bridge comply with the DuPage County Countywide Stormwater and Floodplain Ordinance (Ordinance). Section 15-81.D.1 of the Ordinance requires that any fill placed within the floodplain be replaced at a 1.5:1 ratio. Per discussions with the FPD, CBBEL understands that DuPage County often considers FPD projects to be “roadway development” projects, which per section 15-81.D.4 only require a 1:1 compensatory storage ratio.

CBBEL analyzed 25 ft cross sections throughout the project limits to evaluate the cut to fill ratio. Based on these cross sections, the following modifications have been made since the preliminary feasibility study to obtain a 1:1 compensatory storage ratio:

- The path profile east of the bridge was lowered to more closely match the existing ground. A sag vertical curve was introduced to the profile to achieve this. This modification reduces the amount of fill in the floodplain.
- The retaining walls on the east side of the bridge were lengthened. The northeast wall was extended to Sta. 14+75, and the southeast wall was extended to Sta. 14+50. This modification reduces the amount of fill in the floodplain.
- Remove approximately 3’ of soil below the low chord of the bridge. IDOT typically recommends a minimum of 2’ of clearance below the structure for inspection purposes. Removing an additional foot of material under the bridge increases the amount of cut in the floodplain.

If stricter compensatory storage measures are required by DuPage County, it’s possible to cut additional material from the southwest corner of the bridge. This would likely require additional tree removals.

SECTION 4 – PROPOSED ALTERNATES

For the preliminary feasibility study, two main bridge types and two different configurations were analyzed. Other bridge types were considered, but quickly ruled out. For the final feasibility study, a single span press brake formed steel tub girder structure was selected, and the span length was refined. Drawings and cost estimates for each preliminary alternate are provided in Appendix H for reference. Final drawings and a cost estimate for the preferred alternative are located in Appendix C and D, respectively. A geotechnical report was prepared by Testing Service Corporation and is located in Appendix F.

Below is a list of the alternates studied:

- Alternate 1 - Prefabricated Steel Truss Superstructure – Single Span – 125 ft (App. H, Drawing C-1)
- Alternate 2 - Prefabricated Steel Truss Superstructure – Single Span – 85 ft (App. H, Drawing C-2)
- Alternate 3 - Press Brake Formed Steel Tub Girder – Two Span – 125 ft (App. H, Drawing D-1)
- Alternate 4 - Press Brake Formed Steel Tub Girder – Single Span 85 ft (App. H, Drawing D-2)
- Final – Press Brake Formed Steel Tub Girder – Single Span – 75 ft (App. C, Drawing D-3)

For this study, CBBEL consulted with Contech Engineering Solutions (truss alternates) and Valmont Industries, Inc. (tub girder alternates). As mentioned in Section 1, the existing bridge is approximately 122 ft long. To keep a similar overall bridge length, two alternates considered bridges with a length of 125 ft. As three of the existing nine spans are near completely to completely obstructed, a shorter, 85 ft long option was considered for each structure type. Note that Valmont confirmed that they can accommodate a single 85 ft span with their 33" deep tub girders. As a result of FEQ modeling performed since the preliminary feasibility study, CBBEL refined the span length and analyzed a 75 ft span tub girder structure.

All alternates will be designed per the AASHTO LRFD Bridge Design Specifications (9th Edition) and the AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges (December 2009 with 2015 Interims). Per chapter 3 of the LRFD Guide Specification, with a proposed clear width of 12'-0", the bridge should be designed for a 90 psf, or an H10 vehicle load (10 ton truck).

This section will provide a discussion on the proposed sewer layout, the proposed substructure, and the alternates studied.

Proposed Sanitary Sewer Layout

See Drawing B-3 for proposed sanitary sewer layout. See Drawing E-2 for tree impacts associated with the proposed sewer construction.

As previously noted in Section 2, the proposed bridge will be built on a parallel alignment to the existing bridge. The centerline of the proposed structure will be located approximately 19'-9" from the centerline of the existing bridge. The DGSD sewer will be reconstructed from the nearest manholes. New 5' diameter sanitary manholes will be placed within 50ft to 60ft from the proposed bridge in order to accommodate the alignment change in the structure. Placing the manholes closer to the bridge, on the proposed path is not feasible, as the rim to invert height would be too shallow. The proposed manholes will be placed off of the proposed path, where the ground is higher and standard rim to invert heights can be achieved.

The existing sewer will remain live while the proposed sewer is being constructed. The final step of the proposed sewer construction will be the connection of the new sewer to the existing manholes. Once this connection has been made, the existing bridge can be removed. The remaining portions of the existing sanitary sewer may be plugged and filled with controlled low strength material.

Per the request of the DGSD, the pipe will be PVC from the existing manholes to the proposed manholes, and the segment between proposed manholes and attached to the bridge will be ductile iron pipe (DIP) with flexible joints. These materials will allow for flexibility in the pipe in order to accommodate bridge movements. The connection of the proposed sewer to the bridge is dependent on the superstructure type. Regardless of bridge type selected, the proposed sewer must also remain at its current elevation across the bridge. The average invert of the sewer is 694.7 across the bridge, and the proposed sewer will have a slope of approximately 0.086%.

For the prefabricated steel truss superstructure types, the pipes would most likely be connected to the floor beams of the structure. Per discussions with Contech, the proposed bridge deck will be 6" thick at the edge and approximately 7.25" thick at the crown. The pipe, running full, will weigh roughly 400 pounds per foot, depending on the material type selected. The proposed floor beams can be made as shallow as 12" tall for this bridge width. The pipe will not be flush against the bottom of the floor beam but will likely be several inches lower to accommodate insulation. The pipe will likely have an outside diameter of 25.8", plus insulation. Keeping the invert of the pipe at 694.7 places the crown of the deck at approximately 698.65, approximately 9" higher than the top of deck elevation of the existing bridge.



Sketch From Contech – Sample Pipe Hanger Connection to Floor Beam



Photo – Sample Sewer Connection to Structure by Contech

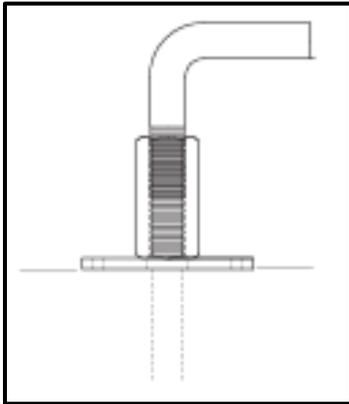
For the truss option, the bottom of the pipe would be approximately 5" below the proposed low bridge chord.

Note that it may also be possible to mount the sewer to the side of the truss without a profile raise; however, this was ruled out as it will not be aesthetically pleasing. Additionally, side mounting the pipe presents additional safety concerns, as the pipe may encourage people to attempt to cross the structure by walking on the pipe.

While several beam and slab type structures were considered, press brake formed steel tub girders were considered the most favorable as they will allow for the low chord of the bridge and the invert of the proposed 24" sanitary sewer to remain at roughly the same elevation. The main reason for this is that the external diaphragms placed between the beams for stability may be removed from the tub girders once the bridge deck has cured. Other beam types, for example steel W sections or plate girders, would likely 15" deep or larger diaphragm beams that would be centered on the bridge beams (as shown in figure 3.3.22-3

of the 2023 IDOT Bridge Manual). This would result in a more significant profile raise than the truss (likely 1.5' higher than the existing top of bridge deck) to place the beam under the structure. Again, side mounting may lessen this raise; however, this would still not be an aesthetically pleasing solution.

Utilizing a 33" tub girder, a 7" thick reinforced concrete deck and allowing for two inches for formwork will place the low chord of the structure at 694.3±. The pipe will be hung from the bridge deck. Threaded inserts will be cast into the deck at intervals to be determined. The proposed sewer invert would remain at 694.7. The pipe would not be visible from the side of the structure, and the tub girders would offer some shielding protection for the pipe from debris (see Drawings D-1 and D-2).



Sample Cast-In Threaded Insert for Pipe Hanger System



Sample – Pipe Roller Support

For both the truss and the tub girder alternates, pipe roller supports will most likely be utilized (see above). The roller supports will allow for longitudinal movement due to expansion and contraction of the bridge. Bracing on the top of the pipe would also likely be required to resist buoyancy forces.

The pipe hanger system will be studied in greater detail during Phase I and Phase II engineering.

Proposed Substructure

Refer to Appendix F for the project geotechnical report. For this study TSC drilled three soil borings. Borings 1 and 2 were located near the existing bridge abutments and were drilled to auger refusal at depths of 64ft and 62 ft, respectively. A shallow, 7.5ft deep, scour boring was drilled near the edge of the creek.

Consideration was given to both shallow and deep foundations. The bottom of the proposed footings would likely fall in the 688.0 range, which corresponds to a medium dense sand/gravel layer. The geotechnical report mentions that a center pier would likely need to be supported on piles due to potential scour/undermining of the footing. Conservatively, CBBEL is assuming that all abutments and piers will be placed on piles. This can be refined further during the next stages of design.

Given the presence of cobbles and boulders in the borings, it's likely that metal shell piles would be damaged while driving. Steel H-piles (HP piles) are recommended in the geotechnical report. Pile shoes to assist with driving have been included in the cost estimates for each alternate.

Short retaining walls will be required at all four corners of the bridge. For the cost estimate, CBBEL assumed these would be segmental block retaining walls (e.g. Keystone retaining walls or Redi-Rock retaining walls). 20 ft long approach slabs were included in each alternate to minimize path settlement behind the proposed

abutments. Additionally, decorative ledgestone has been added to each estimate to serve as an erosion protection measure as well as an aesthetic feature of the structure.

Note that the structure will have an approximate skew of 25° to fit the site conditions.

Alternate Designs – Preliminary Alternatives

For reference, all drawings and cost estimates for the preliminary alternatives are included in Appendix H. Two main bridge types were analyzed for the preliminary feasibility study. Given the preliminary/conceptual nature of the design, a 20% contingency was added to each cost estimate. The cost estimates also included approximate engineering and permitting costs for budgeting purposes.

Prefabricated Steel Truss Superstructure: CBBEL considered a single span, 125 ft long truss (Alternate 1), as well as an 85 ft long, single span steel truss (Alternate 2). Refer to Drawings C-1 and C-2 and cost estimates for Alternates 1 and 2. The shape of the trusses shown in the drawings is conceptual, and the exact style can be determined at a later date.

The following assumptions were made for the two truss options:

- Finish will be weathering steel.
- Style – Connector H-Section
- Clear Deck Width – 12'-0"
- Skew Angle - 25°
- The deck will be reinforced concrete with a 1.5% cross slope. The deck will be 6" thick at the edges and 7.25" thick at the crown. The deck will be cast after the bridge has been set.
- The bridge will be shipped in two sections for both alternates.
- 90 psf pedestrian loading and H10 vehicle load will be used for design.
- The pipe hanger system will be installed by the contractor, and the pipe will be hung from the floor beams.
- The pipe will hang below the low chord of the structure by approximately 5".
- Total shipping weight for Alternate 1 is approximately 78,000 pounds. Total shipping weight for Alternate 2 is approximately 53,000 pounds.

In order to accommodate future inspection of the structure, it is recommended that the proposed ground line be at least 2ft lower than the low chord of the structure. In the case of the truss options, the pipe will be the lowest feature of the structure.

CBBEL estimates that Alternate 1 will cost approximately \$1.715 Million, and Alternate 2 will cost approximately \$1.518 Million.

There are several advantages to selecting a prefabricated truss superstructure.

1. Prefabricated steel truss superstructures are one of the most common bridge types for pedestrian structures, and as such, contractors have the most familiarity with this type of structure.
2. No piers will be required for either option, creating a larger opening under the structure. For Alternate 1, the opening will increase to 367 sf (vs. 206 sf existing), or roughly a 78% increase. For Alternate 2, the opening will increase to 288 sf, or roughly a 40% increase.
3. A truss is an aesthetically pleasing superstructure.

4. The raise in the structure profile will lessen the steepness of the east approach to the structure.

There are also some disadvantages to selecting a prefabricated truss superstructure.

1. Selection of a truss will likely require a raise in the top of deck elevation of the structure. While the low elevation of the structure will not be lowered, raising the deck and increasing the overall structure height could have negative impacts hydraulically, and will result in more fill in the floodway and floodplain.
2. In addition to the profile raise, the vertical and diagonal main truss members will create additional fill in the floodway and floodplain. These members will also increase the likelihood of debris buildup.
3. Given the open nature of a truss, less shielding for debris will be provided to the pipe by the truss members.
4. Seeing the pipe sticking below the proposed structure may appear strange to path users.

Press Brake Formed Steel Tub Girders: CBBEL considered a two span, 125 ft long tub girder option (Alternate 3), as well as an 85 ft long tub girder option (Alternate 4). Refer to Drawings C-1 and C-2 and cost estimates for Alternates 1 and 2.

The following assumptions were made for the two tub girder options:

- Finish of tub girders will be galvanized steel.
- Member Depth – 33” Tall
- Clear Deck Width – 12’-0” (between rails)
- Out-to-Out Width – 14’-0”
- Skew Angle - 25°
- The deck will be reinforced concrete with a 1.5% cross slope. The deck will be 7” thick and composite with the steel tub girders. The deck will be cast after the bridge has been set. Pipe hanger inserts will be cast in the deck.
- 90 psf pedestrian loading and H10 vehicle load will be used for design.
- Pipe hanger system will be installed by the contractor.
- Total shipping weight for Alternate 3 is approximately 28,000 pounds. Total shipping weight for Alternate 4 is approximately 20,600 pounds.

In order to accommodate future inspection of the structure, it is recommended that the proposed ground line be at least 2ft lower than the low chord of the structure. In the case of the tub girder options, this will be the bottom of the tub girders. The bottom of the pipe will be higher than the bottom of the girders.

CBBEL estimates that Alternate 3 will cost approximately \$1.924 Million, and Alternate 4 will cost approximately \$1.567 Million.

There are several advantages to selecting press brake formed tub girders.

1. The tub girder will not require a profile raise, and it will also not require an overall increase in the structure depth.
2. The pipe will be concealed by the tub girders which should allow for some shielding benefits from debris for the pipe.

3. Although these structures are not as common as a prefabricated steel truss, contractors in the area are becoming more and more familiar with them. Tub girder bridges do not require special equipment to construct. A tub girder bridge was recently utilized for the FPD at another location (Sawmill Creek Pedestrian Bridge Replacement Project).
4. While a pier is required for Alternate 3, both alternates will increase the opening under the structure. For Alternate 3, the opening will increase to 348 sf (vs. 206 sf existing), or roughly a 69% increase. For Alternate 4, the opening will increase to 278 sf, or roughly a 35% increase.
5. There will be less bridge elements in the floodway/floodplain, which will provide less opportunities for debris to build up.
6. Access openings in the tub girder will allow the girders to fill with water during flood events. This will minimize buoyancy forces on the structure. The beams would drain through the access openings once the floodwaters recede.

There are also some disadvantages to selecting press brake formed tub girders.

1. The longest single span option without introducing a pier is 85 ft.
2. Bridge deflections will likely be greater with the tub girders than the truss. This will be analyzed in further detail at a later stage. If pipe cannot accommodate deflections, a center pier may need to be added to Alternate 4.
3. While keeping the profile of the structure relatively similar to the existing bridge may be an advantage as it relates to hydraulics and permitting, the approaches to the tub girder bridges will be steeper than the truss options.

Alternate Design – Final Analysis

Further analysis, particularly FEQ modeling, shows that a 75 ft single span press brake formed tub girder structure satisfies the project goals and is an optimized design. See Appendix C for drawings and Appendix D for a cost estimate for this alternative. CBBEL estimates that this option will cost approximately \$1.662 Million. This includes a 15% construction contingency and updated costs for Phase I and Phase II Engineering, based on CBBEL's recently submitted proposal for Phase I and II Engineering Services. Permitting and approximate Phase III engineering costs have been included in this estimate.

This refined alternative has all of the advantages noted above, including an increase in the opening under the structure. The opening will increase to 276 sf (vs. 206 sf existing), or roughly a 34% increase. Further analysis shows that a pier is not required for strength or serviceability requirements. Per correspondence with Valmont, live load deflection with a 75 ft span will be well below the AASHTO requirement of $L/360$. While the west approach to the bridge is steeper for the tub girder options than the truss options, all code requirements are still satisfied.

SECTION 5 – RECOMMENDATIONS AND NEXT STEPS

Based on this study, CBBEL recommends that the 75 ft single span press brake formed tub girder structure be selected for the proposed structure and used as the basis for the completion of Phase I and Phase II Engineering. The 75 ft tub girder option allows the overall structural depth to remain approximately the same as the existing structure, and the top and bottom elevations of the structure will remain approximately the same as the existing structure as well. The tub girders provide additional shielding benefits for the sanitary sewer over the truss options, and the overall costs of the tub girder and truss options are relatively the same. Additionally, FEQ modeling of this alternative shows the proposed structure will not cause the downstream or upstream flood elevation increases greater than 0.1 ft.

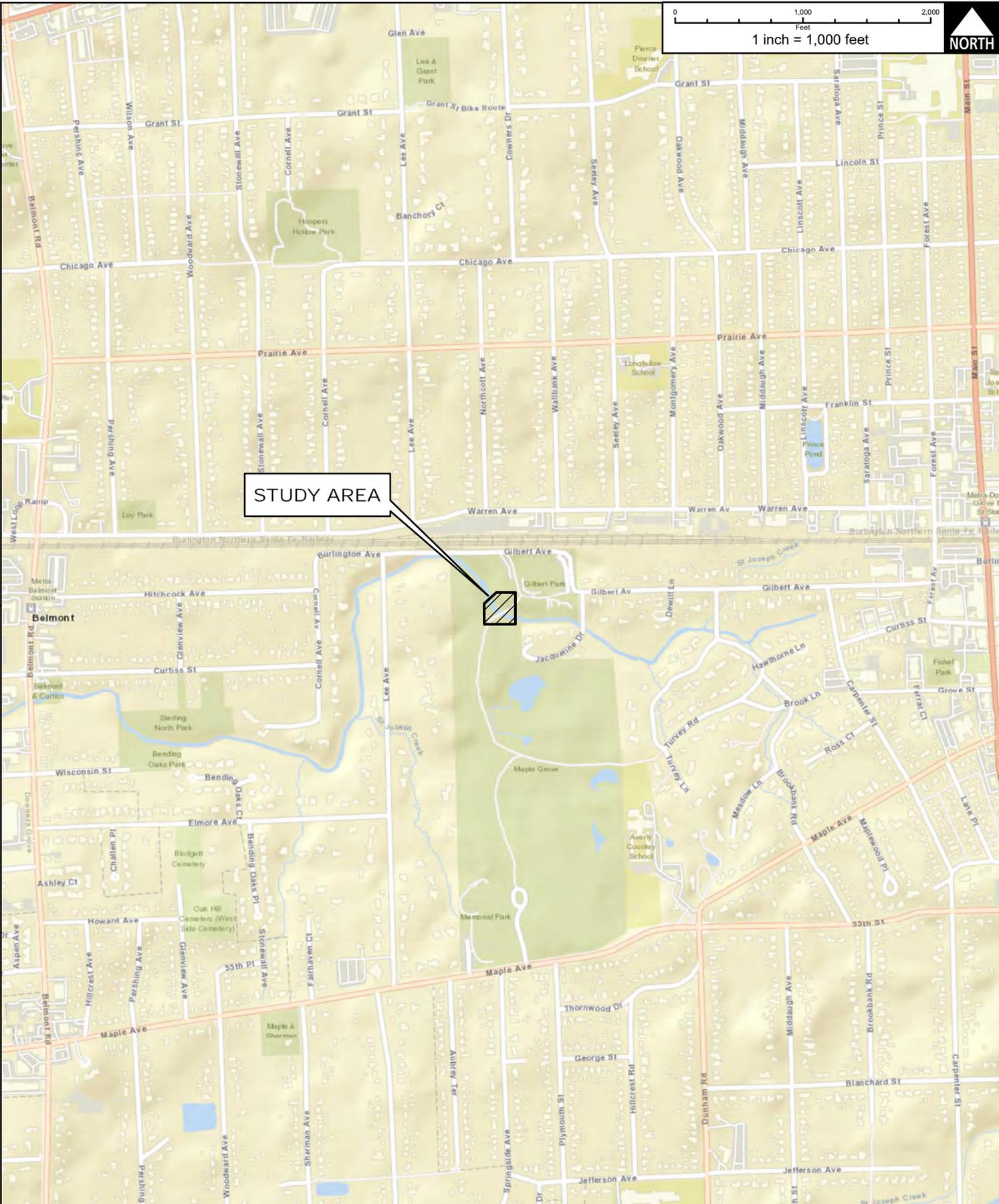
Upon FPD and DGSD concurrence with this recommendation, a detailed project schedule can be developed. Note that Phase I and Phase II design services can be performed concurrently; however, it would be prudent to wait until IDOT feedback is received on certain Phase I tasks before beginning Phase II design (e.g. Bridge Condition Report and Preliminary Bridge Design and Hydraulic Report). At this time, a late 2025/early 2026 letting date is feasible. Due to timing, an advanced tree clearing contract may need to be considered to protect for the potential presence of the state-listed northern long-eared bat in the vicinity of the project. This will be evaluated in further detail in the coming months.

CBBEL looks forward to discussing the findings of this study with you. We are excited to continue working with the FPD and DGSD on this very important project. Please let us know if you have any questions or comments on this report.

APPENDIX A

LOCATION MAP, FIRMETTE AND PHOTOS





STUDY AREA

CLIENT:
**FOREST PRESERVE DISTRICT
 OF DUPAGE COUNTY**

TITLE:
LOCATION MAP

CBBEL # 23-0312
 DATE: 1/10/2024

CHRISTOPHER B. BURKE Engineering, Ltd.
 9575 W. Higgins Road, Suite 600, Rosemont, Illinois 60018 (847)823-0500

DSGN.		SCALE:	1" = 1,000'
DWN.	KEK	USER:	kkopija
CHKD.	TGM	PLOT DATE:	1/10/2024
FILE NAME:	230312_LOC		

EXH 1

M:\DUPAGE COUNTY\FPD\230312\GIS\Exhibits\230312_LOC.mxd

National Flood Hazard Layer FIRMMette



88°1'43"W 41°47'55"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X	Future Conditions 1% Annual Chance Flood Hazard Zone X	Area with Reduced Flood Risk due to Levee. See Notes. Zone X	Area with Flood Risk due to Levee Zone D

OTHER AREAS	NO SCREEN Area of Minimal Flood Hazard Zone X	Effective LOMRs	Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer	Levee, Dike, or Floodwall

OTHER FEATURES	20.2 Cross Sections with 1% Annual Chance Water Surface Elevation	17.5 Coastal Transect	Base Flood Elevation Line (BFE)	Limit of Study	Jurisdiction Boundary	Coastal Transect Baseline	Profile Baseline	Hydrographic Feature

MAP PANELS	Digital Data Available	No Digital Data Available	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

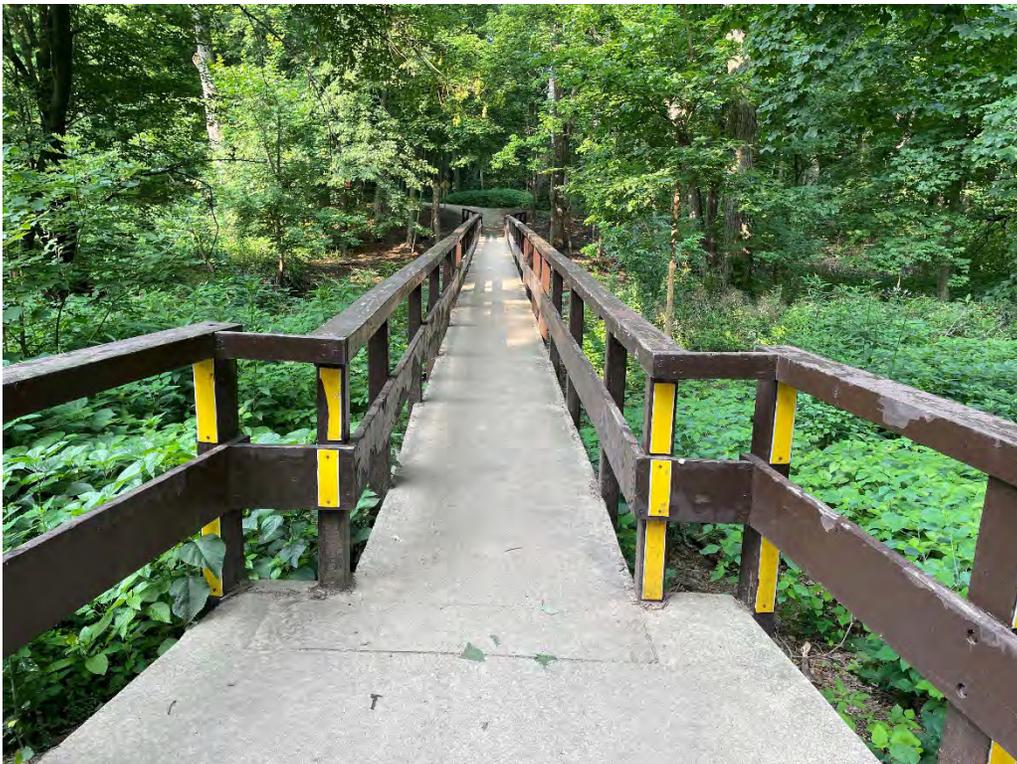
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/22/2024 at 2:05 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



East Approach to Structure – 4ft Wide HMA Path



Maple Grove Bridge – Looking West



Maple Grove Bridge – Looking East



West Approach to Structure – 8ft Wide Gravel Path



North Elevation (Upstream) of Structure – Note that wall has been placed in easternmost span and two westernmost spans are completely obstructed



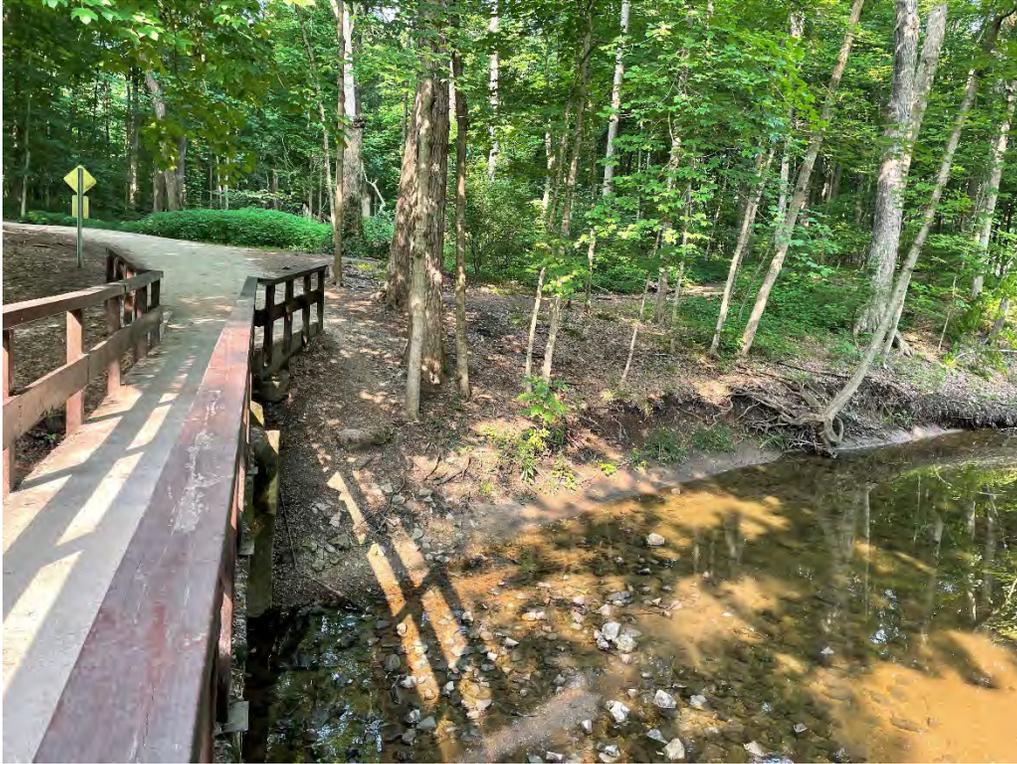
South Elevation (Downstream) of Structure



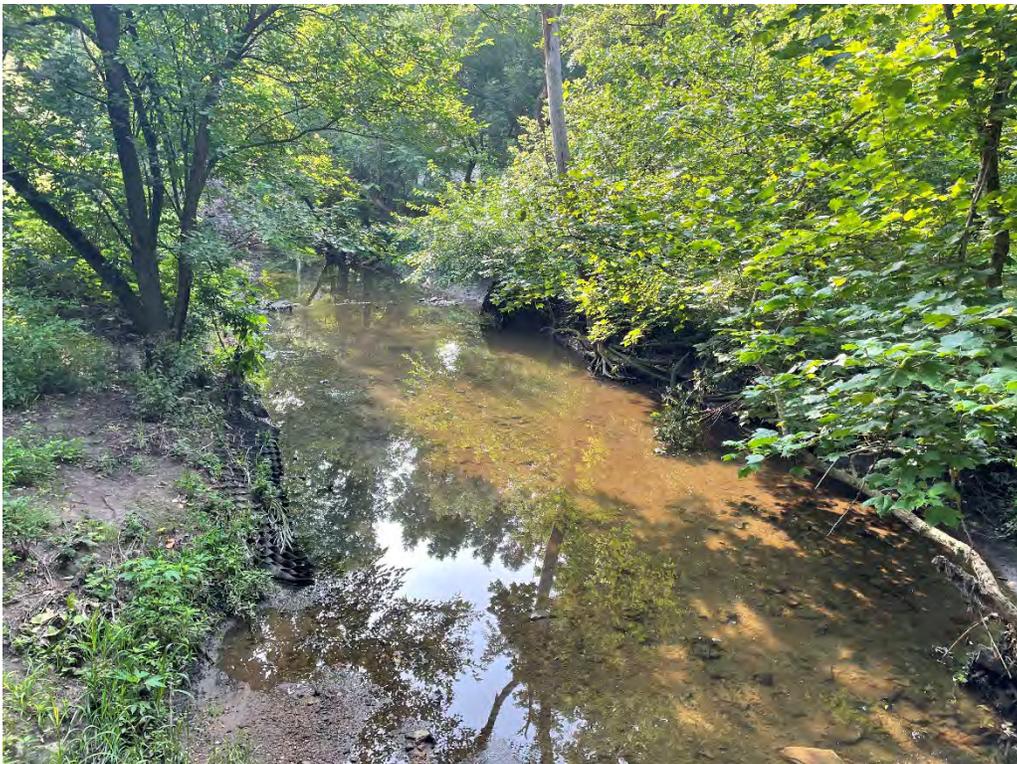
Typical Underside Condition – Bridge superstructure is in serious condition



Trees on North Side of Structure (East Bank) - Proposed Location of New Structure



Trees on North Side of Structure (West Bank) – Proposed Location of New Structure



Looking South/Downstream of Structure



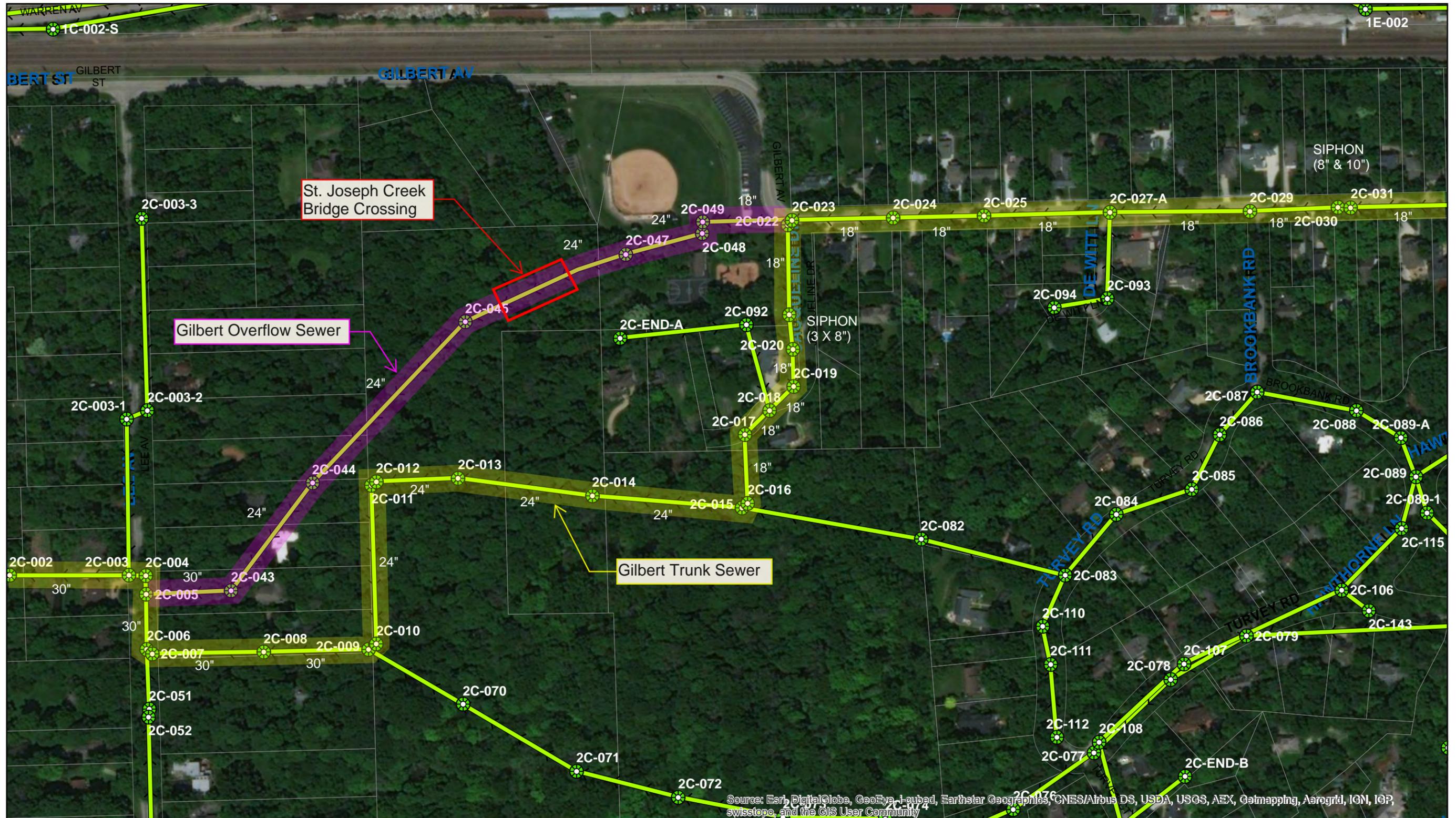
Looking North/Upstream of Structure

APPENDIX B

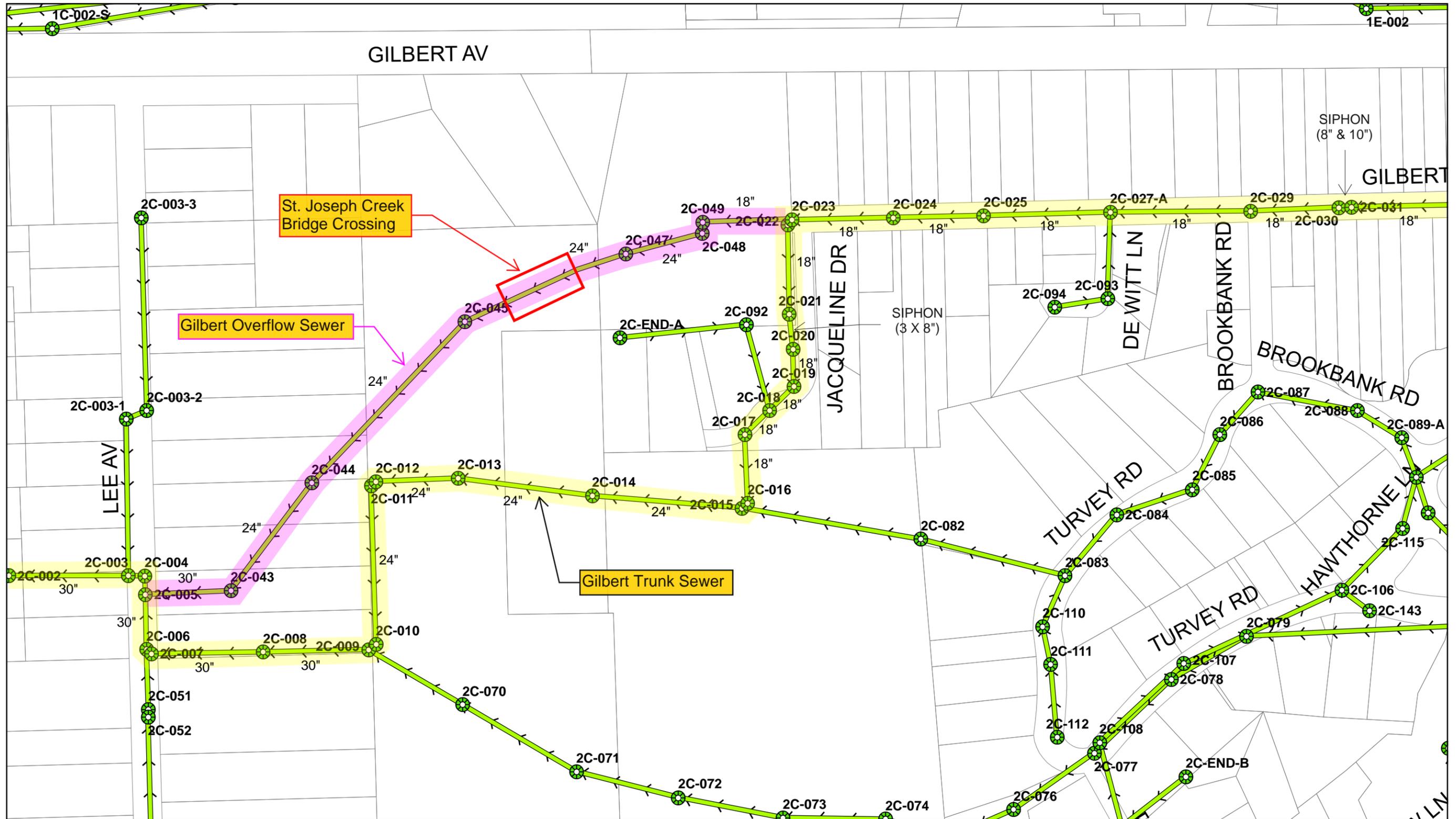
SEWER ATLAS AND EASEMENT EXHIBITS

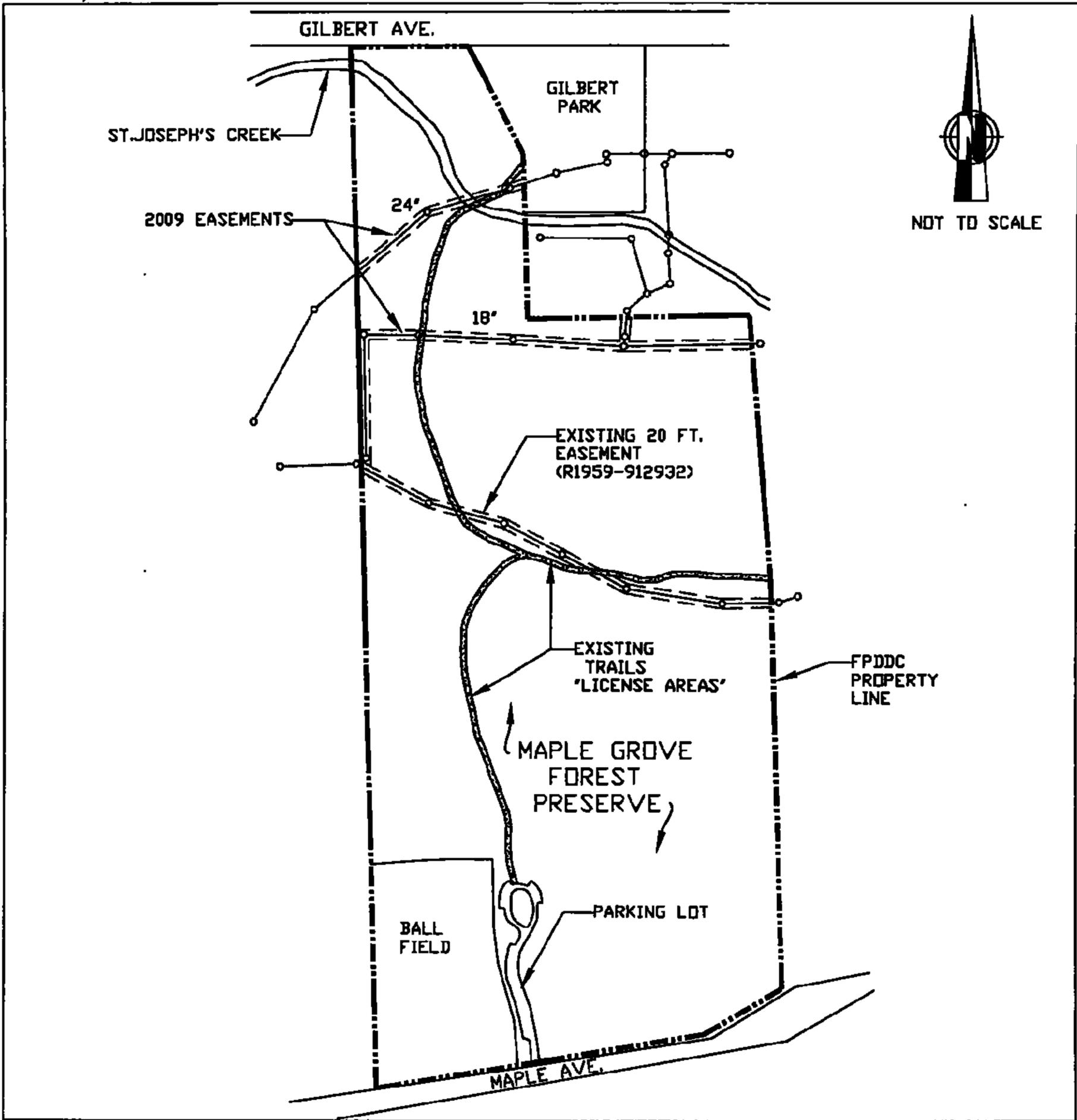


Downers Grove Sanitary District Gilbert Overflow Sewer - St. Joseph Creek Bridge Crossing Evaluation



