Environmental Assessment Worksheet

Scherer Site and Hall's Island Reconstruction

Prepared for
Minneapolis Park & Recreation Board

February 2017

4300 MarketPointe Drive, Suite 200
Minneapolis, MN 55435
952.832.2600
www.barr.com

Environmental Assessment Worksheet

Scherer Site and Hall's Island Reconstruction

February 2017

Contents

1. Project Title 1
2. Proposer 1
3. RGU 1
4. Reason for EAW Preparation 2
5. Project Location 2
6. Project Description 3
7. Cover Types 9
8. Permits and Approvals Required 10
9. Land Use 12
10. Geology, Soils and Topography/Land Forms 15
11. Water Resources 18
12. Contamination/Hazardous Materials/Wastes 23
13. Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features) 27
14. Historic Properties 37
15. Visual 38
16. Air 38
17. Noise 39
18. Transportation 40
19. Cumulative Potential Effects 43
20. Other Potential Environmental Effects 47

List of Tables

Table 1 Project Magnitude Summary....8
Table 2 Summary of Cover Types (in acres)....10
Table 3 Permits and Approvals Required....11
Table 4 Fish Species Documented in the Upper St. Anthony Pool, 2006–2008....30
Table 5 Federal and State Listed Species Recorded near the Proposed Project....33
Table 6 Estimated Traffic....41

List of Figures

Figure 1 Project Location
Figure 2 U.S. Geological Survey (7.5 Minute Quadrangle)
Figure 3 Historic Aerial Imagery
Figure 4 Island Progression History
Figure 5 Project Overview
Figure 6 Proposed Habitat Zones
Figure 7 Minneapolis Primary Zoning
Figure 8 Water Resources
Figure 9 Soils
Figure 10 Existing Site Conditions and Proposed Grading
Figure 11 Mussel Survey Area
Figure 12 Sensitive Ecological Resources
Figure 13 Cultural Resources

List of Appendices

Appendix A 60% Design Plans
Appendix B Mussel Survey Report
Appendix C References

July 2013 version

ENVIRONMENTAL ASSESSMENT WORKSHEET

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at: http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm. The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item, or can be addresses collectively under EAW Item 19.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. Project Title

Scherer Site and Hall's Island Reconstruction

2. Proposer

Minneapolis Park & Recreation Board
Contact person: Jon Duesman
Title: Construction Project Manager
Address: 2117 West River Road
City, State, ZIP: Minneapolis, MN 55411
Phone: 612-230-6471
Email: jduesman@minneapolisparks.org

3. RGU

Minneapolis Park & Recreation Board
Contact person: Michael Schroeder
Title: Assistant Superintendent for Planning Services
Address: 2117 West River Road
City, State, ZIP: Minneapolis, MN 55411
Phone: 612-230-6467
Email: mschroeder@minneapolisparks.org

4. Reason for EAW Preparation

Required:	Discretionary:
☐ EIS Scoping	☐ Citizen petition
X Mandatory EAW	☐ RGU discretion
	☐ Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s): Subpart 27 – Wetlands and Public Waters

5. Project Location

- County: Hennepin
- City/Township: Minneapolis
- PLS Location (¼, ¼, Section, Township, Range): SW ¼ SE ¼ of Section 15, T29W, R24N

  Watershed (81 major watershed scale): 20—Mississippi River-Twin Cities

  GPS Coordinates: 44.994411°N, -93.272328°W

  Tax Parcel Numbers: 053-1502924410018
  053-1502924440044
  053-1502924440046
  053-1502924440065
  053-1502924440066

At a minimum attach each of the following to the EAW:

- County map showing the general location of the project (**Figure 1**)
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable) (**Figure 2**)
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.

  Figures are included in the "Figures" section at the end of the document text.

6. Project Description

a. Provide the brief project summary to be published in the *EQB Monitor*, (approximately 50 words).

The Minneapolis Park & Recreation Board is proposing to restore Hall's Island in the Mississippi River and establish an adjacent eight-acre riverfront park at the Scherer Site, upstream of the Plymouth Avenue Bridge in northeast Minneapolis. The proposed project would be located primarily on Park Board-owned land and would be habitat-focused with opportunities for recreational use.

b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

Project Background

In 2010, the Minneapolis Park & Recreation Board (MPRB) purchased an 11.4-acre parcel of land formerly owned by Scherer Brothers Lumber Company, with the intent to eventually develop approximately eight acres of the area into parkland (**Figure 1** and **Figure 2**). The purchase was funded through the Minnesota Legacy Act's Parks and Trails Fund, the Regional Park Acquisition Opportunity Fund, and from Interstate 35W condemnation funds from parkland purchased for the new Interstate 35W bridge in downtown Minneapolis. This parkland development is included in the MPRB's 2013 Draft Above the Falls Master Plan, a long-range vision to develop Minneapolis' Upper Mississippi Riverfront as a regional park and revitalized residential and commercial district from upstream of the Central Mississippi Riverfront Regional Park to the city limits, essentially the city's Upper Riverfront. It also complements the MPRB's Comprehensive Plan visions to create parkland that "endures and captivates, shapes city character, and meets diverse community needs."

RiverFirst is a 20-year vision for development of riverfront parks along the Mississippi River. The MPRB, along with its RiverFirst partners, have initiated design and planning for priority projects along 5.5 miles of the Upper Riverfront in Minneapolis, including restoration of Hall's Island and a park on the adjacent Scherer Site. The park is envisioned to serve as a recreational entry point to the Mississippi River, Mississippi East Bank Trail, and upper river regional park system for cyclists, runners, walkers, canoeists and kayakers, with a focus on restoring aquatic and upland habitat in the surrounding urban environment.

Historical photographs show Hall's Island existing in the Mississippi River channel in 1938, while the Mississippi River Commission Survey's drawings show the island in place as early as 1895 (**Figure 3**). It was once owned by the City of Minneapolis, which operated public bathing houses on the island from 1905 to 1926.

Prior to the 2010 land purchase by the MPRB, Scherer Brothers Lumber Company operated a lumber mill on the mainland adjacent to Hall's Island. Expansion of the lumber operations was limited by surrounding industrial developments. In 1965, the U.S. Army Corps of Engineers issued a permit authorizing Scherer Brothers Lumber Company to remove most of Hall's Island and use it to fill landward, in the backchannel between the island and mainland. The permit also authorized construction of dock facilities for Scherer Brothers Lumber Company use. In 1966, Hall's Island was partially dredged and deposited at the adjacent shoreline to expand the mainland at the Scherer Brothers site (referred to as the Scherer Site) (**Figure 4**).

Due to the Scherer Site's former industrial use, environmental investigations and response actions were conducted on the Scherer Site between 2009 and 2012 in anticipation of redeveloping the site into a park. These investigations focused on the upper four feet of soils at the site. In 2012, site soils that were found to contain elevated levels of metals and polycyclic aromatic hydrocarbons (PAHs) were excavated and backfilled with clean, debris-free fill so that the upper four feet of soils at the site met the Minnesota Pollution Control Agency's (MPCA's) recreational soil reference values. However, it was noted at that time that additional investigation or response actions may be needed if soils at greater depths or along the riverbank are disturbed.

Project Overview

The MPRB is proposing to restore Hall's Island in the Mississippi River and establish an adjacent approximately eight-acre riverfront park on a portion of the Scherer Site, property formerly owned by Scherer Brothers Lumber Company located on the east bank of the Mississippi River, upstream of Plymouth Avenue in northeast Minneapolis (**Figure 5**). The main goals for the proposed project are to: improve biodiversity, create a softer and more accessible connection to the river, and provide a migratory flyway stopover for birds within the urban core. Hall's Island would be maintained as natural habitat, with a single boardwalk trail supporting only pedestrian use traversing it. The shoreline area of the Scherer Site would also be maintained as either gravel beach or natural habitat.

Restoration of Hall's Island would create new habitat within the Mississippi River channel in a portion of the north/northeast Minneapolis urban environment that is dominated by

industrial uses and has limited access to natural areas. Hall's Island restoration nearly triples park shoreline from 700 linear feet to nearly 2,000 linear feet. Hall's Island is currently planned to feature several types of natural habitats, including a shrub-dominated riparian bench, sandy beach, and an upland zone providing a mix of floodplain forest and mesic to wet herbaceous layers (**Figure 6**). The side channel east of the island (between the island and the mainland) would be designed to incorporate features that improve mussel habitat along this stretch of river. Additional planned habitat features for fauna include nesting/basking logs, rock and brush nesting areas, sandy beach area, rock ledges and standing snags for habitat.

Hall's Island and the side channel between the island and the mainland Scherer Site have been designed to have no negative effects on recreational navigation in the river or flood levels and river flow. Floodplain modeling shows that the proposed island and side channel configuration will result in no rise in floodplain elevations up and downstream of the proposed project, though there would be a maximum rise of 0.12 feet (1.44 inches) in the 100-year water surface elevation (approximately 808 feet) near the center to Hall's Island and the Scherer Site. In addition, sediment modeling shows that the integrity of the island will be maintained given local river velocities and engineered erosion control measures. The sediment modeling also shows that the side channel will flush accumulated fine sediments (silts and clays) at regular intervals.

In addition to the island, the park design for the Scherer Site would include a gravel beach designed to withstand seasonal flooding and multiple zones of native vegetation. The recently-constructed Mississippi East Bank Trail connection through the site would be preserved, serving as an important bicycle commuter connection with Boom Island to the south and a trail extension to the north. Additional public amenities that may be included at the Scherer Site include boat rental and storage for paddlers, a farmer's market area, a park-supportive café pavilion, and terraced gathering spaces to be programmed throughout the seasons.

Construction of Hall's Island and a park at the Scherer Site are consistent with RiverFirst initiatives to transform currently low habitat-value segments of the river corridor through island and shoreline restoration. Additional benefits derived from these efforts include creating economic and recreation opportunities in underserved communities and educating urban youth about healthy ecosystems.