Downers Grove Sanitary District Gilbert Overflow Sewer - St. Joseph Creek Bridge Crossing Evaluation





MAPLE GROVE SANITARY SEWER EASEMENT EXHIBIT C -- "LICENSE AREAS"

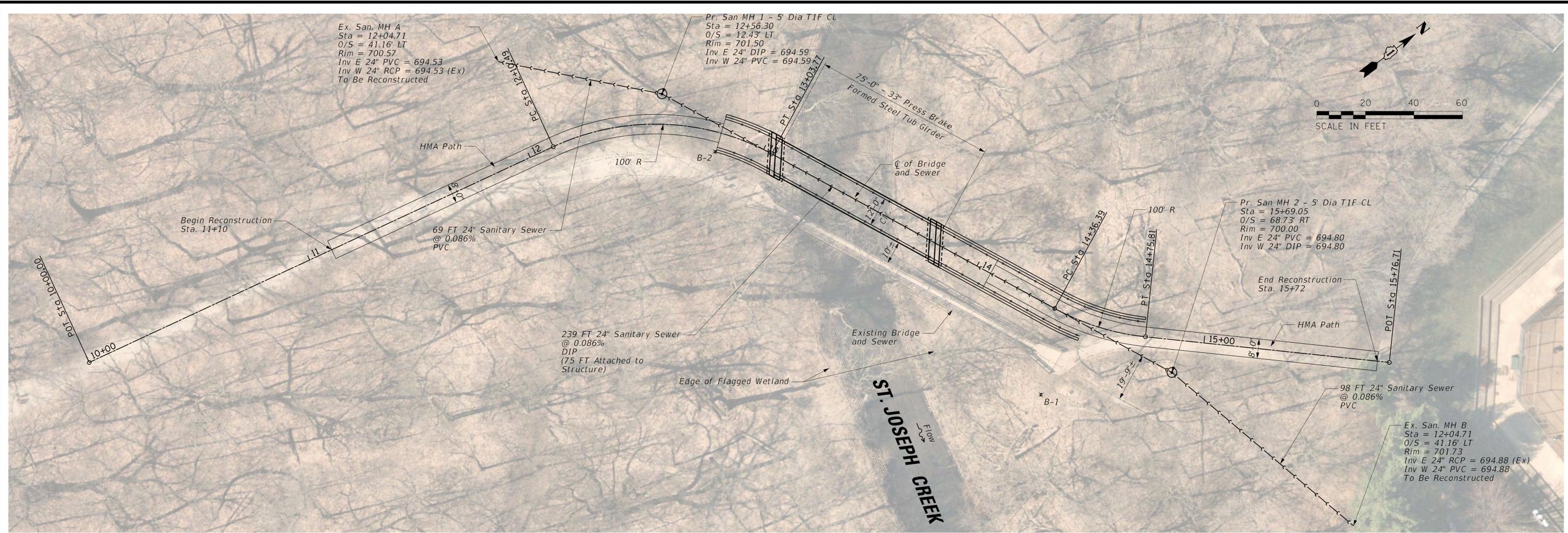
Forest Preserve District of DuPage County

DATE: AUGUST 11, 2009
Project No.: X-190-018E

APPENDIX C

DRAWINGS



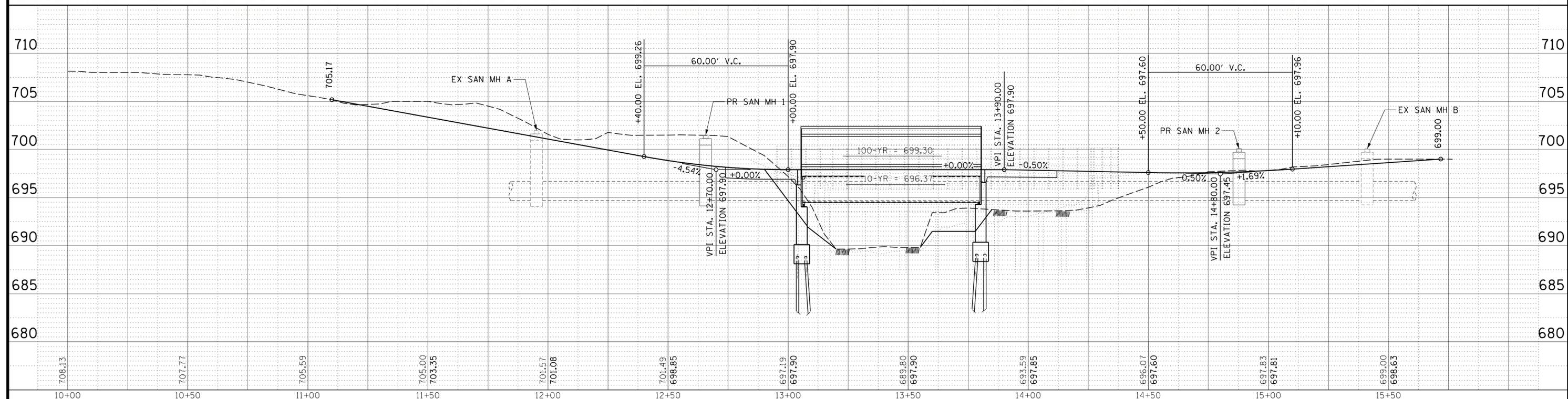


Ex. San. MH A
Sta = 12+04.71
O/S = 41.16' LT
Rim = 700.57
Inv E 24" PVC = 694.53
Inv W 24" RCP = 694.53 (Ex)
To Be Reconstructed

Pr. San MH 1 - 5' Dia T1F CL
Sta = 12+56.30
O/S = 12.43' LT
Rim = 701.50
Inv E 24" DIP = 694.59
Inv W 24" PVC = 694.59

Pr. San MH 2 - 5' Dia T1F CL
Sta = 15+69.05
O/S = 68.73' RT
Rim = 700.00
Inv E 24" PVC = 694.80
Inv W 24" DIP = 694.80

Ex. San. MH B
Sta = 12+04.71
O/S = 41.16' LT
Rim = 701.73
Inv E 24" RCP = 694.88 (Ex)
Inv W 24" PVC = 694.88
To Be Reconstructed



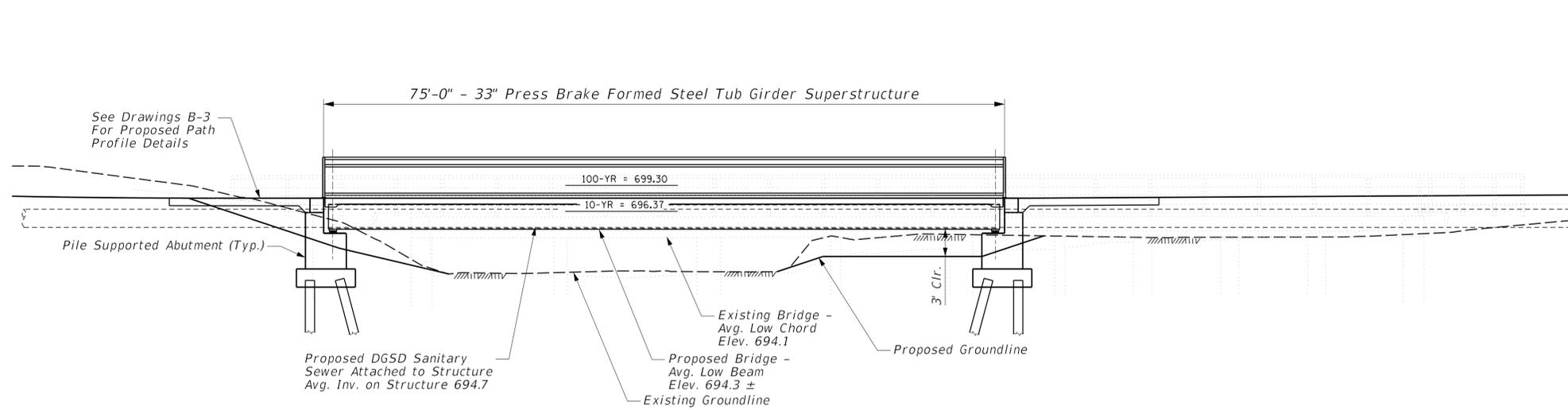
CHRISTOPHER B. BURKE ENGINEERING, LTD.
9575 W. Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

CLIENT:
**FOREST PRESERVE DISTRICT
OF DuPAGE COUNTY**

NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:
FILE NAME	N:\DUPAGE COUNTY FPD\230312\Struct\230312-Plan_Profile-03.Final.sht			

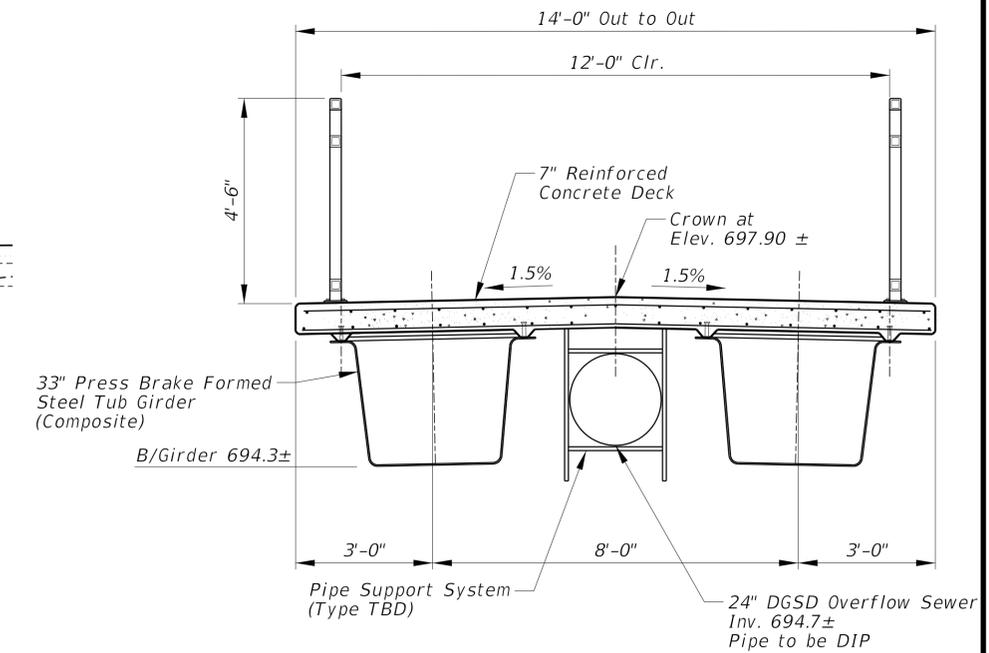
TITLE:
**MAPLE GROVE BRIDGE
AND SANITARY SEWER REPLACEMENT
TUB GIRDER - FINAL
PLAN AND PROFILE**

PROJ. NO. 230312
DATE: 8/28/2024
SHEET OF
DRAWING NO.
B-3

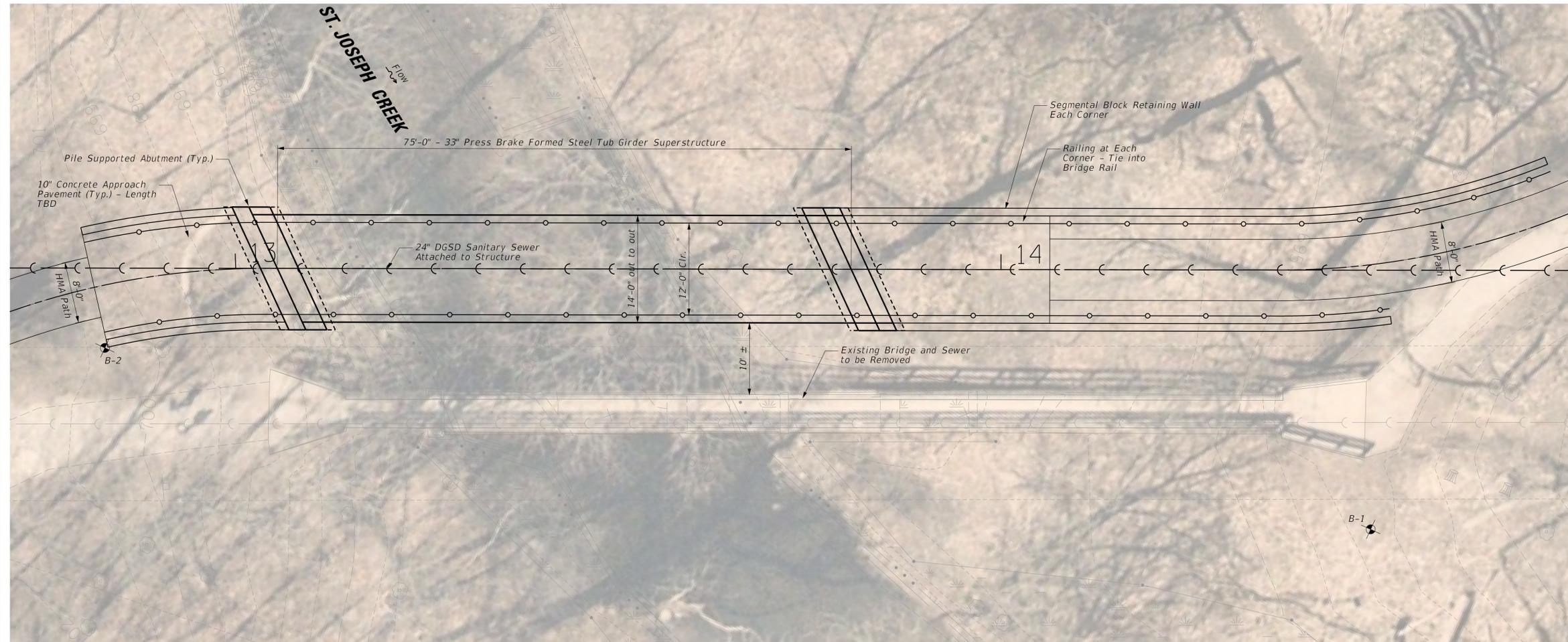


ELEVATION

Approximate Opening Under Proposed Bridge - 276 sf



TYPICAL SECTION



PLAN

CHRISTOPHER B. BURKE ENGINEERING, LTD.
 9575 W. Higgins Road, Suite 600
 Rosemont, Illinois 60018
 (847) 823-0500

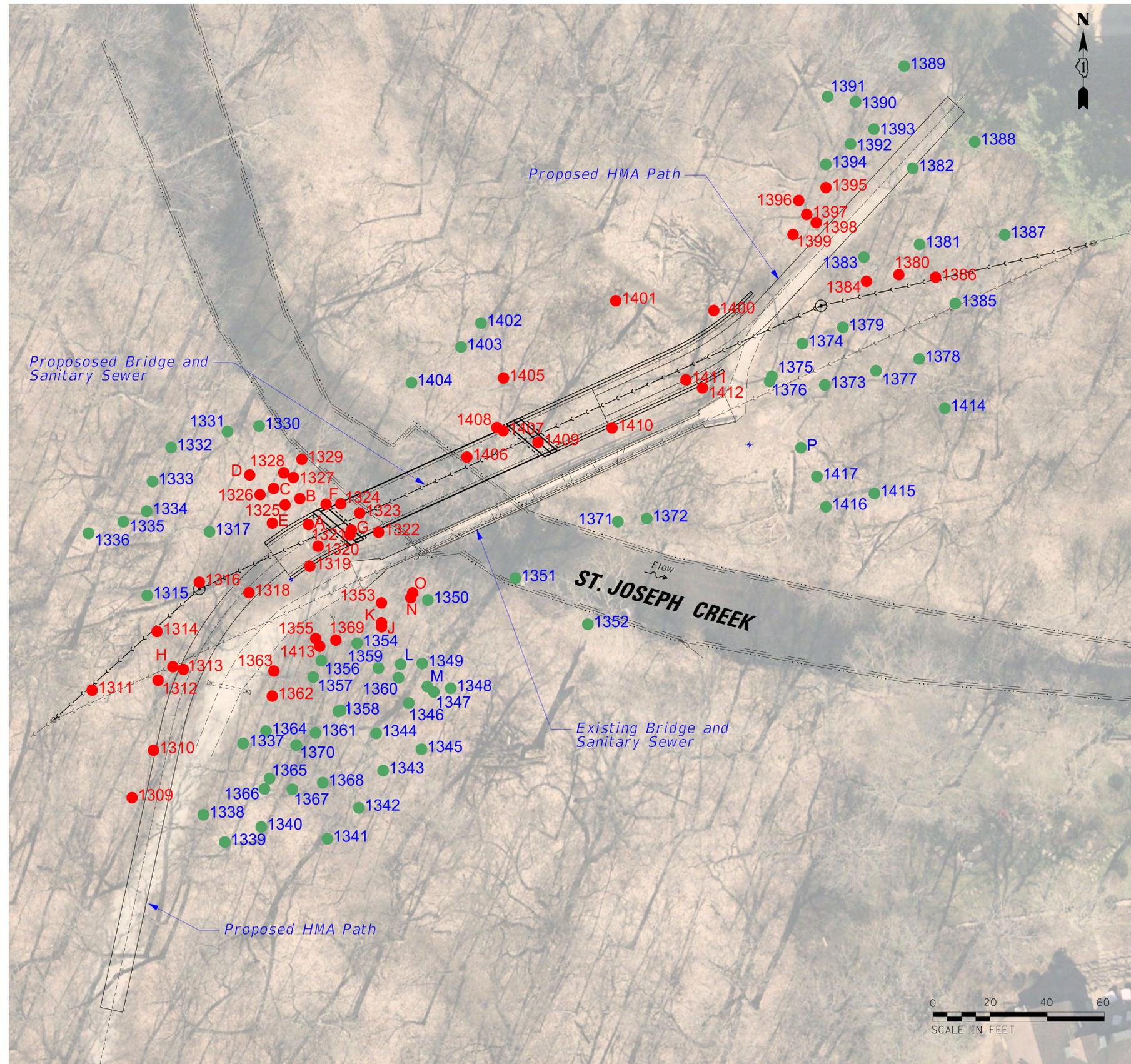
CLIENT:
FOREST PRESERVE DISTRICT OF DuPAGE COUNTY

NO.	DATE	NATURE OF REVISION	CHKD.	MODEL:
FILE NAME	N:\DUPAGE COUNTY FPD\230312\Struct\230312-CPE-TubGirder-75 - Final.sht			
DSGN.	JMB			
DWN.	PDR			
CHKD.	JMB			
SCALE:	N.T.S.			
PLOT DATE:	8/28/2024			
CAD USER:	jbarnett			
MODEL:	Default			

TITLE: **MAPLE GROVE BRIDGE AND SANITARY SEWER REPLACEMENT 75' TUB GIRDER - GENERAL PLAN, ELEVATION AND SECTION**

FINAL

PROJ. NO. 230312
 DATE: 8/28/2024
 SHEET OF
 DRAWING NO.
D-3



TREE IMPACT TABLE

TREE #	TREE SPECIES - COMMON NAME	TREE SPECIES - BOTANICAL NAME	SIZE - DIAMETER AT BREST HEIGHT (DBH) AS INCHES	CONDITION	FORM	Notes
1309	Sugar maple	Acer saccharum	12	2	2	Path/Bridge
1310	Sugar maple	Acer saccharum	4	2	2	Path/Bridge
1311	Sugar maple	Acer saccharum	5	2	2	Sewer
1312	Sugar maple	Acer saccharum	19	2	2	Path/Bridge
1313	Sugar maple	Acer saccharum	10	2	2	Path/Bridge
1314	Sugar maple	Acer saccharum	4	2	2	Sewer
1316	Sugar maple	Acer saccharum	5	2	2	Sewer
1318	Sugar maple	Acer saccharum	4	3	3	Path/Bridge
1319	Sugar maple	Acer saccharum	5	2	2	Path/Bridge
1320	Sugar maple	Acer saccharum	20	4	4	Path/Bridge
1321	Sugar maple	Acer saccharum	24	4	4	Path/Bridge
1322	Sugar maple	Acer saccharum	6	2	2	Path/Bridge
1323	Sugar maple	Acer saccharum	5	2	2	Path/Bridge
1324	Sugar maple	Acer saccharum	4	2	2	Path/Bridge
1325	Sugar maple	Acer saccharum	4	2	2	Path/Bridge
1326	Sugar maple	Acer saccharum	10	2	2	Crane
1327	Sugar maple	Acer saccharum	4	2	2	Crane
1328	Sugar maple	Acer saccharum	7	2	2	Crane
1329	Sugar maple	Acer saccharum	7	3	4	Crane
1353	Sugar maple	Acer saccharum	10	2	2	Grading
1355	Sugar maple	Acer saccharum	5	2	2	Grading
1362	Sugar maple	Acer saccharum	4	2	2	Grading
1363	Sugar maple	Acer saccharum	11	2	2	Grading
1369	Sugar maple	Acer saccharum	4	2	2	Grading
1380	Sugar maple	Acer saccharum	7	2	2	Sewer
1384	Sugar maple	Acer saccharum	9	2	2	Sewer
1386	Sugar maple	Acer saccharum	12	2	2	Sewer
1395	Sugar maple	Acer saccharum	4	2	2	Crane
1396	Sugar maple	Acer saccharum	4	2	2	Crane
1397	Sugar maple	Acer saccharum	10	3	4	Crane
1398	Sugar maple	Acer saccharum	4	2	2	Crane
1399	Sugar maple	Acer saccharum	5	2	2	Crane
1400	Sugar maple	Acer saccharum	8	2	2	Crane
1401	Box elder	Acer negundo	12	3	4	Crane
1405	Sugar maple	Acer saccharum	10	2	2	Crane
1406	Sugar maple	Acer saccharum	6	2	3	Path/Bridge
1407	Silver maple	Acer saccharinum	28	2	3	Path/Bridge
1408	Box elder	Acer negundo	4	2	2	Path/Bridge
1409	Sugar maple	Acer saccharum	24	2	2	Path/Bridge
1410	Hackberry	Celtis occidentalis	4	2	2	Path/Bridge
1411	Sugar maple	Acer saccharum	19	2	2	Path/Bridge
1412	Sugar maple	Acer saccharum	13	2	2	Path/Bridge
1413	Sugar maple	Acer saccharum	4	2	2	Grading

TREES LESS THAN 4" DBH

CBBEL ID	TREE SPECIES - COMMON NAME	TREE SPECIES - BOTANICAL NAME	SIZE - DIAMETER AT BREST HEIGHT (DBH) AS INCHES	CONDITION	FORM	Notes
A	Sugar maple	Acer saccharum	2	2	2	Path/Bridge
B	Sugar maple	Acer saccharum	3	2	2	Path/Bridge
C	Sugar maple	Acer saccharum	3	2	2	Crane
D	Sugar maple	Acer saccharum	2	2	2	Crane
E	Sugar maple	Acer saccharum	2	2	2	Path/Bridge
F	Sugar maple	Acer saccharum	2	2	2	Path/Bridge
G	Sugar maple	Acer saccharum	2	2	2	Path/Bridge
H	Sugar maple	Acer saccharum	3	2	2	Path/Bridge
J	Sugar maple	Acer saccharum	3	2	2	Grading
K	Sugar maple	Acer saccharum	2	2	2	Grading
N	Sugar maple	Acer saccharum	2	2	2	Grading
O	Sugar maple	Acer saccharum	3	2	2	Grading

TREE INVENTORY LIST - RATING DESCRIPTIONS

During the tree survey, each tree was evaluated on a scale rating from 1 - 5. These ratings were based on general observations at the time of the inventory. A rating of 5 (poor) has the lowest value in terms of protection or preservation. A rating of 1 (excellent) has the highest value and are the highest quality trees found.

For example:

- A. (5 = worst condition) A rating of 5 was given to a tree that has significant deadwood, bad sweep or lean, disease or damage by insect pests and larvae, lightning damage, split, or other physical damage.
- B. (4 = bad condition) A rating of 4 was given to a tree that has some deadwood, minor sweep or lean, distorted shape, trunk or bark damage, multiple stems, or poor physical quality.
- C. (3 = typical condition) A rating of 3 was given to a tree that is average in condition, form, physical state, appearance, and health.
- D. (2 = above average) A rating of 2 was given to a tree that has little or no damage, sound, good shape and form, and is good in overall physical quality.
- E. (1 = excellent condition) A rating of 1 was given to a tree that is excellent in appearance, condition and form, balanced branching and healthy. In our opinion, a tree worth preserving.

LEGEND

- Tree
- 1309 Tree ID #
- 1341 Tree Not Impacted by Construction - See Complete Tree Inventory Table in Appendix E
- 1309 Tree Impacted by Construction - See Table Above

APPENDIX D

COST ESTIMATE



FOREST PRESERVE DISTRICT OF DUPAGE COUNTY - MAPLE GROVE PEDESTRIAN BRIDGE AND SANITARY SEWER REPLACEMENT PROJECT
FINAL FEASIBILITY STUDY - COST ESTIMATE
CBEL PROJECT NO. 230312

Final - Structure Replacement Using Single Span, 75' Long Tub Girders (See Drawing D-3)

IDOT Code	Description	Unit	Unit Cost	Sanitary Sewer Construction		Bridge Construction		Complete Construction	
				Sanitary Sewer Construction Quantity	Sanitary Sewer Construction Cost	Bridge Construction Quantity	Bridge Construction Cost	Total Quantity	Total Cost
20100110	Tree Removal (6 to 15 Units Diameter)	Unit	\$ 24.00	42	\$ 1,008	235	\$ 5,640	277	\$ 6,648
20100210	Tree Removal (Over Units Diameter)	Unit	\$ 36.00	0	\$ -	134	\$ 4,824	134	\$ 4,824
20200100	Earth Excavation	Cu. Yd.	\$ 50.00	0	\$ -	375	\$ 18,750	375	\$ 18,750
20700110	Porous Granular Embankment	Cu. Yd.	\$ 85.00	0	\$ -	95	\$ 8,075	95	\$ 8,075
21101625	Topsoil Furnish and Place, 6"	Sq. Yd.	\$ 7.00	270	\$ 1,890	1,350	\$ 9,450	1,620	\$ 11,340
25000115	Seeding, IDOT Class 1B	Acre	\$ 25,000.00	0.05	\$ 1,250	0.12	\$ 3,000	0.17	\$ 4,250
25000200	Seeding, IDOT Class 2	Acre	\$ 25,000.00	0.05	\$ 1,250	0.12	\$ 3,000	0.17	\$ 4,250
25100630	Erosion Control Blanket	Sq. Yd.	\$ 3.00	270	\$ 810	1,350	\$ 4,050	1,620	\$ 4,860
25200200	Supplemental Watering	Unit	\$ 75.00	3	\$ 225	12	\$ 900	15	\$ 1,125
28000400	Perimeter Erosion Barrier	Foot	\$ 4.00	0	\$ -	400	\$ 1,600	400	\$ 1,600
31101400	Subbase Granular Material, Type B, 6"	Sq. Yd.	\$ 20.00	0	\$ -	270	\$ 5,400	270	\$ 5,400
40603085	Hot-Mix Asphalt Binder Course, IL-19.0, N50	Ton	\$ 175.00	0	\$ -	38	\$ 6,650	38	\$ 6,650
40603335	Hot-Mix Asphalt Surface Course, Mix "D", N50	Ton	\$ 225.00	0	\$ -	23	\$ 5,175	23	\$ 5,175
50100100	Removal of Existing Structures	Each	\$ 35,000.00	0	\$ -	1	\$ 35,000	1	\$ 35,000
50200100	Structure Excavation	Cu. Yd.	\$ 60.00	0	\$ -	135	\$ 8,100	135	\$ 8,100
50201101	Cofferdam (Type 1) (Location 1)	Each	\$ 30,000.00	0	\$ -	1	\$ 30,000	1	\$ 30,000
50201102	Cofferdam (Type 1) (Location 2)	Each	\$ 30,000.00	0	\$ -	1	\$ 30,000	1	\$ 30,000
50300225	Concrete Structures	Cu. Yd.	\$ 1,300.00	0	\$ -	40	\$ 52,000	40	\$ 52,000
50300255	Concrete Superstructure	Cu. Yd.	\$ 1,800.00	0	\$ -	24	\$ 43,200	24	\$ 43,200
50300300	Protective Coating	Sq. Yd.	\$ 2.00	0	\$ -	150	\$ 300	150	\$ 300
50301350	Concrete Superstructure (Approach Slab)	Cu. Yd.	\$ 900.00	0	\$ -	17	\$ 15,300	17	\$ 15,300
50800205	Reinforcement Bars, Epoxy Coated	Pound	\$ 2.50	0	\$ -	9,720	\$ 24,300	9,720	\$ 24,300
50901720	Bicycle Railing	Foot	\$ 300.00	0	\$ -	360	\$ 108,000	360	\$ 108,000
51201600	Furnishing Steel Piles. Size TBD	Foot	\$ 85.00	0	\$ -	720	\$ 61,200	720	\$ 61,200
51202305	Driving Piles	Foot	\$ 1.00	0	\$ -	720	\$ 720	720	\$ 720
51203600	Test Pile Steel HP, Size TBD	Each	\$ 10,000.00	0	\$ -	2	\$ 20,000	2	\$ 20,000
51204650	Pile Shoes	Each	\$ 450.00	0	\$ -	12	\$ 5,400	12	\$ 5,400
52200800	Segmental Concrete Block Wall	Sq. Ft.	\$ 70.00	0	\$ -	950	\$ 66,500	950	\$ 66,500
59100100	Geocomposite Wall Drain	Sq. Yd.	\$ 25.00	0	\$ -	25	\$ 625	25	\$ 625
60146304	Pipe Underdrain for Structures 4"	Foot	\$ 25.00	0	\$ -	230	\$ 5,750	230	\$ 5,750
67100100	Mobilization	L. Sum	\$ 60,000.00	0	\$ -	1	\$ 60,000	1	\$ 60,000
X0322791	Fill Existing Sanitary Sewers	Cu. Yd.	\$ 500.00	34	\$ 17,000	0	\$ -	34	\$ 17,000
X0327036	Bike Path Removal	Sq. Yd.	\$ 20.00	0	\$ -	210	\$ 4,200	210	\$ 4,200
X0426200	Dewatering	L. Sum	\$ 5,000.00	0	\$ -	1	\$ 5,000	1	\$ 5,000
X6022820	Manholes, Sanitary, 5' Diameter, Type 1 Frame, CL	Each	\$ 8,000.00	4	\$ 32,000	0	\$ -	4	\$ 32,000
X7010216	Traffic Control and Protection (Special)	L. Sum	\$ 6,000.00	0	\$ -	1	\$ 6,000	1	\$ 6,000
Z0013797	Stabilized Construction Entrance	Sq. Yd.	\$ 30.00	0	\$ -	200	\$ 6,000	200	\$ 6,000
Z0013798	Construction Layout	L. Sum	\$ 8,000.00	0	\$ -	1	\$ 8,000	1	\$ 8,000
Z0057500	Sanitary Sewer 24"	Foot	\$ 350.00	405	\$ 141,750	0	\$ -	405	\$ 141,750
N/A	Pipe Hanger System	L. Sum	\$ 15,000.00	1	\$ 15,000	0	\$ -	1	\$ 15,000
N/A	Decorative LedgeStone	Sq. Yd.	\$ 150.00	0	\$ -	55	\$ 8,250	55	\$ 8,250
N/A	Restore Existing Gilbert Park Bike Path	L. Sum	\$ 20,000.00	0	\$ -	1	\$ 20,000	1	\$ 20,000
N/A	Press-Break-Formed Steel Tub Girder (PBFSTG) Sys.	Foot	\$ 1,000.00	0	\$ -	150	\$ 150,000	150	\$ 150,000
				Subtotal =	\$ 213,000.00	Subtotal =	\$ 851,000.00	Subtotal =	\$ 1,063,000.00
				15% Cont. =	\$ 32,000.00	15% Cont. =	\$ 128,000.00	15% Cont. =	\$ 160,000.00
				San. Sewer Total =	\$ 245,000.00	Bridge Total =	\$ 979,000.00	Const. Total =	\$ 1,223,000.00

Phase I Engineering = \$ 128,000.00
Phase II Engineering = \$ 151,000.00
Permitting (3%) = \$ 37,000.00
Phase III Engineering (10%) = \$ 123,000.00
TOTAL CONSTRUCTION AND ENGINEERING = \$ 1,662,000.00

APPENDIX E

ENVIRONMENTAL





CHRISTOPHER B. BURKE ENGINEERING, LTD.

9575 W Higgins Road, Suite 600 Rosemont, Illinois 60018-4920 Tel (847) 823-0500 Fax (847) 823-0520

January 15, 2024

Forest Preserve District of DuPage County
Planning and Development - Engineering
3S580 Naperville Road
Wheaton, IL 60189

Attention: Christopher Welch, PE, CFM

Subject: Waters of the U.S./Wetland Assessment for the St. Joseph Creek Sanitary
Sewer Crossing Corridor within the Maple Grove Forest Preserve, Downers
Grove, DuPage County, Illinois
(CBBEL Project No. 230312)

Dear Mr. Welch:

As requested, Christopher B. Burke Engineering, Ltd. (CBBEL) completed a Waters of the U.S./wetland assessment for the St. Joseph Creek Sanitary Sewer Crossing Corridor study area in Downers Grove, DuPage County, Illinois. One Waters of the U.S./wetland area consisting of an on-site portion of St. Joseph Creek with vegetated wetland edge was identified and flagged at the time of our site visit using the U.S. Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (August 2010). An aerial photograph delineation showing the GPS sub-meter accuracy Waters of the U.S./wetland area limits is included as Exhibit 8.

The U.S. Army Corps of Engineers no longer has jurisdiction over isolated wetlands with no hydrologic connections to navigable waterways. Wetlands with direct hydrologic connections to navigable waterways are federally regulated by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. In DuPage County, all wetlands and adjacent upland buffers are regulated by the DuPage County Stormwater Management Department under the DuPage County Countywide Stormwater and Flood Plain Ordinance (Ordinance).

In our opinion, the Waters of the U.S./wetland area, which consists of an on-site portion of St. Joseph Creek, contains a direct hydrologic connection with navigable Waters of the U.S. and will be regulated by the U.S. Army Corps of Engineers and any impacts to the regulated Waters of the U.S./wetland area will require a permit under Section 404 of the Clean Water Act. As previously noted, all wetlands and adjacent upland buffers are regulated as Special Management Areas by DuPage County under the Ordinance. Therefore, proposed impacts to the Waters of the U.S./wetland area or the adjacent upland buffer will require an authorization to impact Special Management Areas by the DuPage County Stormwater Management Department.

The attached report describes the identified Waters of the U.S./wetland area and presents the methodology and reference material used to assist in the assessment. The Midwest Region Wetland Determination Data Forms, required by the USACE, are included as Appendix A. The Wildlife Habitat/Use Evaluation Score Sheet, required by DuPage County, is included in Appendix B. This Waters of the U.S./wetland assessment is based on field conditions at the time of the CBBEL site visit and our understanding of current federal, state and local regulations. An evaluation of historic site conditions was not performed.

Please contact me should you have any questions or if I can be of further assistance.

Sincerely,

A handwritten signature in blue ink, appearing to read 'T. McArdle', with a stylized flourish at the end.

Thomas G. McArdle
Manager, Environmental Resources Department

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**WATERS OF THE U.S./WETLAND ASSESSMENT REPORT
ST. JOSEPH CREEK SANITARY SEWER CORRIDOR PROJECT SITE
DOWNERS GROVE, DuPAGE COUNTY, ILLINOIS
CBBEL Project No. 320312**

WETLAND DELINEATION

On January 5, 2024, Christopher B. Burke Engineering, Ltd. (CBBEL) completed a wetland/Waters of the U.S. field investigation of the subject site to determine on-site wetland and Waters of the U.S. boundaries. This report was prepared to document our findings. Identified wetland and Waters of the U.S. boundaries were delineated using the U.S. Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (August 2010). The GPS sub-meter accuracy Waters of the U.S./wetland limits are shown on Exhibit 8. The Midwest Region Wetland Determination Data Forms, required by the USACE, are also included.

METHODOLOGY

The Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (August 2010), identifies the mandatory technical criteria for wetland identification. The three essential characteristics of a jurisdictional wetland are hydrophytic vegetation, hydric soils and wetland hydrology as described below:

Hydrophytic Vegetation: The hydrophytic vegetation criterion is based on a separation of plants into five basic groups:

- (1) Obligate wetland plants (OBL) almost always occur (estimated probability >99%) in wetlands under natural conditions;
- (2) Facultative wetland plants (FACW) usually occur in wetlands (estimated probability 67-99%), but occasionally are found in non-wetlands;
- (3) Facultative plants (FAC) are equally likely to occur in wetlands or non-wetlands (estimated probability 34-66%);
- (4) Facultative upland plants (FACU) usually occur in non-wetlands (estimated probability 67-99%), but occasionally are found in wetlands; and
- (5) Obligate upland plants (UPL) almost always occur (estimated probability >99%) in non-wetlands under natural conditions.

Four procedures completed in the following order are used to determine if hydrophytic vegetation is present:

- 1) **Rapid Test:** The Rapid Test for hydrophytic vegetation is met if all dominant species across all strata are OBL or FACW, or a combination of the two based on a visual assessment.

- 2) **Dominance Test**: Using the 50/20 Rule, if greater than 50% of the plants present are FAC, FACW, or OBL, the subject area meets the hydrophytic vegetation criterion.
- 3) **Prevalence Index**: Each plant species in a sampling plot is assigned a numeric value (OBL=1; FACW=2; FAC=3; FACU=4; UPL=5). Based on the sampling data, the absolute cover is calculated for each species in each stratum and using the specified formula, if the Prevalence Index is 3 or less, hydrophytic vegetation is present.
- 4) **Morphological Adaptations**: Various species may develop physical characteristics after growing in wetland areas such as multi-stemmed trunks, shallow roots and buttressed stems. Hydrophytic vegetation is present if an adaptation is observed in more than 50% of FACU species growing in an area that contains hydric soil and wetland hydrology.

Hydric Soils: Hydric soils are defined in the manual as "soils that are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper part." Field indicators of hydric soil are found in the NTCHS Field Indicators of Hydric Soils in the United States (USDA Natural Resources Conservation Service 2006b or current version).

Wetland Hydrology: The wetland hydrology criterion is often the most difficult to determine. Typically, the presence of water for a portion of the growing season creates anaerobic conditions. Anaerobic conditions lead to the prevalence of wetland plants. Morphological adaptations of plants, driftlines and watermarks are examples of wetland hydrology field indicators.

RESULTS AND DISCUSSION

STUDY AREA

The study area is located in the DuPage County Maple Grove Forest Preserve and consists of open space surrounding St. Joseph Creek to the south of Gilbert Avenue and east of Lee Avenue in Downers Grove, DuPage County, Illinois, as shown on Exhibit 1. The project site contains an on-site portion of St. Joseph Creek that passes underneath a pedestrian trail bridge with a degraded sanitary sewer line attached to the underside of the structure. St. Joseph Creek contains sparsely vegetated, eroded side slopes and is surrounded by upland woods containing a dominance of overstory trees, saplings and a sparse coverage of shrubs and herbaceous vegetation. As previously noted, St. Joseph Creek contains a direct hydrologic connection with navigable Waters of the U.S. and will be regulated by the U.S. Army Corps of Engineers and any proposed impacts to the regulated area will require a permit under Section 404 of the Clean Water Act. In addition, St. Joseph Creek and the adjacent upland buffers are classified as Special Management Areas under the Ordinance and any proposed impacts within the areas will require a permit from the DuPage County Stormwater Management Department as well.

IDENTIFIED WATERS OF THE U.S./WETLAND AREA

The following is a brief description of the identified Waters of the U.S./wetland area with a list of the dominant plant species observed and their corresponding wetland indicator categories. A coefficient of conservatism (C-value) is also included for each plant species. C-values were established by Swink and Wilhelm (1999) to quantify an area's native attributes for comparative purposes.