Commercial development is included in future, long-range plans for the remaining 3.5 acres of land located in the northeast portion the Scherer Site, known as Parcel D (**Figure 5**).

Commercial development in this location would aid in activating and financially supporting the operations of the park. Parcel D development would occur under a separate process and is not included with the currently proposed Scherer Site and Hall's Island project.

Proposed Construction Methods and Sequencing

The proposed project is planned to be constructed in phases, with Phase 1 beginning in late 2017. Phase 1 will consist of soil clean-up, debris removal, and grading at the Scherer Site and construction of Hall's Island. It is anticipated that construction would begin by grading the Scherer Site and then working outward from the mainland to construct the island. The mainland portion of the project would be contoured according to the proposed grading plan using on-site materials. Excess materials from grading would either remain stabilized on-site for future incorporation or disposed of at an approved off-site location. Approximately 1,500 cubic yards (CY) of fine gravel would be imported to construct the gravel beach.

Hall's Island would best be constructed in low-flow river conditions, which typically occur during winter. The contractor would be responsible for ensuring that construction methodologies minimize erosion and sedimentation in the river and comply with all permit conditions. From the mainland, approximately 32,700 CY of imported, clean sand fill would be placed to form the base of the island below the ordinary high water level (OHWL) at an elevation of 802 feet. The sand base would be lined with approximately 4,600 CY of salvaged and new riprap to minimize the potential for erosion. This aligns with island construction methodologies the USACE has used for island construction downstream in Mississippi River Pools 4 through 10, in Minnesota, Wisconsin, and Iowa. Approximately 7,900 CY of on-site soils would be placed to form upland portions of the island (i.e. area above the OHWL). Once island construction is complete, upland portions would be vegetated with native, habitat-supportive herbaceous seed mixes, shrubs, and trees, and temporary erosion control measures installed; vegetation maintenance would be required for up to five years or until performance standards established by permitting are met.

A semi-permanently saturated riparian bench approximately 10 feet wide would be constructed around most of the island perimeter. This bench would serve several purposes, including stability, habitat development, and safety. The outer edge of the bench would consist of a vegetated reinforced soil slope (VRSS). VRSS is a bioengineering method used to cushion shoreline against hydrologic forces and stabilize slopes (see plan sheets in **Appendix A**). In this case, VRSS would provide an additional measure of shoreline protection for portions of the island subject to higher river velocities. The riparian bench would include pockets of shrubs within the herbaceous vegetation layer to provide

protection from erosion, as well as to create diverse habitat features for songbirds, amphibians, reptiles, and small mammals. Additionally, the riparian bench would provide a safety zone between the upland portion of the island and the steep island slope below the water's surface. Essentially the riparian bench would be constructed such that it would not be attractive or easy for users to access the island from the water to protect habitat. It would also be a deterrent for park users who may venture off the boardwalk and toward the island edge.

It is anticipated that the side channel would be constructed once the island has been formed. The central portion of the side channel would be excavated first, with the upstream and downstream ends remaining blocked to minimize sediment transport. Substrate in the side channel would consist of imported materials intended to provide suitable mussel habitat (gravels embedded in sand). Once the majority of the side channel is constructed, the downstream portion would be opened first to allow for construction in that location to take place in as dry of conditions as practicable. The upstream opening of the side channel would be constructed last to minimize through-flow while the final segment of the channel is being constructed.

Phase 1 construction is anticipated to last up to eight months, with the majority of the in-water work occurring during low-flow conditions.

Additional, future phases of island development would include boardwalk construction, as well as pedestrian bridge abutments, piers, and pedestrian bridges to connect the mainland with the island. The boardwalk would consist of an elevated walkway allowing pedestrians to traverse the length of the island while limiting pedestrian access to other parts of the island as a means of protecting habitat. In addition, the boardwalk would allow for movement of water and wildlife below the elevated walkway. Observation platforms along the boardwalk would allow opportunities for users to enjoy river and skyline views outside of the main walkway.

Three future pedestrian bridges are planned in association with the proposed project: 1) replacement of the existing bridge to Boom Island Park along an alignment that allows for better flow of bicycle traffic, 2) a new bridge to access Hall's Island from the south end, and 3) a new bridge to access Hall's Island from the north end. The bridge to Boom Island Park and the south bridge to Hall's Island are planned to be clear-spans. The north bridge to Hall's Island is the longest and is planned to be constructed with four span segments, requiring the placement of three piers in the side channel. Piers for the north bridge will be

designed to be hydrologically efficient and would include proper scour protection at each pier base as part of installation.

Future phases of the mainland park development include increased landscaping, additional shared use trail connections, equipment rental facilities, and structures needed to support activities such as a farmers market, a café, and/or interpretive programming. Construction timing for future phases of island and park development is dependent on project funding.

c. Project magnitude:

Table 1 provides a summary of the proposed project's magnitude.

Table 1 Project Magnitude Summary

Component	Size
Total project acreage	12.2 acres
Linear project length	Not applicable
Number and type of residential units	Not applicable
Commercial building area (in square feet)	Not applicable
Industrial building area (in square feet)	Not applicable
Institutional building area (in square feet)	Not applicable
Other uses—specify (in square feet)	Not applicable
Structure height(s)	Not applicable

d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of the proposed project is to begin to create recreational improvements along this portion of the Mississippi River, as envisioned by the RiverFirst Initiative and other related comprehensive land use plans, as described below in EAW Item 9. The proposed project is driven by three key components:

- Ecological Benefits, protecting and supporting a diverse range of native terrestrial species and,
- Community Connections, reconnecting people to the River through a need for dynamic, year-round park experience;
- Recreation; providing a softer and more accessible connection to the River and linking multiple regional routes.

Beneficiaries of the proposed project include users of park facilities, particularly those in underserved areas of north and northeast Minneapolis. Beyond local beneficiaries, Hall's Island and the Scherer Site would be part of Minneapolis' regional park system, a large network of parks that essentially function as the metro-area's version of the state park system. As a result, the proposed project would have a regional orientation. Based on visitor counts, current use at the Central Mississippi Riverfront Regional Park located immediately downstream from the Plymouth Avenue Bridge is in excess of 2.1 million users annually. The connectivity provided by the proposed project between the Central Mississippi Riverfront Regional Park and upstream parks would likely lead to similar usage levels for both the trail users passing through the proposed project and park visitors to the proposed project. In addition to the ecological benefits driving the proposed project, it would serve a growing need for recreational space within Minneapolis and the larger metropolitan region.

e. Are future stages of this development including development on any other property planned or likely to happen? **X** Yes ☐ No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

As described in detail as part of the Proposed Construction Methods and Sequencing portion of EAW Item 6, the proposed project is planned to be constructed in phases as funding becomes available.

f. Is this project a subsequent stage of an earlier project? ☐ Yes **X** No

If yes, briefly describe the past development, timeline and any past environmental review.

7. Cover Types

Estimate the acreage of the site with each of the following cover types before and after development: An assessment of land cover types was estimated using GIS; the results are summarized in **Table 2.**

Table 2 Summary of Cover Types (in acres)

Cover Type	Before	After
Wetlands	0	0.4
Deep water/streams	3.1	3.5
Wooded/forest	0	2.9
Brush/grassland	0	1.4
Cropland	0	0
Lawn/landscaping	0.3	3.5
Impervious Surface	0.3	0.5
Stormwater Pond	0	0
Other – Vacant lot/sparse vegetation	8.5	0
Total Area	**12.2**	**12.2**

8. Permits and Approvals Required

List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

Table 3 lists permits and approvals required.

Table 3 Permits and Approvals Required

Unit of Government	Type of Application	Status
U.S. Army Corps of Engineers	• Section 404 Permit • Section 10 Permit	• To be obtained • To be obtained
Federal Emergency Management Agency	• Conditional Letter of Map Revision (CLOMR)	• In progress
U.S. Fish and Wildlife Service	• Section 7 Concurrence	• To be obtained
U.S. Coast Guard	• Bridge Permit	Applicability is pending
Minnesota Pollution Control Agency	• Section 401 Water Quality Certification • NPDES/SDS Construction Stormwater Permit • Response Action Plan	• To be obtained • To be obtained • In progress
Minnesota Department of Natural Resources	• Work in Public Waters Permit	• To be obtained
State Historic Preservation Office	• Section 106 Concurrence	• To be obtained
MN Office of State Archaeologist	• Project Approval	• To be obtained
City of Minneapolis	• Preliminary Development Review (will include Floodplain Permit) • Conditional Use Permit • Right-of-Way Permit (for work under Plymouth Avenue Bridge) • Bridge Engineer Approval	• To be obtained • To be obtained • To be obtained • To be obtained
Minneapolis Park & Recreation Board	• Construction Permit • Maintenance agreement with City of Minneapolis	• To be obtained • In progress

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 9-18, or the RGU can address all cumulative potential effects in response to EAW Item No. 19. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 19

All potential cumulative impacts are discussed in EAW Item 19, Cumulative Potential Effects.

9. Land Use

a. Describe:

i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

The proposed project is located within a vacant parcel that was the former site of the Scherer Brothers Lumber Company. No structures are present on the property and the boundaries are partially fenced. The Mississippi River runs adjacent to the property on the west. Other adjacent land uses include industrial properties to the north and east and Boom Island Park to the south (**Figure 7**).

The combined use Mississippi East Bank Trail runs approximately east-west through the proposed project area with a connection to the Boom Island Park trails. Additional land use near the site includes residential properties, commercial establishments, and five additional parks, including Boom Island and B.F. Nelson Park (approximately 0.20 miles to the southeast), Dickman Park (approximately 0.25 miles to the east), Sheridan Memorial Park (approximately 0.25 miles to the north) Nicollet Island Park (approximately 0.65 miles to the east), and Ole Olson Park (approximately 0.75 miles to the northwest. The James I. Rice West River Parkway is adjacent to West River Road, across the Plymouth Bridge (a distance of approximately 0.25 miles) from the proposed project.

ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

Comprehensive land use planning applicable to the proposed project is discussed below. Unless noted, the proposed project area would be located within the boundary of these plans.

RiverFirst: A Park Design Proposal and Implementation Plan for the Minneapolis Upper Riverfront was adopted by the MPRB in 2012. RiverFirst is a 20-year urban design vision that includes a set of design recommendations for phased parks development, including priority projects such as river islands. Its main goals include establishing parks as economic drivers, connecting communities to the riverfront, and refocusing the city toward the Mississippi River. The Scherer Site/Hall's Island was identified as one of five priority projects within the RiverFirst plan.

Draft Above the Falls Regional Park Master Plan (Plan Update 2013) includes the goal of developing the upper Mississippi riverfront into a regional park amenity. The plan includes several objectives related to the proposed project, including:

- Provide public access to the river through a continuous system of riverfront parks and trails;
- Enhance the ecological function of the river corridor.

This updated plan envisions the evolution of some of the industrial uses along the river and it guides redevelopment of riverfront parcels toward park uses related to the city's land use plan.

Central Mississippi Riverfront Regional Park Master Plan guides the redevelopment and enhancement of existing MPRB facilities and resources, as well as the acquisition of additional property and expansion of the regional park boundary. The plan outlines several guiding principles that relate to the proposed project, including:

- Connect to and along the river by foot, bicycle, transit, boat, and private vehicle;
- Restore and enhance natural resources
- Improve wildlife habitat and water quality;
- Reveal and interpret past and present, nature and culture;
- Engage visitors through activities, amenities, food, and events.

The Central Mississippi Riverfront Regional Park Plan also specifically identifies the proposed Scherer Site/Hall's Island as a significant project due to its direct linkage to Boom Island Park. Though the Central Mississippi Riverfront Regional Park Plan limits terminate at Boom Island Park, the connection between the Scherer Site and Boom Island Park would be in alignment with this plan's objectives by expanding trail connections along the river, introducing areas of adjacent natural habitat, and enhancing the visitor experience.

The Metropolitan Council's *2030 Regional Parks Policy Plan* lays out the goals for the expansion of the parks system, and the strategies designed to meet these goals. This plan discusses the *2030 Regional Development Framework* that includes a policy to "work with local and regional partners to reclaim, conserve, protect and enhance the region's vital natural resources: encouraging the integration of natural-resource conservation into all land-planning decisions. Seeking to protect important natural

resources and adding areas to the regional parks system. Working to protect the region's water resources."

The Saint Anthony West Neighborhood Association (STAWNO) has filed the *Saint Anthony West Neighborhood Small Area Plan (Volume 2,* April 2016*)* with the City of Minneapolis for incorporation into the City's next Comprehensive Plan. The STAWNO Plan advocates for continued improvements to local parks, including a riverfront trail connection to the Scherer Site and for creation of a shared use trail between the Scherer Site and Boom Island Park beneath the Plymouth Avenue Bridge.

The *Watershed Management Plan 2011-2021* serves as the guide for the Mississippi Watershed Management Organization (MWMO) to implement watershed goals. The management plan acknowledges that the MWMO is a highly-developed watershed with limited viable fish and wildlife habitat. As such, the areas within the watershed that foster fish and wildlife populations are important to preserve, monitor, and enhance. The management plan also identifies Ecosystem Health as one of ten key focus areas, including finding ways to protect, create, and enhance vegetated areas, springs, native plant communities, habitat, open space, and green infrastructure.

The Minneapolis Plan for Sustainable Growth (2009) is the City of Minneapolis' comprehensive plan that provides the vision and framework for the City's urban renaissance and growth as a great city of the future. Within the *Open Space and Parks Chapter* of this plan, one of the stated strategies for creating future parks includes "continuing to expand physical access to the Mississippi River in a manner that is aesthetically compatible with the riverfront and sensitive to the environment, giving priority to implementing the *Above the Falls Master Plan*."

iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

The proposed project area is currently zoned Medium Industrial (I2) (**Figure 7**). Regulations for industrial districts within the City of Minneapolis are "established to promote industrial development and to maintain and improve compatibility with surrounding areas. In addition to industrial uses, limited commercial uses, parking facilities, institutional and public uses and public services and utilities are allowed." Park uses are permitted in a Medium Industrial District per Chapter 550.30 in the City of Minneapolis' zoning code.

The proposed project would be located within the shoreland zone (within 300 feet of a river or stream). The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map depicts the entire proposed project area within the mapped 100-year floodplain (**Figure 8**). The segment of the Mississippi River that would border the proposed project is part of the Minnesota State Water Trail. The proposed project would also be located within the National Park Service's (NPS) Mississippi National River and Recreation Area (MNRRA) and the Minnesota Department of Natural Resources' (MNDNR) Mississippi River Corridor Critical Area program (MRCCA); these areas are described further on EAW Item 13b.

b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The proposed project would be compatible with the nearby land uses, zoning, and plans previously described in EAW Item 9aii. The proposed project would also provide additional greenspace and recreational opportunities for existing and future residential development by transforming a former industrial site into park land. Though restoration of Hall's Island would result in the permanent loss of 1.82 acres of existing aquatic habitat, approximately 2.78 acres of new aquatic habitat would be created within the proposed side channel. This would result in a net gain of approximately one acre of new, higher quality aquatic habitat within the Mississippi River channel and a net gain in park land in an urban environment that has limited access to natural areas. Additional information regarding the proposed project's effects on flood and flow levels can be found in EAW Item 11.

c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

The proposed project would be compatible with current land uses and would increase existing park and recreation opportunities within a part of the City of Minneapolis currently with limited access to water and natural areas.

10. Geology, Soils and Topography/Land Forms

a. Geology – Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

The bedrock formation in the proposed project area is St. Peter Sandstone (Minnesota Geological Survey 1989). St. Peter Sandstone is weakly cemented, though well compacted,

and is fairly homogenous. It is well sorted, friable sandstone, predominately consisting of fine to medium grained quartz. Depth to bedrock in the proposed project area is approximately 50 to 150 feet below ground surface. Surficial geology consists of sandy floodplain alluvium and gravelly sand, interstratified with clay and silty clay. No geologically sensitive features are known to occur in the vicinity of the proposed project area.

b. Soils and topography – Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

Topography of the Scherer Site is generally flat, ranging between 804 to 810 feet elevation, with some minor downward sloping towards the Mississippi River. There are no topographic features of note within the proposed project area.

Soil in the Scherer Site is mapped as Urban land-Udorthents, wet substratum, complex, rarely flooded (Map Unit U5A) and Urban land-Udipsamments (cut and fill land) rarely flooded (Map Unit U4A) (USDA NRCS, 2015; **Figure 9**). The historic Hall's Island was excavated in the 1960s and excavated materials were used to fill in the channel, which is currently the western extent of the Scherer Site (**Figure 4**). Additional fill from other unknown sources was also placed at the Scherer Site over time. As a result, legacy fill soils contain a large amount of debris (e.g. concrete, glass, wood, and bricks) and some documented chemical impacts.

Fill soils at the Scherer Site consist primarily of silty sand. Native soils below the fill are primarily composed of silty sands, similar to fill, but without the debris. Native soils are situated within the range of 5 feet below the ground surface on the east side of the site to 18 feet below the ground surface near the Mississippi River.

The proposed project would include excavation, grading, creation of a side channel, and the restoration of Hall's Island. Approximately 75,000 CY of soil would be excavated from the Scherer Site, approximately 10,500 CY of which would be excavated from areas previously backfilled with clean fill imported to the Scherer Site in 2012 as part of the response actions (see discussion in EAW Item 12, Contamination/Hazardous Materials/Wastes), and the

remaining excavation (approximately 64,500 CY) consists primarily of legacy fill soils placed during the historical Hall's Island excavation. Some native soil below the legacy fill may be excavated in some areas.

Approximately 41,000 CY of clean, imported sand would be needed to construct the core of Hall's Island (not including rip rap, topsoil, beach stone or other cover materials). A portion of on-site soils would be screened to remove debris and reused above the OHWL, where suitable, for construction of Hall's Island.

Clean sand, gravel, stone and other fill or cover material would be imported to the proposed project area for use in constructing Hall's Island, creating the proposed habitats, and providing erosion control. Imported material placed to construct the island base below water would be composed of clean, medium-grained sand. On-site soils, primarily reclaimed from previously imported backfill (from the 2011-2012 site clean-up efforts), would be reused to build the portion of Hall's Island that is above the OHWL. Imported gravel-sand mixture, sized specifically to promote mussel habitat, would be placed in the side channel. Rip rap would be utilized to protect the outer portions of the island subject to river erosion, as well as the downstream end of the side channel. The island beach would be covered with sand and the mainland beach with pea-sized gravel. A riparian bench approximately 10 feet wide would be constructed around most of the perimeter around Hall's Island two feet below the OHWL at an elevation of 800, which would provide added stability. The outer edge of the bench would consist of VRSS, a bioengineering method used to protect the shoreline against hydrologic forces, as an additional measure of shoreline protection for portions of Hall's Island that are subject to higher river velocities. The riparian bench would include pockets of shrubs within the herbaceous vegetation layer to provide additional protection from erosion. Imported sand, stone and other granular materials would be obtained from a commercial gravel pit and would be required to meet specific gradation requirements based upon location of placement.

Construction would begin in late 2017 and is anticipated to start with grading the Scherer Site and working outward from the mainland to construct Hall's Island (site plans are provided in **Appendix A**). Hall's Island would best be constructed in low-flow river conditions, which typically occur during winter. Appropriate best management practices (BMPs) would be implemented to minimize erosion and sedimentation of the river, including silt curtains or other sediment controls, and total suspended solids (TSS) monitoring that would be required to meet downstream water quality monitoring performance specifications. Construction sequencing and materials would be utilized to control erosion and downstream sediment transport to the extent practicable. Once

construction is complete, soils would be stabilized with vegetation. It is expected that the side channel would be constructed once the island has been formed; details regarding construction of the side channel are provided under EAW Item 11 (Water Resources).