Each plant species is rated on a scale of 0 to 10, 0-representing non-native or noxious species commonly found in a variety of habitats, and 10 representing plants found only under specific ecological conditions. The C-values of plants found in wetland areas can give some insight as to the overall quality or value of the wetland. Wetlands containing an abundance of plants with a low C-value suggest that these wetlands have been disturbed in the past. Wetlands containing an abundance of plants with a high C-value suggest that specific ecological conditions necessary for their survival are intact thus disturbance is probably minimal and the wetland maintains at least some of its original integrity.

St. Joseph Creek – Waters of the U.S./Wetland #1

Waters of the U.S. are defined as the ordinary high water mark in non-tidal waters, provided the jurisdiction is not extended by the presence of wetlands. The term “ordinary high water mark” (OHWM) refers to the line established by fluctuations of water. These fluctuations can be indicated by physical characteristics such as a clear, natural line impressed on the bank (scour line), shelving, changes in the character of soil, destruction of terrestrial vegetation, or the presence of litter and debris.

Waters of the U.S./Wetland #1 consists of an on-site portion of St. Joseph Creek containing a narrow, well-defined channel with sparsely vegetated lower channel banks. The Waters of the U.S./wetland area was characterized at data points 1A and 2A, as shown on Exhibit 8. The sparsely vegetated portions of the Waters of the U.S./wetland area are dominated by a limited mixture of primarily invasive and pioneer, woody and herbaceous wetland vegetation. The vegetation was comprised of primarily facultative and facultative wetland plant species. The lower channel banks were also eroded in many locations with undercut slopes and exposed tree roots. The sparse vegetative dominants included box elder (*Acer negundo*), common beggar's ticks (*Bidens frondosa*), heartsease (*Polygonum lapathifolium*), elderberry (*Sambucus canadensis*), rough avens (*Geum laciniatum*), riverbank grape (*Vitis riparia*), fowl manna grass (*Glyceria striata*) and silver maple (*Acer saccharinum*). The presence of these vegetative dominants meets the hydrophytic vegetation criteria.

Positive wetland hydrology was indicated by shallow flowing water within the interior channel, saturated soil along the lower channel banks, water marks, drift lines, water stained vegetation and sediment deposits. The area was mapped as underlain with Sawmill silty clay loam on the Soil Survey of DuPage County, Illinois. Sawmill silty clay loam is classified as a hydric soil by the DuPage County Natural Resources Conservation Service and the identified soil probes revealed low chroma colors and redoximorphic features in the subhorizon. These soil characteristics are indicative of soil formation in anaerobic conditions and the presence of hydric soil.

The following lists plants identified during the dormant season site visit with the calculated native mean C-value and FQI:

FLORISTIC QUALITY DATA		Native		Adventive		
16 NATIVE SPECIES	Tree	3	12.5%	Tree	0	0.0%
24 Total Species	Shrub	2	8.3%	Shrub	1	4.2%
1.6 NATIVE MEAN C	W-Vine	1	4.2%	W-Vine	1	4.2%
1.0 W/Adventives	H-Vine	0	0.0%	H-Vine	0	0.0%
6.3 NATIVE FQI	P-Forb	4	16.7%	P-Forb	2	8.3%
5.1 W/Adventives	B-Forb	1	4.2%	B-Forb	1	4.2%
-1.6 NATIVE MEAN W	A-Forb	3	12.5%	A-Forb	0	0.0%
-0.8 W/Adventives	P-Grass	1	4.2%	P-Grass	2	8.3%
AVG: Fac. Wetland (-)	A-Grass	1	4.2%	A-Grass	1	4.2%
	P-Sedge	0	0.0%	P-Sedge	0	0.0%
	A-Sedge	0	0.0%	A-Sedge	0	0.0%
	Cryptogam	0	0.0%			

ACRONYM	C SCIENTIFIC NAME	W WETNESS	PHYSIOGNOMY	COMMON NAME
ACENEG	0 Acer negundo	-2 FACW-	Nt Tree	BOX ELDER
ACESAI	0 Acer saccharinum	-3 FACW	Nt Tree	SILVER MAPLE
ACTALT	5 Actinomeris alternifolia	-3 FACW	Nt P-Forb	WINGSTEM
AGRALA	0 AGROSTIS ALBA	-3 FACW	Ad P-Grass	REDTOP
ALLPET	0 ALLIARIA PETIOLATA	0 FAC	Ad B-Forb	GARLIC MUSTARD
BIDFRO	1 Bidens frondosa	-3 FACW	Nt A-Forb	COMMON BEGGAR'S TICKS
CIRARV	0 CIRSIUM ARVENSE	5 UPL	Ad P-Forb	FIELD THISTLE
CONARV	0 CONVULVULUS ARVENSIS	5 UPL	Ad P-Forb	FIELD BINDWEED
CORRAC	1 Cornus racemosa	-2 FACW-	Nt Shrub	GRAY DOGWOOD
CRAMOL	2 Crataegus mollis	4 FACU-	Nt Tree	DOWNY HAWTHORN
GEULAT	2 Geum laciniatum trichocarpum	-3 FACW	Nt P-Forb	ROUGH AVENS
GLYSTR	4 Glyceria striata	-3 [FACW]	Nt P-Grass	FOWL MANNA GRASS
HACVIR	0 Hackelia virginiana	1 FAC-	Nt B-Forb	STICKSEED
HYDVIR	5 Hydrophyllum virginianum	0 [FAC]	Nt P-Forb	VIRGINIA WATERLEAF
PANCAP	1 Panicum capillare	0 FAC	Nt A-Grass	OLD WITCH GRASS
PHAARU	0 PHALARIS ARUNDINACEA	-4 FACW+	Ad P-Grass	REED CANARY GRASS
PHYAME	1 Phytolacca americana	1 FAC-	Nt P-Forb	POKEWEED
POLLAP	0 Polygonum lapathifolium	-4 FACW+	Nt A-Forb	HEARTSEASE
POLPEN	0 Polygonum pennsylvanicum	-4 FACW+	Nt A-Forb	PINKWEED
RHACAT	0 RHAMNUS CATHARTICA	3 FACU	Ad Shrub	COMMON BUCKTHORN
SAMCAN	1 Sambucus canadensis	-2 FACW-	Nt Shrub	ELDERBERRY
SETGLA	0 SETARIA GLAUCA	0 FAC	Ad A-Grass	YELLOW FOXTAIL
SOLDUL	0 SOLANUM DULCAMARA	0 FAC	Ad W-Vine	BITTERSWEET NIGHTSHADE
VITRIP	2 Vitis riparia	-2 FACW-	Nt W-Vine	RIVERBANK GRAPE

WETLAND CLASSIFICATION

The on-site wetland must be classified as either “regulatory” or “critical”, as required in the Ordinance, Section 15-134.3. To make this determination, four criteria, specified by DuPage County, are evaluated for the wetland. Critical wetland status is assigned to a wetland that has been determined to satisfy one or more of the following criteria.

- Was the on-site wetland identified as critical on the ADID study?

No. The wetland area is mapped as Regulatory Wetland on the DuPage County Wetland Inventory, as shown on Exhibit 3.

- Is the site known to possess, or have a recorded presence within the last three years, of a Federal or State listed threatened or endangered species?

Endangered and Threatened Species Consultation with the Illinois Department of Natural Resources (IDNR) and the U.S. Fish and Wildlife Service (USFWS) are ongoing and we will submit the results during the permit application process.

- Is the native mean C-value as defined by Swink and Wilhelm (1994) greater than or equal to 3.5, or is the native mean floristic quality index 20 or higher during a single season assessment?

No. The Swink and Wilhelm Method was applied to the identified wetland area. As described in the preceding narrative, the native mean C-value was not greater than or equal to 3.5 and the FQI value was not 20 or higher.

- Is the Mean Rated Wildlife Quality (MRWQ) 5.0 or higher as defined by the Modified Michigan Department of Natural Resources (MDNR) Method?

No. The identified wetland was evaluated and did not receive an MRWQ value of 5.0 or higher. Three habitat parameters were evaluated as described in the MDNR Method. These three assessment parameters include utilization by wildlife, interspersed vegetative cover, and vegetative cover to open water. Appendix B contains the evaluation score sheet for the wetland.

REFERENCE MATERIALS

The following reference materials were reviewed and used to assist in the wetland field reconnaissance. They are included as Exhibits 1-7.

LOCATION

The study area is located in the DuPage County Maple Grove Forest Preserve and consists of open space surrounding St. Joseph Creek to the south of Gilbert Avenue and east of Lee Avenue in Downers Grove, DuPage County, Illinois, as shown on Exhibit 1. Geographically, the study area is located in Section 7, Township 38 North, Range 11, East of the Third Principal Meridian.

NATIONAL WETLAND INVENTORY

The National Wetland Inventory map (NWI) for the Wheaton (1983) Quadrangle, as shown on Exhibit 2, indicates that wetland area is mapped within the study area. The NWI serves only as a large-scale guide and actual wetland locations and types often vary from that mapped. The following wetland type is mapped within the study area:

R2UBHx - Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded, Excavated

DUPAGE COUNTY WETLAND INVENTORY

The DuPage County Wetland Inventory map (DCWI) and Advanced Identification map for Downers Grove North Township (2001), as shown on Exhibit 3, indicates that wetland is

mapped within the study area. The identified wetland is mapped as a Regulatory Wetland area. As with the NWI, the DCWI map serves as a large-scale guide and actual wetland locations often vary from that mapped.

SOIL SURVEY

The Soil Survey of DuPage County, Illinois (2013), as shown on Exhibit 4, was reviewed to determine the location of hydric soils within the study area. Mapped hydric soil can be indicative of wetland conditions. The following soils are mapped within the study area:

530B	-	Ozaukee silt loam	
3107A	-	Sawmill silty clay loam, frequently flooded	- Hydric

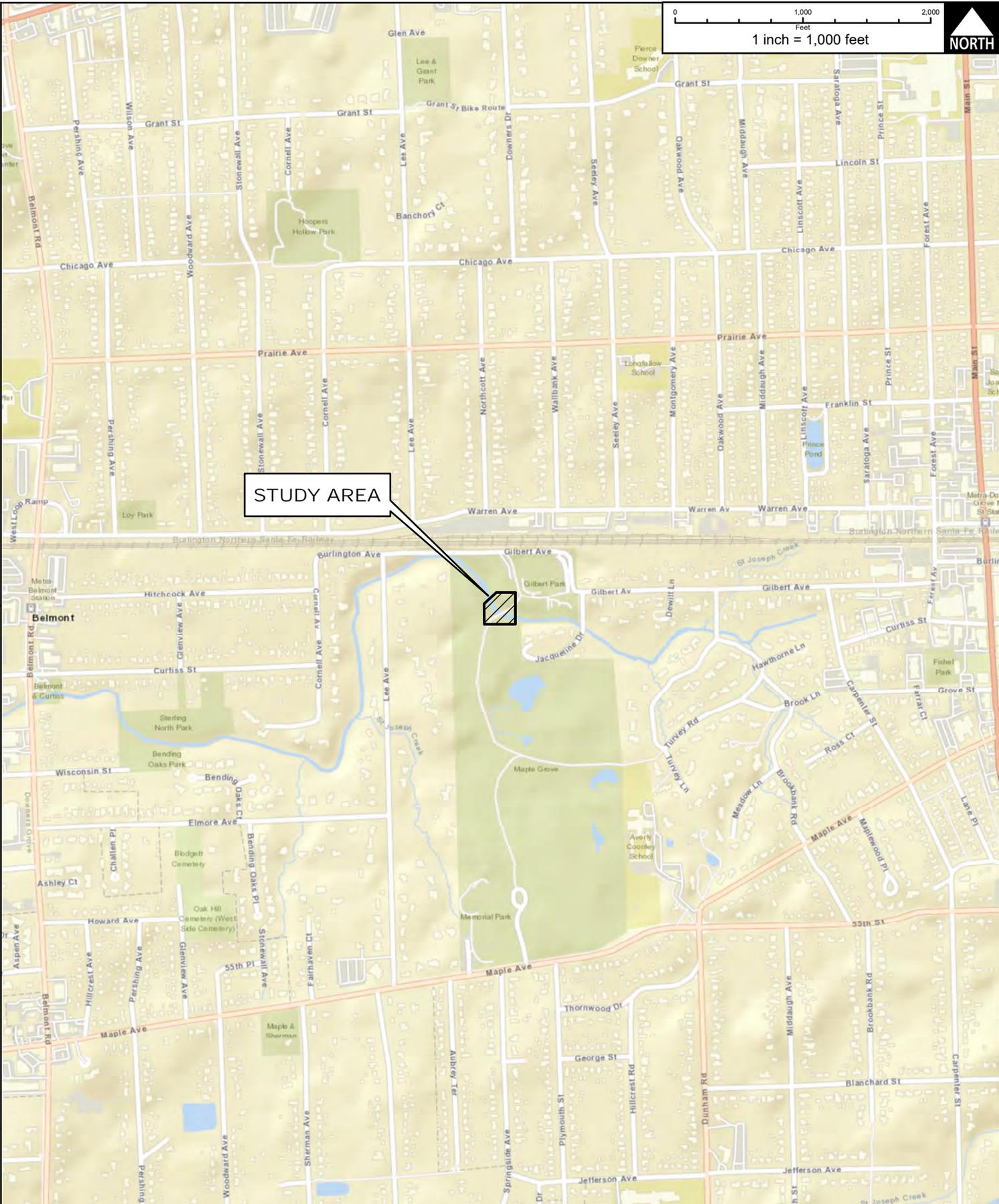
HYDROLOGIC ATLAS & UNITED STATES GEOLOGICAL SURVEY

The Hydrologic Atlas and United States Geological Survey (USGS) map for the Wheaton Quadrangle (1964 & 1993, respectively), as shown on Exhibits 5 and 6, were reviewed to determine historic local drainage patterns. The Hydrologic Atlas and USGS map indicate that St. Joseph Creek passes through the study area, surface water is conveyed to the west and is tributary to the East Branch of the DuPage River.

FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map (FIRM) for DuPage County and Incorporated Areas, Map Number 17043C0167 J, effective August 1, 2019, as shown on Exhibit 7, was reviewed to determine the location of regulatory floodplain and floodway within the study area. The presence of floodplain and floodway can be indicative of wetland hydrology. The FIRM indicates that there is 100-year regulatory floodplain and floodway mapped within the project site.

N:\DuPage County FPD\230312\Env\Docs\L1-011124.del.docx



STUDY AREA

CLIENT:
**FOREST PRESERVE DISTRICT
 OF DUPAGE COUNTY**

TITLE:
LOCATION MAP

CBBEL # 23-0312
 DATE: 1/10/2024

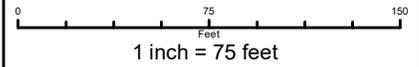
CHRISTOPHER B. BURKE Engineering, Ltd.
 9575 W. Higgins Road, Suite 600, Rosemont, Illinois 60018 (847)823-0500

DSGN.		SCALE:	1" = 1,000'
DWN.	KEK	USER:	kkopija
CHKD.	TGM	PLOT DATE:	1/10/2024
FILE NAME:	230312_LOC		

EXH 1

M:\DUPAGE COUNTY\FPD\230312\GIS\Exhibits\230312_LOC.mxd

NOTE: TAKEN FROM THE NATIONAL WETLAND INVENTORY (NWI), WHEATON QUADRANGLE (1983)



LEGEND

R2UBHx - RIVERINE, LOWER PERENNIAL, UNCONSOLIDATED BOTTOM, PERMANENTLY FLOODED, EXCAVATED



STUDY AREA

R2UBHx

N:\DUPAGE COUNTY\FPD\230312\GIS\Exhibits\230312_NWI.mxd

CLIENT:
**FOREST PRESERVE DISTRICT
 OF DUPAGE COUNTY**

TITLE:
NATIONAL WETLAND INVENTORY

CBBEL # 23-0312
 DATE: 1/10/2024

CHRISTOPHER B. BURKE Engineering, Ltd.
 9575 W. Higgins Road, Suite 600, Rosemont, Illinois 60018 (847)823-0500

DSGN.		SCALE:	1" = 75'
DWN.	KEK	USER:	kkopija
CHKD.	TGM	PLOT DATE:	1/10/2024
FILE NAME:	230312_NWI		

EXH 2

NOTE: TAKEN FROM THE DUPAGE COUNTY WETLAND INVENTORY(DCWI), DOWNERS GROVE NORTH TOWNSHIP(2001)



1 inch = 75 feet

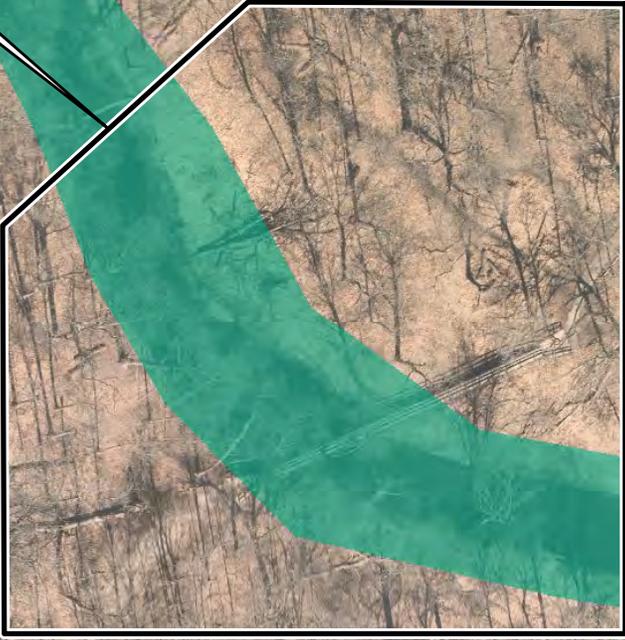


Legend

REGULATORY WETLAND



STUDY AREA



N:\DUPAGE COUNTY\FPD\230312\GIS\Exhibits\230312_DCWI.mxd

CLIENT:
**FOREST PRESERVE DISTRICT
OF DUPAGE COUNTY**

TITLE:
**DUPAGE COUNTY
WETLAND INVENTORY**

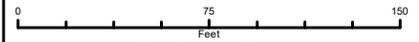
CBBEL # 23-0312
DATE: 1/10/2024

CHRISTOPHER B. BURKE Engineering, Ltd.
9575 W. Higgins Road, Suite 600, Rosemont, Illinois 60018 (847)823-0500

DSGN.		SCALE:	1" = 75'
DWN.	KEK	USER:	kkopija
CHKD.	TGM	PLOT DATE:	1/10/2024
FILE NAME:	230312_DCWI		

EXH 3

NOTE: TAKEN FROM THE SOIL SURVEY OF DUPAGE COUNTY, ILLINOIS(2019)



1 inch = 75 feet



LEGEND

- 530B - OZAUKEE SILT LOAM
- 3107A - SAWMILL SILTY CLAY LOAM, FREQUENTLY FLOODED



CLIENT:
**FOREST PRESERVE DISTRICT
 OF DUPAGE COUNTY**

TITLE:
SOIL SURVEY

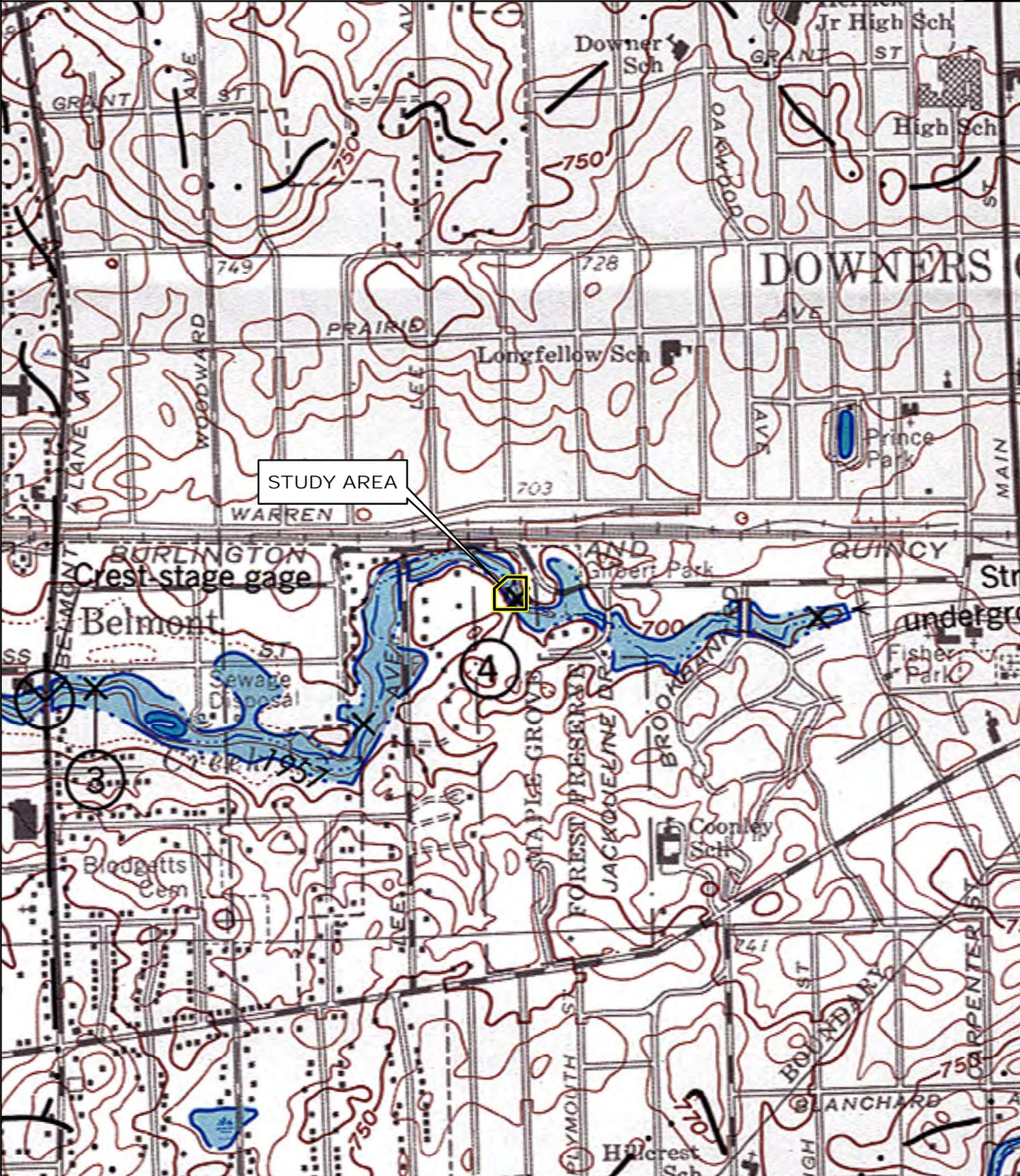
CBBEL # 23-0312
 DATE: 1/10/2024

CHRISTOPHER B. BURKE Engineering, Ltd.
 9575 W. Higgins Road, Suite 600, Rosemont, Illinois 60018 (847)823-0500

DSGN.		SCALE:	1" = 75'
DWN.	KEK	USER:	kkopija
CHKD.	TGM	PLOT DATE:	1/10/2024
FILE NAME:	230312_SOILS		

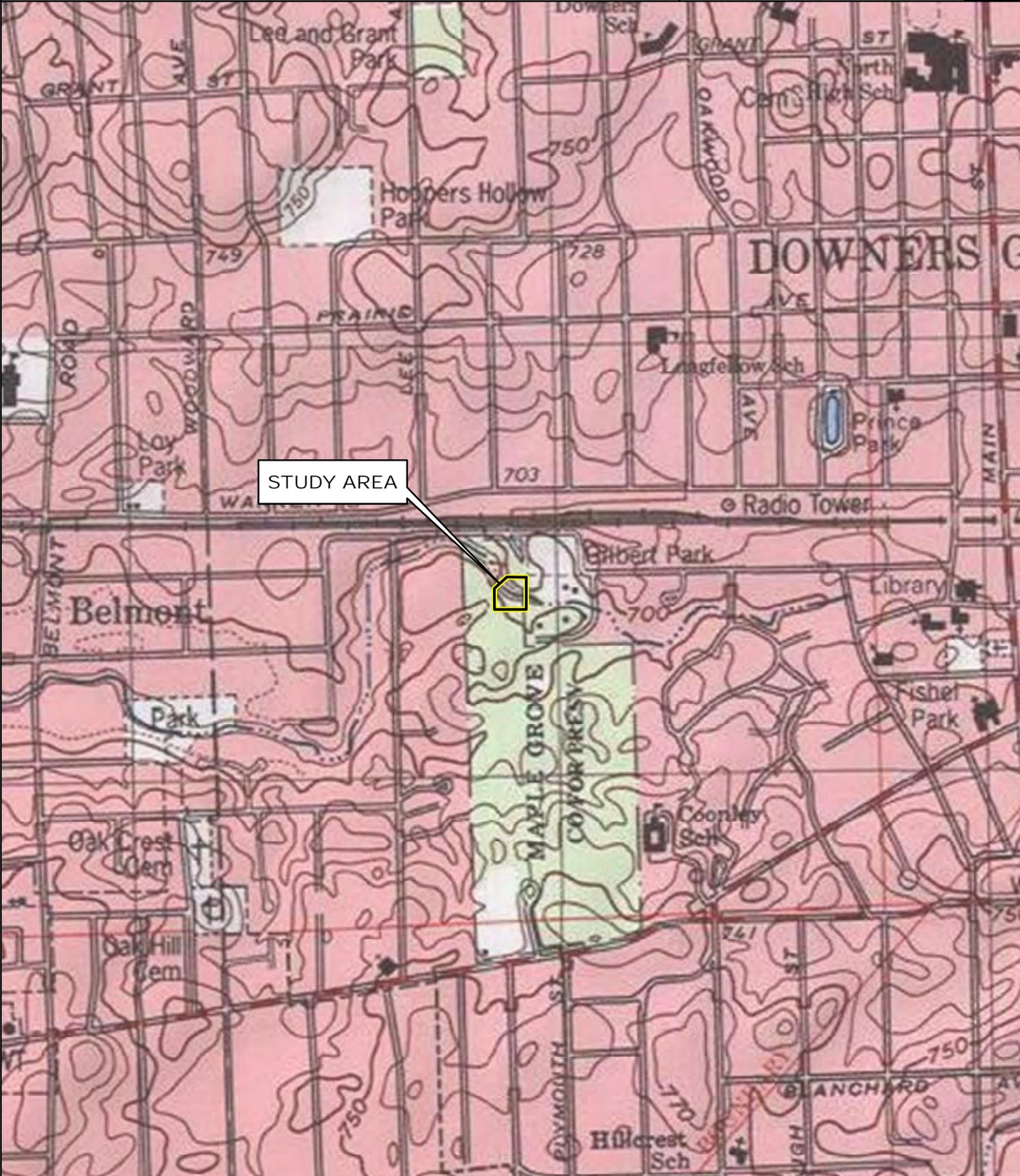
EXH 4

N:\DUPAGE COUNTY\FPD\230312\GIS\Exhibits\230312_SOILS.mxd



CLIENT:		TITLE:		CBBEL # 23-0312	
FOREST PRESERVE DISTRICT OF DUPAGE COUNTY		HYDROLOGIC ATLAS		DATE: 1/10/2024	
CHRISTOPHER B. BURKE Engineering, Ltd. 9575 W. Higgins Road, Suite 600, Rosemont, Illinois 60018 (847)823-0500		DSGN.	KEK	SCALE:	1" = 1,000'
CHKD.	TGM	USER:	kkopija	PLOT DATE:	1/10/2024
FILE NAME:	230312_HA				
					EXH 5

M:\DUPAGE COUNTY\FPD\230312\GIS\Exhibits\230312_HA.mxd



STUDY AREA

CLIENT:
**FOREST PRESERVE DISTRICT
OF DUPAGE COUNTY**

TITLE:
UNITED STATES GEOLOGICAL SURVEY

CBBEL # 23-0312
DATE: 1/10/2024

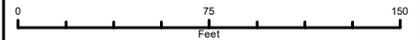
CHRISTOPHER B. BURKE Engineering, Ltd.
9575 W. Higgins Road, Suite 600, Rosemont, Illinois 60018 (847)823-0500

DSGN.		SCALE:	1" = 1,000'
DWN.	KEK	USER:	kkopija
CHKD.	TGM	PLOT DATE:	1/10/2024
FILE NAME:	230312_USGS		

EXH 6

M:\DUPAGE COUNTY\FPD\230312\GIS\Exhibits\230312_USGS.mxd

NOTE: TAKEN FROM THE FLOOD INSURANCE RATE MAP(FIRM), DUPAGE COUNTY AND INCORPORATED AREAS, ILLINOIS, MAP NUMBER 17043C0167J, EFFECTIVE DATE: AUGUST 1, 2019

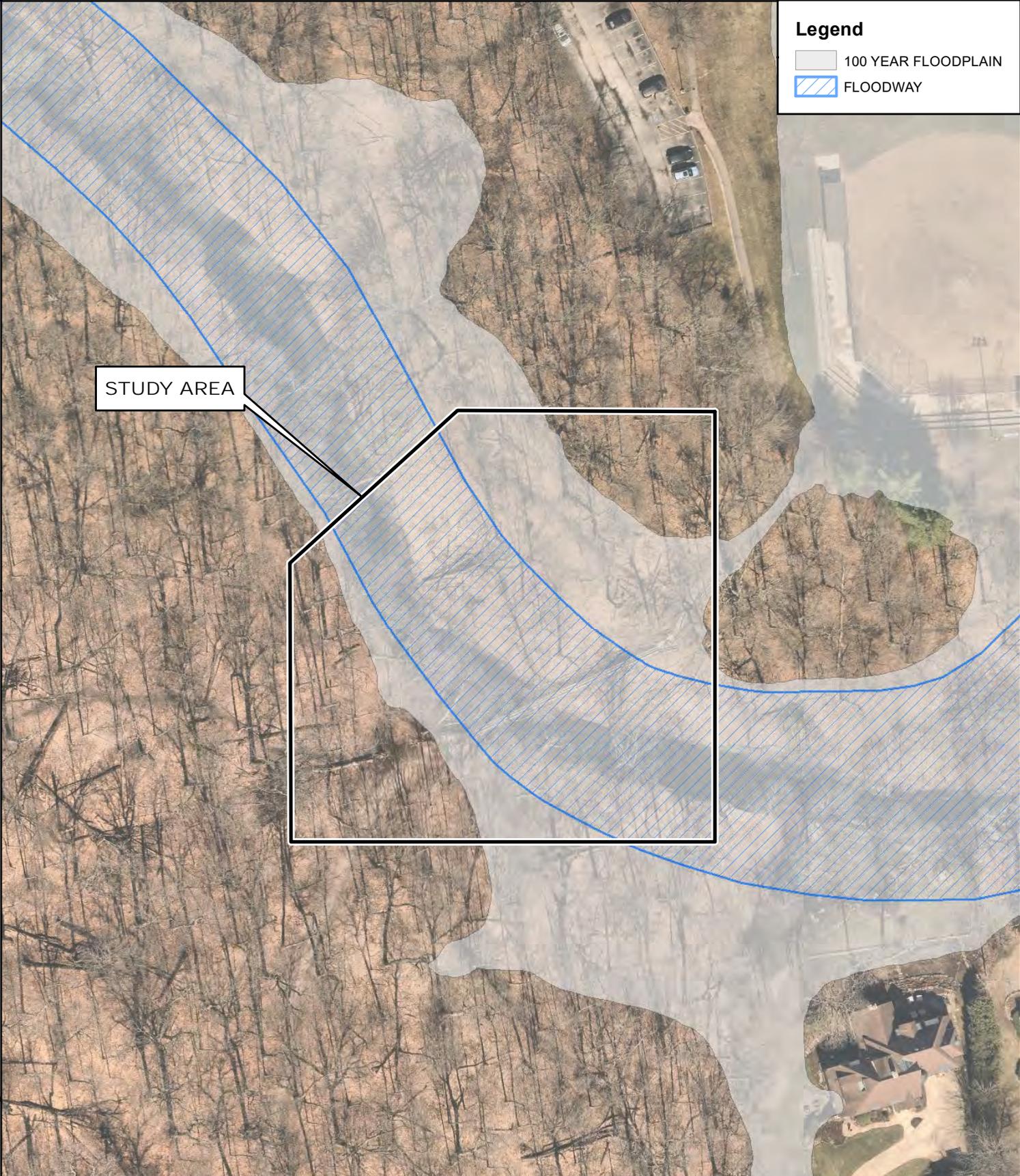


1 inch = 75 feet



Legend

-  100 YEAR FLOODPLAIN
-  FLOODWAY



STUDY AREA

N:\DUPAGE COUNTY\FPD\230312\GIS\Exhibits\230312_FIRM.mxd

CLIENT:
**FOREST PRESERVE DISTRICT
OF DUPAGE COUNTY**

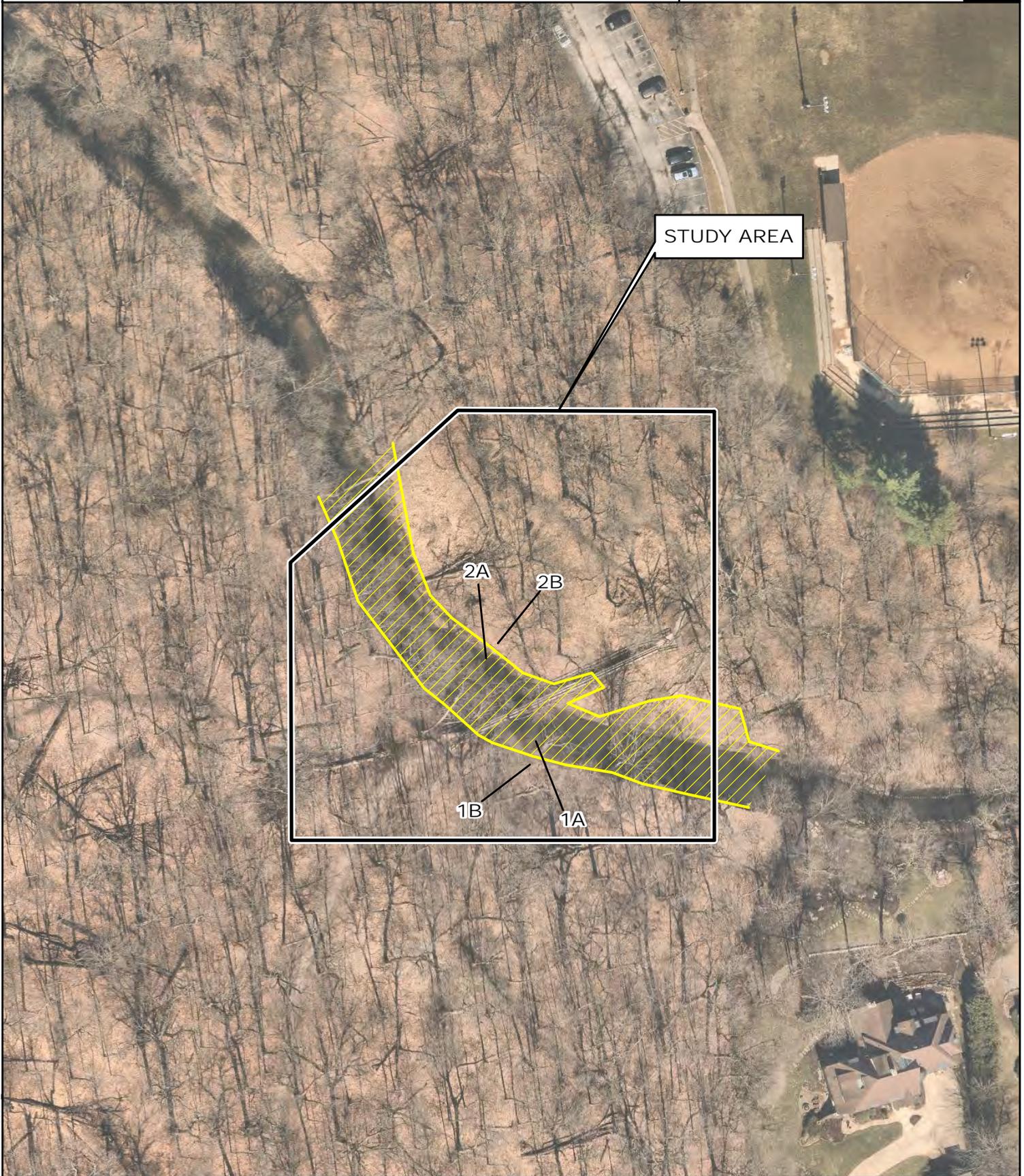
TITLE:
FLOOD INSURANCE RATE MAP

CBBEL # 23-0312
DATE: 1/10/2024

 **CHRISTOPHER B. BURKE Engineering, Ltd.**
9575 W. Higgins Road, Suite 600, Rosemont, Illinois 60018 (847)823-0500

DSGN.		SCALE:	1" = 75'
DWN.	KEK	USER:	kkopija
CHKD.	TGM	PLOT DATE:	1/10/2024
FILE NAME:	230312_FIRM		

EXH 7



CLIENT:
**FOREST PRESERVE DISTRICT
OF DUPAGE COUNTY**

TITLE:
**APPROXIMATE
WETLAND DELINEATION**

CBBEL # 23-0312
DATE: 1/10/2024

CHRISTOPHER B. BURKE Engineering, Ltd.
9575 W. Higgins Road, Suite 600, Rosemont, Illinois 60018 (847)823-0500

DSGN.		SCALE:	1" = 75'
DWN.	KEK	USER:	kkopija
CHKD.	TGM	PLOT DATE:	1/10/2024
FILE NAME:	230312_AWD		

EXH 8

N:\DUPAGE COUNTY\FPD\230312\GIS\Exhibits\230312_AWD.mxd

Maple Grove Forest Preserve Project Site
DuPage County, Illinois

Site Photographs from
Site Reconnaissance on January 5, 2024



St. Joseph Creek – Looking Southeast



St. Joseph Creek – Looking West



St. Joseph Creek – Looking East

APPENDIX A

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Maple Grove Forest Preserve City/County: DuPage Sampling Date: 1/5/24
 Applicant/Owner: Forest Preserve District of DuPage County State: IL Sampling Point: 1A
 Investigator(s): Thomas McArdle Section, Township, Range: Sec. 7, T38N, R11E
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave
 Slope (%): 10% Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name Sawmill silty clay loam NWI Classification: R2UBHx

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? present? Yes

SUMMARY OF FINDINGS (If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: _____
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>Y</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet
1 <u>Acer negundo</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	
2 _____	_____	_____	_____	Total Number of Dominant Species Across all Strata: <u>5</u> (B)
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
4 _____	_____	_____	_____	
5 _____	_____	_____	_____	
<u>5</u> = Total Cover				
Sapling/Shrub stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet
1 <u>Sambucus canadensis</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	
2 _____	_____	_____	_____	OBL species <u>0</u> x 1 = <u>0</u>
3 _____	_____	_____	_____	FACW species <u>45</u> x 2 = <u>90</u>
4 _____	_____	_____	_____	FAC species <u>0</u> x 3 = <u>0</u>
5 _____	_____	_____	_____	FACU species <u>0</u> x 4 = <u>0</u>
_____	_____	_____	_____	UPL species <u>0</u> x 5 = <u>0</u>
_____	_____	_____	_____	Column totals <u>45</u> (A) <u>90</u> (B)
<u>5</u> = Total Cover				Prevalence Index = B/A = <u>2.00</u>
Herb stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators:
1 <u>Bidens frondosus</u>	<u>15</u>	<u>Y</u>	<u>FACW</u>	
2 <u>Geum laciniatum</u>	<u>15</u>	<u>Y</u>	<u>FACW</u>	<input checked="" type="checkbox"/> Dominance test is >50%
3 <u>Polygonum lapathifolium</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	<input checked="" type="checkbox"/> Prevalence index is ≤3.0*
4 _____	_____	_____	_____	Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
5 _____	_____	_____	_____	Problematic hydrophytic vegetation* (explain)
6 _____	_____	_____	_____	
7 _____	_____	_____	_____	
8 _____	_____	_____	_____	
9 _____	_____	_____	_____	
10 _____	_____	_____	_____	
<u>35</u> = Total Cover				
Woody vine stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic vegetation present? <u>Y</u>
1 <u>Vitis riparia</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	
2 _____	_____	_____	_____	
<u>5</u> = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: 1A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-11	10 YR 2/1	100					Silty clay loam	Sediments
12-21	10 YR 4/1	80	10 YR 5/4	20	D	M	Silty clay loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils:
<input type="checkbox"/> Histisol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Dark Surface (S7) (LRR K, L)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Other (explain in remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	

Restrictive Layer (if observed): Type: <u>None</u> Depth (inches): _____	Hydric soil present? <u>Y</u>
---	--------------------------------------

Remarks:

Sediments

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> True Aquatic Plants (B14)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Crayfish Burrows (C8)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	

Field Observations:		Wetland hydrology present? <u>Y</u>
Surface water present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2"</u>		
Water table present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____		
Saturation present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0"</u>		
(includes capillary fringe)		

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

None available

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Maple Grove Forest Preserve City/County: DuPage Sampling Date: 1/5/24
 Applicant/Owner: Forest Preserve District of DuPage County State: IL Sampling Point: 1B
 Investigator(s): Thomas McArdle Section, Township, Range: Sec. 7, T38N, R11E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Flat
 Slope (%): 0% Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name Ozaukee silt loam NWI Classification: NA