11. Water Resources

a. Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.

i. Surface water – lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

The proposed project is located on the east bank of the Mississippi River, near river mile 855, just upstream of the Plymouth Avenue Bridge (**Figure 8**). The Mississippi River is listed on the MNDNR Public Waters Inventory (ID number 01001a). The MPCA identifies this reach of the Mississippi River (from the Crow River to Upper St. Anthony Falls) as an impaired water with recreation, aquatic consumption, and aquatic life as the designated uses and fecal coliform, mercury and PCB in fish tissue, and nutrient/eutrophication biological indicators as the pollutants/stressors (MPCA 2016).

A wetland delineation was conducted across the proposed project area on October 8, 2014. No wetlands were identified in the proposed project area during the delineation; the Mississippi River was the only surface water feature identified within the proposed project area (Barr 2015).

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

According to the Minnesota Geologic Survey – Hennepin County Geologic Atlas, the groundwater surface within the proposed project area is approximately 800 feet above mean sea level, and regional groundwater flow is from west-southwest toward the Mississippi River. There are no known springs or seeps in the vicinity of the proposed project area. The proposed project is not located in a Minnesota Department of Health wellhead protection area. According to the Minnesota County Well Index (Minnesota

Geologic Survey 2016), there is an abandoned well located in the proposed project area; the current status of this well is sealed (well ID 329025; **Figure 8**).

b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

i. Wastewater – For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

2) If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.

3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.

The proposed project would not produce any sanitary, municipal/domestic, or industrial wastewater.

ii. Stormwater – Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

When owned by The Scherer Brothers Lumber Company, the Scherer Site consisted primarily of impervious surfaces, including buildings and pavement. At present, all buildings have been removed and the Scherer Site consists of a non-native grass field (see EAW Item 13; Fish, wildlife, plant communities, and sensitive ecological resources).

There is no stormwater treatment on the Scherer Site. Local runoff flows through the Scherer Site towards the Mississippi River.

There is an existing 48-inch reinforced concrete pipe storm sewer line located beneath 10th Avenue that conveys stormwater from the upstream contributing area to the Mississippi River (**Figure 8**). This storm sewer line outlets to the Mississippi River through a 36-inch by 58-inch corrugated metal pipe, which is located in the far northwest portion of the proposed project area. The proposed project would require modifications at the outlet in order to tie the proposed project into existing ground; however, stormwater conveyance through this network would be maintained.

A Stormwater Pollution Prevention Plan (SWPPP) would be developed prior to construction as part of the construction National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) permit. Specific BMPs used for site stabilization and sediment control during project construction would be identified in the SWPPP and detailed site plans.

iii. Water appropriation – Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

The proposed project would not appropriate surface or groundwater.

iv. Surface Waters

a) Wetlands – Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed, and identify those probable locations.

No wetlands are present within the proposed project area; as such, the proposed project would not impact wetlands.

b) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

The proposed project would involve excavating approximately 3.73 acres of the Scherer Site to restore the historic Hall's Island and adjacent side channel. Approximately 0.94 acres of the 3.73-acre excavation area would be part of Hall's Island; the remaining 2.78 acres would become the adjacent side channel. Future components of the proposed project would include construction of a boardwalk, as well as abutments, piers, and bridges to connect the mainland with the proposed island.

The restoration of Hall's Island would result in the permanent loss of approximately 1.82 acres of existing aquatic habitat. However, approximately 2.78 acres of aquatic habitat would be created within the proposed side channel, resulting in a net gain of approximately one acre of aquatic habitat. The proposed project would increase the length of shoreline from 700 feet to approximately 2,000 feet once Hall's Island and the adjacent side channel are constructed. The river shoreline would provide an

interspersion of rock shoreline, large woody structures and shrub community riparian habitats to protect the shoreline from erosion and enhance habitat diversity.

Hall's Island would best be constructed in low-flow river conditions, which typically occur during winter. It is anticipated that construction of the side channel would likely occur after the island has been formed. The central portion of the side channel would be excavated first, with the upstream and downstream ends remaining blocked to minimize sediment transport. Substrate in the side channel would consist of imported materials intended to provide suitable mussel habitat. Once the majority of the side channel is constructed, the downstream portion would be opened first to allow for construction in that location to occur in the driest possible conditions. The upstream opening of the side channel would be constructed last to minimize through-flow while the channel is being constructed. The contractor would be responsible for ensuring that construction methodologies minimize erosion and sedimentation of the river, and complies with all permit requirements. Appropriate BMPs, such as sediment fencing or other suitable measures, would be implemented during construction in order to minimize the potential for turbidity or sedimentation. These BMPs would be outlined in the SWPPP, site plans, and/or through permitting conditions.

The proposed configuration of Hall's Island was optimized using USACE HEC-RAS software with the goal of minimizing impacts to the one-percent annual chance flood (100-year design flood) at adjacent upstream and downstream properties. The model indicates that following construction, there would be a maximum rise in the 100-year water surface elevation of 0.12 feet (1.44 inches) near the center of Hall's Island and the Scherer Site; however the 100-year water surface elevation would be at or below the existing stage at the upstream and downstream extents of the proposed project area. The proposed water surface elevation impacts are contained on MPRB property and would be reviewed through FEMA's Conditional Letter of Map Revision/Letter of Map Revision (CLOMR/LOMR) process.

Sediment modeling completed for the proposed project shows that the integrity of Hall's Island would be maintained given local river velocities and that the side channel will flush accumulated fine sediments (silts and clays) at regular intervals.

The proposed project would result in the establishment of new habitat and enhancing existing low-quality habitat within this portion of the Mississippi River, as discussed under EAW Item 13 (Fish, wildlife, plant communities, and sensitive ecological resources).

The proposed project has been designed to have no negative effects on recreational navigation in the river. Furthermore, commercial navigation on the portion of the river above the St. Anthony Falls Dam ceased with closure of the lock in 2015. As such, the proposed project would also not impact commercial navigation.

12. Contamination/Hazardous Materials/Wastes

a. Pre-project site conditions – Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

Environmental investigations and response actions were conducted at the site between 2009 and 2012 in anticipation of redevelopment of the site as a park. The concept plans for restoration of Hall's Island had not been developed at that time; therefore the initial investigation and response actions focused on the top four feet of soils at the site.

In 2012, areas of fill soil that contained elevated levels of metals and PAHs were excavated to ensure the site soils in the upper four feet met the MPCA recreational soil reference values (SRVs), with the exception of select areas of metals concentrations in the eastern half of the site that were below MPCA industrial SRVs and reported to be representative of natural background concentrations (Peer 2012). Areas of soil in the northern portion of the site with Toxicity Characteristic Leaching Procedure (TCLP) hazardous levels of lead required stabilization prior to disposal (Peer, 2012). Clean debris-free fill was tested and imported to the site as backfill (Peer, 2012). Lead concentrations above industrial SRVs remain at the base of excavation Area 3, shown on **Figure 10**. A No Further Action letter was issued by the MPCA in October 2012 for the contamination identified in soil based on recreational use of the site, with a note that additional investigation or response actions may be needed if soils at depth or along the riverbank are disturbed (MPCA 2012).

Following the 2012 response actions, three investigations were conducted in support of the proposed project under the MPCA voluntary program (VP32360).

The 2014 pre-design environmental investigation assessed the soil, groundwater, and soil vapor conditions at the site to obtain information needed for construction and design of the proposed island and park, as well as for future development of Parcel D. The soil

assessment focused on the deeper soil at the proposed project area in order to evaluate management options for soil that would remain in the future upland portion of the park, soil that would be left below the new channel between the Scherer Site and the island, and soil proposed to be excavated.

In 2015, a test trench was completed to characterize and provide a representative visual confirmation of the fill, including the types and extent of the debris within the fill. A 2015 soil vapor investigation on Parcel D involved the collection of soil, vapor and groundwater samples to identify the likely source and extent of trichloroethylene (TCE) concentrations in soil gas on the parcel.

The assessment of data from all previous environmental investigations indicates the following conditions currently exist at the site:

- Much of the soil proposed to be excavated would be composed of fill containing significant debris. Fill at the site is heterogeneous, with various sizes and types of debris, ranging from 4-foot pieces of concrete, to smaller debris such as glass, wood and bricks in some areas (Barr, 2015a and 2015b).
- The soil proposed to be excavated would not meet MPCA guidelines for Unregulated Fill (MPCA, 2012), primarily due to the significant debris in the fill, as well as individual sample results above MPCA Residential SRVs. The excavated soil cannot be reused off-site or used to construct project features below the OHWL, and would need to be either managed on-site or disposed of at a permitted landfill. The soil proposed to be excavated is not anticipated to be hazardous for disposal purposes.
- The previously placed fill soil meets recreational screening levels for human health exposures above the OHWL, but does not meet sediment screening levels for ecological exposure below the OHWL.
- The clean backfill soils that had been imported for the 2012 response action would be suitable for reuse as the surficial soil layer in restoring the island or upland portions of the park.

A Response Action Plan (RAP) for the proposed project has been developed to address environmental impacts at the site and achieve the following objectives:

- Improve cover over fill soils below the waterline.
- Appropriately manage excavated fill soils with debris and marginal chemical impacts.
- Protect water quality during excavation and island construction.

The RAP was submitted to the MPCA for approval in February 2017. The response action objectives will be achieved through the following RAP activities during construction:

- Previously placed fill soils would be reused to construct the portion of the island above the water line. Soils would be inspected in the field for evidence of contamination and debris before placement.
- Excess soils generated for the proposed project would be disposed of at a nonhazardous waste permitted landfill.
- Fill soils left in place below the side channel's waterline after construction of the island would be covered with appropriate cover materials, engineered to resist erosion and provide an armored barrier mitigating direct exposure to fill soils beneath. The cover would be a minimum of 12 inches thick, and include the following:
    - Riparian bench. A ten foot wide vegetated bench would be constructed at the normal water level around most of the island and on the mainland near the upstream end of the channel. The bench would consist of 24 inches of clean imported cover materials
    - Side Channel. The majority of the new channel between Hall's Island and the Scherer Site would be excavated and lined with 12 inches of an imported sand and gravel mixture.
    - Side Channel – south end. The southern portion of the side channel near the Plymouth Avenue Bridge would be lined with rip rap and a geotextile filter for erosion protection.
    - Outer perimeter and upstream end of island. The outer perimeter of the island on the river side would be lined with 24 inches of rip rap for erosion protection.
- No actions would be needed to address residual concentrations of contaminants in soil proposed to be left or reused above the waterline on the island or Scherer Site. If debris-rich fill soil is reused on the site, the debris would be removed prior to placement.
- Water quality best management practices would be implemented to control suspended sediment transport during excavation and island construction. These include construction sequencing to minimize water inflow during channel excavation, use of downgradient sediment control measures such as silt curtains, and water quality (TSS) monitoring.

If unanticipated environmental conditions are encountered, they would be managed under the Site Contingency Plan, which is part of the RAP. Unexpected contingent conditions could include uncovering an unknown underground storage tank, a water well or vent pipe, debris, containers, or contaminated soils that are different than those described in the RAP.

b. Project related generation/storage of solid wastes – Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

Mass grading and excavation to construct the side channel and Hall's Island is anticipated to result in approximately 60,000 CY of excess soil that cannot be reused for island construction or on-site grading because it contains contamination and/or debris. The excess fill soils would be excavated, hauled off-site and disposed of at approved permitted disposal facility. Debris may be disposed of separately at a permitted demolition landfill. The soil would be managed in accordance with the MPCA-approved RAP. Waste generation from other sources is not anticipated.

c. Project related use/storage of hazardous materials – Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

Hazardous material storage would include secondary containment of fuels during the construction phase of the proposed project.

Fuels, oils, lubricants and other materials typical for use by construction equipment would be used during construction. No other chemicals or hazardous materials would be needed for or generated by the proposed project.

Refueling spills and equipment breakdowns, such as a broken hydraulic line, could introduce contaminants into the soil during construction. A spill could result in potentially adverse effects to on-site soils. However, the amounts of fuel and other lubricants and oils would be limited to that needed by the equipment on-site. Supplies and equipment needed to quickly limit any contamination would be located on site.

The contractor would be required to prepare a Spill Prevention and Response Plan to address accidental spills or the release of any hazardous material or petroleum products. To minimize the likelihood of potential spills and leaks of petroleum and hydraulic fluids during project construction, equipment would be inspected daily for leaks and petroleum contamination, fuels for construction would be stored at staging areas in upland locations, and equipment refueling and maintenance would be performed in locations that are not proximate to the river. In addition, the contractor would be required to utilize double-walled tanks or secondary containment for single-walled tanks used for on-site storage of petroleum products. Any bulk lubricants would also be stored with secondary containment protection. All petroleum and lubricant storage containers would be inspected on a weekly basis and the inspections would be documented.

d. Project related generation/storage of hazardous wastes – Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

Construction and operation of the proposed project is not anticipated to generate any hazardous waste. Excavated soils on site are not considered to be hazardous for disposal purposes.

13. Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features)

a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

The MNDNR, in collaboration with the U.S. Forest Service, developed an Ecological Classification System (ECS) for hierarchical mapping and classification of Minnesota land areas with similar native plant communities and other ecological features. Based on the ECS, the proposed project area is located within the Anoka Sand Plain Subsection of the Minnesota and Northeast Iowa Morainal Section of the Eastern Broadleaf Forest Province. The Anoka Sand Plain Subsection consists of a flat, sandy lake plain and terraces along the Mississippi River. Pre-settlement vegetation was primarily comprised of oak savanna on the droughty uplands, with upland prairies and floodplain forests forming narrow bands along the Mississippi River. However, the proposed project area was previously utilized as an industrial area as early as 1885 (most recently as the Scherer Brothers Lumber Company mill) and the landscape has been significantly altered from native plant communities present before development.

The proposed project is located within the NPS Mississippi National River and Recreational Area (MNRRA); this area is also part of the Mississippi River Corridor Critical Area program (MRCCA). There are no designated habitat areas (i.e. wildlife refuges) in the vicinity of the proposed project.

A wetland delineation completed in October 2014 did not identify any wetlands within the proposed project area. The delineation included vegetation identification and found the upland area on the east portion of the proposed project area to be comprised of a highly disturbed grass field dominated by Kentucky blue grass (*Poa pratensis*), with the following non-native species also present: hoary alyssum (*Berteroa incana*), wormwood (*Artemisia absinthium*), white cockle (*Silene latifolia*), and yellow toadflax (*Linaria vulgaris*). The shoreline of the Mississippi River within and adjacent to the proposed project area is rocky, with upland vegetation present at the top of the bank, approximately two feet from the water. Upland shoreline vegetation is dominated by Kentucky bluegrass and wormwood in the understory and Siberian elm (*Ulmus pumila*) in the overstory, with occasional small cottonwoods (*Populus deltoides*) present in the shrub layer. This section of the river is largely devoid of aquatic vegetation.

A desktop habitat review was completed utilizing publically available sources including Google Earth, Google Spheres, Pictometry, and historical aerial imagery. Upstream and downstream land cover is similar to that present within the proposed project area (primarily industrial uplands and riverine); however other habitat types present within and adjacent to the river include: wooded river shoreline present on the opposite and upstream/downstream banks of the river; open grassy areas at local parks; and residential development and associated urban woodlots further from the proposed project area. Also present in the surrounding area of the proposed project are a series of islands within the Mississippi River. Publically available on-site photos available through Google Spheres show that the first upstream island is dominated by cottonwood and willow species and is home to a great blue heron rookery. Reports from various sources, including Chanen (2012), state that the rookery was formerly located at the second upstream island, but was destroyed during a tornado in 2011.

Because the proposed project area is situated in a largely industrial area and does not contain any wetlands, floodplain forests, or native terrestrial plant communities, wildlife habitat is scarce, therefore limiting the number of terrestrial wildlife species likely to be present. Species expected to be present would be considered habitat generalists or those adapted to living in an urban environment such as gray squirrels, raccoons, and several species of common songbirds.

However, in general, the Mississippi River provides habitat for a diversity of organisms, such as fish, mussels and other aquatic invertebrates, amphibians, and mammals. Studies conducted by the U.S. Geological Survey and NPS have documented 14 species of frogs and salamanders and 8 species of turtles in the MNRRA corridor (Lafrancois et al. 2007, MNDNR 2006). Some of the aquatic mammals present within the MNRRA corridor include the American beaver, river otter, mink, and muskrat (Lafrancois et al. 2007). Birds also frequent the Upper Mississippi River. The Mississippi River Flyway is the migration corridor for a significant portion of North America's waterfowl and shorebirds. According to the NPS, approximately 105 species of water-based birds are present or likely present within the MNRRA corridor (Lafrancois et al. 2007).

Fish

The fisheries community found in the Upper St. Anthony Falls Pool has reduced species diversity when compared with downstream pools with the exception of the Lower St. Anthony Falls Pool, which is habitat-limited and only approximately one-half mile in length. Historically, St. Anthony Falls functioned as a fish barrier to upstream migration of fishes with the result being a fish assemblage of only about one-half the species that are found downstream (Eddy 1963). Species in greatest conservation need (SGCN) found in the Upper St. Anthony Pool during 2006 and 2008 included: the state-threatened black buffalo (*Ictiobus niger*) and the greater redhorse (*Moxostoma valenciennnesi*). The historic species list, pool diversity, and SGCN occurrence for the Upper St. Anthony Falls Pool is documented in Schmidt, K. and N. Prolux (2009) and included below in **Table 4**. Other species documented between 2006 and 2008 found in the Upper St. Anthony Falls Pool include walleye, northern pike, channel catfish, large and smallmouth bass, freshwater drum, white bass, and short head redhorse. MNDNR (2009) sampling in the Upper St. Anthony Falls Pool noted most abundant species as smallmouth bass (*Micropterus dolomieu*) and channel catfish (*Icalurus punctatus*).

Sampling in the Upper St. Anthony pool during 2006-2009, as noted in the previous paragraph, has included documentation of the presence of freshwater drum (*Aplodinotus grunniens*), host species to a number of freshwater mussels including the fawnsfoot (*Truncilla donaciformis)* (Ohio State University 2015).

Table 4 Fish Species Documented in the Upper St. Anthony Pool, 2006–2008

Family/Species	Family/Species
Cyprinidae-Minnow Family Spotfin shiner (Cyprinella spiloptera) Brassy minnow (Hybognathus hankinsoni) Common shiner (Luxilus comutus) Hornyhead chub (Nocomis biguttatus) Emerald shiner (Notropis atherinoides) Bigmouth shiner (Notropis dorsalis) Sand shiner (Notropis stramineus) Mimic shiner (Notropis volucellus) Channel shiner (Notropis wickliffi) Bluntnose minnow (Pimephales notatus) Fathead minnow (Pimephales promelas) Bullhead minnow (Pimephales vigilax) Creek chub (Semotilus atromaculatus)	**Catistomidae-Sucker Family** River carpsucker (Carpiodes carpio) Quillback (Carpiodes cyprinus) White sucker (Catostomas commersonii) Northern hogsucker (Hypentelium nigricans) Bigmouth buffalo (Ictiobus cyprinellus) Black buffalo (Ictiobus niger) Silver redhorse (Moxostoma anisurum) Shorthead redhorse (Moxostoma macrolepidotum) Greater redhorse (Moxostoma valenciennesi
Centrachidae-Sunfish Family Rock bass (Ambloplities rupestris) Green sunfish (Lepomis cyanellus) Pumpkinseed sunfish (Lepomis gibbosus) Orangespotted sunfish (Lepomis humilis) Bluegill (Lepomis macrochirus) Smallmouth bass (Micropterus dolomieu) Largemouth bass (Micropterus salmoides)	**Ictaluridae-Bullhead Catfish Family** Black bullhead (Ameiurus melas) Yellow bullhead (Ameiurus natalis) Channel catfish (Ictalurus punctatus) Stonecat (Noturus flavus)
Clupeidae-Herring Family Gizzard shad (Dorosoma cepedianum)	**Esocidae-Pike Family** Northern pike (Esox lucius)
Lepisosteidae-Gar Family Shortnose gar (Lepisosteus platostomus)	**Amiidae-Bowfin Family** Bowfin (Amia calva)
Percopsidae-Trout-perch Family Trout-perch (Percopsis omiscomaycus)	**Atherinopsidae-Silverside Family** Brook silverside (Labidesthes sicculus)
Maronidae-Temperate Bass Family White bass (Marone chrysops)	**Umbridae-Mudminnow Family** Central mudminnnow (Umbra limi)
Percidae-Perch Family Johnny darter (Etheostoma nigraum) Blackside darter (Percina maculata) Walleye (Sander vitreus)	**Sciaenidae-Drum Family** Freshwater drum (Aplodinotus grunniens)