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? present? Yes

SUMMARY OF FINDINGS (If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>N</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: _____
Hydric soil present? <u>N</u>	
Wetland hydrology present? <u>N</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet
1 <u>Acer saccharum</u>	30	Y	FACU	
2 <u>Tilia americana</u>	20	Y	FACU	Total Number of Dominant Species Across all Strata: <u>5</u> (B)
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>40.00%</u> (A/B)
4 _____	_____	_____	_____	
5 _____	_____	_____	_____	
	50 = Total Cover			
Sapling/Shrub stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet
1 <u>Sambucus canadensis</u>	15	Y	FACW	
2 _____	_____	_____	_____	OBL species <u>0</u> x 1 = <u>0</u>
3 _____	_____	_____	_____	FACW species <u>20</u> x 2 = <u>40</u>
4 _____	_____	_____	_____	FAC species <u>10</u> x 3 = <u>30</u>
5 _____	_____	_____	_____	FACU species <u>60</u> x 4 = <u>240</u>
	15 = Total Cover			UPL species <u>5</u> x 5 = <u>25</u>
Herb stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species	Indicator Status	Column totals <u>95</u> (A) <u>335</u> (B)
1 <u>Phytolacca americana</u>	10	Y	FAC	Prevalence Index = B/A = <u>3.53</u>
2 <u>Cirsium arvense</u>	10	Y	FACU	
3 <u>Convolvulus arvensis</u>	5	N	UPL	
4 <u>Verbesina alternifolia</u>	5	N	FACW	
5 _____	_____	_____	_____	
6 _____	_____	_____	_____	
7 _____	_____	_____	_____	
8 _____	_____	_____	_____	
9 _____	_____	_____	_____	
10 _____	_____	_____	_____	
	30 = Total Cover			
Woody vine stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species	Indicator Status	
1 _____	_____	_____	_____	
2 _____	_____	_____	_____	
	0 = Total Cover			

Hydrophytic Vegetation Indicators:
 _____ Rapid test for hydrophytic vegetation
 _____ Dominance test is >50%
 _____ Prevalence index is ≤3.0*
 _____ Morphological 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? N

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: 1B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-6	10 YR 3/2	100					Silt loam	
7-21	10 YR 4/3	100					Silt loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils:
<input type="checkbox"/> Histisol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Dark Surface (S7) (LRR K, L)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Other (explain in remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed): Type: <u>None</u> Depth (inches): _____	Hydric soil present? <u>N</u>
---	--------------------------------------

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> True Aquatic Plants (B14)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Gauge or Well Data (D9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Surface Soil Cracks (B6)	
	<input type="checkbox"/> Drainage Patterns (B10)
	<input type="checkbox"/> Dry-Season Water Table (C2)
	<input type="checkbox"/> Crayfish Burrows (C8)
	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
	<input type="checkbox"/> Stunted or Stressed Plants (D1)
	<input type="checkbox"/> Geomorphic Position (D2)
	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface water present? Yes _____ No <u>X</u> Depth (inches): _____ Water table present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland hydrology present? <u>N</u>
--	--

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
None available

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Maple Grove Forest Preserve City/County: DuPage Sampling Date: 1/5/24
 Applicant/Owner: Forest Preserve District of DuPage County State: IL Sampling Point: 2A
 Investigator(s): Thomas McArdle Section, Township, Range: Sec. 7, T38N, R11E
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave
 Slope (%): 10% Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name Sawmill silty clay loam NWI Classification: R2UBHx

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? present? Yes

SUMMARY OF FINDINGS (If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: _____
Hydric soil present? <u>Y</u>	
Wetland hydrology present? <u>Y</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet
1 <u>Acer saccharinum</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	
2 <u>Acer negundo</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	Total Number of Dominant Species Across all Strata: <u>4</u> (B)
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
4 _____	_____	_____	_____	
5 _____	_____	_____	_____	
<u>10</u> = Total Cover				
Sapling/Shrub stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet
1 _____	_____	_____	_____	
2 _____	_____	_____	_____	OBL species <u>10</u> x 1 = <u>10</u>
3 _____	_____	_____	_____	FACW species <u>40</u> x 2 = <u>80</u>
4 _____	_____	_____	_____	FAC species <u>0</u> x 3 = <u>0</u>
5 _____	_____	_____	_____	FACU species <u>0</u> x 4 = <u>0</u>
<u>0</u> = Total Cover				UPL species <u>0</u> x 5 = <u>0</u>
				Column totals <u>50</u> (A) <u>90</u> (B)
				Prevalence Index = B/A = <u>1.80</u>
Herb stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species	Indicator Status	Hydrophytic Vegetation Indicators: _____ Rapid test for hydrophytic vegetation <input checked="" type="checkbox"/> Dominance test is >50% <input checked="" type="checkbox"/> Prevalence index is ≤3.0* Morphological 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
1 <u>Bidens frondosus</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
2 <u>Glyceria striata</u>	<u>10</u>	<u>Y</u>	<u>OBL</u>	
3 <u>Polygonum lapathifolium</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	
4 <u>Geum laciniatum</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	
5 _____	_____	_____	_____	
6 _____	_____	_____	_____	
7 _____	_____	_____	_____	
8 _____	_____	_____	_____	
9 _____	_____	_____	_____	
10 _____	_____	_____	_____	
<u>40</u> = Total Cover				
Woody vine stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species	Indicator Status	
1 _____	_____	_____	_____	
2 _____	_____	_____	_____	
<u>0</u> = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: 2A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-8	10 YR 2/1	100					Silty clay loam	Sediments
9-21	10 YR 4/1	80	10 YR 5/4	20	D	M	Silty clay loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils:
<input type="checkbox"/> Histisol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Dark Surface (S7) (LRR K, L)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Other (explain in remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	

Restrictive Layer (if observed): Type: <u>None</u> Depth (inches): _____	Hydric soil present? <u>Y</u>
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Remarks:

Sediments

HYDROLOGY

Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> True Aquatic Plants (B14)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)
<input checked="" type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Gauge or Well Data (D9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	

Field Observations: Surface water present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2"</u> Water table present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0"</u> (includes capillary fringe)	Wetland hydrology present? <u>Y</u>
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Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

None available

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Maple Grove Forest Preserve City/County: DuPage Sampling Date: 1/5/24
 Applicant/Owner: Forest Preserve District of DuPage County State: IL Sampling Point: 2B
 Investigator(s): Thomas McArdle Section, Township, Range: Sec. 7, T38N, R11E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Flat
 Slope (%): 0% Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name Sawmill silty clay loam NWI Classification: NA

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? present? Yes

SUMMARY OF FINDINGS (If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>N</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: _____
Hydric soil present? <u>N</u>	
Wetland hydrology present? <u>N</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet
1 <u>Acer saccharum</u>	50	Y	FACU	
2 <u>Celtis occidentalis</u>	10	N	FAC	Total Number of Dominant Species Across all Strata: <u>4</u> (B)
3 _____	_____	_____	_____	Percent of Dominant Species that are OBL, FACW, or FAC: <u>25.00%</u> (A/B)
4 _____	_____	_____	_____	
5 _____	_____	_____	_____	
	60 = Total Cover			
Sapling/Shrub stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species	Indicator Status	Prevalence Index Worksheet
1 <u>Lonicera tatarica</u>	20	Y	FACU	
2 _____	_____	_____	_____	OBL species <u>0</u> x 1 = <u>0</u>
3 _____	_____	_____	_____	FACW species <u>30</u> x 2 = <u>60</u>
4 _____	_____	_____	_____	FAC species <u>10</u> x 3 = <u>30</u>
5 _____	_____	_____	_____	FACU species <u>80</u> x 4 = <u>320</u>
	20 = Total Cover			UPL species <u>15</u> x 5 = <u>75</u>
Herb stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species	Indicator Status	Column totals <u>135</u> (A) <u>485</u> (B)
1 <u>Verbesina alternifolia</u>	25	Y	FACW	Prevalence Index = B/A = <u>3.59</u>
2 <u>Convolvulus arvensis</u>	15	Y	UPL	
3 <u>Cirsium arvense</u>	10	N	FACU	
4 <u>Bidens frondosus</u>	5	N	FACW	
5 _____	_____	_____	_____	
6 _____	_____	_____	_____	
7 _____	_____	_____	_____	
8 _____	_____	_____	_____	
9 _____	_____	_____	_____	
10 _____	_____	_____	_____	
	55 = Total Cover			
Woody vine stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species	Indicator Status	
1 _____	_____	_____	_____	
2 _____	_____	_____	_____	
	0 = Total Cover			

Hydrophytic Vegetation Indicators:
 _____ Rapid test for hydrophytic vegetation
 _____ Dominance test is >50%
 _____ Prevalence index is ≤3.0*
 _____ Morphological 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? N

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: 2B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-7	10 YR 3/2	100					Silt loam	
8-21	10 YR 4/3	100					Silt loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators: <input type="checkbox"/> Histisol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)		Indicators for Problematic Hydric Soils: <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) <input type="checkbox"/> Dark Surface (S7) (LRR K, L) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (explain in remarks)	
*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic					

Restrictive Layer (if observed): Type: <u>None</u> Depth (inches): _____	Hydric soil present? <u>N</u>
---	--------------------------------------

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks)		<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5)	
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Field Observations: Surface water present? Yes _____ No <u>X</u> Depth (inches): _____ Water table present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland hydrology present? <u>N</u>
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Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
 None available

Remarks:

APPENDIX B

OBSERVER: Thomas McArdle
DATE: January 5, 2024
LOCATION: St. Joseph Creek - Wetland/Waters of the U.S. #1
 Maple Grove Forest Preserve

WILDLIFE HABITAT/USE EVALUATION SCORE SHEET

To assess the existing and/or potential wildlife habitat use of the subject wetland, the applicant must first complete this scoresheet. The attached documentation provides examples of each scoring parameter.

A separate sheet must be completed for each wetland considered.

Applicants must document their basis for scoring decisions with field surveys followed by current photographs, aerial photographs, and other appropriate information.

A. Utilization By Wildlife

<u>Wildlife Use</u>	<u>Score</u>
Significant	3
Evident	2
Low	1
Occasional	0.5
<u>Non-Existent</u>	<u>0</u>

SUB-TOTAL SCORE = 1.0

B. Interspersion of Vegetative Cover

<u>Interspersion</u>	<u>Score</u>
High	3
Medium	2
<u>Low</u>	<u>1</u>

SUB-TOTAL SCORE = 1.0

C. Vegetative Cover to Open Water

<u>Cover</u>	<u>Score</u>
>95% Cover	0.5
76% - 95% Cover, Peripheral	1.5
76% - 95% Cover, Various	2.5
26% - 75% Cover, Peripheral	2.0
26% - 75% Cover, Patches	3.0
5% - 25% Cover, Peripheral	1.0
<u><5% Cover</u>	<u>0.5</u>

SUB-TOTAL SCORE = 0.5

TOTAL SCORE (A+B+C)= 2.5

Total score > 5.00 wetland receives critical status
 Total score < 5.00 wetland receives regulatory status

APPENDIX C

Applicant: Burke Engineering
Contact: Thomas McArdle
Address: 9575 W. Higgins
Rosemont, IL 60018

IDNR Project Number: 2408818
Date: 01/10/2024

Project: Trail Bridge and Sanitary Sewer Replacement
Address: Maple Grove Forest Preserve, Downers Grove

Description: A degraded sanitary sewer is located on the underside of a degraded, concrete trail bridge. The degraded sanitary sewer and trail bridge will be replaced.

Natural Resource Review Results

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Maple Grove Forest Preserve INAI Site
Northern Long-Eared Myotis (*Myotis septentrionalis*)
Tuckerman's Sedge (*Carex tuckermani*)

An IDNR staff member will evaluate this information and contact you to request additional information or to terminate consultation if adverse effects are unlikely.

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: DuPage

Township, Range, Section:
38N, 11E, 7



IL Department of Natural Resources
Contact
Bradley Hayes
217-785-5500
Division of Ecosystems & Environment

Government Jurisdiction
U.S. Army Corps of Engineers

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

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1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

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MAPLE GROVE BRIDGE AND SANITARY SEWER REPLACEMENT PROJECT -
TREE SURVEY

TREE #	TREE SPECIES - COMMON NAME	TREE SPECIES - BOTANICAL NAME	SIZE - DIAMETER AT BREAST HEIGHT (DBH) AS INCHES	CONDITION	FORM	LATITUDE	LONGITUDE	NORTHING	EASTING
1309	Sugar maple	<i>Acer saccharum</i>	12	2	2	41.79369696	-88.02477467	1867564.712	1068390.581
1310	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79374219	-88.02474688	1867581.219	1068398.1
1311	Sugar maple	<i>Acer saccharum</i>	5	2	2	41.79380002	-88.02482549	1867602.216	1068376.586
1312	Sugar maple	<i>Acer saccharum</i>	19	2	2	41.7938093	-88.02474071	1867605.681	1068399.693
1313	Sugar maple	<i>Acer saccharum</i>	10	2	2	41.79381961	-88.02470818	1867609.469	1068408.552
1314	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79385613	-88.02474183	1867622.741	1068399.327
1315	Sugar maple	<i>Acer saccharum</i>	18	2	2	41.79389057	-88.02475433	1867635.28	1068395.874
1316	Sugar maple	<i>Acer saccharum</i>	5	2	2	41.79390315	-88.02468733	1867639.929	1068414.127
1317	Sugar maple	<i>Acer saccharum</i>	12	2	2	41.79395144	-88.02467408	1867657.54	1068417.678
1318	Sugar maple	<i>Acer saccharum</i>	4	3	3	41.79389297	-88.02462366	1867636.281	1068431.503
1319	Sugar maple	<i>Acer saccharum</i>	5	2	2	41.79391813	-88.02454538	1867645.526	1068452.815
1320	Sugar maple	<i>Acer saccharum</i>	20	4	4	41.79393728	-88.02453466	1867652.516	1068455.713
1321	Sugar maple	<i>Acer saccharum</i>	24	4	4	41.79394799	-88.02449392	1867656.46	1068466.809
1322	Sugar maple	<i>Acer saccharum</i>	6	2	2	41.79395041	-88.02445693	1867657.375	1068476.892
1323	Sugar maple	<i>Acer saccharum</i>	5	2	2	41.79396873	-88.02448115	1867664.028	1068470.264
1324	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79397767	-88.02450543	1867667.263	1068463.632
1325	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79397693	-88.02457699	1867666.923	1068444.119
1326	Sugar maple	<i>Acer saccharum</i>	10	2	2	41.79398675	-88.02460907	1867670.468	1068435.357
1327	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79400306	-88.02456612	1867676.456	1068447.049
1328	Sugar maple	<i>Acer saccharum</i>	7	2	2	41.79400757	-88.02457841	1867678.086	1068443.692
1329	Sugar maple	<i>Acer saccharum</i>	7	3	4	41.7940205	-88.02455517	1867682.82	1068450.011
1330	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79405248	-88.0246099	1867694.418	1068435.046
1331	Sugar maple	<i>Acer saccharum</i>	33	2	3	41.79404738	-88.02465044	1867692.522	1068423.997
1332	Sugar maple	<i>Acer saccharum</i>	12	2	2	41.79403236	-88.02472292	1867686.979	1068404.254
1333	Sugar maple	<i>Acer saccharum</i>	13	2	2	41.7939998	-88.02474699	1867675.089	1068397.732
1334	Sugar maple	<i>Acer saccharum</i>	20	2	2	41.79397128	-88.02475463	1867664.688	1068395.686
1335	Sugar maple	<i>Acer saccharum</i>	5	2	2	41.79396132	-88.02478458	1867661.03	1068387.532
1336	Sugar maple	<i>Acer saccharum</i>	17	2	2	41.79395037	-88.02482928	1867656.998	1068375.357
1337	Sugar maple	<i>Acer saccharum</i>	14	2	2	41.7937485	-88.02463179	1867583.631	1068429.476
1338	Sugar maple	<i>Acer saccharum</i>	14	2	2	41.79368034	-88.02468319	1867558.744	1068415.548
1339	Sugar maple	<i>Acer saccharum</i>	14	2	2	41.79365404	-88.02465582	1867549.185	1068423.046
1340	Sugar maple	<i>Acer saccharum</i>	18	2	2	41.79366854	-88.02460893	1867554.518	1068435.811
1341	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79365674	-88.02452412	1867550.301	1068458.955
1342	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79368637	-88.02448353	1867561.138	1068469.985
1343	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79372201	-88.02445237	1867574.155	1068478.434
1344	Sugar maple	<i>Acer saccharum</i>	5	2	2	41.79375767	-88.02446109	1867587.139	1068476.01
1345	Sugar maple	<i>Acer saccharum</i>	6	2	2	41.79374233	-88.0244031	1867581.605	1068491.844
1346	Sugar maple	<i>Acer saccharum</i>	34	2	3	41.79378657	-88.02441902	1867597.713	1068487.445
1347	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79379718	-88.02438691	1867601.61	1068496.187
1348	Sugar maple	<i>Acer saccharum</i>	7	2	2	41.79380064	-88.02436514	1867602.891	1068502.118
1349	Sugar maple	<i>Acer saccharum</i>	34	2	2	41.79382454	-88.02440175	1867611.564	1068492.104
1350	Basswood	<i>Tilia americana</i>	14	2	2	41.79388538	-88.02439425	1867633.742	1068494.069
1351	Box elder	<i>Acer negundo</i>	6	4	4	41.79390594	-88.02428162	1867641.344	1068524.755
1352	White mulberry	<i>Morus alba</i>	6	2	3	41.79386153	-88.02418885	1867625.252	1068550.112
1353	Sugar maple	<i>Acer saccharum</i>	10	2	2	41.79388271	-88.0244537	1867632.711	1068477.863
1354	Sugar maple	<i>Acer saccharum</i>	18	2	2	41.793844	-88.02448518	1867618.576	1068469.327
1355	Sugar maple	<i>Acer saccharum</i>	5	2	2	41.79384884	-88.0245382	1867620.287	1068454.864
1356	Sugar maple	<i>Acer saccharum</i>	7	2	2	41.79382754	-88.02453102	1867612.532	1068456.85
1357	Sugar maple	<i>Acer saccharum</i>	8	2	2	41.79381184	-88.02454172	1867606.801	1068453.953
1358	Sugar maple	<i>Acer saccharum</i>	7	2	2	41.79377886	-88.02450943	1867594.813	1068462.802
1359	Sugar maple	<i>Acer saccharum</i>	6	2	2	41.7938202	-88.02445776	1867609.927	1068476.836
1360	Sugar maple	<i>Acer saccharum</i>	6	2	2	41.79381098	-88.02443209	1867606.592	1068483.849
1361	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79375847	-88.02453883	1867587.354	1068454.81
1362	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79379377	-88.02459422	1867600.165	1068439.661
1363	Sugar maple	<i>Acer saccharum</i>	11	2	2	41.79381786	-88.024592	1867608.943	1068440.234
1364	Sugar maple	<i>Acer saccharum</i>	5	2	2	41.79376013	-88.0246025	1867587.899	1068437.446
1365	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79371484	-88.02459812	1867571.398	1068438.7
1366	Sugar maple	<i>Acer saccharum</i>	7	2	2	41.79370485	-88.02460471	1867567.752	1068436.916
1367	Sugar maple	<i>Acer saccharum</i>	14	2	2	41.79370436	-88.02456888	1867567.609	1068446.688
1368	Sugar maple	<i>Acer saccharum</i>	10	2	3	41.79371063	-88.02452981	1867569.932	1068457.333
1369	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79384726	-88.02451237	1867619.735	1068461.911
1370	Sugar maple	<i>Acer saccharum</i>	12	2	2	41.79374666	-88.02456361	1867583.028	1068448.069
1371	White mulberry	<i>Morus alba</i>	14,6	3	3	41.79395974	-88.02414987	1867661.078	1068560.611
1372	Box elder	<i>Acer negundo</i>	13,5	3	3	41.7939625	-88.02411273	1867662.121	1068570.737
1373	Sugar maple	<i>Acer saccharum</i>	13	2	2	41.79408995	-88.02388377	1867708.786	1068633.004
1374	Sugar maple	<i>Acer saccharum</i>	8	2	2	41.79412963	-88.02391232	1867723.218	1068625.166
1375	Sugar maple	<i>Acer saccharum</i>	7	2	2	41.79409836	-88.0239515	1867711.783	1068614.522
1376	American elm	<i>Ulmus americana</i>	9	2	2	41.79409363	-88.02395442	1867710.057	1068613.732
1377	Sugar maple	<i>Acer saccharum</i>	13	2	2	41.79410337	-88.02381781	1867713.741	1068650.971
1378	Sugar maple	<i>Acer saccharum</i>	14	2	2	41.79411453	-88.02376242	1867717.861	1068666.061
1379	Sugar maple	<i>Acer saccharum</i>	10	2	2	41.79414513	-88.02386602	1867728.918	1068639.357
1380	Sugar maple	<i>Acer saccharum</i>	7	2	2	41.7941954	-88.02378804	1867747.304	1068658.969
1381	Sugar maple	<i>Acer saccharum</i>	18	2	2	41.7942243	-88.02376134	1867757.864	1068666.213
1382	Sugar maple	<i>Acer saccharum</i>	23	2	2	41.79429731	-88.0237699	1867784.456	1068663.784
1383	Sugar maple	<i>Acer saccharum</i>	7	2	2	41.79421238	-88.02383293	1867753.447	1068646.707
1384	Sugar maple	<i>Acer saccharum</i>	9	2	2	41.79418916	-88.02382966	1867744.99	1068647.628
1385	American elm	<i>Ulmus americana</i>	22	2	2	41.79416762	-88.02371561	1867737.253	1068678.758
1386	Sugar maple	<i>Acer saccharum</i>	12	2	2	41.79419282	-88.02374098	1867746.411	1068671.807
1387	Sugar maple	<i>Acer saccharum</i>	29	2	3	41.79423329	-88.02365201	1867761.246	1068696.014
1388	White pine	<i>Pinus strobus</i>	14	2	2	41.79432251	-88.02369007	1867793.72	1068685.517
1389	Blue beech	<i>Carpinus caroliniana</i>	7,5	2	3	41.79439527	-88.02378027	1867820.144	1068660.827
1390	American elm	<i>Ulmus americana</i>	9	2	2	41.79436135	-88.0238429	1867807.721	1068643.791

MAPLE GROVE BRIDGE AND SANITARY SEWER REPLACEMENT PROJECT -
TREE SURVEY

TREE #	TREE SPECIES - COMMON NAME	TREE SPECIES - BOTANICAL NAME	SIZE - DIAMETER AT BREAST HEIGHT (DBH) AS INCHES	CONDITION	FORM	LATITUDE	LONGITUDE	NORTHING	EASTING
1391	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79436639	-88.02387864	1867809.523	1068634.04
1392	Black cherry	<i>Prunus serotina</i>	4	3	3	41.79432086	-88.02384936	1867792.961	1068642.085
1393	Sugar maple	<i>Acer saccharum</i>	5	2	2	41.79433503	-88.02381944	1867798.156	1068650.223
1394	Sugar maple	<i>Acer saccharum</i>	27	2	2	41.79430131	-88.02388131	1867785.805	1068633.398
1395	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79427909	-88.02388127	1867777.708	1068633.437
1396	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79426686	-88.02391628	1867773.22	1068623.906
1397	Sugar maple	<i>Acer saccharum</i>	10	3	4	41.79425337	-88.02390603	1867768.314	1068626.718
1398	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79424562	-88.02389396	1867765.501	1068630.021
1399	Sugar maple	<i>Acer saccharum</i>	5	2	2	41.79423425	-88.02392382	1867761.327	1068621.892
1400	Sugar maple	<i>Acer saccharum</i>	8	2	2	41.79416168	-88.02402571	1867734.786	1068594.204
1401	Box elder	<i>Acer negundo</i>	12	3	4	41.79417135	-88.02415148	1867738.185	1068559.895
1402	Sugar maple	<i>Acer saccharum</i>	18	2	2	41.79415043	-88.02432469	1867730.39	1068512.692
1403	Sugar maple	<i>Acer saccharum</i>	11	2	2	41.79412763	-88.02435038	1867722.057	1068505.715
1404	Sugar maple	<i>Acer saccharum</i>	6	2	2	41.7940936	-88.02441425	1867709.595	1068488.343
1405	Sugar maple	<i>Acer saccharum</i>	10	2	2	41.79409769	-88.02429599	1867711.201	1068520.586
1406	Sugar maple	<i>Acer saccharum</i>	6	2	3	41.79402207	-88.02434346	1867683.6	1068507.74
1407	Silver maple	<i>Acer saccharinum</i>	28	2	3	41.79404707	-88.02429679	1867692.756	1068520.434
1408	Box elder	<i>Acer negundo</i>	4	2	2	41.7940503	-88.02430476	1867693.925	1068518.256
1409	Sugar maple	<i>Acer saccharum</i>	24	2	2	41.79403598	-88.02425194	1867688.759	1068532.68
1410	Hackberry	<i>Celtis occidentalis</i>	4	2	2	41.79404952	-88.02415685	1867693.785	1068558.59
1411	Sugar maple	<i>Acer saccharum</i>	19	2	2	41.79409531	-88.02406183	1867710.563	1068584.443
1412	Sugar maple	<i>Acer saccharum</i>	13	2	2	41.79408755	-88.02404068	1867707.759	1068590.219
1413	Sugar maple	<i>Acer saccharum</i>	4	2	2	41.79384135	-88.02453311	1867617.56	1068456.262
1414	Sugar maple	<i>Acer saccharum</i>	17	2	2	41.79406726	-88.02372966	1867700.67	1068675.058
1415	Sugar maple	<i>Acer saccharum</i>	26	2	3	41.79398574	-88.02382052	1867670.876	1068650.388
1416	Box elder	<i>Acer negundo</i>	5	3	3	41.79397313	-88.02388271	1867666.22	1068633.445
1417	Catalpa	<i>Catalpa speciosa</i>	4	2	2	41.79400215	-88.02389419	1867676.782	1068630.276

TREES LESS THAN 4" DBH

CBBEL ID	TREE SPECIES - COMMON NAME	TREE SPECIES - BOTANICAL NAME	SIZE - DIAMETER AT BREAST HEIGHT (DBH) AS INCHES	CONDITION	FORM	LATITUDE	LONGITUDE	NORTHING	EASTING
A	Sugar maple	<i>Acer saccharum</i>	2	2	2	41.79395789	-88.02454686	1867660.013	1068452.361
B	Sugar maple	<i>Acer saccharum</i>	3	2	2	41.7939828	-88.02455788	1867669.079	1068449.322
C	Sugar maple	<i>Acer saccharum</i>	3	2	2	41.79399268	-88.02459144	1867672.648	1068440.159
D	Sugar maple	<i>Acer saccharum</i>	2	2	2	41.79400557	-88.02462219	1867677.315	1068431.756
E	Sugar maple	<i>Acer saccharum</i>	2	2	2	41.79395939	-88.02459337	1867660.514	1068439.676
F	Sugar maple	<i>Acer saccharum</i>	2	2	2	41.79397735	-88.02452428	1867667.129	1068458.491
G	Sugar maple	<i>Acer saccharum</i>	2	2	2	41.79395249	-88.02449189	1867658.1	1068467.357
H	Sugar maple	<i>Acer saccharum</i>	3	2	2	41.79382228	-88.02472159	1867610.426	1068404.89
I	Sugar maple	<i>Acer saccharum</i>	2	2	2	41.79377989	-88.02450639	1867595.193	1068463.629
J	Sugar maple	<i>Acer saccharum</i>	3	2	2	41.79385988	-88.02445372	1867624.392	1068477.886
K	Sugar maple	<i>Acer saccharum</i>	2	2	2	41.79386363	-88.02445376	1867625.758	1068477.87
L	Sugar maple	<i>Acer saccharum</i>	3	2	2	41.79382386	-88.0244294	1867611.289	1068484.565
M	Sugar maple	<i>Acer saccharum</i>	2	2	2	41.79380243	-88.02439521	1867603.513	1068493.917
N	Sugar maple	<i>Acer saccharum</i>	2	2	2	41.7938876	-88.02441599	1867634.531	1068488.14
O	Sugar maple	<i>Acer saccharum</i>	3	2	2	41.79389222	-88.02441353	1867636.216	1068488.802
P	Hackberry	<i>Celtis occidentalis</i>	2	2	2	41.79402992	-88.02391456	1867686.881	1068624.686

Notes:

- 1) Tree survey data collected by Christopher B Burke Engineering, Ltd (CBBEL) on April 5, 2024.
- 2) Tree survey tagged all stems 4-inches and greater diameter at breast height (DBH) and plot also includes trees 2" to 3" DBH as well.
- 3) Trees were inventoried in dormant conditions with no leaf cover.
- 4) Condition and form ratings are based on general observations at the time of the CBBEL dormant season site visit, and range on a scale of 1 (excellent) to 5 (poor).

N:\DuPage County FPD\230312\Env\Docs\Maple Grove Trees_Formatted Spreadsheet_04122024.xlsx

TREE INVENTORY LIST – RATING DESCRIPTIONS

During the tree survey, each tree was evaluated on a scale rating from 1 – 5. These ratings were based on general observations at the time of the inventory. A rating of 5 (poor) has the lowest value in terms of protection or preservation. A rating of 1 (excellent) has the highest value and are the highest quality trees found.

For example:

- A. (5 = worst condition) A rating of 5 was given to a tree that has significant deadwood, bad sweep or lean, disease or damage by insect pests and larvae, lightning damage, split, or other physical damage.
- B. (4 = bad condition) A rating of 4 was given to a tree that has some deadwood, minor sweep or lean, distorted shape, trunk or bark damage, multiple stems, or poor physical quality.
- C. (3 = typical condition) A rating of 3 was given to a tree that is average in condition, form, physical state, appearance, and health.
- D. (2 = above average) A rating of 2 was given to a tree that has little or no damage, sound, good shape and form, and is good in overall physical quality.
- E. (1 = excellent condition) A rating of 1 was given to a tree that is excellent in appearance, condition and form, balanced branching and healthy. In our opinion, a tree worth preserving.



January 10, 2024

Thomas McArdle
9575 W. Higgins
Rosemont, IL 60018

**RE: Trail Bridge and Sanitary Sewer Replacement
Consultation Program
EcoCAT Review #2408818
DuPage County**

Dear Mr. McArdle:

The Department has received your submission for this project for the purposes of consultation pursuant to the *Illinois Endangered Species Protection Act* [520 ILCS 10/11], the *Illinois Natural Areas Preservation Act* [525 ILCS 30/17], and Title 17 *Illinois Administrative Code* Part 1075.

The proposed action consists of the replacement of a degraded sanitary sewer located on the underside of a degraded, concrete trail bridge in DuPage County, IL. The degraded sanitary sewer and trail bridge will be replaced.

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Illinois Natural Areas Inventory (INAI)
Maple Grove Forest Preserve

State Threatened or Endangered Species
Northern Long-eared Myotis (*Myotis septentrionalis*)
Tuckerman's Sedge (*Carex tuckermanii*)

Due to the project scope and proximity to protected resources, the Department offers the following comments and recommends the following actions be taken to avoid adversely impacting listed species and protected natural areas in the vicinity of the project:

Maple Grove Forest Preserve INAI Site

Impacts to this INAI site should be avoided or minimized as much as possible. However, if impacts are necessary, the Department recommends:

- Soil erosion and sediment control BMPs should be implemented and properly maintained. If erosion control blanket is to be used, wildlife-friendly plastic-free blanket should be used to prevent the entanglement of native wildlife. If wildlife-friendly plastic-free blanket cannot be used, then the plastic erosion control blanket should be removed once vegetation is established.
- Good housekeeping practices should be implemented and maintained during and after construction to prevent trash and other debris from inadvertently blowing or washing into nearby natural areas.

Northern Long-eared Myotis

EcoCAT indicated records for the state-listed northern long-eared bat in the vicinity of the project area. The Department recommends no tree clearing between the dates of April 1st and October 31st

Tuckerman's Sedge

The state-listed Tuckerman's Sedge has been identified in the vicinity and appropriate habitat may be found within the project area. The Department recommends:

- The plant be searched for, flagged, and avoided if possible.
- If avoidance is not possible, please consider seed collection and planting, translocation, and surface soil conservation measures to help promote the continued existence of this plant in the area.
- State-listed plant species belong to the landowner and their fate resides with the landowner's conservation decisions. If take is unavoidable, express written permission from the landowner should be obtained to take listed plants to comply with the Illinois Endangered Species Protection Act.

Given the above recommendations are adopted, the Department has determined that impacts to these protected resources are unlikely. The Department has determined impacts to other protected resources in the vicinity of the project location are also unlikely.

In accordance with 17 Ill. Adm. Code 1075.40(h), please notify the Department of your decision regarding these recommendations.

Consultation on the part of the Department is closed, unless the applicant desires additional information or advice related to this proposal. Consultation for Part 1075 is valid for two years unless new information becomes available which was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the action has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal and should not be regarded as a final statement on the project being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are unexpectedly encountered during the project's implementation, the applicant must comply with the applicable statutes and regulations.

This letter does not serve as permission to take any listed or endangered species. As a reminder, no take of an endangered species is permitted without an Incidental Take Authorization or the required permits. Anyone who takes a listed or endangered species without an Incidental Take Authorization or required permit may be subject to criminal and/or civil penalties pursuant to the *Illinois Endangered Species Act*, the *Fish and Aquatic Life Act*, the *Wildlife Code* and other applicable authority.

Please contact me with any questions about this review.

Sincerely,

A handwritten signature in cursive script that reads "Bradley Hayes".

Bradley Hayes
Manager, Impact Assessment Section
Division of Real Estate Services and Consultation
Office of Realty & Capital Planning
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702
Bradley.Hayes@Illinois.gov
Phone: (217) 782-0031

Applicant: Burke Engineering
Contact: Thomas McArdle
Address: 9575 W. Higgins
Rosemont, IL 60018

IDNR Project Number: 2408818
Date: 01/10/2024

Project: Trail Bridge and Sanitary Sewer Replacement
Address: Maple Grove Forest Preserve, Downers Grove

Description: A degraded sanitary sewer is located on the underside of a degraded, concrete trail bridge. The degraded sanitary sewer and trail bridge will be replaced.

Natural Resource Review Results

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Maple Grove Forest Preserve INAI Site
Northern Long-Eared Myotis (*Myotis septentrionalis*)
Tuckerman's Sedge (*Carex tuckermani*)

An IDNR staff member will evaluate this information and contact you to request additional information or to terminate consultation if adverse effects are unlikely.

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: DuPage

Township, Range, Section:
38N, 11E, 7



IL Department of Natural Resources
Contact
Bradley Hayes
217-785-5500
Division of Ecosystems & Environment

Government Jurisdiction
U.S. Army Corps of Engineers

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

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3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

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Unauthorized use, tampering with or modification of this system, including supporting hardware or software, may subject the violator to criminal and civil penalties. In the event of unauthorized intrusion, all relevant information regarding possible violation of law may be provided to law enforcement officials.

Privacy

EcoCAT generates a public record subject to disclosure under the Freedom of Information Act. Otherwise, IDNR uses the information submitted to EcoCAT solely for internal tracking purposes.



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Chicago Ecological Service Field Office

U.s. Fish And Wildlife Service Chicago Ecological Services Office

230 South Dearborn St., Suite 2938

Chicago, IL 60604-1507

Phone: (312) 485-9337

In Reply Refer To:

04/29/2024 18:06:22 UTC

Project Code: 2024-0083240

Project Name: Maple Grove Trail Bridge Replacement

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

Additionally, please note that on March 23, 2022, the Service published a proposal to reclassify the northern long-eared bat (NLEB) as endangered under the Endangered Species Act. The U.S. District Court for the District of Columbia has ordered the Service to complete a new final listing

determination for the NLEB by November 2022 (Case 1:15-cv-00477, March 1, 2021). The bat, currently listed as threatened, faces extinction due to the range-wide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across the continent. The proposed reclassification, if finalized, would remove the current 4(d) rule for the NLEB, as these rules may be applied only to threatened species. Depending on the type of effects a project has on NLEB, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective (anticipated to occur by December 30, 2022). If your project may result in incidental take of NLEB after the new listing goes into effect this will first need to be addressed in an updated consultation that includes an Incidental Take Statement. If your project may require re-initiation of consultation, please contact our office for additional guidance.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see <https://www.fws.gov/program/migratory-bird-permit/what-we-do>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and

their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Chicago Ecological Service Field Office

U.s. Fish And Wildlife Service Chicago Ecological Services Office
230 South Dearborn St., Suite 2938
Chicago, IL 60604-1507
(312) 485-9337

PROJECT SUMMARY

Project Code: 2024-0083240
Project Name: Maple Grove Trail Bridge Replacement
Project Type: Bridge - Maintenance
Project Description: Maple Grove Trail Bridge Replacement
Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@41.7936855,-88.02423261149302,14z>



Counties: DuPage County, Illinois

ENDANGERED SPECIES ACT SPECIES

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Whooping Crane <i>Grus americana</i> Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non- Essential

INSECTS

NAME	STATUS
Hine's Emerald Dragonfly <i>Somatochlora hineana</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7877	Endangered
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Eastern Prairie Fringed Orchid <i>Platanthera leucophaea</i> No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> Follow the guidance provided at https://www.fws.gov/midwest/endangered/section7/s7process/plants/epfos7guide.html Species profile: https://ecos.fws.gov/ecp/species/601	Threatened
Leafy Prairie-clover <i>Dalea foliosa</i> Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5498	Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: County of DuPage
Name: Thomas McArdle
Address: 9575 W. Higgins Road, Suite 600
City: Rosemont
State: IL
Zip: 60018
Email: tmcardle@cbbel.com
Phone: 8478230500

LEAD AGENCY CONTACT INFORMATION

Lead Agency: County of DuPage

APPENDIX F

GEO TECHNICAL





Local Office
January 29, 2024

Mr. Jeffrey M. Barnett, PE
Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018

TESTING SERVICE CORPORATION

Corporate Office:

360 S. Main Place, Carol Stream, IL 60188-2404
630.462.2600 • Fax 630.653.2988

Local Office:

457 E. Gundersen Drive, Carol Stream, IL 60188-2492
630.653.3920 • Fax 630.653.2726

RE: L-96,725
Pedestrian Bridge Replacement
Maple Grove Forest Preserve
Gilbert Ave East of Lee Ave
Downers Grove, Illinois

Dear Mr. Barnett:

This report presents the results of a subsurface investigation performed for a pedestrian bridge replacement over Saint Joseph Creek in Downers Grove, Illinois. These geotechnical engineering services are being provided in accordance with TSC Proposal No. 71,891 dated October 2, 2023 and the attached General Conditions, incorporated herein by reference.

Current plans call for the replacement of the existing pedestrian bridge structure located within the Maple Grove Forest Preserve. The bridge is situated on the south side of Gilbert Avenue and lies about 900 feet east of Lee Avenue. The existing pedestrian bridge consists of a nine-span reinforced concrete slab superstructure supported by reinforced concrete piers. The structure was originally built to carry a stormwater pipe (still present) and later converted to pedestrian use. The existing structure spans approximately 122 feet across Saint Joseph Creek. It is understood that the existing bridge structure and deck are in serious condition.

The replacement pedestrian bridge will likely consist of a two-span structure. Otherwise, the bridge length and width have not been determined at the time this report was written but will likely have similar dimensions to the existing structure. It is assumed the bridge abutments and center pier are to be supported on either footings or pile foundations.

Field Investigation and Laboratory Testing

A total of three (3) soil borings (Nos. 1 - 3) were drilled for the new pedestrian bridge structure over Saint Joseph Creek. Borings 1 and 2, situated near the existing bridge abutments, were extended to auger refusal at depths of 64 and 62 feet below existing grade, respectively. Also included was a scour boring (B-3), located near the edge of the creek, that was extended to a depth of 7½ feet. Ground surface elevations at the boring locations were also acquired by TSC using a Trimble R12 GNSS receiver, being rounded to the nearest 0.5 foot. A Boring Location Plan is enclosed showing the drilling layout, being plotted on an aerial photograph of the project area.

Borings 1 and 2 were drilled and samples tested in accordance with the current recommended American Society for Testing and Materials specifications. Soil sampling was performed at 2½-foot intervals to at least 15 feet in depth and at 5-foot intervals thereafter. The samples were taken in conjunction with the Standard Penetration Test (SPT), for which driving resistance to a 2" split-spoon sampler (N-value in blows per foot) provides an indication of the relative density of granular materials and consistency of cohesive soils.

Boring 3 was advanced using hand auger methods. Samples were taken at 2½-foot intervals by driving a split-spoon sampler with a sledgehammer (no N-values were obtained). Water level readings were taken during and following completion of hand-auger and drilling operations

All soil samples were examined in the laboratory to verify field descriptions and to classify them in accordance with the Unified Soil Classification System. Laboratory testing included moisture content determinations for all cohesive and intermediate (silt or loamy) soil types. An estimate of unconfined compressive strength was obtained for all cohesive soils using a calibrated pocket penetrometer (Qp), with actual measurements of unconfined compressive strength (Qu) performed on representative samples of native clay soils. For scour analysis, two (2) grain-size analyses were performed on representative samples from B-3 at or near the approximate streambed elevation.