Mussels

Historically, as many as 41 mussel species, including the federally and state endangered Higgins' eye pearly mussel (Higgins' eye; *Lampsilis higginsi*), winged mapleleaf (*Quadrula fragosa*), and spectaclecase (*Cumberlandia monodonta*) have been found in the MNRRA Corridor, as well as most state-listed mussel species (Kelner and Davis 2002). However, pollution through much of the 1900s decimated populations of aquatic fauna in this stretch of the Mississippi River. Partially due to water quality improvements over the last 20 years, and the fact that zebra mussels are not currently abundant, mussel populations are recovering today (Kelner and Davis 2002; Davis 2007; USFWS 2012). Over the past couple of decades, the MNDNR, in collaboration with other state and federal agencies, have made significant efforts towards inventorying and re-establishing mussel communities in the Upper Mississippi River.

Freshwater mussels are known to occur in the Upper St. Anthony Falls Pool of the Mississippi River. As previously noted, St. Anthony Falls has historically acted as a barrier to upstream dispersal of fish; recent reports indicate that mussels are expanding their range above St. Anthony Falls. A total of 18 mussel species have been reported from this pool, including the Minnesota threatened species fawnsfoot (*Truncilla donaciformis*) and species of special concern round pigtoe (*Pleurobema sintoxia*) and black sandshell (*Ligumia recta*) (Kelner 2011, Kelner and Davis 2002, Ecological Specialists, Inc. 2014). Kelner and Davis (2002) surveyed a site on the right descending bank (RDB) at mile 855.2 (directly across the channel from the proposed project; **Figure 11**). Six species were collected live at this site, all of which are considered "common" or "abundant" in the Upper St. Anthony Falls Pool. Two additional species were collected as dead shells, including black sandshell.

In the fall of 2014 Ecological Specialists, Inc. completed a Level I mussel survey to document mussel communities near the proposed project. The 2014 survey was completed along RDB at the site surveyed by Kelner and Davis (2002) and along the left descending bank (LDB) at the proposed Hall's Island site (**Figure 11**) (Ecological Specialists, Inc. 2014). The full mussel survey report is provided in **Appendix B**.

Mussels were present in low abundance in both the LDB and RDB survey areas. A total of 192 mussels of 12 species were collected from both areas combined. Species composition was fairly similar in the LDB and RDB survey areas. In the RDB survey area 10 species were collected; mapleleaf (*Quadrula quadrula*) was the most abundant species at 56 percent of the total catch; threehorn wartyback (*Obliquaria reflexa*; 18%) was also common; and the remaining 8 species each comprised less than 10 percent of the total. In the LDB survey area mapleleaf was again the most abundant species at nearly 50 percent of the total catch;

Wabash pigtoe (*Fusconaia flava*; 10%) was also common; and the remaining nine species each comprised less than 10 percent of the total. Two state-threatened wartyback (*Quadrula nodulata*) individuals were collected, one in the RDB and one in the LDB. This species had not previously been reported from the St. Anthony Falls Pool. In addition, a fresh dead black sandshell individual was collected in the LDB.

Mussel abundance appeared to correlate with substrate composition. In both survey areas, mussels were generally more abundant in the near bank areas, where substrate was a more heterogeneous mix of cobble, gravel, and sand. Few mussels were collected in the riverward locations in both sites, where substrate was primarily loose, shifting sand. Among these were the two wartyback individuals. Both individuals were collected from riverward locations in loose sand substrate. Overall mussel abundance was relatively low, and catch per unit effort was less than 1 mussel/minute in both survey areas.

b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-___) and/or correspondence number (ERDB _____) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) online tool identifies one federally threatened species and 3 federally endangered species as occurring in Hennepin County. The MNDNR's Natural Heritage Information System (NHIS) database (Barr License Agreement LA-722) and Statewide Mussel Survey database were reviewed in January 2017. Federal and state listed threatened and endangered species are summarized in **Table 5**.

Table 5 Federal and State Listed Species Recorded near the Proposed Project

Common Name	Scientific Name	Federal Status	State Status
Northern long-eared bat	*Myotis septentrionalis*	Threatened	Special Concern
Higgins eye Pearlymussel	*Lampis higginsii*	Endangered	Endangered
Snuffbox	*Epioblasma triquetra*	Endangered	Endangered
Rusty patched bumble bee	*Bombus affinis*	Endangered	Not listed
Black sandshell	*Ligumia recta*	Not Listed	Special Concern
Tri-colored bat	*Perimyotis subflavus*	Not Listed	Special Concern

It is possible but unlikely that the northern long-eared bat would occur within the proposed project area as desirable habitat, including caves, mines, and large upland forests, are not present proximate to the proposed project area. It is possible that northern long-eared bats are found amongst tri-colored bats in Chute's Cave, located 0.95 miles south of the proposed project.

According to the NHIS database and Statewide Mussel survey database, the state and federally endangered Higgins' eye and snuffbox mussels have not been documented within the vicinity of the proposed project area. While habitat suitable for Higgins' eye and snuffbox is likely present in the proposed project area, the 2014 mussel survey throughout and adjacent to the proposed project area did not document any individuals of either species.

According to the NHIS database, two state special concern species—the black sandshell (*Ligumia recta*) and the tricolored bar (*Perimyotis subflavus*)—have been documented within one mile of the proposed project area (**Figure 12**). Neither of these records overlaps the proposed project area and, although the record for black sandshell is located adjacent to the proposed project area along the RDB across from Hall's Island, the record accounts for dead shells identified in 2001 and 2015. In addition to the two species records, NHIS data document a bat colony approximately 0.95 miles south of the proposed project area in Chute's Cave, near St. Anthony Falls.

Data from the MNDNR Minnesota Biological Survey (MBS) were reviewed to determine if any Minnesota Biological Survey Sites of Biodiversity Significance (SBS), native plant communities, Scientific Natural Areas, wildlife refuges, or other sensitive ecological resources are present within or near the proposed project. According to the MNDNR data, no sensitive ecological resources are present within the vicinity of the proposed project.

As noted previously, the proposed project is located within the NPS MNRRA, which is a 72-mile river park offering opportunities for fishing, boating, canoeing, birdwatching, cycling, and hiking. This area is also part of the State's MRCCA. The MRCCA shares a boundary with the MNRRA and is a joint state, regional, and local program that provides coordinated planning and management for this stretch of the Mississippi River, which traverses 54,000 acres of land across 30 local jurisdictions.

c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

General Impacts

The proposed project is not expected to directly impact rare plant communities or ecosystems, as these rare features are not present within the immediate vicinity.

Within the river, mobile organisms such as fish are expected to avoid and move away from the work area during construction. Direct impacts may occur to more sessile organisms, such as mussels, that are unable to remove themselves from the construction area. While it is possible that the proposed project could affect mussels at the individual level, it is unlikely that the proposed project would adversely affect mussels at the population level. Ecological Specialists, Inc. submitted the Level I mussel survey results to the MNDNR (Richard Baker) for review. On October 16, 2014 Richard Baker responded indicating that no further mussel surveys, nor any mussel relocation, would be necessary for the proposed project. A copy of this correspondence is included in **Appendix B**.

Construction of the proposed project would result in the permanent loss of 1.82 acres of existing aquatic habitat, which may result in long-term proposed project-related impacts to aquatic biota. However, 2.78 acres of aquatic habitat would be created within the Mississippi River channel of the Upper St. Anthony Falls Pool upon completion of the proposed project (**Figure 5**), resulting in a net gain of nearly one acre of aquatic habitat that is higher quality than present habitat in the area.

Due to the industrial nature of the proposed project area, terrestrial wildlife habitat is limited; however, construction activities may cause minor temporary impacts on any terrestrial wildlife that is present in the vicinity of the proposed project area. Temporary impacts to terrestrial wildlife, including increased noise and human activity, may occur during construction. Wildlife species expected to be using the current project area are

habitat generalists and would likely not be adversely impacted by this temporary disturbance. Many wildlife species, even those accustomed to human proximity, could abandon habitats near the proposed project area until work is completed. Wildlife species are likely to find suitable habitat outside the proposed project area and are expected to return to areas abandoned during construction shortly after the completion of work. Furthermore, the proposed project would result in an increase in diverse, high-quality upland habitat consisting of grasses, shrubs, and trees that is expected to be used by a variety of migratory and resident birds, small mammals, amphibians, and reptiles such as turtles.

At present, the upland portion of the proposed project area consists of highly disturbed grass field comprised of Kentucky bluegrass and non-native weeds. During construction, soil materials moved off site would follow standard protocols to avoid the spread of invasive or non-native weedy species. Any fill brought on site would be certified clean. Ultimately the proposed project would decrease the susceptibility of the site to invasive species through establishment of native plant communities.