Reference is made to the attached boring logs which indicate subsurface stratigraphy and soil descriptions, results of field and laboratory tests, as well as water level observations. Definitions of descriptive terminology are also included. While strata changes are shown as a definite line on the logs, the actual transition between subsurface layers is likely to be more gradual. Fluctuations in the groundwater table may also occur due to variations in precipitation (short-term and seasonal) as well as rises or drops in Saint Joseph Creek or other nearby surface water features, i.e. water levels at a future date may be higher or lower than those recorded at the time of drilling.

Discussion of Test Data

Bridge Borings

Borings 1 and 2 were drilled near the east and west bridge abutments, respectively. Surficial topsoil was on the order of 12 inches thick at these borings. Medium stiff to stiff silty clay soils of apparent medium to high plasticity were found underlying the topsoil layer in B-2. These borderline CL/CH type materials (Unified classification) extended about 5½ feet below existing grade. They exhibited unconfined compressive strengths ranging from 1.0 to 1.25 tons per square foot (tsf) at water contents varying from 26 to 30 percent.

Very stiff sandy clay soils of low to medium plasticity (CL-ML by Unified classification) were found in Boring 1, extending about 3 feet below existing grade. The clay sample had an unconfined compressive strength of 2.5 tsf at a water content of 19 percent. A loose clayey sand deposit was found below the cohesive materials in B-1, extending about 5½ feet deep and having an SPT N-value of 8 blows per foot (bpf).

Medium dense to very dense sand/gravel, silty sand/gravel, sandy silt and silt deposits otherwise predominated in the borings extending approximately 61 to 63 feet below existing grade. The granular and/or intermediate materials typically had SPT N-values ranging from 10 to 45 bpf, occasionally as high as 100 blows for 3 inches, but generally increasing with depth. Cobbles and/or boulders were encountered in the borings.

Hard drilling and/or high sampler blow counts were first encountered approximately 63 and 61 feet below existing grade in Borings 1 and 2, respectively. This likely represents the presence of boulder zone materials or possible weathered/fractured bedrock. The drilling operation was able to advance



about 1 foot into these materials before virtual auger refusal was met. Split-spoon samples attempted in these materials had very high blow counts of 100 blows for 1 inch with little recovery obtained.

Borings 1 and 2 were noted as "dry" both during and upon completion of drilling operations, i.e. no free water was encountered in them.

Scour Boring

Boring 3 revealed 8 inches of topsoil/muck at the surface. Black sand and gravel fill materials were found below the topsoil layer, extending about 3 feet below existing grade. Native gravel trace sand materials otherwise predominated in B-3, extending to the completion depth of 7½ feet.

Analysis and Recommendations

Seismic Considerations

The project site is located towards the southeast corner of DuPage County, lying towards the middle of the Village of Downers Grove. The Spectral Acceleration values are expressed as a fraction of gravity based on a 7 percent probability of exceedance in 75 years. In accordance with ASCE/SEI 7-22, the following is a summary of seismic information:

Soil Site Classification:	C
Seismic Performance Zone (SPZ):	1
Design Spectral Acceleration at 1.0 sec (S_{D1}):	0.067g
Design Spectral Acceleration at 0.2 sec (S_{DS}):	0.11g

Based on the site stratigraphy, the relatively low seismic design loads will not have a significant impact on geotechnical issues such as slope stability, liquefaction, settlement or bearing capacity.

General Overview

Current plans call for the replacement of the existing bridge structure over Saint Joseph Creek which is in serious condition. The bridge is located within the Maple Grove Forest Preserve situated on the south side of Gilbert Avenue and lying about 900 feet east of Lee Avenue. Borings 1 and 2 were drilled near the existing west and east pedestrian bridge abutments, respectively. The replacement pedestrian bridge will likely consist of a two-span structure. The new bridge length and width have not been determined but will likely have similar dimensions to the existing structure.

Scour Potential

Boring 3 was drilled on the west side of Saint Joseph Creek, near the edge of the water. Gravel materials were encountered at the approximate streambed elevation and predominated to the boring completion depth of 7½ feet below existing grade. Grain-size analyses were performed on two representative samples from B-3, with the D_{50} particle size summarized in the following table.



Boring	Sample Location		D50 Particle Size	Soil Classification
	Depth (Ft)	Elevation		
3	3.5 - 5.0	685.0 - 686.5	14.1 mm	Gravel, trace sand
3	6.0 - 7.5	682.5 - 684.0	19.4 mm	Gravel, trace sand

Based on the samples tested from Boring 3, Gravel trace sand materials were encountered between Elevations 682.5 and 686.5. These samples had D_{50} particle size between 14.1 and 19.4 mm.

The proposed bridge design will presumably include placement of large rip-rap adjacent to the new abutments for scour protection. Therefore, the estimated pile lengths at the abutments do not take scour into account.

Spread Footings

Consideration may be given to supporting the bridge abutments on spread footing foundations. However, the center pier will likely have to be supported on pile foundations due to potential scour undermining the footing foundation.

Since abutment locations and depths were unknown at the time this report was written, it was assumed that the abutment foundations would extend a minimum of 4 feet below existing grade, i.e. frost depth. Slope protection/erosion control is also recommended in order to prevent erosion and undermining of the new bridge foundations.

Loose clayey sand materials were encountered at the approximate abutment foundation depth (frost depth) in B-1. Boring 2 revealed relatively low strength silty clay soils at the approximate foundation depth. These cohesive and intermediate materials are not considered suitable for foundation support. It is recommended that foundations be extended through the loose clayey sand and relatively low strength silty clay soils to bear on the underlying medium stiff sand and gravel materials.

Medium dense native sand and gravel materials were encountered approximately 5½ feet below existing grade in Borings 1 and 2, having SPT N-values of 18 to 27 bpf. These granular materials are considered capable of supporting of a nominal bearing resistance of 10,000 pounds per square foot (psf). The factored bearing resistance is calculated using a geotechnical resistance factor of 0.5 and the nominal bearing resistance. Therefore, a factored bearing resistance of 5,000 psf can be used for shallow abutment foundations design in connection with 10,000 psf nominal bearing resistance soils. However, once the bridge abutments depth and size have been determined the bearing resistance values should be recalculated to verify the correct interpretation of recommendations contained herein and to modify the findings accordingly.

Please note that the bridge abutment foundations should always be provided with a minimum of 4.0 feet of cover for frost protection. Also, once the initial foundation excavation has been made, a qualified soils technician or engineer should inspect the foundation soils to confirm that suitable bearing soils have been reached. All loose and disturbed soil should be removed from the excavation.



Groundwater problems are not anticipated given that free water was not encountered in Borings 1 and 2. However, the accumulation of run-off water or seepage at the base of excavations may still occur during foundation construction. The Contractor should therefore be prepared to implement dewatering procedures, as a minimum to include pumping from strategically placed sumps.

Pile Foundations

Consideration may be given to supporting the bridge abutments and center pier on steel H-piles (HP). Metal shell piles were considered, however, given the cobbles found at shallow depths extending metal shell piles through these materials would likely damage them or possibly not allowing them to be driven to the required depth. Four (4) pile sections have been evaluated in connection with them, i.e. Steel HP 10x42, 12x53, 14x73 and 14x89. The following table provides the maximum Nominal Required Bearing (RN) and maximum Factor Resistance Available (RF) for each of the different piles.

Pile Designation	Maximum Nominal Required Bearing (kips) *	Maximum Factored Resistance Available (kips) **
Steel HP 10x42	335	184
Steel HP 12x53	419	231
Steel HP 14x73	578	318
Steel HP 14x89	705	387

* Factored Resistance Available computed using a geotechnical resistance factor of 0.55 (AGMU Memo 10.2); no reduction was taken for scour, downdrag or liquefaction.

Since abutment locations and depths were unknown at the time this report was written, it was assumed that the bottom of the pile caps would extend a minimum of 4 feet below existing grade, i.e. frost depth. The estimated pile lengths for the bridge abutments are summarized in the following table using the Modified IDOT static method. Four (4) typical pile sections have been evaluated for four (4) Nominal Required Bearing (R_N) values. They have been prepared in connection with Design Guide 3.10.1, LRFD Geotechnical Pile Design Procedure and AGMU Memo 10.2 (Geotechnical Pile Design). The estimated pile lengths include 1.0 foot of embedment into the abutment pile cap.

Boring 1 East Abutment		Nominal Required Bearing - R_N (kips)			
		200	300	400	500
Pile Designation Bottom Pile Cap Elev. = 695.0		Factored Resistance Available - R_F (kips) #			
		110	165	220	275
HP 10x42	Length (ft)*	54	61	NA	NA
	Elevation**	641	634		
HP 12x53	Length (ft)*	52	57	61	NA
	Elevation**	643	638	634	



Boring 1 East Abutment		Nominal Required Bearing - R_N (kips)			
		200	300	400	500
Pile Designation Bottom Pile Cap Elev. = 695.0		Factored Resistance Available - R_F (kips) #			
		110	165	220	275
HP 14x73	Length (ft)*	49	54	58	61
	Elevation**	646	641	637	634
HP 14x89	Length (ft)*	49	54	58	61
	Elevation**	646	641	637	634

Boring 2 West Abutment		Nominal Required Bearing - R_N (kips)			
		200	300	400	500
Pile Designation Bottom Pile Cap Elev. = 696.0		Factored Resistance Available - R_F (kips) #			
		110	165	220	275
HP 10x42	Length (ft)*	56	59	NA	NA
	Elevation**	641	638		
HP 12x53	Length (ft)*	54	58	59	NA
	Elevation**	643	639	638	
HP 14x73	Length (ft)*	52	58	59	60
	Elevation**	645	639	638	637
HP 14x89	Length (ft)*	49	56	58	59
	Elevation**	648	641	639	638

NA Nominal Required Bearing exceeds the maximum nominal required bearing for the pile.

* The estimated pile length includes 1.0 foot of embedment into the abutment pile cap, being rounded to the nearest foot.

** The estimated bottom of the pile elevation to achieve the Factored Resistance Available, being rounded to the nearest foot.

Factored Resistance Available was computed using a geotechnical resistance factor of 0.55. Due to the presence of cobbles within the soil stratigraphy, it is recommended that the piles be provided with metal pile shoes (pile points). The above estimated pile lengths are being provided for contract estimates. They were estimated using the Modified IDOT Static Method and the soils revealed by the borings. It should be noted that the length of piles not driven to rock are more difficult to predict.

The actual pile lengths should be determined during installation based on resistance to driving criteria. It is recommended that at least one test pile be driven at each substructure prior to ordering piles for production driving. The test piles are normally driven to 110 percent of the Allowable Required Bearing shown on the plans. It is also recommended that piles that have been driven to their full furnished length and have not reached but are within 85% of the full nominal required bearing should be left for a minimum of 24 hours to allow soil set-up to occur. This allows excess pore water pressures to



dissipate and reconsolidation of the soil around the pile to occur, over time resulting in an increase in pile capacity.

The driving equipment should be selected so that the piles can be driven to the required capacity (Ultimate Required Bearing) at an adequate final penetration resistance and without inducing pile stresses that exceed allowable values. A wave equation analysis may be performed to further evaluate pile driveability which is to ultimately be confirmed during the driving of test piles. Dynamic pile testing may also be performed during test pile driving operations to more accurately assess the capacity being achieved by the piles (nominal driven bearing) and to establish the driving criteria.

Closure

It is recommended that technician services be provided by Testing Service Corporation personnel during foundation construction, so that the bearing capacity of the soils at undercut and foundation levels can be verified. In addition, the adequacy of building materials and undercutting should be monitored for compliance with the recommended procedures and specifications.

This report has been prepared without the benefit of the bridge TS&L which provides the bridge abutment locations and depths as well as the foundation size. It is therefore suggested that Testing Service Corporation review these plans when they are available, to check the accuracy of this report as it may be affected, to verify the correct interpretation of recommendations contained herein and to modify the findings accordingly. Additional borings may be suggested at that time to fill in any gaps in information.

The analysis and recommendations submitted in this report are based upon the data obtained from the two (2) structure borings and one (1) scour boring performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings or elsewhere on the site, the nature and extent of which may not become evident until during the course of construction. If variations are then identified, recommendations contained in this report should be re-evaluated after performing on-site observations.

Please call if there are any questions or if we may be of further service.

Respectfully submitted,

TESTING SERVICE CORPORATION

Timothy R. Peceniak, P.E.
Project Engineer
Registered Professional Engineer
Illinois No. 062-061269



Samuel J. Patrick, P.E.
Geotechnical Engineer

TRP:SJP:trp
Enc.



TESTING SERVICE CORPORATION

GENERAL CONDITIONS

Geotechnical and Construction Services

1. PARTIES AND SCOPE OF WORK: If Client is ordering the services on behalf of another, Client represents and warrants that Client is the duly authorized agent of said party for the purpose of ordering and directing said services, and in such case the term "Client" shall also include the principal for whom the services are being performed. Prices quoted and charged by TSC for its services are predicated on the conditions and the allocations of risks and obligations expressed in these General Conditions. Unless otherwise stated in writing, Client assumes sole responsibility for determining whether the quantity and the nature of the services ordered by Client are adequate and sufficient for Client's intended purpose. Unless otherwise expressly assumed in writing, TSC's services are provided exclusively for client. TSC shall have no duty or obligation other than those duties and obligations expressly set forth in this Agreement. TSC shall have no duty to any third party. Client shall communicate these General Conditions to each and every party to whom the Client transmits any report prepared by TSC. Ordering services from TSC shall constitute acceptance of TSC's proposal and these General Conditions.

2. SCHEDULING OF SERVICES: The services set forth in this Agreement will be accomplished in a timely and workmanlike manner. If TSC is required to delay any part of its services to accommodate the requests or requirements of Client, regulatory agencies, or third parties, or due to any cause beyond its reasonable control, Client agrees to pay such additional charges, if any, as may be applicable.

3. ACCESS TO SITE: TSC shall take reasonable measures and precautions to minimize damage to the site and any improvements located thereon as a result of its services or the use of its equipment; however, TSC has not included in its fee the cost of restoration of damage which may occur. If Client desires or requires TSC to restore the site to its former condition, TSC will, upon written request, perform such additional work as is necessary to do so and Client agrees to pay to TSC the cost thereof plus TSC's normal markup for overhead and profit.

4. CLIENT'S DUTY TO NOTIFY ENGINEER: Client represents and warrants that Client has advised TSC of any known or suspected hazardous materials, utility lines and underground structures at any site at which TSC is to perform services under this Agreement. Unless otherwise agreed in writing, TSC's responsibility with respect to underground utility locations is to contact the Illinois Joint Utility Locating Information for Excavators for the location of public, but not private, utilities.

5. DISCOVERY OF POLLUTANTS: TSC's services shall not include investigation for hazardous materials as defined by the Resource Conservation Recovery Act, 42 U.S.C. § 6901, et, seq., as amended ("RCRA") or by any state or Federal statute or regulation. In the event that hazardous materials are discovered and identified by TSC, TSC's sole duty shall be to notify Client.

6. MONITORING: If this Agreement includes testing construction materials or observing any aspect of construction of improvements, Client's construction personnel will verify that the pad is properly located and sized to meet Client's projected building loads. Client shall cause all tests and inspections of the site, materials and work to be timely and properly performed in accordance with the plans, specifications, contract documents, and TSC's recommendations. No claims for loss, damage or injury shall be brought against TSC unless all tests and inspections have been so performed and unless TSC's recommendations have been followed.

TSC's services shall not include determining or implementing the means, methods, techniques or procedures of work done by the contractor(s) being monitored or whose work is being tested. TSC's services shall not include the authority to accept or reject work or to in any manner supervise the work of any contractor. TSC's services or failure to

perform same shall not in any way operate or excuse any contractor from the performance of its work in accordance with its contract. "Contractor" as used herein shall include subcontractors, suppliers, architects, engineers and construction managers.

Information obtained from borings, observations and analyses of sample materials shall be reported in formats considered appropriate by TSC unless directed otherwise by Client. Such information is considered evidence, but any inference or conclusion based thereon is, necessarily, an opinion also based on engineering judgment and shall not be construed as a representation of fact. Subsurface conditions may not be uniform throughout an entire site and ground water levels may fluctuate due to climatic and other variations. Construction materials may vary from the samples taken. Unless otherwise agreed in writing, the procedures employed by TSC are not designed to detect intentional concealment or misrepresentation of facts by others.

7. DOCUMENTS AND SAMPLES: Client is granted an exclusive license to use findings and reports prepared and issued by TSC and any sub-consultants pursuant to this Agreement for the purpose set forth in TSC's proposal provided that TSC has received payment in full for its services. TSC and, if applicable, its sub-consultant, retain all copyright and ownership interests in the reports, boring logs, maps, field data, field notes, laboratory test data and similar documents, and the ownership and freedom to use all data generated by it for any purpose. Unless otherwise agreed in writing, test specimens or samples will be disposed immediately upon completion of the test. All drilling samples or specimens will be disposed sixty (60) days after submission of TSC's report.

8. TERMINATION: TSC's obligation to provide services may be terminated by either party upon (7) seven days prior written notice. In the event of termination of TSC's services, TSC shall be compensated by Client for all services performed up to and including the termination date, including reimbursable expenses. The terms and conditions of these General Conditions shall survive the termination of TSC's obligation to provide services.

9. PAYMENT: Client shall be invoiced periodically for services performed. Client agrees to pay each invoice within thirty (30) days of its receipt. Client further agrees to pay interest on all amounts invoiced and not paid or objected to in writing for valid cause within sixty (60) days at the rate of twelve (12%) per annum (or the maximum interest rate permitted by applicable law, whichever is the lesser) until paid and TSC's costs of collection of such accounts, including court costs and reasonable attorney's fees.

10. WARRANTY: TSC's professional services will be performed, its findings obtained and its reports prepared in accordance with these General Conditions and with generally accepted principles and practices. In performing its professional services, TSC will use that degree of care and skill ordinarily exercised under similar circumstances by members of its profession. In performing physical work in pursuit of its professional services, TSC will use that degree of care and skill ordinarily used under similar circumstances. This warranty is in lieu of all other warranties or representations, either express or implied. Statements made in TSC reports are opinions based upon engineering judgment and are not to be construed as representations of fact.

Should TSC or any of its employees be found to have been negligent in performing professional services or to have made and breached any express or implied warranty, representation or contract, Client, all parties claiming through Client and all parties claiming to have in any way relied upon TSC's services or work agree that the maximum aggregate amount of damages for which TSC, its officers, employees and agents shall be liable is limited to \$50,000 or the total amount of the fee paid to TSC for its services performed with respect to the project, whichever amount is greater.

In the event Client is unwilling or unable to limit the damages for which TSC may be liable in accordance with the provisions set forth in the preceding paragraph, upon written request of Client received within five days of Client's acceptance of TSC's proposal together with payment of an additional fee in the amount of 5% of TSC's estimated cost for its services (to be adjusted to 5% of the amount actually billed by TSC for its services on the project at time of completion), the limit on damages shall be increased to \$500,000 or the amount of TSC's fee, whichever is the greater. This charge is not to be construed as being a charge for insurance of any type, but is increased consideration for the exposure to an award of greater damages.

11. INDEMNITY: Subject to the provisions set forth herein, TSC and Client hereby agree to indemnify and hold harmless each other and their respective shareholders, directors, officers, partners, employees, agents, subsidiaries and division (and each of their heirs, successors, and assigns) from any and all claims, demands, liabilities, suits, causes of action, judgments, costs and expenses, including reasonable attorneys' fees, arising, or allegedly arising, from personal injury, including death, property damage, including loss of use thereof, due in any manner to the negligence of either of them or their agents or employees or independent contractors. In the event both TSC and Client are found to be negligent or at fault, then any liability shall be apportioned between them pursuant to their pro rata share of negligence or fault. TSC and Client further agree that their liability to any third party shall, to the extent permitted by law, be several and not joint. The liability of TSC under this provision shall not exceed the policy limits of insurance carried by TSC. Neither TSC nor Client shall be bound under this indemnity agreement to liability determined in a proceeding in which it did not participate represented by its own independent counsel. The indemnities provided hereunder shall not terminate upon the termination or expiration of this Agreement, but may be modified to the extent of any waiver of subrogation agreed to by TSC and paid for by Client.

12. SUBPOENAS: TSC's employees shall not be retained as expert witnesses except by separate, written agreement. Client agrees to pay TSC pursuant to TSC's then current fee schedule for any TSC employee(s) subpoenaed by any party as an occurrence witness as a result of TSC's services.

13. OTHER AGREEMENTS: TSC shall not be bound by any provision or agreement (i) requiring or providing for arbitration of disputes or controversies arising out of this Agreement or its performance, (ii) wherein TSC waives any rights to a mechanics lien or surety bond claim; (iii) that conditions TSC's right to receive payment for its services upon payment to Client by any third party or (iv) that requires TSC to indemnify any party beyond its own negligence. These General Conditions are notice, where required, that TSC shall file a lien whenever necessary to collect past due amounts. This Agreement contains the entire understanding between the parties. Unless expressly accepted by TSC in writing prior to delivery of TSC's services, Client shall not add any conditions or impose conditions which are in conflict with those contained herein, and no such additional or conflicting terms shall be binding upon TSC. The unenforceability or invalidity of any provision or provisions shall not render any other provision or provisions unenforceable or invalid. This Agreement shall be construed and enforced in accordance with the laws of the State of Illinois. In the event of a dispute arising out of or relating to the performance of this Agreement, the breach thereof or TSC's services, the parties agree to try in good faith to settle the dispute by mediation under the Construction Industry Mediation Rules of the American Arbitration Association as a condition precedent to filing any demand for arbitration, or any petition or complaint with any court. Paragraph headings are for convenience only and shall not be construed as limiting the meaning of the provisions contained in these General Conditions.

TESTING SERVICE CORPORATION457 East Gundersen Drive
Carol Stream, Illinois

TSC Job No. L-96,725

Client: Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, IL 60018**Project:** Pedestrian Bridge Replacement
Maple Grove Forest Preserve
Gilbert Ave East of Lee Ave
Downers Grove, Illinois**SOIL TEST DATA**

BORING NUMBER	3	3	
SAMPLE NUMBER	2	3	
DEPTH IN FEET	3½ - 5	6 - 7½	
UNIFIED CLASSIFICATION	GP	GP	
GRADATION - PASSING 1 ½" SIEVE %	100	100	
GRADATION - PASSING 1" SIEVE %	100	100	
GRADATION - PASSING ¾" SIEVE %	66	46	
GRADATION - PASSING ⅜" SIEVE %	29	13	
GRADATION - PASSING # 4 SIEVE %	14	5	
GRADATION - PASSING # 10 SIEVE %	8	3	
GRADATION - PASSING # 40 SIEVE %	6	3	
GRADATION - PASSING # 100 SIEVE %	6	3	
GRADATION - PASSING # 200 SIEVE %	5	2	
GRAVEL %	86	95	
SAND %	9	3	
SILT & CLAY %	5	2	

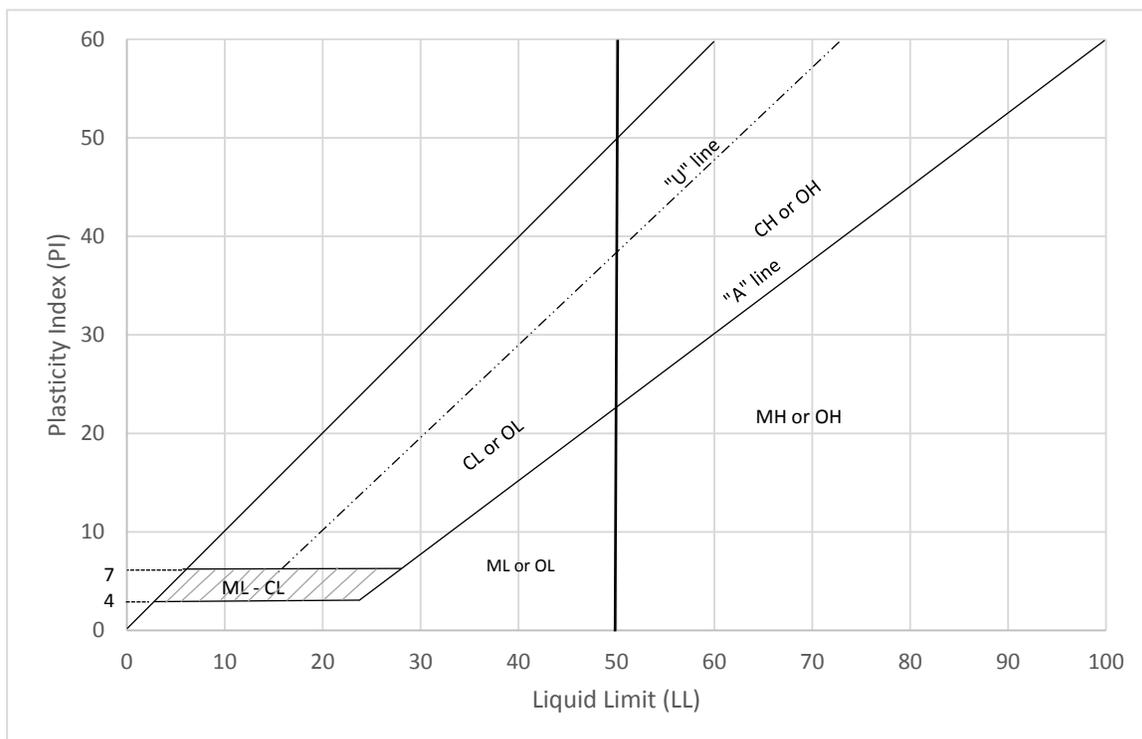
Testing Service Corporation Unified Classification Chart



CRITERIA FOR ASSIGNING GROUP SYMBOLS AND GROUP NAMES USING LABORATORY TEST ^a				SOIL CLASSIFICATION	
				Group Symbol	GROUP NAME ^b
COARSE - GRAINED SOILS more than 50% retained on No. 200 sieve	GRAVELS More than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS less than 5% fines ^c	$C_u \geq 4$ and $1 \leq C_c \leq 3$ ^e	GW	Well-graded gravel ^f
			$C_u < 4$ and/or $1 > C_c > 3$ ^e	GP	Poorly-graded gravel ^f
		GRAVELS WITH FINES more than 12% fines ^c	Fines classify as ML or MH	GM	Silty gravel ^{f, g, h}
			Fines classify as CL or CH	GC	Clayey gravel ^{f, g, h}
	SANDS 50% or more of coarse fraction passes No. 4 sieve	CLEAN SANDS less than 5% fines ^d	$C_u \geq 6$ and $1 \leq C_c \leq 3$ ^e	SW	Well-graded sand ^l
			$C_u < 6$ and/or $1 > C_c > 3$ ^e	SP	Poorly-graded sand ^l
		SANDS WITH FINES more than 12% fines ^d	Fines classify as ML or MH	SM	Silty sand ^{g, h, f}
			Fines classify as CL or CH	SC	Clayey sand ^{g, h, f}
FINE - GRAINED SOILS 50% or more passed the No. 200 sieve	SILTS & CLAYS Liquid limit less than 50%	Inorganic	$PI > 7$ or 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	$\frac{\text{Liquid limit} - \text{oven dried}}{\text{Liquid limit} - \text{not dried}} < 0.75$	OL	Organic clay ^{k, l, m, n} Organic silt ^{k, l, m, o}
			PI plots on or above "A" line	CH	Fat clay ^{k, l, m}
	SILTS & CLAYS Liquid limit 50% or more	Inorganic	PI plots below "A" line	MH	Elastic silt ^{k, l, m}
			$\frac{\text{Liquid limit} - \text{oven dried}}{\text{Liquid limit} - \text{not dried}} < 0.75$	OH	Organic clay ^{k, l, m, p} Organic silt ^{k, l, m, q}
		Organic	PI plots on or above "A" line	PT	Peat
			PI plots below "A" line	PT	Peat

- a. Based on the material passing the 3-inch (75-mm) sieve.
 b. If field sample contained cobbles and/or boulders, add "with cobbles and/or boulders" to group name
 c. Gravels with 5 to 12% fines required 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. 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
 e. $C_u = D_{60}/D_{10}$ $C_c = \frac{(D_{30})^2}{D_{10} D_{60}}$

- f. If soils contains $\geq 15\%$ sand, add "with sand" to group name.
 g. If fines classify as CL-ML, use dual symbol GC-GM, SC-SM
 h. If fines are organic, add "with organic fines" to group name
 i. If soils contains $\geq 15\%$ gravel, add "with gravel" to group name
 j. If Atterberg Limits plot in hatched area, soil is a CL - ML, silty clay
 k. If soils contains 15 to 29% plus No. 200, add "with sand" or "with gravel" whichever is predominant
 l. If soil contains $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.
 m. If soils contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name
 n. $PI \geq 4$ and plots on or above "A" line
 o. $PI \geq 4$ and plots below "A" line
 p. PI plots on or above "A" line
 q. PI plots below "A" line





LEGEND FOR BORING LOGS



FILL



TOPSOIL



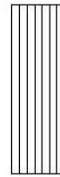
PEAT



GRAVEL



SAND



SILT



CLAY



LIMESTONE/
DOLOMITE

SAMPLE TYPE

SS	=	Split-Spoon
ST	=	Thin-Walled Tube
A	=	Auger
MC	=	Macro-Core (Geoprobe)

WATER LEVEL OBSERVATIONS

▼	While Drilling
▽	End of Boring
▼	24 Hours

FIELD AND LABORATORY TEST DATA

N	=	Standard Penetration Resistance in Blows per Foot (bpf)
WC	=	In-Situ Water Content (%)
Qu	=	Unconfined Compressive Strength in Tons per Square Foot (tsf)
*	=	Pocket Penetrometer Reading: Maximum Value = 4.5 tsf
γ _{dry}	=	Dry Unit Weight in Pounds per Cubic Foot (pcf)

SOIL DESCRIPTIONS:

MATERIAL

BOULDER
COBBLE
Large GRAVEL
Small GRAVEL
Coarse SAND
Medium SAND
Fine SAND
SILT and CLAY

PARTICLE SIZE RANGE

Over 12 inches
12 inches to 3 inches
3 inches to ¾ inch
¾ inch to No. 4 Sieve
No. 4 Sieve to No. 10 Sieve
No. 10 Sieve to No. 40 Sieve
No. 40 Sieve to No. 200 Sieve
Passing No. 200 Sieve

COHESIVE SOILS

<u>CONSISTENCY</u>	<u>Qu (tsf)</u>
Very Soft	Less than 0.25
Soft	0.25 to 0.5
Medium Stiff	0.5 to 1.0
Stiff	1.0 to 2.0
Very Stiff	2.0 to 4.0
Hard	4.0 and over

COHESIONLESS SOILS

<u>RELATIVE DENSITY</u>	<u>N (bpf)</u>
Very Loose	0 – 3
Loose	4 – 9
Medium Dense	10 – 29
Dense	30 – 49
Very Dense	50 and over

MODIFYING TERM

Trace
Little
Some

PERCENT BY WEIGHT

1 – 10
10 – 20
20 – 35

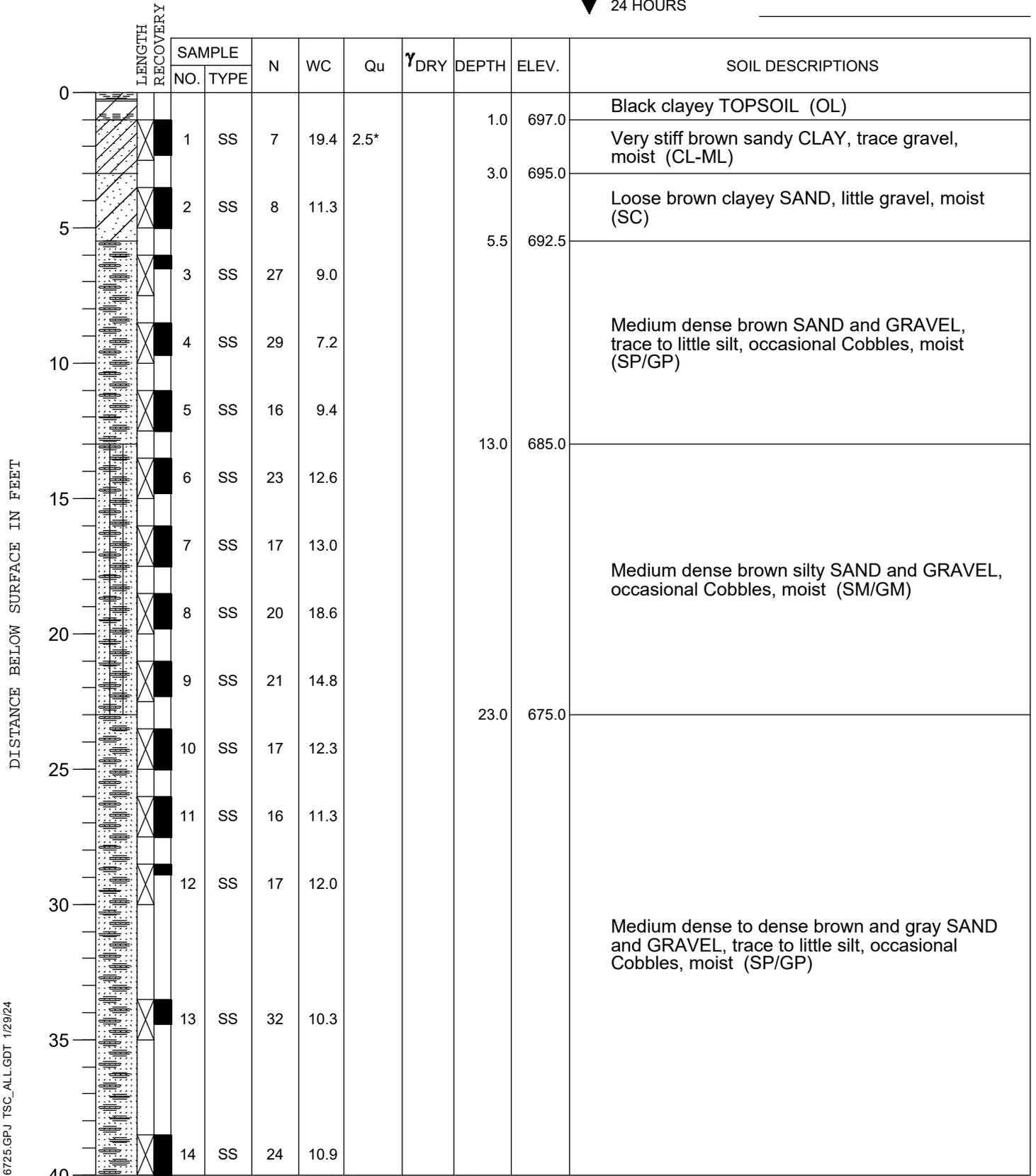


ELEVATIONS

GROUND SURFACE **698.0**
 END OF BORING **634.0**

WATER LEVEL OBSERVATIONS

▽ WHILE DRILLING **Dry**
 ▽ AT END OF BORING **Dry**
 ▼ 24 HOURS



TSC2 96725.GPJ TSC_ALL.GDT 1/29/24

Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual.



ELEVATIONS

GROUND SURFACE **698.0**
 END OF BORING **634.0**

WATER LEVEL OBSERVATIONS

▽ WHILE DRILLING **Dry**
 ▽ AT END OF BORING **Dry**
 ▼ 24 HOURS

DISTANCE BELOW SURFACE IN FEET	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ _{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
40								42.0	656.0	
45		15	SS	41	11.1					Dense gray SILT, little sand and gravel, occasional Cobbles, moist (ML)
50		16	SS	36	10.7			52.0	646.0	
55		17	SS	44-50/1"	9.4					Very dense gray sandy SILT, little gravel, occasional Cobbles and Boulders, moist (ML)
60		18	SS	100/5"	10.9					
63.0		19	SS	100/1"	7.1			63.0	635.0	Weathered/Fractured Bedrock or Boulder Zone [Hard Drilling]
65										Auger Refusal at 64.0' * Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.
70										
75										
80										

TSC2 96725.GPJ TSC_ALL.GDT 1/29/24

Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual.



ELEVATIONS
 GROUND SURFACE **700.0**
 END OF BORING **638.0**

WATER LEVEL OBSERVATIONS
 ▽ WHILE DRILLING **Dry**
 ▽ AT END OF BORING **Dry**
 ▼ 24 HOURS

DISTANCE BELOW SURFACE IN FEET	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ _{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0								1.0	699.0	Black clayey TOPSOIL (OL)
1		1	SS	6	29.7	1.25*				Stiff to medium stiff dark brown silty CLAY, little sand, trace gravel, trace organic, moist to very moist (CL/CH)
2		2	SS	4	25.6	1.0*				
5								5.5	694.5	Dense to medium dense brown and gray SAND and GRAVEL, trace to little silt, occasional Cobbles, moist (SP/GP)
3		3	SS	18	13.4					
4		4	SS	100/3"	2.8					
5		5	SS	39	9.8					
6		6	SS	36	8.4					
7		7	SS	19	13.0					
8		8	SS	21	14.9					
9		9	SS	18	15.4					
10		10	SS	13	21.6					
11		A	SS	13	20.5					
12		B	SS	13	23.8			27.0	673.0	
12		12	SS	14	17.8					Medium dense brown and gray clayey SILT, little sand, moist (ML)
13		13	SS	32	9.2					Medium dense to dense brown and gray SAND and GRAVEL, occasional Cobbles, moist (SP/GP)
14		14	SS	24	8.8			32.0	668.0	

TSC2 96725.GPJ TSC_ALL.GDT 1/29/24

Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual.



ELEVATIONS

GROUND SURFACE **700.0**
 END OF BORING **638.0**

WATER LEVEL OBSERVATIONS

▽ WHILE DRILLING **Dry**
 ▽ AT END OF BORING **Dry**
 ▼ 24 HOURS

DISTANCE BELOW SURFACE IN FEET	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ _{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
40										
45		15	SS	27	7.9					Medium dense to dense brown and gray SAND and GRAVEL, occasional Cobbles, moist (SP/GP)
50		16	SS	33	7.4			52.0	648.0	
55		17	SS	45	14.2					Dense to very dense gray sandy SILT, little gravel, occasional Cobbles and Boulders, moist (ML)
60		18	SS	44 50/1"	15.3					
61.0		19	SS	100/1"	2.9			61.0	639.0	Weathered/Fractured Bedrock or Boulder Zone [Hard Drilling]
65										Auger Refusal at 62.0' * Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.
70										
75										
80										

TSC2 96725.GPJ TSC_ALL.GDT 1/29/24



ELEVATIONS

GROUND SURFACE **690.0**
 END OF BORING **682.5**

WATER LEVEL OBSERVATIONS

▽ WHILE DRILLING **Surface**
 ▽ AT END OF BORING **Surface**
 ▼ 24 HOURS

DISTANCE BELOW SURFACE IN FEET	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ_{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0								0.7	689.3	FILL - Black clayey TOPSOIL/MUCK
		1	SS	HA	8.9			3.0	687.0	FILL - Black and gray SAND and GRAVEL, wet (SP/GP)
5		2	SS	HA	6.0					Brown and gray GRAVEL, trace sand and silt wet (GP)
		3	SS	HA	5.2					
10										End of Boring at 7.5"
15										* Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.
20										HA = Hand Auger
25										
30										
35										
40										

TSC2 96725.GPJ TSC_ALL.GDT 1/29/24

DRILL RIG NO. **HA**

Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual.



NOTE: GROUND SURFACE ELEVATIONS AT THE BORINGS WERE ACQUIRED BY TSC USING A TRIMBLE R12 GNSS RECEIVER, BEING ROUNDED TO THE NEAREST 0.5 FOOT.

<p><u>LEGEND</u></p>  <p>BORING LOCATION</p>	<p><u>BORING LOCATION PLAN</u> PEDESTRIAN BRIDGE REPLACEMENT GILBERT AVENUE EAST OF LEE AVENUE DOWNERS GROVE, ILLINOIS</p>	 <p>TESTING SERVICE CORP. 457 EAST GUNDERSEN DRIVE CAROL STREAM, ILLINOIS 60188</p>	DRAWN BY: FFE	<p>PAGE NO. 1 OF 1</p>
			CHECKED BY: TRP	
			JOB NO.: L-96,725	
			DATE: 01-19-24	

APPENDIX G
FEQ MODELING
SUMMARY
MEMORANDUM



MEMORANDUM

July 30, 2024

TO:

Project Files (CBBEL Project No. 23-0312)

FROM: Gerald L Robinson, PE, CFM

SUBJECT: FEQ Modeling of St. Joseph Creek for the Proposed Maple Grove Forest Preserve Pedestrian Bridge

The purpose of this memorandum is to present the results of the Christopher B. Burke Engineering, Ltd. (CBBEL) FEQ hydraulic analysis of St. Joseph Creek for the proposed replacement of the existing pedestrian bridge over the creek in the Maple Grove Forest Preserve. The purpose of this hydraulic analysis was to evaluate the proposed bridge, and to show that the proposed project is in compliance with the requirements of the DuPage County Countywide Stormwater and Flood Plain Ordinance (DuPage County Ordinance).