The proposed project would have no influence on the potential for zebra mussels or Asian carp invasion into the Upper St. Anthony Falls Pool. Minnesota Statute 84D.09 identifies state laws that prohibit the transport of invasive species, including zebra mussels. Construction equipment would be cleaned prior to arriving on site and cleaned again upon leaving the site to minimize potential for invasive species transfer.

Threatened and Endangered Species Impacts

Impacts to federally threatened or endangered species are not likely to result from the proposed project. Since desirable habitat, including caves, mines, or large upland forests, are not present within the immediate proposed project area, impacts to northern long-eared bats are unlikely. While suitable habitat is likely present for Higgins' eye and snuffbox mussels, the 2014 mussel survey did not identify any individuals of either species; therefore, proposed project-related impacts are not anticipated. Impacts to the rusty patched bumble bee are not anticipated as no flowering grassland habitat or undisturbed soil are present in the proposed project area.

Impacts to the state special concern tri-colored bat and bat colony are not anticipated. All work will occur in a heavily disturbed area and no suitable maternal roosting sites such as trees, crevices, or buildings will be impacted. The proposed project is located far enough from the nearest known colony location that noise and vibration impacts would not reach the colony.

d. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

Potential impacts to fish, mussels, and other aquatic organisms will be minimized by completing work under low-flow conditions and by excavating the center of the side channel first, with the upstream and downstream ends remaining blocked to minimize sediment transport. Once the majority of the side channel is constructed, the downstream portion would be opened first to allow for construction in that location to occur in the driest possible conditions. The upstream opening of the side channel would be constructed last to minimize through-flow while the channel is being constructed. Conducting work under these conditions will reduce the volume and duration of downstream sedimentation and turbidity, which can impact fish and other aquatic species. Additionally, erosion and sediment control BMPs will be installed on the landward side of the proposed project area to minimize impacts to the Mississippi River.

Potential impacts to terrestrial wildlife species will be minimized by ideally conducting the majority of work in the winter months, thus avoiding bird migration and nesting periods and reducing the likeliness of active small mammals within the proposed project area.

No impacts are expected to state or federally listed species and therefore no additional avoidance or minimization measures are proposed specific to these species.

The effects of the proposed project would be mitigated by creating island habitat within the Mississippi River, creating mussel habitat in the river, and by establishing native plant communities along targeted shoreline areas of the proposed project. As discussed above, two of the goals of the proposed project are to improve biodiversity options and to provide a migratory flyway stopover for birds within the urban core. The proposed project is located in a portion of the north/northeast Minneapolis urban environment that is dominated by industrial uses and has limited access to both the river and natural areas. Once complete, the proposed project would increase habitat quantity and quality and is therefore expected to increase the biological diversity and species richness in the immediate area.

Restoration of Hall's Island would increase the availability, heterogeneity and interspersion of diverse, natural habitat along this reach of the Mississippi River, including a net gain of nearly one acre of high-quality aquatic habitat, as well as improvement in habitat quality to the existing steep riprap shoreline areas. The side channel would be designed to incorporate features that improve mussel, fish, amphibian, and reptile habitat along this stretch of river. The establishment of desirable mussel habitat in the Upper St. Anthony Falls

Pool should create a valuable resource for mussel reintroduction efforts being conducted by the MNDNR and USFWS.

In addition to the side channel, several other project features have been incorporated to promote habitat diversity. The riparian bench would include pockets of shrubs within the herbaceous vegetation layer to provide diverse habitat features for songbirds, amphibians, reptiles, and small mammals. The upland zone would provide a mix of floodplain forest and mesic to wet herbaceous layers that would provide habitat for migratory birds. Accumulated driftwood, snags, rock ledges, and brush nesting areas would be installed to provide habitat for birds, turtles, and fish. Furthermore, the sandy beach and cobble areas would provide habitat for migratory shorebirds.

14. Historic Properties

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

A records review was conducted at the Minnesota Historical Society (MHS) to gather information about known historic properties and archaeological sites in the vicinity of the proposed project area. No recorded historic structures or archaeological sites are located within the boundaries of the proposed project area. There are 206 historic structures and six archaeological sites located with 0.5 miles of the proposed project area (**Figure 13**). Additionally, the proposed project area would be located adjacent to the northern boundary of the St. Anthony Falls Historic District.

Historic maps and photographs were also used to track the changes to the proposed project area. **Figure 4** shows the approximate historic outline of Hall's Island that existed prior to the 1966 dredging, in addition to the location of the proposed island and shoreline. Information from the historic documents indicate that the majority of the historic island was removed and placed as part of the 1966 dredging project, with the exception of the southeast portion of the island lying under and directly north and south of the Plymouth Avenue bridge. A decorative lighthouse structure is currently located on the south end of the former island, south of the Plymouth Avenue Bridge. The lighthouse was built as part of Boom Island Park development, which was completed in 1988.

No known historic properties exist within the proposed project area. Aside from the lighthouse, which construction activities would avoid, no standing structures are within the project area. Due to the heavily disturbed nature of the soils, as a result of historic dredging, it is not anticipated that intact archaeological deposits would be present within the proposed project area. As such, it is anticipated that no historic properties would be adversely affected by the proposed project.

15. Visual

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

The proposed project would be part of the viewshed from the Plymouth Avenue Bridge and Boom Island Park located to the south, and from James I. Rice West River Parkway and recreational trails located directly across the Mississippi River.

Phase I would cause temporary visual impacts during soil cleanup and grading activities, as well as from changes to the river shoreline during the construction of Hall's Island. No environmental effects associated with visual glare or equipment vapor plumes are expected during construction activities.

It is anticipated that the proposed project would improve the visual quality of the area by converting a former industrial area into parkland, increasing shoreline, and incorporating native vegetation diversity to a portion of the river where it is presently absent. Therefore, no measures have been proposed to avoid, minimize or mitigate visual effects.

16. Air

a. Stationary source emissions – Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

Not Applicable – no stationary source emissions would be created by the proposed project.

b. Vehicle emissions – Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

The proposed project would result in short-term, localized air quality impacts due to emissions from construction vehicles during Phase I construction activities, which are expected to last eight months. Emissions from the powered equipment would be minor and temporary in nature during the construction and are expected to have an overall negligible impact on air quality.

c. Construction traffic related to the delivery of project materials and the hauling off-site of excess soil would temporarily increase traffic during construction. To minimize vehicle emissions. Dust and odors – Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

After construction, the proposed project is not expected to generate dust. However, during construction the proposed project would generate limited amounts of dust as a result of site grading and preparation. No impacts to quality of life are anticipated as any fugitive dust emissions from construction activities would be minimized through control measures. These controls include watering or applying dust suppressants. These may be applied to exposed soil surfaces and unpaved roads.

The proposed project is not anticipated to generate any odors.

17. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

Existing noise levels in the proposed project area are typical of an urban industrial setting. Surrounding properties are largely a mix of commercial and industrial uses. Noise is generated primarily by traffic and operations at the adjacent Graco manufacturing site. Other notable noise sources in the area include traffic noise from the Plymouth Avenue

Bridge which passes over the southern end of the proposed Hall's Island site. The nearest residential receptor would be located to the southeast across the intersection of Sibley Street NE and 8th Avenue NE (**Figure 7**). The nearest residence would be more than 150 feet from the proposed project area (the opposing corner of Sibley Street NE and 8th Avenue NE) and would be more than 500 feet from the proposed island restoration grading.

Construction noise is expected to be minimal and limited to the noise generated by construction equipment and workers accessing the proposed project area. The equipment associated with the proposed project is expected to be limited to general earthmoving equipment (dozers, loaders, excavators, etc.) and trucks used to haul material (i.e. sand, gravel, and other materials) to and from the proposed project area. Pile driving may be needed to install bridge piers, resulting in temporary periods of increased noise. Noise generated from construction activities would be limited to daytime hours. Construction of Hall's Island is expected to begin during low-flow river conditions (typically during winter months) and be completed within eight months.

No change in long-term noise level is expected after completion of the proposed project.

18. Transportation

a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

The proposed project would not include additional parking, and no parking currently exists on-site. During the construction phase, parking for workers is anticipated to be provided onsite or in existing lots at Boom Island Park. Once the proposed project is complete, visitors would use a combination of adjacent street parking along Sibley Street and the Boom Island Park parking lot, located immediately south of the proposed project. Boom Island Park has 102 parking spaces in its main lot and 38 parking spaces in its two ancillary parking lots. B.F. Nelson Park, located immediately east of and connected to Boom Island Park also has a parking lot with 24 parking spaces that users may access.

A traffic study of the proposed project was performed by Spack Consulting. Trip generation was based on the rates published in the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 9th Edition and adapted to a city park of this size. **Table 6** shows estimated total average daily traffic and estimated peak hour traffic generated for the proposed project, once fully constructed.

Table 6 Estimated Traffic

Timeframe	Entering Vehicle Trips	Exiting Vehicle Trips	Total Vehicle Trips
Weekday			
Daily	195–250	195–250	390–500
AM Peak Hour	28	22	50
PM Peak Hour	22	17	39
Saturday			
Daily	125	125	250
Peak Hour	25	25	50

During the eight-month construction phase, it is anticipated that up to 6,000 trucks would be entering and/or leaving the proposed project area to haul project-related materials. It is expected that trucks would utilize local haul routes, including Marshall Street NE (located one block east of the proposed project) and Broadway Street NE (located three blocks north of the proposed project). To reduce construction-related traffic congestion, hauling would be minimized during morning and evening peak traffic hours, to the extent possible.

The proposed project is not directly adjacent to current public transit routes; however, the 11A Metro Transit bus route stops approximately four blocks (0.3 miles) east of the proposed project and the 7E Metro Transit bus stops approximately 0.5 miles west of the proposed project. A recently completed segment of the East Bank Trail traverses the proposed project, with further connections included as part of the proposed project. The trail connections would allow site access for both bicycle commuters and recreational trail users. The Metro Transit and trail options would allow visitors to access the site using alternative modes of transportation, potentially further reducing the relatively low traffic estimates.

b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system.