FEQ HYDRAULIC ANALYSIS

Baseline Conditions FEQ Hydraulic Model

The hydraulic analysis in this memorandum was performed using the DuPage County FEQ hydraulic model of St. Joseph Creek. The latest floodplain mapping FEQ (version 10.61) hydraulic model was utilized in this analysis. The FEQ Model utilizes the DuPage County hydrology in the form of a historical time series file (TSF). This TSF file consists of a sequential collection of historic storm events which occurred between 1949 and 2008 in the northeastern Illinois area for 157 storm events. The rainfall data for this period is compiled from gage records collected at the Morton Arboretum (Wheaton gage) and O'Hare airport (O'Hare gage) locations.

CBBEL made the following modifications to the existing St. Joseph Creek FEQ hydraulic model to develop the baseline conditions FEQ hydraulic Model (EBSJ_EX.INP):

- Changed the WSPRO representation of the pedestrian bridge to be a culvert. The openings were based upon a CBBEL survey of the existing bridge. The revised table file "MAPLEFPD_EX.TAB" is included in Appendix 1.



Proposed Conditions FEQ Hydraulic Model

CBBEL made the following modifications to the baseline St. Joseph Creek FEQ hydraulic model to develop the Proposed conditions FEQ hydraulic Model (EBSJ_PR75.FEQ):

- Changed the existing culvert with multiple piers to a single 75' span with no piers located in the stream. The revised table file "MAPLEFPD_PR75.TAB" is included in Appendix 1.

A CD-ROM containing the baseline and proposed conditions FEQ hydraulic models and FEQUTL files/table is included in Appendix 3.

RESULTS AND DISCUSSION

The historical runoff time series from 1949 to 2008 (157 storm events) was simulated with the baseline and the proposed conditions FEQ hydraulic models. The results from the baseline and the proposed conditions FEQ models were compared upstream and downstream of the pedestrian bridge. The comparison result file is provided in Appendix 2. The key to the different columns is as follows:

- Column marked as EBSJ_EX.PEK (1S) represents the peak water surface elevations from the baseline conditions simulation.
- Column marked as EBSJ_EX.PEK (1F) represents the peak water flow rates from the baseline conditions simulation.
- Column marked as EBSJ_P75.PEK (2S) represents the peak water surface elevations from the proposed conditions FEQ hydraulic model simulation.
- Column marked as EBSJ_P75.PEK (2F) represents the peak water flow rates from the proposed conditions FEQ hydraulic model simulation.
- Column marked as 2-1 (S) represents the difference between the proposed conditions and baseline conditions peak water surface elevations.
- Column marked as 2-1 (F) represents the percent difference between the proposed conditions and baseline conditions peak flow rates.

The comparison of the results from the baseline and proposed conditions FEQ hydraulic analysis shows that the proposed conditions will not cause the downstream or upstream flood



MEMORANDUM

elevation increases greater than 0.1 feet. Therefore, the proposed 75' span pedestrian bridge complies with the DuPage County Ordinance requirements.

GLR

N:\DUPAGE COUNTY FPD\230312\Water\Docs\M230312_30July2024 (Proposed Bridge FEQ Analysis).docx



Appendix 1

Baseline and Proposed Conditions Tables

* Created by program: fequtl
 * Version: 5.99 Version date: 13 July 2010 Date/time of run: 2024/07/29: 12.15.46.585

; Source code repository location and revision are:
 ; URL: http://www.iqdotdt.com/svn/usf/trunk/fequtl/fequtl.for
 ; Rev: 1074

; Report on executable:
 ; Operating system is: MS Windows
 ; Compiler used was: Lahey F95-V 5.70f
 ; Solution precision: Single
 ; Prefetch option used was: No longer applicable.

TABID= 1240
 TYPE= -13 HDATUM= 690.000 CULVERT zrhufd= 0.0000
 LABEL=MAPLE GROVE FPD PEDESTRIAN BRIDGE
 NHUP= 26
 NPFD= 10
 HUP 5000-4 7500-4 1000-3 1250-3 1500-3 1750-3 2000-3 2500-3 3000-3 3500-3
 FDROP 2846-4 4218-4 5597-4 7019-4 8739-4 1018-3 1110-3 1313-3 1491-3 1655-3
 PFD Flows for HUP and Proportion of FDROP
 3162-6 1595-3 3660-3 6395-3 9906-3 1441-2 1946-2 2462-2 3676-2 5346-2 7185-2
 1789-5 4013-3 8720-3 1521-2 2357-2 3423-2 4619-2 5835-2 8630-2 1239-1 1703-1
 4930-5 6552-3 1423-2 2480-2 3837-2 5548-2 7473-2 9445-2 1403-1 2003-1 2774-1
 1012-4 9123-3 1982-2 3446-2 5322-2 7689-2 1035-1 1308-1 1945-1 2750-1 3823-1
 1768-4 1156-2 2510-2 4360-2 6723-2 9682-2 1301-1 1646-1 2448-1 3423-1 4752-1
 2789-4 1370-2 2973-2 5161-2 7939-2 1139-1 1528-1 1935-1 2878-1 3983-1 5513-1
 4100-4 1541-2 3344-2 5798-2 8897-2 1270-1 1701-1 2158-1 3213-1 4422-1 6057-1
 5724-4 1658-2 3598-2 6231-2 9539-2 1354-1 1810-1 2302-1 3433-1 4733-1 6382-1
 7684-4 1713-2 3727-2 6459-2 9882-2 1398-1 1867-1 2379-1 3550-1 4901-1 6531-1
 1000-3 1772-2 3843-2 6642-2 1014-1 1427-1 1896-1 2415-1 3602-1 4972-1 6617-1
 HUP 4000-3 4500-3 5000-3 5500-3 6000-3 6165-3 6500-3 7000-3 7500-3 8000-3
 FDROP 1776-3 1922-3 2083-3 2303-3 2556-3 2641-3 2815-3 3101-3 3426-3 3764-3
 PFD Flows for HUP and Proportion of FDROP
 3162-6 8544-2 9067-2 9719-2 1043-1 1115-1 1138-1 1182-1 1249-1 1319-1 1386-1
 1789-5 2027-1 2145-1 2304-1 2475-1 2649-1 2703-1 2810-1 2970-1 3137-1 3297-1
 4930-5 3306-1 3551-1 3813-1 4101-1 4391-1 4482-1 4662-1 4931-1 5210-1 5478-1
 1012-4 4601-1 5010-1 5428-1 5849-1 6273-1 6406-1 6666-1 7057-1 7461-1 7849-1
 1768-4 5835-1 6681-1 7092-1 7682-1 8255-1 8436-1 8789-1 9320-1 9863-1 1039+0
 2789-4 6920-1 8210-1 8776-1 9524-1 1028+0 1052+0 1099+0 1167+0 1238+0 1305+0
 4100-4 7785-1 9256-1 1032+0 1132+0 1228+0 1258+0 1318+0 1406+0 1495+0 1580+0
 5724-4 8346-1 1001+0 1158+0 1290+0 1410+0 1447+0 1523+0 1634+0 1746+0 1853+0
 7684-4 8593-1 1044+0 1236+0 1392+0 1545+0 1593+0 1686+0 1820+0 1958+0 2090+0
 1000-3 8648-1 1063+0 1261+0 1433+0 1591+0 1643+0 1746+0 1900+0 2055+0 2204+0
 HUP 8500-3 9000-3 9500-3 1000-2 1050-2 1100-2
 FDROP 4114-3 4473-3 4841-3 5219-3 5604-3 5995-3
 PFD Flows for HUP and Proportion of FDROP
 3162-6 1451-1 1514-1 1575-1 1635-1 1694-1 1751-1
 1789-5 3452-1 3602-1 3748-1 3892-1 4033-1 4168-1
 4930-5 5737-1 5982-1 6225-1 6464-1 6696-1 6922-1
 1012-4 8223-1 8585-1 8936-1 9280-1 9614-1 9939-1
 1768-4 1089+0 1137+0 1184+0 1230+0 1275+0 1318+0
 2789-4 1370+0 1433+0 1493+0 1551+0 1608+0 1663+0
 4100-4 1662+0 1741+0 1817+0 1890+0 1961+0 2029+0
 5724-4 1956+0 2054+0 2149+0 2241+0 2329+0 2414+0
 7684-4 2217+0 2341+0 2460+0 2575+0 2687+0 2795+0
 1000-3 2348+0 2487+0 2622+0 2758+0 2890+0 3018+0

; Flow defining minimum head= 0.200
 TABID= 1244
 TYPE= -13 HDATUM= 697.700 EMBANKQ zrhufd= 0.0000
 LABEL= PEDESTRIAN BRIDGE OVERFLOW
 NHUP= 42
 NPFD= 10
 HUP 1000-4 2000-4 3000-4 4000-4 5000-4 6000-4 7000-4 8000-4 9000-4 1000-3
 FDROP 2989-5 5929-5 8797-5 1158-4 1429-4 1691-4 1914-4 2150-4 2375-4 2589-4

PFD	Flows for HUP and Proportion of FDROP									
3162-6	8388-4	2395-3	4433-3	6856-3	9623-3	1270-2	1722-2	2142-2	2599-2	3050-2
1789-5	2971-3	8519-3	1587-2	2471-2	3494-2	4648-2	6401-2	7889-2	9503-2	1124-1
4930-5	4566-3	1310-2	2439-2	3797-2	5368-2	7139-2	9829-2	1210-1	1456-1	1718-1
1012-4	6078-3	1743-2	3245-2	5050-2	7136-2	9485-2	1304-1	1606-1	1931-1	2281-1
1768-4	7673-3	2199-2	4092-2	6367-2	8990-2	1194-1	1639-1	2016-1	2423-1	2857-1
2789-4	9183-3	2635-2	4907-2	7642-2	1080-1	1435-1	1970-1	2422-1	2909-1	3429-1
4100-4	1018-2	2924-2	5450-2	8490-2	1200-1	1595-1	2194-1	2700-1	3246-1	3830-1
5724-4	1070-2	3072-2	5727-2	8926-2	1263-1	1680-1	2315-1	2853-1	3434-1	4057-1
7684-4	1100-2	3160-2	5896-2	9200-2	1303-1	1735-1	2396-1	2954-1	3559-1	4208-1
1000-3	1108-2	3186-2	5947-2	9282-2	1315-1	1753-1	2423-1	2992-1	3607-1	4268-1
HUP	1100-3	1200-3	1300-3	1400-3	1500-3	1600-3	1700-3	1800-3	1900-3	2000-3
FDROP	2795-4	2996-4	3194-4	3389-4	3577-4	3761-4	3940-4	4115-4	4286-4	4453-4

PFD	Flows for HUP and Proportion of FDROP									
3162-6	3529-2	4033-2	4930-2	5535-2	6145-2	6792-2	7506-2	8548-2	9382-2	1026-1
1789-5	1310-1	1503-1	1701-1	1909-1	2128-1	2357-1	2598-1	2845-1	3101-1	3367-1
4930-5	1998-1	2288-1	2585-1	2893-1	3214-1	3548-1	3896-1	4259-1	4638-1	5026-1
1012-4	2653-1	3037-1	3431-1	3840-1	4265-1	4709-1	5169-1	5646-1	6140-1	6650-1
1768-4	3319-1	3794-1	4281-1	4786-1	5310-1	5855-1	6418-1	7000-1	7600-1	8218-1
2789-4	3982-1	4549-1	5129-1	5730-1	6352-1	6998-1	7665-1	8355-1	9065-1	9796-1
4100-4	4451-1	5089-1	5741-1	6417-1	7118-1	7842-1	8590-1	9362-1	1016+0	1097+0
5724-4	4720-1	5402-1	6100-1	6822-1	7571-1	8347-1	9148-1	9975-1	1083+0	1170+0
7684-4	4897-1	5606-1	6331-1	7081-1	7860-1	8668-1	9502-1	1036+0	1125+0	1216+0
1000-3	4974-1	5701-1	6445-1	7217-1	8019-1	8851-1	9713-1	1060+0	1152+0	1247+0
HUP	2100-3	2200-3	2300-3	2400-3	2500-3	2600-3	2700-3	2800-3	2900-3	3000-3
FDROP	4616-4	4776-4	4930-4	5083-4	5233-4	5380-4	5524-4	5666-4	5805-4	5941-4

PFD	Flows for HUP and Proportion of FDROP									
3162-6	1135-1	1224-1	1322-1	1419-1	1522-1	1636-1	1760-1	2071-1	2231-1	2396-1
1789-5	3644-1	3934-1	4235-1	4554-1	4899-1	5249-1	5604-1	5974-1	6340-1	6723-1
4930-5	5431-1	5848-1	6279-1	6722-1	7181-1	7653-1	8135-1	8631-1	9142-1	9671-1
1012-4	7180-1	7719-1	8272-1	8843-1	9428-1	1003+0	1065+0	1129+0	1194+0	1260+0
1768-4	8855-1	9511-1	1018+0	1088+0	1159+0	1231+0	1305+0	1381+0	1459+0	1538+0
2789-4	1055+0	1132+0	1211+0	1292+0	1375+0	1460+0	1547+0	1635+0	1726+0	1819+0
4100-4	1181+0	1267+0	1356+0	1446+0	1538+0	1633+0	1730+0	1828+0	1929+0	2032+0
5724-4	1260+0	1353+0	1447+0	1544+0	1643+0	1745+0	1848+0	1954+0	2062+0	2172+0
7684-4	1309+0	1405+0	1504+0	1604+0	1707+0	1812+0	1920+0	2029+0	2141+0	2255+0
1000-3	1344+0	1444+0	1546+0	1651+0	1759+0	1869+0	1981+0	2096+0	2214+0	2333+0
HUP	3250-3	3500-3	3750-3	4000-3	4400-3	5000-3	5700-3	6000-3	7000-3	8000-3
FDROP	6269-4	6586-4	6891-4	7184-4	7627-4	8253-4	8919-4	9191-4	1004-3	1079-3

PFD	Flows for HUP and Proportion of FDROP									
3162-6	2978-1	3476-1	3945-1	4629-1	6045-1	8578-1	1189+0	1399+0	2138+0	2920+0
1789-5	7724-1	8804-1	1001+0	1127+0	1359+0	1726+0	2212+0	2452+0	3293+0	4275+0
4930-5	1110+0	1256+0	1413+0	1578+0	1854+0	2317+0	2919+0	3194+0	4217+0	5414+0
1012-4	1432+0	1613+0	1804+0	2003+0	2342+0	2897+0	3617+0	3950+0	5166+0	6543+0
1768-4	1743+0	1959+0	2186+0	2423+0	2824+0	3479+0	4317+0	4700+0	6096+0	7661+0
2789-4	2059+0	2310+0	2572+0	2845+0	3304+0	4048+0	4994+0	5426+0	6979+0	8694+0
4100-4	2297+0	2575+0	2865+0	3166+0	3673+0	4487+0	5518+0	5985+0	7653+0	9481+0
5724-4	2456+0	2752+0	3060+0	3381+0	3917+0	4779+0	5864+0	6357+0	8105+0	1002+1
7684-4	2550+0	2858+0	3178+0	3511+0	4070+0	4965+0	6093+0	6602+0	8412+0	1039+1
1000-3	2643+0	2966+0	3304+0	3655+0	4244+0	5189+0	6381+0	6920+0	8836+0	1093+1
HUP	9000-3	1000-2								
FDROP	1146-3	1210-3								

PFD	Flows for HUP and Proportion of FDROP	
3162-6	3840+0	5026+0
1789-5	5484+0	6899+0
4930-5	6788+0	8312+0
1012-4	8093+0	9823+0
1768-4	9399+0	1131+1
2789-4	1057+1	1261+1
4100-4	1147+1	1362+1
5724-4	1209+1	1431+1
7684-4	1252+1	1480+1
1000-3	1319+1	1561+1

; Flow defining minimum head= 0.200

TABID= 1245

```

TYPE= -13 HDATUM= 697.700 CHANRAT zrhufd= 0.0000
LABEL= LEFT CHANRAT AT PEDESTRIAN BRIDGE OVERFLOW
NHUP= 17
NPFDP= 10
HUP 1000-4 2000-4 3000-4 4000-4 5000-4 1000-3 1250-3 1500-3 1750-3 2000-3
FDROP 9240-5 1802-4 2678-4 3554-4 4430-4 8663-4 1076-3 1284-3 1491-3 1698-3
PFD Flows for HUP and Proportion of FDROP
3162-6 1953-8 1953-7 6297-7 1392-6 2538-6 2225-5 4204-5 7260-5 1136-4 1660-4
1789-5 4541-8 4569-7 1475-6 3262-6 5951-6 5210-5 9852-5 1700-4 2662-4 3892-4
4930-5 7181-8 7320-7 2371-6 5250-6 9585-6 8369-5 1585-4 2730-4 4281-4 6264-4
1012-4 9501-8 9894-7 3220-6 7147-6 1307-5 1136-4 2157-4 3705-4 5820-4 8527-4
1768-4 1121-7 1202-6 3941-6 8774-6 1607-5 1389-4 2645-4 4526-4 7130-4 1047-3
2789-4 1224-7 1352-6 4471-6 9993-6 1834-5 1573-4 3010-4 5135-4 8100-4 1192-3
4100-4 1291-7 1434-6 4787-6 1075-5 1977-5 1682-4 3233-4 5518-4 8693-4 1282-3
5724-4 1324-7 1463-6 4919-6 1108-5 2044-5 1726-4 3332-4 5695-4 8975-4 1324-3
7684-4 1334-7 1468-6 4947-6 1117-5 2061-5 1738-4 3355-4 5741-4 9053-4 1336-3
1000-3 1338-7 1468-6 4948-6 1117-5 2062-5 1739-4 3358-4 5745-4 9063-4 1337-3
HUP 2500-3 3000-3 3500-3 4000-3 5000-3 6000-3 7000-3
FDROP 2108-3 2515-3 2913-3 3308-3 4097-3 4968-3 5882-3
PFD Flows for HUP and Proportion of FDROP
3162-6 3181-4 5454-4 8739-4 1289-3 2140-3 2357-3 2564-3
1789-5 7455-4 1276-3 2047-3 3021-3 5090-3 5605-3 6099-3
4930-5 1199-3 2046-3 3287-3 4862-3 8449-3 9305-3 1012-2
1012-4 1631-3 2770-3 4460-3 6619-3 1207-2 1333-2 1450-2
1768-4 2001-3 3393-3 5450-3 8123-3 1518-2 1762-2 1917-2
2789-4 2277-3 3866-3 6174-3 9238-3 1743-2 2212-2 2407-2
4100-4 2452-3 4163-3 6634-3 9915-3 1885-2 2533-2 2917-2
5724-4 2534-3 4306-3 6857-3 1025-2 1952-2 2679-2 3218-2
7684-4 2559-3 4349-3 6926-3 1035-2 1972-2 2721-2 3291-2
1000-3 2561-3 4353-3 6935-3 1036-2 1975-2 2725-2 3309-2
; Flow defining minimum head= 0.200

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TABID= 1246
TYPE= -13 HDATUM= 697.700 CHANRAT zrhufd= 0.0000
LABEL= RIGHT CHANRAT AT PEDESTRIAN BRIDGE OVERFLOW
NHUP= 19
NPFDP= 10
HUP 1000-4 2000-4 3000-4 4000-4 5000-4 1000-3 1250-3 1500-3 1750-3 2000-3
FDROP 9226-5 1787-4 2649-4 3511-4 4373-4 8651-4 1071-3 1275-3 1479-3 1679-3
PFD Flows for HUP and Proportion of FDROP
3162-6 1180-8 1315-7 4341-7 9694-7 1778-6 1285-5 2599-5 4492-5 7204-5 1104-4
1789-5 2738-8 3075-7 1017-6 2272-6 4169-6 3002-5 6082-5 1052-4 1684-4 2584-4
4930-5 4312-8 4923-7 1634-6 3657-6 6716-6 4798-5 9753-5 1690-4 2694-4 4142-4
1012-4 5665-8 6645-7 2218-6 4978-6 9155-6 6460-5 1320-4 2294-4 3638-4 5601-4
1768-4 6620-8 8059-7 2713-6 6110-6 1126-5 7807-5 1606-4 2804-4 4444-4 6812-4
2789-4 7161-8 9041-7 3075-6 6957-6 1286-5 8765-5 1809-4 3176-4 5046-4 7684-4
4100-4 7508-8 9568-7 3289-6 7480-6 1386-5 9399-5 1924-4 3395-4 5411-4 8228-4
5724-4 7683-8 9746-7 3378-6 7713-6 1433-5 9721-5 1976-4 3485-4 5571-4 8476-4
7684-4 7736-8 9770-7 3396-6 7770-6 1445-5 9822-5 1994-4 3512-4 5612-4 8540-4
1000-3 7741-8 9772-7 3397-6 7773-6 1446-5 9833-5 1995-4 3516-4 5616-4 8553-4
HUP 2500-3 3000-3 3500-3 4000-3 4500-3 5300-3 6000-3 7000-3 8000-3
FDROP 2076-3 2466-3 2850-3 3232-3 3612-3 4195-3 4682-3 5349-3 6085-3
PFD Flows for HUP and Proportion of FDROP
3162-6 2181-4 3950-4 6365-4 9485-4 1389-3 2473-3 3895-3 6844-3 7491-3
1789-5 5108-4 9242-4 1491-3 2223-3 3244-3 5767-3 9100-3 1599-2 1782-2
4930-5 8209-4 1482-3 2395-3 3576-3 5175-3 9205-3 1454-2 2558-2 2957-2
1012-4 1115-3 2005-3 3251-3 4865-3 6976-3 1242-2 1957-2 3445-2 4237-2
1768-4 1364-3 2440-3 3975-3 5968-3 8536-3 1506-2 2364-2 4168-2 5582-2
2789-4 1546-3 2755-3 4503-3 6789-3 9720-3 1692-2 2652-2 4678-2 6585-2
4100-4 1655-3 2951-3 4817-3 7290-3 1046-2 1810-2 2820-2 4970-2 7140-2
5724-4 1704-3 3038-3 4965-3 7517-3 1080-2 1867-2 2902-2 5100-2 7377-2
7684-4 1718-3 3065-3 5007-3 7584-3 1091-2 1885-2 2929-2 5145-2 7443-2
1000-3 1719-3 3067-3 5012-3 7592-3 1092-2 1887-2 2932-2 5149-2 7453-2

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* Created by program: fequtl
 * Version: 5.99 Version date: 13 July 2010 Date/time of run: 2024/07/29: 12.27.40.561

; Source code repository location and revision are:
 ; URL: http://www.iqdotdt.com/svn/usf/trunk/fequtl/fequtl.for
 ; Rev: 1074

; Report on executable:
 ; Operating system is: MS Windows
 ; Compiler used was: Lahey F95-V 5.70f
 ; Solution precision: Single
 ; Prefetch option used was: No longer applicable.

TABID= 1240
 TYPE= -13 HDATE= 690.000 CULVERT zrhufd= 0.0000
 LABEL=MAPLE GROVE FPD PROPOSED 75 SPAN PEDESTRIAN BRIDGE

NHUP= 26
 NPF= 10
 HUP 5000-4 7500-4 1000-3 1250-3 1500-3 1750-3 2000-3 2500-3 3000-3 3500-3
 FDROP 3282-4 5459-4 6458-4 7135-4 7667-4 8261-4 8947-4 1012-3 1117-3 1201-3

PFID Flows for HUP and Proportion of FDROP
 3162-6 2305-3 5338-3 9324-3 1313-2 1775-2 2330-2 2959-2 4400-2 6200-2 7884-2
 1789-5 5760-3 1297-2 2167-2 3143-2 4258-2 5532-2 7004-2 1041-1 1460-1 1869-1
 4930-5 9351-3 2125-2 3521-2 5145-2 6955-2 9089-2 1152-1 1708-1 2393-1 3074-1
 1012-4 1299-2 2930-2 4871-2 7167-2 9729-2 1271-1 1612-1 2390-1 3340-1 4318-1
 1768-4 1639-2 3672-2 6120-2 9063-2 1240-1 1621-1 2055-1 3050-1 4253-1 5547-1
 2789-4 1932-2 4289-2 7186-2 1069-1 1473-1 1938-1 2459-1 3646-1 5087-1 6701-1
 4100-4 2161-2 4737-2 7998-2 1196-1 1659-1 2195-1 2797-1 4150-1 5788-1 7707-1
 5724-4 2310-2 4994-2 8524-2 1284-1 1791-1 2379-1 3039-1 4545-1 6338-1 8425-1
 7684-4 2374-2 5110-2 8765-2 1333-1 1870-1 2492-1 3190-1 4788-1 6688-1 8877-1
 1000-3 2437-2 5196-2 8853-2 1349-1 1899-1 2535-1 3246-1 4876-1 6821-1 9079-1

HUP 4000-3 4500-3 5000-3 5500-3 6000-3 6225-3 6500-3 7000-3 7500-3 8000-3
 FDROP 1338-3 1497-3 1745-3 1940-3 2151-3 2264-3 2413-3 2698-3 3001-3 3318-3

PFID Flows for HUP and Proportion of FDROP
 3162-6 9503-2 1061-1 1188-1 1280-1 1367-1 1409-1 1462-1 1555-1 1645-1 1732-1
 1789-5 2244-1 2504-1 2809-1 3026-1 3238-1 3341-1 3467-1 3692-1 3908-1 4117-1
 4930-5 3692-1 4128-1 4626-1 5005-1 5364-1 5537-1 5749-1 6127-1 6490-1 6840-1
 1012-4 5185-1 5861-1 6555-1 7115-1 7641-1 7892-1 8202-1 8751-1 9281-1 9789-1
 1768-4 6668-1 7500-1 8515-1 9283-1 1001+0 1035+0 1078+0 1152+0 1224+0 1293+0
 2789-4 8058-1 9352-1 1042+0 1144+0 1239+0 1284+0 1340+0 1437+0 1531+0 1621+0
 4100-4 9275-1 1110+0 1218+0 1342+0 1467+0 1524+0 1595+0 1719+0 1839+0 1953+0
 5724-4 1025+0 1225+0 1355+0 1515+0 1666+0 1738+0 1824+0 1979+0 2128+0 2272+0
 7684-4 1092+0 1289+0 1438+0 1632+0 1814+0 1895+0 1995+0 2180+0 2358+0 2534+0
 1000-3 1111+0 1313+0 1469+0 1666+0 1860+0 1954+0 2067+0 2266+0 2459+0 2648+0

HUP 8500-3 9000-3 9500-3 1000-2 1050-2 1100-2
 FDROP 3649-3 3992-3 4344-3 4703-3 5068-3 5440-3

PFID Flows for HUP and Proportion of FDROP
 3162-6 1817-1 1899-1 1978-1 2055-1 2130-1 2203-1
 1789-5 4319-1 4516-1 4707-1 4891-1 5070-1 5244-1
 4930-5 7168-1 7496-1 7814-1 8121-1 8419-1 8709-1
 1012-4 1028+0 1075+0 1121+0 1166+0 1209+0 1251+0
 1768-4 1360+0 1424+0 1485+0 1545+0 1603+0 1659+0
 2789-4 1708+0 1791+0 1870+0 1947+0 2021+0 2092+0
 4100-4 2064+0 2169+0 2271+0 2368+0 2460+0 2550+0
 5724-4 2411+0 2544+0 2673+0 2796+0 2913+0 3027+0
 7684-4 2704+0 2869+0 3029+0 3184+0 3333+0 3479+0
 1000-3 2837+0 3022+0 3201+0 3377+0 3550+0 3720+0

; Flow defining minimum head= 0.200

TABID= 1244
 TYPE= -13 HDATE= 697.900 EMBANKQ zrhufd= 0.0000
 LABEL= BLODGETT CONDUIT OVERFLOW INTO DEPRESSION IN DOWN

NHUP= 42
 NPF= 10
 HUP 1000-4 2000-4 3000-4 4000-4 5000-4 6000-4 7000-4 8000-4 9000-4 1000-3
 FDROP 2993-5 5953-5 8860-5 1171-4 1448-4 1719-4 1983-4 2240-4 2489-4 2732-4

PFD		Flows for HUP and Proportion of FDROP								
3162-6	8397-4	2403-3	4459-3	6913-3	9725-3	1287-2	1628-2	1999-2	2396-2	2815-2
1789-5	2972-3	8529-3	1590-2	2477-2	3506-2	4667-2	5944-2	7345-2	8861-2	1048-1
4930-5	4567-3	1311-2	2443-2	3806-2	5383-2	7161-2	9117-2	1126-1	1357-1	1604-1
1012-4	6080-3	1745-2	3251-2	5063-2	7158-2	9519-2	1211-1	1495-1	1801-1	2128-1
1768-4	7676-3	2202-2	4101-2	6386-2	9025-2	1200-1	1526-1	1882-1	2267-1	2676-1
2789-4	9185-3	2636-2	4914-2	7656-2	1083-1	1440-1	1832-1	2260-1	2722-1	3212-1
4100-4	1018-2	2925-2	5454-2	8502-2	1203-1	1599-1	2035-1	2511-1	3025-1	3572-1
5724-4	1070-2	3073-2	5731-2	8934-2	1264-1	1682-1	2142-1	2644-1	3188-1	3766-1
7684-4	1100-2	3160-2	5896-2	9198-2	1303-1	1735-1	2211-1	2731-1	3295-1	3895-1
1000-3	1108-2	3185-2	5945-2	9277-2	1314-1	1751-1	2232-1	2759-1	3331-1	3939-1
HUP	1100-3	1200-3	1300-3	1400-3	1500-3	1600-3	1700-3	1800-3	1900-3	2000-3
FDROP	2968-4	3197-4	3421-4	3638-4	3849-4	4055-4	4255-4	4453-4	4666-4	4857-4

PFD		Flows for HUP and Proportion of FDROP								
3162-6	3260-2	3856-2	4360-2	4888-2	5442-2	6476-2	7136-2	7837-2	8534-2	9284-2
1789-5	1221-1	1405-1	1598-1	1801-1	2016-1	2240-1	2475-1	2720-1	2958-1	3220-1
4930-5	1868-1	2148-1	2438-1	2745-1	3067-1	3401-1	3749-1	4110-1	4462-1	4845-1
1012-4	2476-1	2845-1	3230-1	3635-1	4060-1	4501-1	4962-1	5440-1	5904-1	6408-1
1768-4	3112-1	3574-1	4055-1	4560-1	5089-1	5636-1	6207-1	6800-1	7377-1	8002-1
2789-4	3734-1	4286-1	4861-1	5463-1	6094-1	6745-1	7424-1	8126-1	8809-1	9548-1
4100-4	4154-1	4771-1	5412-1	6084-1	6788-1	7516-1	8273-1	9057-1	9816-1	1064+0
5724-4	4383-1	5038-1	5718-1	6432-1	7180-1	7954-1	8760-1	9594-1	1040+0	1127+0
7684-4	4535-1	5214-1	5921-1	6664-1	7442-1	8246-1	9083-1	9949-1	1078+0	1169+0
1000-3	4590-1	5280-1	5999-1	6756-1	7549-1	8370-1	9227-1	1011+0	1097+0	1190+0
HUP	2100-3	2200-3	2300-3	2400-3	2500-3	2600-3	2700-3	2800-3	2900-3	3000-3
FDROP	5043-4	5224-4	5399-4	5570-4	5737-4	5898-4	6055-4	6207-4	6354-4	6496-4

PFD		Flows for HUP and Proportion of FDROP								
3162-6	1006-1	1126-1	1213-1	1306-1	1411-1	1522-1	1648-1	1757-1	1880-1	2000-1
1789-5	3494-1	3780-1	4077-1	4382-1	4697-1	5024-1	5364-1	5719-1	6090-1	6481-1
4930-5	5242-1	5654-1	6080-1	6520-1	6976-1	7450-1	7945-1	8452-1	8981-1	9523-1
1012-4	6931-1	7473-1	8033-1	8615-1	9215-1	9836-1	1047+0	1112+0	1179+0	1249+0
1768-4	8649-1	9315-1	1000+0	1071+0	1144+0	1219+0	1296+0	1376+0	1457+0	1541+0
2789-4	1031+0	1110+0	1191+0	1274+0	1360+0	1448+0	1538+0	1630+0	1725+0	1823+0
4100-4	1149+0	1237+0	1327+0	1419+0	1514+0	1612+0	1712+0	1815+0	1920+0	2028+0
5724-4	1218+0	1311+0	1407+0	1506+0	1607+0	1711+0	1818+0	1927+0	2039+0	2154+0
7684-4	1263+0	1360+0	1459+0	1562+0	1667+0	1775+0	1886+0	2000+0	2116+0	2235+0
1000-3	1286+0	1386+0	1488+0	1594+0	1702+0	1814+0	1929+0	2046+0	2167+0	2291+0
HUP	3250-3	3500-3	3750-3	4000-3	4400-3	5000-3	5700-3	6000-3	7000-3	8000-3
FDROP	6825-4	7155-4	7486-4	7823-4	8334-4	9061-4	9840-4	1016-3	1116-3	1205-3

PFD		Flows for HUP and Proportion of FDROP								
3162-6	2510-1	3128-1	3633-1	4219-1	5286-1	7378-1	1125+0	1268+0	1985+0	2778+0
1789-5	7527-1	8637-1	9806-1	1102+0	1316+0	1688+0	2164+0	2388+0	3240+0	4195+0
4930-5	1096+0	1246+0	1405+0	1571+0	1848+0	2308+0	2910+0	3187+0	4208+0	5394+0
1012-4	1431+0	1621+0	1816+0	2017+0	2359+0	2918+0	3645+0	3977+0	5188+0	6569+0
1768-4	1758+0	1983+0	2216+0	2458+0	2866+0	3529+0	4378+0	4767+0	6176+0	7753+0
2789-4	2076+0	2338+0	2608+0	2886+0	3353+0	4107+0	5068+0	5505+0	7075+0	8806+0
4100-4	2307+0	2596+0	2893+0	3197+0	3708+0	4531+0	5570+0	6040+0	7721+0	9563+0
5724-4	2453+0	2760+0	3076+0	3399+0	3941+0	4810+0	5902+0	6397+0	8156+0	1008+1
7684-4	2545+0	2863+0	3190+0	3524+0	4085+0	4982+0	6113+0	6624+0	8441+0	1042+1
1000-3	2614+0	2946+0	3287+0	3636+0	4221+0	5160+0	6344+0	6879+0	8782+0	1086+1
HUP	9000-3	1000-2								
FDROP	1289-3	1364-3								

PFD		Flows for HUP and Proportion of FDROP	
3162-6	3664+0	4682+0	
1789-5	5314+0	6685+0	
4930-5	6755+0	8239+0	
1012-4	8113+0	9824+0	
1768-4	9498+0	1141+1	
2789-4	1070+1	1275+1	
4100-4	1156+1	1372+1	
5724-4	1216+1	1439+1	
7684-4	1256+1	1486+1	
1000-3	1310+1	1550+1	

; Flow defining minimum head= 0.200

TABID= 1245

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TYPE= -13 HDATUM= 697.900 CHANRAT zrhufd= 0.0000
LABEL= LEFT CHANRAT AT PEDESTRIAN BRIDGE OVERFLOW
NHUP= 20
NPFDD= 10
HUP 1000-4 2000-4 3000-4 4000-4 5000-4 1000-3 1250-3 1500-3 1750-3 2000-3
FDROP 9253-5 1815-4 2703-4 3579-4 4443-4 8750-4 1090-3 1304-3 1517-3 1730-3
PFD Flows for HUP and Proportion of FDROP
3162-6 2964-8 2667-7 8391-7 2121-6 4201-6 2986-5 5564-5 9198-5 1397-4 2025-4
1789-5 6905-8 6242-7 1966-6 4956-6 9830-6 7001-5 1304-4 2157-4 3277-4 4746-4
4930-5 1096-7 1001-6 3161-6 7924-6 1576-5 1127-4 2098-4 3472-4 5279-4 7637-4
1012-4 1460-7 1355-6 4296-6 1067-5 2132-5 1536-4 2854-4 4731-4 7199-4 1039-3
1768-4 1738-7 1650-6 5262-6 1291-5 2594-5 1888-4 3501-4 5814-4 8859-4 1277-3
2789-4 1916-7 1861-6 5976-6 1444-5 2921-5 2153-4 3990-4 6631-4 1012-3 1459-3
4100-4 2031-7 1979-6 6405-6 1536-5 3104-5 2319-4 4302-4 7144-4 1092-3 1575-3
5724-4 2088-7 2024-6 6589-6 1578-5 3179-5 2395-4 4450-4 7392-4 1130-3 1632-3
7684-4 2106-7 2031-6 6629-6 1589-5 3199-5 2414-4 4491-4 7465-4 1142-3 1648-3
1000-3 2107-7 2032-6 6631-6 1590-5 3200-5 2416-4 4494-4 7472-4 1143-3 1650-3
HUP 2500-3 3000-3 3500-3 4000-3 5000-3 6000-3 7000-3 8000-3 9000-3 1000-2
FDROP 2152-3 2565-3 2972-3 3377-3 4195-3 5090-3 6016-3 6958-3 7906-3 8860-3
PFD Flows for HUP and Proportion of FDROP
3162-6 3737-4 6380-4 9965-4 1454-3 2145-3 2362-3 2568-3 2762-3 2944-3 3117-3
1789-5 8763-4 1494-3 2336-3 3403-3 5101-3 5618-3 6108-3 6568-3 7002-3 7412-3
4930-5 1412-3 2399-3 3759-3 5466-3 8467-3 9326-3 1014-2 1090-2 1162-2 1230-2
1012-4 1925-3 3255-3 5112-3 7445-3 1213-2 1336-2 1453-2 1562-2 1665-2 1763-2
1768-4 2368-3 3977-3 6265-3 9151-3 1581-2 1766-2 1920-2 2064-2 2200-2 2329-2
2789-4 2704-3 4526-3 7118-3 1044-2 1848-2 2217-2 2411-2 2592-2 2763-2 2925-2
4100-4 2918-3 4881-3 7649-3 1124-2 2013-2 2596-2 2923-2 3143-2 3350-2 3546-2
5724-4 3024-3 5055-3 7914-3 1162-2 2092-2 2765-2 3273-2 3668-2 3957-2 4189-2
7684-4 3056-3 5109-3 7998-3 1174-2 2116-2 2813-2 3367-2 3839-2 4253-2 4625-2
1000-3 3060-3 5115-3 8007-3 1175-2 2119-2 2819-2 3377-2 3854-2 4278-2 4664-2
; Flow defining minimum head= 0.200

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TABID= 1246
TYPE= -13 HDATUM= 697.900 CHANRAT zrhufd= 0.0000
LABEL= RIGHT CHANRAT AT PEDESTRIAN BRIDGE OVERFLOW
NHUP= 19
NPFDD= 10
HUP 1000-4 2000-4 3000-4 4000-4 5000-4 1000-3 1250-3 1500-3 1750-3 2000-3
FDROP 9230-5 1791-4 2657-4 3523-4 4389-4 8650-4 1071-3 1277-3 1479-3 1679-3
PFD Flows for HUP and Proportion of FDROP
3162-6 1310-8 1417-7 4648-7 1035-6 1896-6 1474-5 2913-5 5044-5 8322-5 1261-4
1789-5 3041-8 3313-7 1089-6 2426-6 4445-6 3447-5 6821-5 1178-4 1946-4 2951-4
4930-5 4793-8 5306-7 1749-6 3905-6 7160-6 5520-5 1095-4 1884-4 3118-4 4734-4
1012-4 6310-8 7164-7 2375-6 5315-6 9759-6 7452-5 1484-4 2552-4 4212-4 6414-4
1768-4 7393-8 8693-7 2906-6 6524-6 1200-5 9041-5 1811-4 3122-4 5115-4 7819-4
2789-4 8019-8 9758-7 3294-6 7429-6 1370-5 1015-4 2048-4 3543-4 5762-4 8829-4
4100-4 8420-8 1033-6 3525-6 7987-6 1477-5 1078-4 2184-4 3797-4 6165-4 9418-4
5724-4 8623-8 1053-6 3620-6 8237-6 1527-5 1110-4 2240-4 3905-4 6345-4 9693-4
7684-4 8684-8 1056-6 3640-6 8298-6 1540-5 1120-4 2258-4 3932-4 6393-4 9767-4
1000-3 8690-8 1056-6 3640-6 8301-6 1541-5 1121-4 2260-4 3936-4 6397-4 9775-4
HUP 2500-3 3000-3 3500-3 4000-3 4500-3 5300-3 6000-3 7000-3 8000-3
FDROP 2076-3 2466-3 2853-3 3239-3 3619-3 4205-3 4696-3 5376-3 6152-3
PFD Flows for HUP and Proportion of FDROP
3162-6 2517-4 4452-4 7061-4 1041-3 1559-3 2759-3 4286-3 6988-3 7476-3
1789-5 5887-4 1042-3 1655-3 2441-3 3643-3 6441-3 1000-2 1662-2 1778-2
4930-5 9431-4 1674-3 2662-3 3930-3 5823-3 1028-2 1599-2 2729-2 2952-2
1012-4 1274-3 2270-3 3620-3 5355-3 7840-3 1381-2 2156-2 3716-2 4228-2
1768-4 1554-3 2772-3 4438-3 6582-3 9521-3 1676-2 2613-2 4523-2 5588-2
2789-4 1762-3 3137-3 5045-3 7508-3 1081-2 1886-2 2934-2 5091-2 6756-2
4100-4 1888-3 3358-3 5413-3 8086-3 1164-2 2013-2 3123-2 5420-2 7400-2
5724-4 1943-3 3461-3 5581-3 8352-3 1204-2 2078-2 3212-2 5566-2 7672-2
7684-4 1959-3 3489-3 5630-3 8430-3 1216-2 2098-2 3242-2 5614-2 7749-2
1000-3 1961-3 3492-3 5635-3 8439-3 1217-2 2100-2 3246-2 5620-2 7760-2

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Appendix 2

Comparison of Results from the Baseline and Proposed FEQ Hydraulic Models

The key to the different columns is as follows:

- Column marked as EBSJ_EX.PEK (1S) represents the peak water surface elevations from the baseline conditions simulation.
- Column marked as EBSJ_EX.PEK (1F) represents the peak water flow rates from the baseline conditions simulation.
- Column marked as EBSJ_P75.PEK (2S) represents the peak water surface elevations from the proposed conditions FEQ hydraulic model simulation.
- Column marked as EBSJ_P75.PEK (2F) represents the peak water flow rates from the proposed conditions FEQ hydraulic model simulation.
- Column marked as 2-1 (S) represents the difference between the proposed conditions and baseline conditions peak water surface elevations.
- Column marked as 2-1 (F) represents the percent difference between the proposed conditions and baseline conditions peak flow rates.

Maple Grove Forest Preserve Pedestrian Bridge Replacement (CBBEL Project Number 23-0312)
 Comparison of Peak Water Surface Elevations (S) and Flow Rates (F)

at

U22 594

1. Branch# 22; Node ID: JACQULIN; Station: 20354.0000

Nodes ==>	(1) EBSJ_EX.PEK 2202		(2) EBSJ_P75.PEK 2202		2-1	2-1
	(S)	(F)	(S)	(F)	(S)	(F)
1925/01/02	691.24	13.00	691.24	13.00	0.00	-0.01
1949/06/21	695.95	444.97	695.93	444.96	-0.02	0.00
1949/07/27	695.25	300.75	695.24	300.84	-0.01	0.03
1949/12/31	695.07	274.33	695.06	274.36	-0.01	0.01
1950/01/31	694.87	247.83	694.86	247.87	-0.01	0.02
1950/05/03	695.59	359.90	695.58	359.76	-0.01	-0.04
1950/06/11	695.27	304.75	695.26	304.96	-0.01	0.07
1951/03/09	694.86	245.91	694.85	245.94	-0.01	0.01
1951/05/17	694.73	231.53	694.72	231.55	-0.01	0.01
1951/07/29	695.21	294.04	695.20	294.14	-0.01	0.03
1952/01/25	695.18	288.14	695.17	288.21	-0.01	0.02
1952/03/28	694.07	164.10	694.07	164.10	-0.01	0.00
1953/03/23	694.58	214.62	694.58	214.62	-0.01	0.00
1953/06/16	695.05	276.02	695.04	276.19	0.00	0.06
1953/07/28	696.92	674.72	696.87	675.26	-0.05	0.08
1954/04/05	696.79	565.44	696.73	565.88	-0.06	0.08
1954/05/08	695.21	293.95	695.20	294.09	-0.01	0.05
1954/08/29	695.29	310.49	695.28	310.29	-0.01	-0.06
1954/10/25	696.40	510.19	696.36	510.74	-0.04	0.11
1955/03/09	693.32	107.01	693.32	107.01	-0.01	0.00
1956/05/18	694.72	232.74	694.71	232.81	-0.01	0.03
1957/01/27	693.97	155.78	693.96	155.79	-0.01	0.01
1957/03/04	695.49	339.95	695.48	340.00	-0.01	0.01
1957/07/28	698.43	850.67	698.36	848.43	-0.07	-0.26
1958/04/30	695.52	352.28	695.52	352.41	-0.01	0.04
1958/06/19	695.01	268.55	695.01	268.61	-0.01	0.02
1958/07/11	694.27	184.33	694.27	184.34	-0.01	0.01
1959/04/07	693.45	116.95	693.45	116.95	-0.01	0.00
1959/07/27	692.96	85.56	692.96	85.57	0.00	0.01
1960/01/21	694.73	233.86	694.72	233.93	-0.01	0.03
1960/04/04	693.03	88.81	693.02	88.81	0.00	0.00
1961/08/09	694.98	264.38	694.97	264.47	-0.01	0.03
1961/10/06	696.34	493.28	696.31	493.49	-0.04	0.04
1962/04/15	693.36	110.17	693.36	110.17	-0.01	0.00
1962/07/08	695.45	339.10	695.44	339.24	-0.01	0.04
1963/05/07	694.31	186.87	694.30	186.88	-0.01	0.01
1964/04/12	693.76	138.80	693.75	138.81	-0.01	0.01
1964/07/25	695.22	300.21	695.21	300.42	-0.01	0.07
1965/03/22	694.22	177.76	694.22	177.76	-0.01	0.00
1966/02/15	694.09	166.38	694.08	166.40	-0.01	0.01
1966/05/18	694.83	242.48	694.82	242.49	-0.01	0.00
1967/04/09	693.90	149.31	693.89	149.31	-0.01	0.00
1967/07/01	695.49	341.18	695.48	341.21	-0.01	0.01
1968/08/24	695.55	353.95	695.54	353.77	-0.01	-0.05
1969/04/13	693.87	148.19	693.86	148.20	-0.01	0.01
1969/06/15	694.36	192.14	694.35	192.15	-0.01	0.01
1969/08/01	693.37	111.04	693.36	111.04	-0.01	0.00
1969/10/25	696.31	504.26	696.28	504.57	-0.03	0.06
1970/05/20	694.34	193.05	694.33	193.09	-0.01	0.02
1970/12/18	693.80	141.84	693.80	141.84	-0.01	0.00
1971/03/04	693.35	110.03	693.35	110.03	-0.01	0.00
1971/08/28	695.12	282.13	695.11	282.18	-0.01	0.02
1972/03/21	694.67	224.59	694.66	224.63	-0.01	0.02

1972/04/27	695.67	375.41	695.66	375.44	-0.01	0.01
1972/09/01	696.79	600.69	696.75	601.50	-0.05	0.13
1972/10/05	695.35	317.56	695.34	317.62	-0.01	0.02
1973/01/08	695.53	344.45	695.52	344.46	-0.01	0.00
1973/05/08	694.67	225.98	694.66	226.05	-0.01	0.03
1974/02/28	694.64	220.50	694.63	220.53	-0.01	0.01
1974/04/21	694.24	179.30	694.23	179.30	-0.01	0.00
1974/05/25	694.04	162.91	694.04	162.92	-0.01	0.01
1975/01/16	693.84	144.95	693.84	144.95	-0.01	0.00
1975/05/05	695.07	277.21	695.07	277.36	-0.01	0.05
1975/09/08	695.22	297.21	695.22	297.29	-0.01	0.03
1976/03/21	694.91	255.34	694.91	255.47	-0.01	0.05
1977/07/05	694.74	235.55	694.74	235.62	-0.01	0.03
1977/08/13	694.12	169.78	694.12	169.79	-0.01	0.01
1977/09/07	694.29	187.95	694.28	188.00	-0.01	0.03
1978/04/02	692.72	71.20	692.71	71.20	0.00	0.00
1978/05/21	693.87	148.11	693.86	148.11	-0.01	0.00
1978/07/09	694.27	182.55	694.26	182.55	-0.01	0.00
1978/09/25	695.49	347.77	695.49	347.94	-0.01	0.05
1979/04/18	695.38	317.26	695.37	317.26	-0.01	0.00
1979/09/05	694.90	252.16	694.89	252.24	-0.01	0.03
1980/01/21	692.70	70.41	692.70	70.41	0.00	0.00
1980/08/26	695.42	332.24	695.42	332.31	-0.01	0.02
1980/09/26	694.25	181.64	694.24	181.66	-0.01	0.01
1981/05/03	694.66	225.75	694.66	225.83	-0.01	0.04
1981/06/05	695.93	440.51	695.91	440.57	-0.01	0.01
1981/06/21	693.90	149.76	693.90	149.76	-0.01	0.00
1981/08/23	694.50	206.42	694.49	206.43	-0.01	0.00
1982/03/28	695.21	293.80	695.21	293.95	-0.01	0.05
1982/07/31	695.12	282.06	695.11	282.19	-0.01	0.05
1982/08/14	695.46	337.71	695.45	337.75	-0.01	0.01
1982/12/12	696.92	618.84	696.87	619.13	-0.06	0.05
1983/01/04	695.21	295.53	695.20	295.76	-0.01	0.08
1983/04/22	694.81	239.71	694.80	239.71	-0.01	0.00
1983/06/04	694.65	221.89	694.64	221.91	-0.01	0.01
1983/07/09	695.47	337.95	695.46	337.99	-0.01	0.01
1983/12/05	695.21	293.98	695.20	294.05	-0.01	0.02
1984/02/25	695.12	280.62	695.12	280.65	-0.01	0.01
1984/04/03	694.80	239.22	694.79	239.28	-0.01	0.03
1985/03/19	695.97	434.22	695.95	434.44	-0.02	0.05
1985/12/11	694.53	211.33	694.53	211.36	-0.01	0.01
1986/07/19	693.76	139.10	693.75	139.13	-0.01	0.02
1986/10/10	695.19	291.51	695.18	291.60	-0.01	0.03
1987/09/06	698.44	839.22	698.37	840.86	-0.06	0.20
1988/01/01	694.01	160.02	694.01	160.03	-0.01	0.01
1988/02/07	693.59	126.74	693.59	126.75	-0.01	0.01
1988/04/13	693.59	126.35	693.59	126.35	-0.01	0.00
1988/10/26	695.76	402.84	695.75	402.90	-0.01	0.01
1989/08/18	696.21	505.06	696.18	505.56	-0.03	0.10
1989/09/18	695.50	343.69	695.49	343.76	-0.01	0.02
1990/03/16	695.10	279.06	695.10	279.20	-0.01	0.05
1990/05/19	695.37	319.26	695.36	319.26	-0.01	0.00
1990/08/28	695.79	408.61	695.78	408.73	-0.01	0.03
1990/12/10	694.89	251.51	694.89	251.53	-0.01	0.01
1991/04/23	694.40	196.39	694.40	196.39	-0.01	0.00
1991/06/02	694.22	178.84	694.22	178.86	-0.01	0.01
1991/10/09	694.70	228.98	694.69	229.00	-0.01	0.01
1991/11/08	694.32	189.12	694.31	189.16	-0.01	0.02
1991/12/18	693.12	95.01	693.12	95.03	-0.01	0.03
1992/09/21	694.67	230.94	694.67	231.05	-0.01	0.05
1993/01/11	694.48	204.43	694.47	204.47	-0.01	0.02
1993/04/29	694.82	241.47	694.82	241.49	-0.01	0.01
1993/07/06	694.91	253.13	694.90	253.14	-0.01	0.00
1994/03/13	694.67	223.24	694.66	223.25	-0.01	0.00
1994/07/02	695.34	317.38	695.34	317.36	-0.01	-0.01

1994/08/24	693.69	133.33	693.69	133.33	-0.01	0.00
1995/01/25	693.84	144.57	693.84	144.57	-0.01	0.00
1995/05/06	693.89	148.68	693.88	148.69	-0.01	0.01
1995/08/24	694.79	241.73	694.79	241.82	-0.01	0.04
1995/11/18	694.34	190.00	694.33	190.00	-0.01	0.00
1996/06/27	694.80	243.79	694.80	243.91	-0.01	0.05
1996/08/05	695.63	371.33	695.62	371.29	-0.01	-0.01
1997/03/06	696.93	577.01	696.86	577.19	-0.07	0.03
1998/03/25	693.64	130.43	693.63	130.44	-0.01	0.01
1998/05/15	694.10	167.94	694.10	167.95	-0.01	0.01
1998/08/15	695.38	326.42	695.37	326.52	-0.01	0.03
1998/09/14	694.03	162.37	694.03	162.39	-0.01	0.01
1998/10/25	694.68	227.57	694.67	227.62	-0.01	0.02
1999/02/09	694.73	231.99	694.73	232.03	-0.01	0.02
1999/05/06	695.08	275.97	695.08	276.04	-0.01	0.03
2000/04/28	695.22	300.64	695.22	300.87	-0.01	0.08
2001/03/02	694.72	229.71	694.71	229.75	-0.01	0.02
2001/09/06	697.24	646.99	697.16	647.40	-0.08	0.06
2001/09/30	694.71	230.47	694.71	230.51	-0.01	0.02
2001/10/31	696.44	516.56	696.40	516.91	-0.04	0.07
2002/03/15	693.80	140.91	693.79	140.92	-0.01	0.01
2002/05/22	694.72	231.90	694.72	231.93	-0.01	0.01
2002/07/14	695.22	297.93	695.22	298.10	-0.01	0.06
2002/08/29	696.04	466.29	696.02	466.62	-0.02	0.07
2003/05/19	694.77	236.50	694.76	236.51	-0.01	0.00
2003/08/13	693.73	139.63	693.73	139.65	-0.01	0.01
2003/11/29	694.06	164.79	694.05	164.80	-0.01	0.01
2004/03/11	693.39	112.38	693.39	112.38	-0.01	0.00
2004/06/18	694.87	252.34	694.86	252.48	-0.01	0.06
2005/01/18	694.31	186.56	694.30	186.56	-0.01	0.00
2006/03/18	693.41	114.26	693.41	114.26	0.00	0.00
2006/07/03	694.45	203.07	694.44	203.13	-0.01	0.03
2006/09/29	694.64	221.77	694.63	221.80	-0.01	0.01
2006/10/09	694.54	211.55	694.53	211.60	-0.01	0.02
2007/03/15	694.59	216.80	694.58	216.87	-0.01	0.03
2007/08/31	695.27	305.66	695.27	305.87	-0.01	0.07
2008/03/09	694.86	245.88	694.85	245.89	-0.01	0.00
2008/05/18	693.59	126.02	693.58	126.03	-0.01	0.01
2008/09/23	697.63	705.18	697.53	706.66	-0.10	0.21
MaximumS&F	698.44	850.67	698.37	848.43		
StormEvent	1987/09/06	1957/07/28	1987/09/06	1957/07/28		

Maple Grove Forest Preserve Pedestrian Bridge Replacement (CBBEL Project Number 23-0312)
Comparison of Peak Water Surface Elevations (S) and Flow Rates (F)

at

D22 Upstream Face of Ped Bridge

2. Branch# 22; Node ID: GLBRTPED; Station: 19760.0000

Nodes ==>	(1)		(2)		2-1	2-1
	EBSJ_EX.PEK		EBSJ_P75.PEK			
	(S)	(F)	(S)	(F)		
	2208		2208			
1925/01/02	690.39	13.00	690.32	13.00	-0.07	0.00
1949/06/21	695.34	433.12	695.28	433.95	-0.05	0.19
1949/07/27	694.18	302.44	694.15	302.54	-0.03	0.03
1949/12/31	693.96	275.49	693.93	275.52	-0.02	0.01
1950/01/31	693.73	249.12	693.71	249.15	-0.02	0.01
1950/05/03	694.72	361.85	694.68	361.82	-0.04	-0.01
1950/06/11	694.17	304.19	694.15	304.47	-0.03	0.09
1951/03/09	693.71	248.49	693.68	248.56	-0.02	0.03
1951/05/17	693.57	232.21	693.54	232.21	-0.02	0.00
1951/07/29	694.12	294.40	694.09	294.43	-0.03	0.01

1952/01/25	694.09	290.70	694.06	290.78	-0.03	0.03
1952/03/28	692.86	164.92	692.83	164.93	-0.03	0.01
1953/03/23	693.41	215.46	693.39	215.47	-0.02	0.00
1953/06/16	693.89	274.14	693.86	274.29	-0.02	0.05
1953/07/28	696.63	601.35	696.55	605.93	-0.07	0.76
1954/04/05	696.50	557.47	696.42	558.66	-0.08	0.21
1954/05/08	694.13	296.53	694.10	296.64	-0.03	0.04
1954/08/29	694.22	308.55	694.19	308.44	-0.03	-0.04
1954/10/25	696.01	502.26	695.94	503.23	-0.07	0.19
1955/03/09	692.08	107.71	692.05	107.73	-0.03	0.02
1956/05/18	693.54	231.42	693.52	231.47	-0.02	0.02
1957/01/27	692.73	155.52	692.70	155.52	-0.03	0.00
1957/03/04	694.55	341.93	694.52	342.02	-0.03	0.03
1957/07/28	698.29	849.41	698.22	847.71	-0.08	-0.20
1958/04/30	694.55	349.67	694.51	350.06	-0.03	0.11
1958/06/19	693.87	267.92	693.85	267.95	-0.02	0.01
1958/07/11	693.06	183.24	693.03	183.25	-0.03	0.01
1959/04/07	692.19	116.50	692.16	116.50	-0.03	0.00
1959/07/27	691.70	85.40	691.66	85.43	-0.03	0.04
1960/01/21	693.53	232.69	693.51	232.80	-0.02	0.05
1960/04/04	691.82	88.82	691.79	88.82	-0.03	0.00
1961/08/09	693.83	261.08	693.81	261.16	-0.02	0.03
1961/10/06	695.93	491.34	695.87	492.15	-0.06	0.16
1962/04/15	692.09	110.58	692.06	110.60	-0.03	0.02
1962/07/08	694.45	338.77	694.41	339.10	-0.03	0.10
1963/05/07	693.10	186.60	693.07	186.61	-0.03	0.01
1964/04/12	692.50	138.66	692.47	138.71	-0.03	0.04
1964/07/25	694.07	299.94	694.04	300.28	-0.02	0.11
1965/03/22	693.02	178.91	692.99	178.90	-0.03	-0.01
1966/02/15	692.87	166.58	692.85	166.61	-0.03	0.02
1966/05/18	693.67	244.25	693.65	244.27	-0.02	0.01
1967/04/09	692.66	149.37	692.63	149.38	-0.03	0.01
1967/07/01	694.52	341.30	694.49	341.45	-0.03	0.04
1968/08/24	694.61	355.27	694.58	355.20	-0.04	-0.02
1969/04/13	692.63	148.24	692.60	148.26	-0.03	0.01
1969/06/15	693.16	192.61	693.14	192.61	-0.03	0.00
1969/08/01	692.09	110.59	692.07	110.60	-0.03	0.01
1969/10/25	695.88	494.91	695.82	495.97	-0.06	0.21
1970/05/20	693.08	190.72	693.05	190.78	-0.03	0.03
1970/12/18	692.55	142.07	692.53	142.07	-0.03	0.00
1971/03/04	692.10	109.40	692.07	109.39	-0.03	-0.01
1971/08/28	694.00	283.65	693.97	283.73	-0.02	0.03
1972/03/21	693.51	224.67	693.49	224.70	-0.02	0.01
1972/04/27	694.87	375.97	694.83	376.09	-0.04	0.03
1972/09/01	696.49	563.02	696.42	565.62	-0.07	0.46
1972/10/05	694.29	321.69	694.27	321.81	-0.03	0.04
1973/01/08	694.65	347.63	694.61	347.61	-0.03	-0.01
1973/05/08	693.49	226.12	693.47	226.17	-0.02	0.02
1974/02/28	693.47	221.72	693.45	221.77	-0.02	0.02
1974/04/21	693.04	180.12	693.01	180.13	-0.03	0.01
1974/05/25	692.78	163.33	692.75	163.36	-0.03	0.02
1975/01/16	692.60	145.29	692.58	145.29	-0.03	0.00
1975/05/05	693.94	275.57	693.92	275.82	-0.02	0.09
1975/09/08	694.13	297.65	694.11	297.68	-0.03	0.01
1976/03/21	693.78	254.83	693.76	254.97	-0.02	0.05
1977/07/05	693.55	234.95	693.52	235.03	-0.02	0.03
1977/08/13	692.90	169.88	692.87	169.89	-0.03	0.01
1977/09/07	693.04	185.13	693.02	185.15	-0.03	0.01
1978/04/02	691.48	71.23	691.45	71.23	-0.03	-0.01
1978/05/21	692.59	148.41	692.56	148.44	-0.03	0.02
1978/07/09	693.06	183.31	693.03	183.32	-0.03	0.01
1978/09/25	694.54	343.23	694.51	343.69	-0.03	0.13
1979/04/18	694.39	320.52	694.36	320.51	-0.03	0.00
1979/09/05	693.75	252.56	693.72	252.61	-0.02	0.02
1980/01/21	691.46	70.36	691.43	70.36	-0.03	0.00

1980/08/26	694.40	332.63	694.36	332.77	-0.03	0.04
1980/09/26	693.04	181.84	693.01	181.84	-0.03	0.00
1981/05/03	693.49	224.78	693.46	224.80	-0.02	0.01
1981/06/05	695.28	432.46	695.23	433.57	-0.05	0.26
1981/06/21	692.67	149.91	692.64	149.91	-0.03	0.00
1981/08/23	693.31	208.60	693.28	208.58	-0.02	-0.01
1982/03/28	694.13	298.63	694.11	298.78	-0.02	0.05
1982/07/31	694.00	283.90	693.98	284.07	-0.02	0.06
1982/08/14	694.47	337.00	694.44	337.09	-0.03	0.03
1982/12/12	696.67	576.92	696.59	579.27	-0.08	0.41
1983/01/04	694.12	294.97	694.09	295.31	-0.02	0.12
1983/04/22	693.66	241.61	693.64	241.61	-0.02	0.00
1983/06/04	693.49	221.89	693.47	221.91	-0.02	0.01
1983/07/09	694.48	338.93	694.44	339.01	-0.04	0.02
1983/12/05	694.12	296.11	694.09	296.20	-0.03	0.03
1984/02/25	694.02	283.30	694.00	283.33	-0.02	0.01
1984/04/03	693.66	240.35	693.63	240.43	-0.02	0.03
1985/03/19	695.38	435.43	695.33	436.40	-0.05	0.22
1985/12/11	693.33	211.51	693.31	211.54	-0.02	0.01
1986/07/19	692.47	139.45	692.44	139.45	-0.03	0.00
1986/10/10	694.10	293.72	694.07	293.82	-0.03	0.03
1987/09/06	698.31	845.09	698.24	844.45	-0.07	-0.08
1988/01/01	692.76	160.54	692.73	160.56	-0.03	0.01
1988/02/07	692.33	127.32	692.31	127.35	-0.03	0.02
1988/04/13	692.34	126.10	692.31	126.11	-0.03	0.01
1988/10/26	694.97	399.87	694.93	400.37	-0.04	0.13
1989/08/18	695.74	478.55	695.68	480.92	-0.05	0.50
1989/09/18	694.55	343.86	694.51	344.02	-0.03	0.05
1990/03/16	694.00	279.98	693.98	280.18	-0.02	0.07
1990/05/19	694.35	321.35	694.32	321.63	-0.03	0.09
1990/08/28	695.04	402.18	695.00	402.52	-0.04	0.08
1990/12/10	693.73	253.32	693.71	253.38	-0.02	0.02
1991/04/23	693.20	196.17	693.18	196.17	-0.03	0.00
1991/06/02	693.00	178.38	692.97	178.41	-0.03	0.02
1991/10/09	693.52	228.90	693.50	228.90	-0.02	0.00
1991/11/08	693.12	187.32	693.09	187.32	-0.03	0.00
1991/12/18	691.85	95.29	691.82	95.36	-0.03	0.07
1992/09/21	693.46	227.35	693.43	227.42	-0.02	0.03
1993/01/11	693.29	204.96	693.27	205.01	-0.02	0.02
1993/04/29	693.68	243.60	693.66	243.66	-0.02	0.02
1993/07/06	693.77	253.63	693.74	253.65	-0.02	0.01
1994/03/13	693.50	225.46	693.48	225.48	-0.02	0.01
1994/07/02	694.28	317.79	694.25	317.80	-0.03	0.00
1994/08/24	692.43	134.23	692.41	134.24	-0.03	0.01
1995/01/25	692.60	145.13	692.57	145.13	-0.03	0.00
1995/05/06	692.63	148.91	692.60	148.91	-0.03	0.00
1995/08/24	693.59	241.51	693.57	241.65	-0.02	0.06
1995/11/18	693.13	189.21	693.11	189.22	-0.03	0.01
1996/06/27	693.59	241.98	693.57	242.13	-0.02	0.06
1996/08/05	694.77	370.06	694.73	369.93	-0.04	-0.04
1997/03/06	696.68	575.23	696.59	576.10	-0.09	0.15
1998/03/25	692.37	129.95	692.34	129.95	-0.03	0.00
1998/05/15	692.87	168.03	692.85	168.03	-0.03	0.00
1998/08/15	694.33	323.04	694.30	323.30	-0.03	0.08
1998/09/14	692.78	160.54	692.76	160.57	-0.03	0.02
1998/10/25	693.49	226.18	693.46	226.21	-0.02	0.01
1999/02/09	693.58	233.38	693.55	233.45	-0.02	0.03
1999/05/06	693.96	278.15	693.93	278.25	-0.02	0.04
2000/04/28	694.11	298.27	694.09	298.63	-0.03	0.12
2001/03/02	693.56	230.95	693.54	231.04	-0.02	0.04
2001/09/06	697.04	608.25	696.94	609.48	-0.10	0.20
2001/09/30	693.54	229.34	693.51	229.40	-0.02	0.03
2001/10/31	696.06	504.94	696.00	506.21	-0.07	0.25
2002/03/15	692.58	141.56	692.55	141.56	-0.03	0.00
2002/05/22	693.55	232.01	693.53	232.06	-0.02	0.02

2002/07/14	694.12	297.70	694.10	297.93	-0.03	0.08
2002/08/29	695.49	447.01	695.44	448.67	-0.05	0.37
2003/05/19	693.60	236.99	693.58	236.99	-0.02	0.00
2003/08/13	692.45	136.90	692.42	136.90	-0.03	0.00
2003/11/29	692.82	163.77	692.79	163.79	-0.03	0.01
2004/03/11	692.14	112.25	692.11	112.26	-0.03	0.01
2004/06/18	693.66	249.91	693.64	250.10	-0.02	0.08
2005/01/18	693.11	187.24	693.08	187.25	-0.02	0.01
2006/03/18	692.15	113.81	692.12	113.84	-0.03	0.03
2006/07/03	693.24	203.09	693.21	203.13	-0.02	0.02
2006/09/29	693.47	222.48	693.45	222.51	-0.02	0.01
2006/10/09	693.37	210.28	693.35	210.34	-0.02	0.03
2007/03/15	693.40	217.02	693.38	217.08	-0.02	0.03
2007/08/31	694.17	305.45	694.15	305.74	-0.03	0.09
2008/03/09	693.72	247.17	693.70	247.19	-0.02	0.01
2008/05/18	692.33	126.85	692.30	126.87	-0.03	0.02
2008/09/23	697.46	685.12	697.34	687.95	-0.12	0.41
MaximumS&F	698.31	849.41	698.24	847.71		
StormEvent	1987/09/06	1957/07/28	1987/09/06	1957/07/28		

Maple Grove Forest Preserve Pedestrian Bridge Replacement (CBBEL Project Number 23-0312)
Comparison of Peak Water Surface Elevations (S) and Flow Rates (F)

at

D98 Downstream Face of Ped Brdige

3. Branch# 21; Node ID: GLBRTPED; Station: 19750.0000

Nodes ==>	(1) EBSJ_EX.PEK 2101		(2) EBSJ_P75.PEK 2101		2-1 (S)	2-1 (F)
	(S)	(F)	(S)	(F)		
1925/01/02	690.25	13.00	690.25	13.00	0.00	0.00
1949/06/21	695.21	433.12	695.21	433.95	0.01*	0.19
1949/07/27	694.10	302.44	694.10	302.54	0.00	0.03
1949/12/31	693.89	275.49	693.89	275.52	0.00	0.01
1950/01/31	693.67	249.12	693.67	249.15	0.00	0.01
1950/05/03	694.63	361.85	694.63	361.82	0.00	-0.01
1950/06/11	694.10	304.19	694.10	304.47	0.00	0.09
1951/03/09	693.65	248.49	693.65	248.56	0.00	0.03
1951/05/17	693.51	232.21	693.51	232.21	0.00	0.00
1951/07/29	694.05	294.40	694.05	294.43	0.00	0.01
1952/01/25	694.02	290.70	694.02	290.78	0.00	0.03
1952/03/28	692.80	164.92	692.80	164.93	0.00	0.01
1953/03/23	693.36	215.46	693.36	215.47	0.00	0.00
1953/06/16	693.82	274.14	693.82	274.29	0.00	0.05
1953/07/28	696.40	601.35	696.42	605.93	0.02*	0.76
1954/04/05	696.30	557.47	696.31	558.66	0.01*	0.21
1954/05/08	694.05	296.53	694.05	296.64	0.00	0.04
1954/08/29	694.14	308.55	694.14	308.44	0.00	-0.04
1954/10/25	695.84	502.26	695.85	503.23	0.00	0.19
1955/03/09	692.01	107.71	692.01	107.73	0.00	0.02
1956/05/18	693.48	231.42	693.48	231.47	0.00	0.02
1957/01/27	692.67	155.52	692.67	155.52	0.00	0.00
1957/03/04	694.46	341.93	694.46	342.02	0.00	0.03
1957/07/28	698.01	849.41	698.00	847.71	-0.01	-0.20
1958/04/30	694.45	349.67	694.46	350.06	0.00	0.11
1958/06/19	693.81	267.92	693.81	267.95	0.00	0.01
1958/07/11	693.00	183.24	693.00	183.25	0.00	0.01
1959/04/07	692.13	116.50	692.13	116.50	0.00	0.00
1959/07/27	691.62	85.40	691.62	85.43	0.00	0.04
1960/01/21	693.48	232.69	693.48	232.80	0.00	0.05
1960/04/04	691.75	88.82	691.75	88.82	0.00	0.00
1961/08/09	693.77	261.08	693.77	261.16	0.00	0.03

1961/10/06	695.77	491.34	695.78	492.15	0.01*	0.16
1962/04/15	692.03	110.58	692.03	110.60	0.00	0.02
1962/07/08	694.36	338.77	694.36	339.10	0.00	0.10
1963/05/07	693.04	186.60	693.04	186.61	0.00	0.01
1964/04/12	692.43	138.66	692.43	138.71	0.00	0.04
1964/07/25	693.99	299.94	694.00	300.27	0.00	0.11
1965/03/22	692.96	178.91	692.96	178.90	0.00	-0.01
1966/02/15	692.81	166.58	692.81	166.61	0.00	0.02
1966/05/18	693.62	244.25	693.62	244.27	0.00	0.01
1967/04/09	692.60	149.37	692.60	149.38	0.00	0.01
1967/07/01	694.43	341.30	694.43	341.45	0.00	0.04
1968/08/24	694.52	355.27	694.52	355.20	0.00	-0.02
1969/04/13	692.56	148.24	692.56	148.26	0.00	0.01
1969/06/15	693.10	192.61	693.10	192.61	0.00	0.00
1969/08/01	692.03	110.59	692.03	110.60	0.00	0.01
1969/10/25	695.71	494.91	695.72	495.97	0.01*	0.21
1970/05/20	693.02	190.72	693.02	190.78	0.00	0.03
1970/12/18	692.49	142.06	692.49	142.07	0.00	0.01
1971/03/04	692.03	109.40	692.03	109.39	0.00	-0.01
1971/08/28	693.93	283.65	693.93	283.73	0.00	0.03
1972/03/21	693.46	224.67	693.46	224.70	0.00	0.01
1972/04/27	694.77	375.97	694.77	376.09	0.00	0.03
1972/09/01	696.29	563.02	696.31	565.62	0.02*	0.46
1972/10/05	694.22	321.69	694.22	321.81	0.00	0.04
1973/01/08	694.56	347.63	694.56	347.61	0.00	-0.01
1973/05/08	693.43	226.12	693.43	226.17	0.00	0.02
1974/02/28	693.42	221.72	693.42	221.77	0.00	0.02
1974/04/21	692.98	180.12	692.98	180.13	0.00	0.01
1974/05/25	692.72	163.33	692.72	163.35	0.00	0.01
1975/01/16	692.54	145.29	692.54	145.29	0.00	0.00
1975/05/05	693.87	275.57	693.88	275.82	0.00	0.09
1975/09/08	694.06	297.65	694.06	297.68	0.00	0.01
1976/03/21	693.72	254.83	693.72	254.97	0.00	0.05
1977/07/05	693.49	234.95	693.49	235.03	0.00	0.03
1977/08/13	692.84	169.88	692.84	169.89	0.00	0.01
1977/09/07	692.98	185.13	692.98	185.15	0.00	0.01
1978/04/02	691.41	71.23	691.41	71.23	0.00	-0.01
1978/05/21	692.52	148.41	692.52	148.44	0.00	0.02
1978/07/09	693.00	183.31	693.00	183.32	0.00	0.01
1978/09/25	694.45	343.23	694.45	343.69	0.00	0.13
1979/04/18	694.31	320.52	694.31	320.51	0.00	0.00
1979/09/05	693.69	252.56	693.69	252.61	0.00	0.02
1980/01/21	691.38	70.36	691.38	70.36	0.00	0.00
1980/08/26	694.31	332.63	694.31	332.77	0.00	0.04
1980/09/26	692.98	181.84	692.98	181.84	0.00	0.00
1981/05/03	693.43	224.78	693.43	224.80	0.00	0.01
1981/06/05	695.16	432.46	695.16	433.57	0.00	0.26
1981/06/21	692.61	149.91	692.61	149.91	0.00	0.00
1981/08/23	693.25	208.60	693.25	208.58	0.00	-0.01
1982/03/28	694.06	298.63	694.07	298.78	0.00	0.05
1982/07/31	693.94	283.90	693.94	284.07	0.00	0.06
1982/08/14	694.39	337.00	694.39	337.09	0.00	0.03
1982/12/12	696.46	576.92	696.47	579.27	0.01*	0.41
1983/01/04	694.05	294.97	694.05	295.31	0.00	0.12
1983/04/22	693.61	241.61	693.61	241.61	0.00	0.00
1983/06/04	693.43	221.89	693.43	221.91	0.00	0.01
1983/07/09	694.39	338.93	694.39	339.01	0.00	0.02
1983/12/05	694.04	296.11	694.04	296.20	0.00	0.03
1984/02/25	693.96	283.30	693.96	283.33	0.00	0.01
1984/04/03	693.60	240.35	693.60	240.43	0.00	0.03
1985/03/19	695.25	435.43	695.26	436.40	0.00	0.22
1985/12/11	693.27	211.51	693.27	211.54	0.00	0.01
1986/07/19	692.40	139.45	692.40	139.45	0.00	0.00
1986/10/10	694.03	293.72	694.03	293.82	0.00	0.03
1987/09/06	698.02	845.09	698.02	844.45	0.00	-0.08

1988/01/01	692.70	160.54	692.70	160.55	0.00	0.01
1988/02/07	692.27	127.32	692.27	127.35	0.00	0.02
1988/04/13	692.28	126.10	692.28	126.11	0.00	0.01
1988/10/26	694.86	399.87	694.86	400.37	0.00	0.13
1989/08/18	695.58	478.55	695.59	480.91	0.01*	0.49
1989/09/18	694.46	343.86	694.46	344.02	0.00	0.05
1990/03/16	693.93	279.98	693.94	280.18	0.00	0.07
1990/05/19	694.27	321.35	694.27	321.63	0.00	0.09
1990/08/28	694.93	402.18	694.93	402.52	0.00	0.08
1990/12/10	693.67	253.32	693.67	253.38	0.00	0.02
1991/04/23	693.14	196.16	693.14	196.17	0.00	0.01
1991/06/02	692.94	178.38	692.94	178.41	0.00	0.02
1991/10/09	693.46	228.90	693.46	228.90	0.00	0.00
1991/11/08	693.06	187.32	693.06	187.32	0.00	0.00
1991/12/18	691.78	95.29	691.78	95.36	0.00	0.07
1992/09/21	693.40	227.35	693.40	227.42	0.00	0.03
1993/01/11	693.24	204.96	693.24	205.01	0.00	0.02
1993/04/29	693.62	243.60	693.62	243.66	0.00	0.02
1993/07/06	693.70	253.63	693.71	253.65	0.00	0.01
1994/03/13	693.45	225.46	693.45	225.48	0.00	0.01
1994/07/02	694.20	317.79	694.20	317.80	0.00	0.00
1994/08/24	692.37	134.23	692.37	134.24	0.00	0.01
1995/01/25	692.54	145.13	692.54	145.13	0.00	0.00
1995/05/06	692.57	148.91	692.57	148.91	0.00	0.00
1995/08/24	693.53	241.51	693.53	241.64	0.00	0.05
1995/11/18	693.08	189.21	693.08	189.22	0.00	0.01
1996/06/27	693.53	241.98	693.53	242.13	0.00	0.06
1996/08/05	694.67	370.06	694.67	369.93	0.00	-0.04
1997/03/06	696.46	575.23	696.47	576.10	0.01*	0.15
1998/03/25	692.31	129.95	692.31	129.95	0.00	0.00
1998/05/15	692.81	168.03	692.81	168.03	0.00	0.00
1998/08/15	694.25	323.04	694.25	323.30	0.00	0.08
1998/09/14	692.72	160.54	692.72	160.57	0.00	0.02
1998/10/25	693.43	226.18	693.43	226.21	0.00	0.01
1999/02/09	693.52	233.38	693.52	233.45	0.00	0.03
1999/05/06	693.89	278.15	693.89	278.25	0.00	0.04
2000/04/28	694.04	298.27	694.04	298.63	0.00	0.12
2001/03/02	693.50	230.95	693.50	231.04	0.00	0.04
2001/09/06	696.80	608.25	696.81	609.48	0.01*	0.20
2001/09/30	693.48	229.34	693.48	229.40	0.00	0.03
2001/10/31	695.89	504.94	695.90	506.21	0.01*	0.25
2002/03/15	692.52	141.56	692.52	141.56	0.00	0.00
2002/05/22	693.49	232.01	693.49	232.05	0.00	0.02
2002/07/14	694.05	297.70	694.05	297.93	0.00	0.08
2002/08/29	695.35	447.00	695.36	448.67	0.01*	0.37
2003/05/19	693.55	236.99	693.55	236.99	0.00	0.00
2003/08/13	692.38	136.90	692.38	136.90	0.00	0.00
2003/11/29	692.76	163.77	692.76	163.79	0.00	0.01
2004/03/11	692.07	112.25	692.07	112.26	0.00	0.01
2004/06/18	693.60	249.91	693.60	250.10	0.00	0.08
2005/01/18	693.05	187.24	693.05	187.25	0.00	0.01
2006/03/18	692.08	113.81	692.08	113.84	0.00	0.03
2006/07/03	693.18	203.09	693.18	203.13	0.00	0.02
2006/09/29	693.41	222.48	693.42	222.51	0.00	0.01
2006/10/09	693.32	210.28	693.32	210.34	0.00	0.03
2007/03/15	693.34	217.02	693.34	217.08	0.00	0.03
2007/08/31	694.10	305.45	694.10	305.74	0.00	0.09
2008/03/09	693.66	247.17	693.66	247.19	0.00	0.01
2008/05/18	692.26	126.85	692.26	126.87	0.00	0.02
2008/09/23	697.17	685.12	697.18	687.95	0.01*	0.41
MaximumS&F	698.02	849.41	698.02	847.71		
StormEvent	1987/09/06	1957/07/28	1987/09/06	1957/07/28		

Maple Grove Forest Preserve Pedestrian Bridge Replacement (CBBEL Project Number 23-0312)
 Comparison of Peak Water Surface Elevations (S) and Flow Rates (F)

at

D21 592

4. Branch# 21; Node ID: 1707GLBT; Station: 19157.0000

Nodes ==>	(1) EBSJ_EX.PEK 2104		(2) EBSJ_P75.PEK 2104		2-1	2-1
	(S)	(F)	(S)	(F)	(S)	(F)
	1925/01/02	689.56	13.00	689.56	13.00	0.00
1949/06/21	694.94	426.50	694.94	427.22	0.01*	0.17
1949/07/27	693.79	305.12	693.79	305.25	0.00	0.04
1949/12/31	693.58	276.38	693.58	276.41	0.00	0.01
1950/01/31	693.36	250.78	693.36	250.82	0.00	0.02
1950/05/03	694.35	364.59	694.35	364.80	0.00	0.06
1950/06/11	693.77	303.49	693.77	303.80	0.00	0.10
1951/03/09	693.34	251.87	693.34	251.93	0.00	0.02
1951/05/17	693.19	234.12	693.19	234.13	0.00	0.00
1951/07/29	693.73	297.77	693.73	297.83	0.00	0.02
1952/01/25	693.70	292.00	693.71	292.11	0.00	0.04
1952/03/28	692.50	165.59	692.50	165.59	0.00	0.00
1953/03/23	693.05	217.02	693.05	217.03	0.00	0.00
1953/06/16	693.48	273.92	693.48	274.13	0.00	0.08
1953/07/28	696.17	585.45	696.20	589.06	0.03*	0.62
1954/04/05	696.08	559.82	696.09	561.20	0.01*	0.25
1954/05/08	693.73	295.05	693.73	295.07	0.00	0.01
1954/08/29	693.82	306.84	693.82	307.07	0.00	0.07
1954/10/25	695.61	501.92	695.61	502.32	0.00	0.08
1955/03/09	691.69	108.00	691.69	107.99	0.00	-0.01
1956/05/18	693.17	233.14	693.17	233.19	0.00	0.02
1957/01/27	692.35	155.41	692.35	155.41	0.00	0.00
1957/03/04	694.15	342.76	694.15	342.89	0.00	0.04
1957/07/28	697.82	854.28	697.80	848.52	-0.01	-0.67
1958/04/30	694.14	349.19	694.14	349.64	0.00	0.13
1958/06/19	693.49	270.88	693.49	270.93	0.00	0.02
1958/07/11	692.69	187.41	692.69	187.41	0.00	0.00
1959/04/07	691.80	115.96	691.80	115.95	0.00	-0.01
1959/07/27	691.27	85.21	691.27	85.23	0.00	0.02
1960/01/21	693.15	231.40	693.15	231.51	0.00	0.05
1960/04/04	691.44	89.09	691.44	89.10	0.00	0.00
1961/08/09	693.46	263.80	693.46	263.90	0.00	0.04
1961/10/06	695.53	493.48	695.54	494.42	0.01*	0.19
1962/04/15	691.69	110.66	691.69	110.65	0.00	-0.01
1962/07/08	694.07	343.82	694.08	344.20	0.00	0.11
1963/05/07	692.73	186.79	692.73	186.79	0.00	0.00
1964/04/12	692.12	137.81	692.12	137.82	0.00	0.01
1964/07/25	693.69	305.41	693.69	305.77	0.00	0.12
1965/03/22	692.65	179.10	692.65	179.10	0.00	0.00
1966/02/15	692.51	165.99	692.51	166.00	0.00	0.01
1966/05/18	693.30	245.28	693.30	245.29	0.00	0.00
1967/04/09	692.29	148.80	692.29	148.80	0.00	0.00
1967/07/01	694.13	343.41	694.13	343.54	0.00	0.04
1968/08/24	694.20	357.41	694.20	357.44	0.00	0.01
1969/04/13	692.23	150.13	692.24	150.13	0.00	0.00
1969/06/15	692.79	192.95	692.79	192.96	0.00	0.01
1969/08/01	691.70	111.52	691.70	111.52	0.00	0.00
1969/10/25	695.45	500.32	695.46	501.68	0.01*	0.27
1970/05/20	692.69	188.16	692.69	188.21	0.00	0.03
1970/12/18	692.18	142.09	692.18	142.09	0.00	0.00
1971/03/04	691.70	110.56	691.70	110.55	0.00	-0.01
1971/08/28	693.62	287.83	693.62	287.91	0.00	0.03
1972/03/21	693.16	226.21	693.16	226.25	0.00	0.02
1972/04/27	694.47	375.14	694.48	375.28	0.00	0.04

1972/09/01	696.08	554.90	696.09	557.64	0.02*	0.49
1972/10/05	693.91	321.55	693.91	321.69	0.00	0.04
1973/01/08	694.27	349.38	694.27	349.40	0.00	0.01
1973/05/08	693.12	227.63	693.12	227.69	0.00	0.03
1974/02/28	693.11	221.80	693.11	221.84	0.00	0.02
1974/04/21	692.67	180.71	692.67	180.71	0.00	0.00
1974/05/25	692.40	164.17	692.40	164.21	0.00	0.02
1975/01/16	692.23	145.67	692.23	145.67	0.00	0.00
1975/05/05	693.55	275.34	693.55	275.50	0.00	0.06
1975/09/08	693.74	299.98	693.74	300.04	0.00	0.02
1976/03/21	693.41	254.51	693.41	254.53	0.00	0.01
1977/07/05	693.16	234.90	693.16	234.99	0.00	0.04
1977/08/13	692.52	170.76	692.52	170.77	0.00	0.01
1977/09/07	692.65	185.30	692.65	185.34	0.00	0.02
1978/04/02	691.03	71.57	691.03	71.57	0.00	0.00
1978/05/21	692.19	147.14	692.19	147.16	0.00	0.01
1978/07/09	692.68	183.54	692.68	183.55	0.00	0.01
1978/09/25	694.14	346.95	694.15	346.99	0.00	0.01
1979/04/18	694.01	321.68	694.01	321.67	0.00	0.00
1979/09/05	693.36	255.57	693.37	255.65	0.00	0.03
1980/01/21	691.00	70.60	691.00	70.60	0.00	0.00
1980/08/26	694.00	334.45	694.00	334.60	0.00	0.04
1980/09/26	692.66	183.34	692.66	183.36	0.00	0.01
1981/05/03	693.12	226.22	693.12	226.23	0.00	0.00
1981/06/05	694.90	431.27	694.91	432.30	0.01*	0.24
1981/06/21	692.30	150.73	692.30	150.74	0.00	0.01
1981/08/23	692.94	211.07	692.94	211.12	0.00	0.02
1982/03/28	693.76	302.37	693.76	302.59	0.00	0.07
1982/07/31	693.63	286.98	693.63	287.17	0.00	0.07
1982/08/14	694.07	336.64	694.07	336.78	0.00	0.04
1982/12/12	696.25	573.42	696.27	575.75	0.02*	0.41
1983/01/04	693.73	296.26	693.73	296.34	0.00	0.03
1983/04/22	693.29	242.06	693.29	242.06	0.00	0.00
1983/06/04	693.13	225.07	693.13	225.10	0.00	0.01
1983/07/09	694.06	339.38	694.07	339.48	0.00	0.03
1983/12/05	693.73	297.30	693.73	297.40	0.00	0.03
1984/02/25	693.64	284.74	693.64	284.79	0.00	0.02
1984/04/03	693.28	240.46	693.29	240.54	0.00	0.03
1985/03/19	695.00	436.24	695.01	437.07	0.00	0.19
1985/12/11	692.96	213.76	692.96	213.79	0.00	0.01
1986/07/19	692.07	139.55	692.07	139.58	0.00	0.02
1986/10/10	693.72	296.08	693.72	296.21	0.00	0.04
1987/09/06	697.84	847.71	697.84	847.93	0.00	0.03
1988/01/01	692.36	160.90	692.37	160.92	0.00	0.01
1988/02/07	691.94	128.08	691.94	128.09	0.00	0.01
1988/04/13	691.96	126.20	691.96	126.20	0.00	0.00
1988/10/26	694.56	398.98	694.56	399.44	0.00	0.12
1989/08/18	695.34	467.91	695.36	469.42	0.01*	0.32
1989/09/18	694.14	344.14	694.14	344.33	0.00	0.06
1990/03/16	693.62	280.07	693.62	280.28	0.00	0.07
1990/05/19	693.95	322.52	693.95	322.30	0.00	-0.07
1990/08/28	694.65	396.75	694.65	397.23	0.00	0.12
1990/12/10	693.35	254.75	693.35	254.80	0.00	0.02
1991/04/23	692.83	197.67	692.83	197.68	0.00	0.01
1991/06/02	692.63	180.15	692.63	180.16	0.00	0.01
1991/10/09	693.15	230.90	693.15	230.91	0.00	0.00
1991/11/08	692.75	186.70	692.75	186.71	0.00	0.01
1991/12/18	691.42	95.39	691.42	95.38	0.00	0.00
1992/09/21	693.06	226.22	693.06	226.30	0.00	0.04
1993/01/11	692.94	206.06	692.94	206.09	0.00	0.01
1993/04/29	693.31	244.29	693.31	244.32	0.00	0.01
1993/07/06	693.39	254.95	693.39	254.98	0.00	0.01
1994/03/13	693.14	226.21	693.14	226.22	0.00	0.00
1994/07/02	693.88	317.76	693.88	317.79	0.00	0.01
1994/08/24	692.04	135.08	692.04	135.07	0.00	-0.01

1995/01/25	692.22	145.33	692.22	145.33	0.00	0.00
1995/05/06	692.26	148.24	692.26	148.26	0.00	0.01
1995/08/24	693.21	242.22	693.21	242.36	0.00	0.06
1995/11/18	692.77	190.00	692.77	190.00	0.00	0.00
1996/06/27	693.20	239.53	693.20	239.67	0.00	0.06
1996/08/05	694.36	370.38	694.36	370.08	0.00	-0.08
1997/03/06	696.25	574.59	696.26	575.33	0.01*	0.13
1998/03/25	691.98	130.45	691.98	130.46	0.00	0.01
1998/05/15	692.49	169.17	692.49	169.18	0.00	0.01
1998/08/15	693.93	321.14	693.93	321.40	0.00	0.08
1998/09/14	692.41	161.46	692.41	161.48	0.00	0.01
1998/10/25	693.11	228.07	693.11	228.10	0.00	0.01
1999/02/09	693.21	234.14	693.21	234.15	0.00	0.00
1999/05/06	693.57	279.57	693.57	279.68	0.00	0.04
2000/04/28	693.71	297.28	693.71	297.53	0.00	0.08
2001/03/02	693.19	231.59	693.19	231.68	0.00	0.04
2001/09/06	696.61	611.62	696.62	612.79	0.01*	0.19
2001/09/30	693.17	230.67	693.17	230.69	0.00	0.01
2001/10/31	695.66	502.51	695.67	503.84	0.01*	0.26
2002/03/15	692.22	141.05	692.22	141.05	0.00	0.00
2002/05/22	693.17	231.49	693.17	231.54	0.00	0.02
2002/07/14	693.73	298.94	693.73	299.15	0.00	0.07
2002/08/29	695.10	439.78	695.11	439.96	0.01*	0.04
2003/05/19	693.23	238.45	693.23	238.47	0.00	0.01
2003/08/13	692.04	136.62	692.04	136.64	0.00	0.01
2003/11/29	692.44	163.35	692.44	163.37	0.00	0.01
2004/03/11	691.75	111.92	691.75	111.93	0.00	0.01
2004/06/18	693.26	247.06	693.26	247.24	0.00	0.07
2005/01/18	692.74	187.99	692.74	187.99	0.00	0.00
2006/03/18	691.74	115.07	691.74	115.07	0.00	0.00
2006/07/03	692.84	206.25	692.84	206.29	0.00	0.02
2006/09/29	693.11	228.56	693.11	228.59	0.00	0.01
2006/10/09	693.01	211.42	693.01	211.42	0.00	0.00
2007/03/15	693.02	217.39	693.02	217.46	0.00	0.03
2007/08/31	693.77	303.19	693.77	303.53	0.00	0.11
2008/03/09	693.34	247.57	693.35	247.61	0.00	0.02
2008/05/18	691.93	127.48	691.93	127.49	0.00	0.01
2008/09/23	696.98	680.98	696.99	684.10	0.01*	0.46
MaximumS&F	697.84	854.28	697.84	848.52		
StormEvent	1987/09/06	1957/07/28	1987/09/06	1957/07/28		

**A CD-ROM Containing the Baseline and Proposed
Conditions FEQ Models and Associated FEQUTL Files/Tables
is available upon request.**

APPENDIX H

PRELIMINARY ALTERNATIVES - DRAWINGS AND COST ESTIMATES



TREE IMPACT TABLE

TREE #	TREE SPECIES - COMMON NAME	TREE SPECIES - BOTANICAL NAME	SIZE - DIAMETER AT BREAST HEIGHT (DBH) AS INCHES	CONDITION	FORM	Notes
1309	Sugar maple	<i>Acer saccharum</i>	12	2	2	Path/Bridge
1310	Sugar maple	<i>Acer saccharum</i>	4	2	2	Path/Bridge
1311	Sugar maple	<i>Acer saccharum</i>	5	2	2	Sewer
1312	Sugar maple	<i>Acer saccharum</i>	19	2	2	Path/Bridge
1313	Sugar maple	<i>Acer saccharum</i>	10	2	2	Path/Bridge
1314	Sugar maple	<i>Acer saccharum</i>	4	2	2	Sewer
1316	Sugar maple	<i>Acer saccharum</i>	5	2	2	Sewer
1318	Sugar maple	<i>Acer saccharum</i>	4	3	3	Path/Bridge
1319	Sugar maple	<i>Acer saccharum</i>	5	2	2	Path/Bridge
1320	Sugar maple	<i>Acer saccharum</i>	20	4	4	Path/Bridge
1321	Sugar maple	<i>Acer saccharum</i>	24	4	4	Path/Bridge
1322	Sugar maple	<i>Acer saccharum</i>	6	2	2	Path/Bridge
1323	Sugar maple	<i>Acer saccharum</i>	5	2	2	Path/Bridge
1324	Sugar maple	<i>Acer saccharum</i>	4	2	2	Path/Bridge
1325	Sugar maple	<i>Acer saccharum</i>	4	2	2	Path/Bridge
1326	Sugar maple	<i>Acer saccharum</i>	10	2	2	Crane
1327	Sugar maple	<i>Acer saccharum</i>	4	2	2	Crane
1328	Sugar maple	<i>Acer saccharum</i>	7	2	2	Crane
1329	Sugar maple	<i>Acer saccharum</i>	7	3	4	Crane
1380	Sugar maple	<i>Acer saccharum</i>	7	2	2	Sewer
1384	Sugar maple	<i>Acer saccharum</i>	9	2	2	Sewer
1386	Sugar maple	<i>Acer saccharum</i>	12	2	2	Sewer
1395	Sugar maple	<i>Acer saccharum</i>	4	2	2	Crane
1396	Sugar maple	<i>Acer saccharum</i>	4	2	2	Crane
1397	Sugar maple	<i>Acer saccharum</i>	10	3	4	Crane
1398	Sugar maple	<i>Acer saccharum</i>	4	2	2	Crane
1399	Sugar maple	<i>Acer saccharum</i>	5	2	2	Crane
1400	Sugar maple	<i>Acer saccharum</i>	8	2	2	Crane
1401	Box elder	<i>Acer negundo</i>	12	3	4	Crane
1405	Sugar maple	<i>Acer saccharum</i>	10	2	2	Crane
1406	Sugar maple	<i>Acer saccharum</i>	6	2	3	Path/Bridge
1407	Silver maple	<i>Acer saccharinum</i>	28	2	3	Path/Bridge
1408	Box elder	<i>Acer negundo</i>	4	2	2	Path/Bridge
1409	Sugar maple	<i>Acer saccharum</i>	24	2	2	Path/Bridge
1410	Hackberry	<i>Celtis occidentalis</i>	4	2	2	Path/Bridge
1411	Sugar maple	<i>Acer saccharum</i>	19	2	2	Path/Bridge
1412	Sugar maple	<i>Acer saccharum</i>	13	2	2	Path/Bridge

TREES LESS THAN 4" DBH

CBBEL ID	TREE SPECIES - COMMON NAME	TREE SPECIES - BOTANICAL NAME	SIZE - DIAMETER AT BREAST HEIGHT (DBH) AS INCHES	CONDITION	FORM	Notes
A	Sugar maple	<i>Acer saccharum</i>	2	2	2	Path/Bridge
B	Sugar maple	<i>Acer saccharum</i>	3	2	2	Path/Bridge
C	Sugar maple	<i>Acer saccharum</i>	3	2	2	Crane
D	Sugar maple	<i>Acer saccharum</i>	2	2	2	Crane
E	Sugar maple	<i>Acer saccharum</i>	2	2	2	Path/Bridge
F	Sugar maple	<i>Acer saccharum</i>	2	2	2	Path/Bridge
G	Sugar maple	<i>Acer saccharum</i>	2	2	2	Path/Bridge
H	Sugar maple	<i>Acer saccharum</i>	3	2	2	Path/Bridge

TREE INVENTORY LIST - RATING DESCRIPTIONS

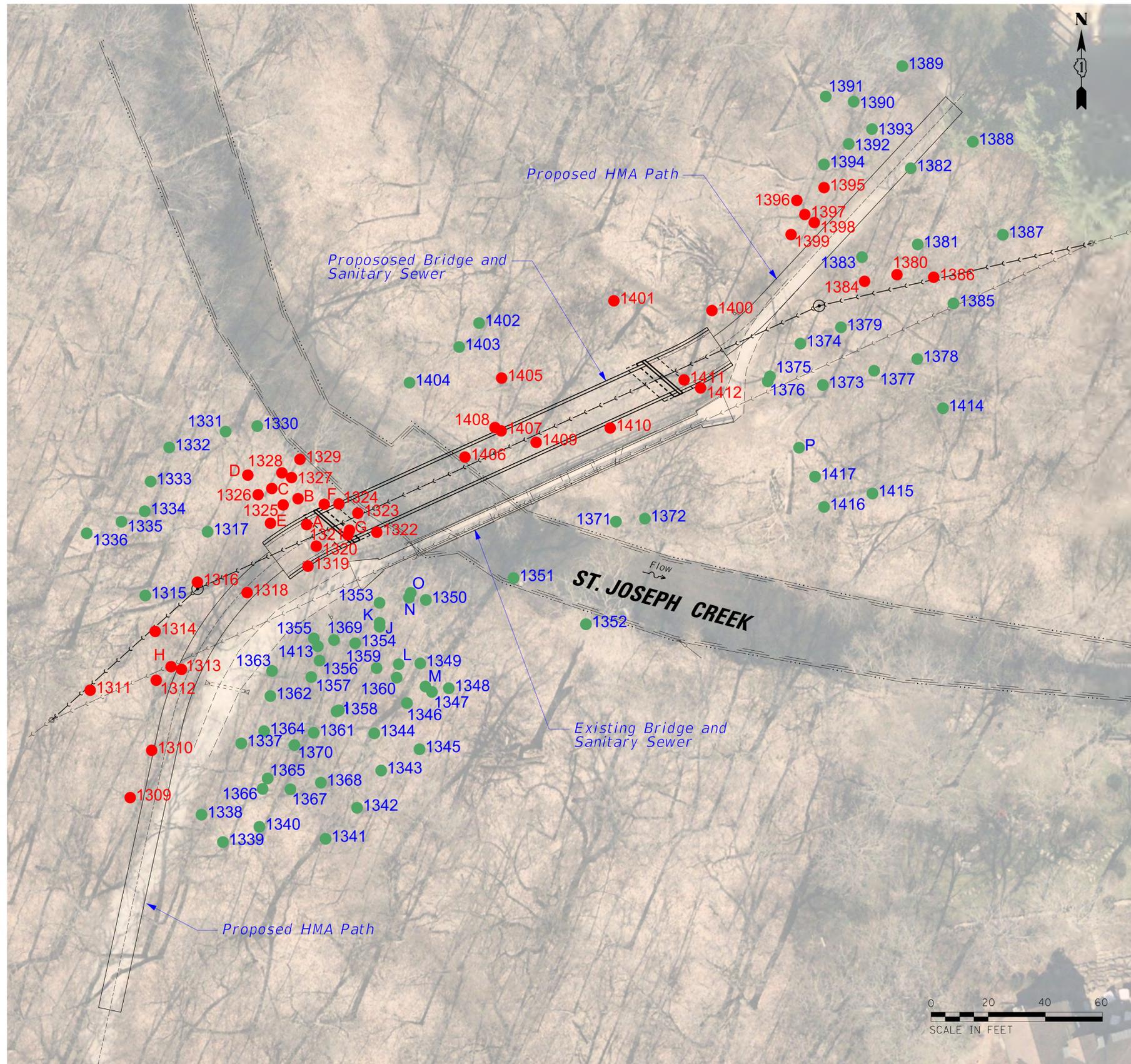
During the tree survey, each tree was evaluated on a scale rating from 1 - 5. These ratings were based on general observations at the time of the inventory. A rating of 5 (poor) has the lowest value in terms of protection or preservation. A rating of 1 (excellent) has the highest value and are the highest quality trees found.

For example:

- A. (5 = worst condition) A rating of 5 was given to a tree that has significant deadwood, bad sweep or lean, disease or damage by insect pests and larvae, lightning damage, split, or other physical damage.
- B. (4 = bad condition) A rating of 4 was given to a tree that has some deadwood, minor sweep or lean, distorted shape, trunk or bark damage, multiple stems, or poor physical quality.
- C. (3 = typical condition) A rating of 3 was given to a tree that is average in condition, form, physical state, appearance, and health.
- D. (2 = above average) A rating of 2 was given to a tree that has little or no damage, sound, good shape and form, and is good in overall physical quality.
- E. (1 = excellent condition) A rating of 1 was given to a tree that is excellent in appearance, condition and form, balanced branching and healthy. In our opinion, a tree worth preserving.

LEGEND

- Tree
- 1309 Tree ID #
- 1341 Tree Not Impacted by Construction - See Complete Tree Inventory Table in Appendix D
- 1309 Tree Impacted by Construction - See Table Above



**PRELIMINARY COST ESTIMATES
 CBBEL PROJECT NO. 230312**

Alternate 1 - Structure Replacement with 125' Prefabricated Truss Superstructure (See Drawing C-1)

IDOT Code	Description	Unit	Quantity	Unit Cost	Total Cost
20100110	Tree Removal (6 to 15 Units Diameter)	Unit	227	\$ 24.00	\$ 5,448
20100210	Tree Removal (Over Units Diameter)	Unit	134	\$ 36.00	\$ 4,824
20200100	Earth Excavation	Cu. Yd.	250	\$ 50.00	\$ 12,500
20700110	Porous Granular Embankment	Cu. Yd.	95	\$ 85.00	\$ 8,075
21101625	Topsoil Furnish and Place, 6"	Sq. Yd.	1175	\$ 8.00	\$ 9,400
25000115	Seeding, IDOT Class 1B	Acre	0.04	\$ 25,000.00	\$ 1,000
25000200	Seeding, IDOT Class 2	Acre	0.04	\$ 25,000.00	\$ 1,000
25100630	Erosion Control Blanket	Sq. Yd.	1175	\$ 3.00	\$ 3,525
25200200	Supplemental Watering	Unit	10	\$ 75.00	\$ 750
28000400	Perimeter Erosion Barrier	Foot	200	\$ 4.00	\$ 800
31101400	Subbase Granular Material, Type B, 6"	Sq. Yd.	270	\$ 20.00	\$ 5,400
40603085	Hot-Mix Asphalt Binder Course, IL-19.0, N50	Ton	38	\$ 175.00	\$ 6,650
40603335	Hot-Mix Asphalt Surface Course, Mix "D", N50	Ton	23	\$ 225.00	\$ 5,175
50100100	Removal of Existing Structures	Each	1	\$ 40,000.00	\$ 40,000
50200100	Structure Excavation	Cu. Yd.	135	\$ 60.00	\$ 8,100
50201101	Cofferdam (Type 1) (Location 1)	Each	1	\$ 30,000.00	\$ 30,000
50201102	Cofferdam (Type 1) (Location 2)	Each	1	\$ 30,000.00	\$ 30,000
50300225	Concrete Structures	Cu. Yd.	40	\$ 1,400.00	\$ 56,000
50300300	Protective Coating	Sq. Yd.	190	\$ 2.00	\$ 380
50301350	Concrete Superstructure (Approach Slab)	Cu. Yd.	20	\$ 900.00	\$ 18,000
50800205	Reinforcement Bars, Epoxy Coated	Pound	7200	\$ 2.50	\$ 18,000
50901720	Bicycle Railing	Foot	95	\$ 300.00	\$ 28,500
51201600	Furnishing Steel Piles. Size TBD	Foot	720	\$ 100.00	\$ 72,000
51202305	Driving Piles	Foot	720	\$ 1.00	\$ 720
51203600	Test Pile Steel HP, Size TBD	Each	2	\$ 10,000.00	\$ 20,000
51204650	Pile Shoes	Each	12	\$ 450.00	\$ 5,400
52200800	Segmental Concrete Block Wall	Sq. Ft.	450	\$ 55.00	\$ 24,750
59100100	Geocomposite Wall Drain	Sq. Yd.	25	\$ 25.00	\$ 625
60146304	Pipe Underdrain for Structures 4"	Foot	135	\$ 25.00	\$ 3,375
67100100	Mobilization	L. Sum	1	\$ 62,000.00	\$ 62,000
X0322508	Pedestrian Truss Superstructure	Sq. Ft.	1500	\$ 250.00	\$ 375,000
X0322791	Fill Existing Sanitary Sewers	Cu. Yd.	33.7	\$ 500.00	\$ 16,850
X0327036	Bike Path Removal	Sq. Yd.	210	\$ 20.00	\$ 4,200
X0426200	Dewatering	L. Sum	1	\$ 5,000.00	\$ 5,000
X6022820	Manholes, Sanitary, 5' Diameter, Type 1 Frame, CL	Each	2	\$ 9,000.00	\$ 18,000
X7010216	Traffic Control and Protection (Special)	L. Sum	1	\$ 6,000.00	\$ 6,000
Z0013797	Stabilized Construction Entrance	Sq. Yd.	200	\$ 30.00	\$ 6,000
Z0013798	Construction Layout	L. Sum	1	\$ 8,000.00	\$ 8,000
Z0057500	Sanitary Sewer 24"	Foot	405	\$ 300.00	\$ 121,500
N/A	Pipe Hanger System	L. Sum	1	\$ 20,000.00	\$ 20,000
N/A	Decorative LedgeStone	Sq. Yd.	55	\$ 150.00	\$ 8,250
N/A	Restore Existing Gilbert Park Bike Path	L. Sum	1	\$ 20,000.00	\$ 20,000

Subtotal = \$ 1,092,000.00
 20% Contingency = \$ 219,000.00
 Construction Total = \$ 1,311,000.00
 Phase I Engineering = \$ 100,000.00
 Phase II Engineering (10%) = \$ 132,000.00
 Permitting (3%) = \$ 40,000.00
 Phase III Engineering (10%) = \$ 132,000.00
TOTAL CONSTRUCTION AND ENGINEERING = \$ 1,715,000.00

**PRELIMINARY COST ESTIMATES
 CBBEL PROJECT NO. 230312**

Alternate 2 - Structure Replacement with 85' Prefabricated Truss Superstructure (See Drawing C-2)

IDOT Code	Description	Unit	Quantity	Unit Cost	Total Cost
20100110	Tree Removal (6 to 15 Units Diameter)	Unit	227	\$ 24.00	\$ 5,448
20100210	Tree Removal (Over Units Diameter)	Unit	134	\$ 36.00	\$ 4,824
20200100	Earth Excavation	Cu. Yd.	250	\$ 50.00	\$ 12,500
20700110	Porous Granular Embankment	Cu. Yd.	95	\$ 85.00	\$ 8,075
21101625	Topsoil Furnish and Place, 6"	Sq. Yd.	1175	\$ 8.00	\$ 9,400
25000115	Seeding, IDOT Class 1B	Acre	0.04	\$ 25,000.00	\$ 1,000
25000200	Seeding, IDOT Class 2	Acre	0.04	\$ 25,000.00	\$ 1,000
25100630	Erosion Control Blanket	Sq. Yd.	1175	\$ 3.00	\$ 3,525
25200200	Supplemental Watering	Unit	10	\$ 75.00	\$ 750
28000400	Perimeter Erosion Barrier	Foot	200	\$ 4.00	\$ 800
31101400	Subbase Granular Material, Type B, 6"	Sq. Yd.	270	\$ 20.00	\$ 5,400
40603085	Hot-Mix Asphalt Binder Course, IL-19.0, N50	Ton	38	\$ 175.00	\$ 6,650
40603335	Hot-Mix Asphalt Surface Course, Mix "D", N50	Ton	23	\$ 225.00	\$ 5,175
50100100	Removal of Existing Structures	Each	1	\$ 40,000.00	\$ 40,000
50200100	Structure Excavation	Cu. Yd.	135	\$ 60.00	\$ 8,100
50201101	Cofferdam (Type 1) (Location 1)	Each	1	\$ 30,000.00	\$ 30,000
50201102	Cofferdam (Type 1) (Location 2)	Each	1	\$ 30,000.00	\$ 30,000
50300225	Concrete Structures	Cu. Yd.	40	\$ 1,400.00	\$ 56,000
50300300	Protective Coating	Sq. Yd.	190	\$ 2.00	\$ 380
50301350	Concrete Superstructure (Approach Slab)	Cu. Yd.	20	\$ 900.00	\$ 18,000
50800205	Reinforcement Bars, Epoxy Coated	Pound	7200	\$ 2.50	\$ 18,000
50901720	Bicycle Railing	Foot	95	\$ 300.00	\$ 28,500
51201600	Furnishing Steel Piles. Size TBD	Foot	720	\$ 100.00	\$ 72,000
51202305	Driving Piles	Foot	720	\$ 1.00	\$ 720
51203600	Test Pile Steel HP, Size TBD	Each	2	\$ 10,000.00	\$ 20,000
51204650	Pile Shoes	Each	12	\$ 450.00	\$ 5,400
52200800	Segmental Concrete Block Wall	Sq. Ft.	450	\$ 55.00	\$ 24,750
59100100	Geocomposite Wall Drain	Sq. Yd.	25	\$ 25.00	\$ 625
60146304	Pipe Underdrain for Structures 4"	Foot	135	\$ 25.00	\$ 3,375
67100100	Mobilization	L. Sum	1	\$ 54,000.00	\$ 54,000
X0322508	Pedestrian Truss Superstructure	Sq. Ft.	1020	\$ 250.00	\$ 255,000
X0322791	Fill Existing Sanitary Sewers	Cu. Yd.	33.7	\$ 500.00	\$ 16,850
X0327036	Bike Path Removal	Sq. Yd.	210	\$ 20.00	\$ 4,200
X0426200	Dewatering	L. Sum	1	\$ 5,000.00	\$ 5,000
X6022820	Manholes, Sanitary, 5' Diameter, Type 1 Frame, CL	Each	2	\$ 9,000.00	\$ 18,000
X7010216	Traffic Control and Protection (Special)	L. Sum	1	\$ 6,000.00	\$ 6,000
Z0013797	Stabilized Construction Entrance	Sq. Yd.	200	\$ 30.00	\$ 6,000
Z0013798	Construction Layout	L. Sum	1	\$ 8,000.00	\$ 8,000
Z0057500	Sanitary Sewer 24"	Foot	405	\$ 300.00	\$ 121,500
N/A	Pipe Hanger System	L. Sum	1	\$ 15,000.00	\$ 15,000
N/A	Decorative Ledge Stone	Sq. Yd.	55	\$ 150.00	\$ 8,250
N/A	Restore Existing Gilbert Park Bike Path	L. Sum	1	\$ 20,000.00	\$ 20,000

Subtotal = \$ 959,000.00
 20% Contingency = \$ 192,000.00
 Construction Total = \$ 1,151,000.00
 Phase I Engineering = \$ 100,000.00
 Phase II Engineering (10%) = \$ 116,000.00
 Permitting (3%) = \$ 35,000.00
 Phase III Engineering (10%) = \$ 116,000.00
TOTAL CONSTRUCTION AND ENGINEERING = \$ 1,518,000.00

**PRELIMINARY COST ESTIMATES
 CBBEL PROJECT NO. 230312**

Alternate 3 - Structure Replacement Using Two Spans, 62.5' Long Spans, Tub Girders (See Drawing D-1)

IDOT Code	Description	Unit	Quantity	Unit Cost	Total Cost
20100110	Tree Removal (6 to 15 Units Diameter)	Unit	227	\$ 24.00	\$ 5,448
20100210	Tree Removal (Over Units Diameter)	Unit	134	\$ 36.00	\$ 4,824
20200100	Earth Excavation	Cu. Yd.	250	\$ 50.00	\$ 12,500
20700110	Porous Granular Embankment	Cu. Yd.	125	\$ 85.00	\$ 10,625
21101625	Topsoil Furnish and Place, 6"	Sq. Yd.	1175	\$ 8.00	\$ 9,400
25000115	Seeding, IDOT Class 1B	Acre	0.04	\$ 25,000.00	\$ 1,000
25000200	Seeding, IDOT Class 2	Acre	0.04	\$ 25,000.00	\$ 1,000
25100630	Erosion Control Blanket	Sq. Yd.	1175	\$ 3.00	\$ 3,525
25200200	Supplemental Watering	Unit	10	\$ 75.00	\$ 750
28000400	Perimeter Erosion Barrier	Foot	200	\$ 4.00	\$ 800
31101400	Subbase Granular Material, Type B, 6"	Sq. Yd.	270	\$ 20.00	\$ 5,400
40603085	Hot-Mix Asphalt Binder Course, IL-19.0, N50	Ton	38	\$ 175.00	\$ 6,650
40603335	Hot-Mix Asphalt Surface Course, Mix "D", N50	Ton	23	\$ 225.00	\$ 5,175
50100100	Removal of Existing Structures	Each	1	\$ 40,000.00	\$ 40,000
50200100	Structure Excavation	Cu. Yd.	185	\$ 60.00	\$ 11,100
50201101	Cofferdam (Type 1) (Location 1)	Each	1	\$ 30,000.00	\$ 30,000
50201102	Cofferdam (Type 1) (Location 2)	Each	1	\$ 30,000.00	\$ 30,000
50201103	Cofferdam (Type 1) (Location 3)	Each	1	\$ 30,000.00	\$ 30,000
50300225	Concrete Structures	Cu. Yd.	60	\$ 1,400.00	\$ 84,000
50300255	Concrete Superstructure	Cu. Yd.	38	\$ 2,200.00	\$ 83,600
50300300	Protective Coating	Sq. Yd.	210	\$ 2.00	\$ 420
50301350	Concrete Superstructure (Approach Slab)	Cu. Yd.	20	\$ 900.00	\$ 18,000
50800205	Reinforcement Bars, Epoxy Coated	Pound	14160	\$ 2.50	\$ 35,400
50901720	Bicycle Railing	Foot	345	\$ 300.00	\$ 103,500
51201600	Furnishing Steel Piles. Size TBD	Foot	1080	\$ 100.00	\$ 108,000
51202305	Driving Piles	Foot	1080	\$ 1.00	\$ 1,080
51203600	Test Pile Steel HP, Size TBD	Each	3	\$ 10,000.00	\$ 30,000
51204650	Pile Shoes	Each	18	\$ 450.00	\$ 8,100
52200800	Segmental Concrete Block Wall	Sq. Ft.	450	\$ 55.00	\$ 24,750
59100100	Geocomposite Wall Drain	Sq. Yd.	25	\$ 25.00	\$ 625
60146304	Pipe Underdrain for Structures 4"	Foot	135	\$ 25.00	\$ 3,375
67100100	Mobilization	L. Sum	1	\$ 70,000.00	\$ 70,000
X0322791	Fill Existing Sanitary Sewers	Cu. Yd.	33.7	\$ 500.00	\$ 16,850
X0327036	Bike Path Removal	Sq. Yd.	210	\$ 20.00	\$ 4,200
X0426200	Dewatering	L. Sum	1	\$ 5,000.00	\$ 5,000
X6022820	Manholes, Sanitary, 5' Diameter, Type 1 Frame, CL	Each	2	\$ 9,000.00	\$ 18,000
X7010216	Traffic Control and Protection (Special)	L. Sum	1	\$ 6,000.00	\$ 6,000
Z0013797	Stabilized Construction Entrance	Sq. Yd.	200	\$ 30.00	\$ 6,000
Z0013798	Construction Layout	L. Sum	1	\$ 8,000.00	\$ 8,000
Z0057500	Sanitary Sewer 24"	Foot	405	\$ 300.00	\$ 121,500
N/A	Pipe Hanger System	L. Sum	1	\$ 20,000.00	\$ 20,000
N/A	Decorative Ledgestone	Sq. Yd.	110	\$ 150.00	\$ 16,500
N/A	Restore Existing Gilbert Park Bike Path	L. Sum	1	\$ 20,000.00	\$ 20,000
N/A	Press-Break-Formed Steel Tub Girder (PBFSTG) Sys.	Foot	250	\$ 850.00	\$ 212,500

Subtotal = \$ 1,234,000.00
 20% Contingency = \$ 247,000.00
 Construction Total = \$ 1,481,000.00
 Phase I Engineering = \$ 100,000.00
 Phase II Engineering (10%) = \$ 149,000.00
 Permitting (3%) = \$ 45,000.00
 Phase III Engineering (10%) = \$ 149,000.00

TOTAL CONSTRUCTION AND ENGINEERING = \$ 1,924,000.00

**PRELIMINARY COST ESTIMATES
 CBBEL PROJECT NO. 230312**

Alternate 4 - Structure Replacement Using Single Span, 85' Long Tub Girders (See Drawing D-2)

IDOT Code	Description	Unit	Quantity	Unit Cost	Total Cost
20100110	Tree Removal (6 to 15 Units Diameter)	Unit	227	\$ 24.00	\$ 5,448
20100210	Tree Removal (Over Units Diameter)	Unit	134	\$ 36.00	\$ 4,824
20200100	Earth Excavation	Cu. Yd.	250	\$ 50.00	\$ 12,500
20700110	Porous Granular Embankment	Cu. Yd.	95	\$ 85.00	\$ 8,075
21101625	Topsoil Furnish and Place, 6"	Sq. Yd.	1175	\$ 8.00	\$ 9,400
25000115	Seeding, IDOT Class 1B	Acre	0.04	\$ 25,000.00	\$ 1,000
25000200	Seeding, IDOT Class 2	Acre	0.04	\$ 25,000.00	\$ 1,000
25100630	Erosion Control Blanket	Sq. Yd.	1175	\$ 3.00	\$ 3,525
25200200	Supplemental Watering	Unit	10	\$ 75.00	\$ 750
28000400	Perimeter Erosion Barrier	Foot	200	\$ 4.00	\$ 800
31101400	Subbase Granular Material, Type B, 6"	Sq. Yd.	270	\$ 20.00	\$ 5,400
40603085	Hot-Mix Asphalt Binder Course, IL-19.0, N50	Ton	38	\$ 175.00	\$ 6,650
40603335	Hot-Mix Asphalt Surface Course, Mix "D", N50	Ton	23	\$ 225.00	\$ 5,175
50100100	Removal of Existing Structures	Each	1	\$ 40,000.00	\$ 40,000
50200100	Structure Excavation	Cu. Yd.	135	\$ 60.00	\$ 8,100
50201101	Cofferdam (Type 1) (Location 1)	Each	1	\$ 30,000.00	\$ 30,000
50201102	Cofferdam (Type 1) (Location 2)	Each	1	\$ 30,000.00	\$ 30,000
50300225	Concrete Structures	Cu. Yd.	40	\$ 1,400.00	\$ 56,000
50300255	Concrete Superstructure	Cu. Yd.	26	\$ 2,200.00	\$ 57,200
50300300	Protective Coating	Sq. Yd.	165	\$ 2.00	\$ 330
50301350	Concrete Superstructure (Approach Slab)	Cu. Yd.	20	\$ 900.00	\$ 18,000
50800205	Reinforcement Bars, Epoxy Coated	Pound	10320	\$ 2.50	\$ 25,800
50901720	Bicycle Railing	Foot	265	\$ 300.00	\$ 79,500
51201600	Furnishing Steel Piles. Size TBD	Foot	720	\$ 100.00	\$ 72,000
51202305	Driving Piles	Foot	720	\$ 1.00	\$ 720
51203600	Test Pile Steel HP, Size TBD	Each	2	\$ 10,000.00	\$ 20,000
51204650	Pile Shoes	Each	12	\$ 450.00	\$ 5,400
52200800	Segmental Concrete Block Wall	Sq. Ft.	450	\$ 55.00	\$ 24,750
59100100	Geocomposite Wall Drain	Sq. Yd.	25	\$ 25.00	\$ 625
60146304	Pipe Underdrain for Structures 4"	Foot	135	\$ 25.00	\$ 3,375
67100100	Mobilization	L. Sum	1	\$ 56,000.00	\$ 56,000
X0322791	Fill Existing Sanitary Sewers	Cu. Yd.	33.7	\$ 500.00	\$ 16,850
X0327036	Bike Path Removal	Sq. Yd.	210	\$ 20.00	\$ 4,200
X0426200	Dewatering	L. Sum	1	\$ 5,000.00	\$ 5,000
X6022820	Manholes, Sanitary, 5' Diameter, Type 1 Frame, CL	Each	2	\$ 9,000.00	\$ 18,000
X7010216	Traffic Control and Protection (Special)	L. Sum	1	\$ 6,000.00	\$ 6,000
Z0013797	Stabilized Construction Entrance	Sq. Yd.	200	\$ 30.00	\$ 6,000
Z0013798	Construction Layout	L. Sum	1	\$ 8,000.00	\$ 8,000
Z0057500	Sanitary Sewer 24"	Foot	405	\$ 300.00	\$ 121,500
N/A	Pipe Hanger System	L. Sum	1	\$ 15,000.00	\$ 15,000
N/A	Decorative Ledge Stone	Sq. Yd.	55	\$ 150.00	\$ 8,250
N/A	Restore Existing Gilbert Park Bike Path	L. Sum	1	\$ 20,000.00	\$ 20,000
N/A	Press-Break-Formed Steel Tub Girder (PBFSTG) Sys.	Foot	170	\$ 1,000.00	\$ 170,000

Subtotal = \$ 992,000.00
 20% Contingency = \$ 199,000.00
 Construction Total = \$ 1,191,000.00
 Phase I Engineering = \$ 100,000.00
 Phase II Engineering (10%) = \$ 120,000.00
 Permitting (3%) = \$ 36,000.00
 Phase III Engineering (10%) = \$ 120,000.00
TOTAL CONSTRUCTION AND ENGINEERING = \$ 1,567,000.00