If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 *(available at: http://www.dot.state.mn.us/accessmanagement/resources.html)* or a similar local guidance,

The proposed project is expected to be accessed via Plymouth Avenue/8th Street NE, which has existing daily traffic estimates of 9,400 vehicles per day. Based on traffic study results, the proposed project is anticipated to generate up to 250 vehicle trips per day (i.e. 125 vehicles) and up to 50 vehicle trips (i.e. 25 vehicles) during peak hours. Assuming the site would be primarily accessed from Plymouth Avenue, proposed project-related traffic would increase Plymouth Avenue/8th Avenue NE traffic estimates to 9,650 vehicles per day, which is less than a three-percent increase. This level of increase is still within the capacity of both Plymouth Avenue (four-lane roadway) and 8th Avenue NE (two-lane roadway). Peak hour traffic increases would be similarly low.

Previously, the proposed project area was used for industrial purposes, which generated more local heavy truck traffic and more frequent trips concentrated during business hours. Traffic projected to be generated by the proposed project is considerably lower in both volume and vehicle size compared to previous industrial operations.

Based on the low traffic volumes anticipated, the proposed project is not anticipated to impact local traffic flow and no roadway improvements are warranted to accommodate traffic generated by the proposed project. Construction of the proposed project is not anticipated to require any vehicular detours, though the segment of the East Bank Trail through site would temporarily be re-routed to exclude trail users from the active construction area.

Nearby regional roadways include Interstate 94, Interstate 394, Trunk Highway 55, and Trunk Highway 65, all of which are accessible within two miles of the proposed project. Both interstates have existing daily traffic volumes in excess of 100,000 vehicles per day, while the highways each have daily traffic volumes of more than 10,000 vehicles per day. Given these regional roadways have multiple driving lanes and are designed to accommodate very high traffic volumes, the expected increase of up to 250 vehicles per day from the proposed project is not expected to impact the regional transportation network.

c. Identify measures that will be taken to minimize or mitigate project related transportation effects.

Long-term impacts to the transportation network are not anticipated, though there may be short-term delays for local traffic during phases of construction that require more frequent construction traffic on and off the site (i.e. when importing/exporting soil). The contractor would be responsible for ensuring the roadways are kept clean and clear of construction-related debris.

The segment of the Mississippi East Bank Trail that crosses the proposed project area would be temporarily detoured during active construction. The detour route would follow the Sibley Street NE and 10th Avenue NE roadways. It would be signed and graded at 10th Avenue NE to re-connect to the segment of the trail that continues north. Upon construction completion, the segment of the Mississippi East Bank Trail that crosses the proposed project area would be repaired when necessary and made available again to the public.

19. Cumulative Potential Effects

(Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

The proposed project would primarily positively affect water resources, recreation, visual aesthetics, and aquatic and terrestrial habitat within the vicinity of the proposed project area. In addition, some temporary effects on resources, such as water quality and noise, would occur during construction of the proposed project. The geographic scale with which cumulative effects were assessed includes north/northeast Minneapolis and the Mississippi River from the Lowry Bridge downstream to the Hennepin Avenue Bridge (St. Anthony Falls).

The timeframe for assessing cumulative effects ranges from short-term construction-related effects to long-term effects. A timeframe of 25 years is used to assess cumulative effects since this timeframe captures the short-term construction effects and the long-term visions/plans captured in the RiverFirst Initiative, Draft Above the Falls Regional Park Master Plan, Central Mississippi Riverfront Regional Park Master Plan, MWMO Watershed Management Plan 2011-2021, and 2030 Regional Parks Policy Plan discussed in EAW Item 9aii.

b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

Past, present, and reasonably foreseeable future projects that are geographically and temporally similar to the proposed project and therefore could potentially interact with the environmental effects of the proposed project are limited and include the following;

- Mississippi East Bank Trail – This project was completed in the fall of 2016 and includes a two-way, off-street combined use trail for bicyclists and pedestrians along the Mississippi River between Boom Island Park and the 1600 block of Marshall Street Northeast. The Mississippi East Bank Trail travels through the Scherer Site and would be preserved in construction of the proposed project (**Figure 5**).
- Parcel D – This planned future project would include some level of commercial and/or residential development on the remaining 3.5 acres of land located in the northeast portion of the Scherer Site (**Figure 5**). A primary goal for Parcel D development is to activate and help support operations of the park on the Scherer Site, as discussed in the RiverFirst Initiative and the Draft Above the Falls Master Plan. There is no timeline for the development of Parcel D.

While the proposed project for the Scherer Site and Hall's Island is one of the first components of the RiverFirst vision for riverfront parks along the Mississippi River, there are several additional projects outlined in the RiverFirst Initiative and master plans discussed above under EAW Item 9 (Land Use) that may occur in this geographic area in the future; however, they either are not yet in the planning stage or are in the very preliminary planning stages at this point in time. As such, these potential future projects (referred to as riverfront projects below) are discussed here in general terms, rather than individually with regards to their potential to interact with the environmental effects of the proposed project.

c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

The cumulative effects analysis for the proposed project assesses both negative and beneficial potential environmental effects.

Negative Effects

In general the potential for negative environmental effects (e.g., water quality, noise) from the proposed project would be short-term, as a result of construction activities; these effects are discussed in detail in the sections above. Because these effects would be short-term and localized in nature, they are not likely to interact with environmental effects associated with any future development of Parcel D and/or additional riverfront projects, which would occur after the proposed project is complete. Construction activities on the Scherer Site would affect the use of the portion of the Mississippi East Bank Trail that traverses the site; however these effects would also be short-term and a marked detour route would be provided for the duration of construction.

As discussed above under EAW Item 11 (Water Resources), the proposed project is expected to result in a maximum rise in the 100-year water surface elevation of 0.12 feet (1.44 inches) near the center of Hall's Island and the Scherer Site. Because this rise in flood elevation would be localized within the proposed project area and the 100-year water surface elevation is not anticipated to rise upstream or downstream of the proposed project area, cumulative effects from foreseeable future projects are not anticipated.

While stormwater impacts are not anticipated from the proposed project, development of Parcel D, and associated impervious surfaces, could require the management of stormwater runoff through the proposed project area. However, stormwater associated with Parcel D would either be tied in to the Minneapolis municipal sewer system or addressed in another suitable manner as determined by the MPRB, any development partners for the project, and City of Minneapolis stormwater rules.

Beneficial Effects

As previously summarized under EAW Item 9 (Land Use), the proposed project is compatible with and supports the comprehensive land use planning applicable to the geographic region of the proposed project, including: RiverFirst, Draft Above the Falls Regional Park Master Plan, Central Mississippi Riverfront Regional Park Master Plan, MWMO Watershed Management Plan 2011-2021, 2030 Regional Parks Policy Plan, and The Minneapolis Plan for Sustainable Growth (see EAW Item 9, Land Use for a summary of each of these plans). In support of these plans, the proposed project would result in long-term positive impacts on recreation and aquatic and terrestrial habitat.

Recreation

The proposed project would increase recreational access and opportunities by creating a softer, more accessible connection to the river in an area of the north/northeast Minneapolis urban environment that is currently dominated by industrial uses, with little access to recreation in natural areas. The proposed gravel beach would provide a way for the public to access and interact with the river, as much of the shoreline in this area is currently inaccessible. The gravel beach would also provide a safe, smooth location for people to launch/land canoes and kayaks. The Hall's Island boardwalk would provide a unique experience for users to connect with both the river and nature, but in a controlled way that would minimize impact to the patterns of native plantings and habitat created on Hall's Island.

Once construction of the proposed project is complete, the Mississippi East Bank Trail connection through the Scherer Site would perpetuate an important bicycle commuter connection with Boom Island Park to the south and a trail extension to the north. Development of Parcel D would provide a way of connecting local businesses and organizations to the park at the Scherer Site and Hall's Island.

Development of additional riverfront projects would complement the proposed project and further meet the objectives of the previously mentioned comprehensive land use plans developed for this geographic area by enhancing public access to the river through a continuous system of parks and trails along the Mississippi River.

Aquatic and Terrestrial Habitat

The proposed project is located in a portion of the north/northeast Minneapolis urban environment that is dominated by industrial uses and has limited access to natural areas. As discussed above, three of the goals of the proposed project are to improve habitat opportunities, increase biodiversity, and to provide a migratory flyway stopover for birds within the urban core.

The proposed project would increase the presence of natural habitats in this highly industrial area. As discussed above in EAW Item 13 (Fish, wildlife, plant communities, and sensitive ecological resources) the proposed project would involve the establishment of natural habitats, including shrub-dominated riparian bench, sandy beach habitat, and an upland zone providing a mix of floodplain forest and mesic to wet herbaceous layers. Although the restoration of Hall's Island would result in the permanent loss of approximately 1.82 acres of existing aquatic habitat, approximately 2.78 acres of aquatic habitat would be created within the proposed side channel, resulting in a net gain of approximately one acre of aquatic habitat. The 2.78 acres of created aquatic habitat would be of higher quality than existing habitat, providing greater aquatic and terrestrial habitat heterogeneity, interspersion and complexity as discussed above in EAW Item 13. This habitat would be designed to incorporate features that favor mussel establishment. Additional planned habitat features would include nesting/basking logs, rock and brush nesting areas, sandy beach area, rock ledges and standing snags for fish habitat. The establishment of desirable mussel habitat in the Upper St. Anthony Falls Pool should create a valuable resource for mussel reintroduction efforts being conducted by the MNDNR and USFWS.

The existing Mississippi East Bank Trail and development of Parcel D would not contribute to cumulative effects to aquatic and terrestrial habitat, as both of these projects are situated

on the Scherer Site, which is currently a disturbed grass field, with minimal ecological function.

Development of additional riverfront projects would complement the proposed project and further meet the objectives of the previously mentioned comprehensive land use plans developed for this geographic area by improving the ecological function of this portion of the Mississippi River corridor.

20. Other Potential Environmental Effects

If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

The proposed project is not anticipated to cause any additional environmental effects beyond those addressed above.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

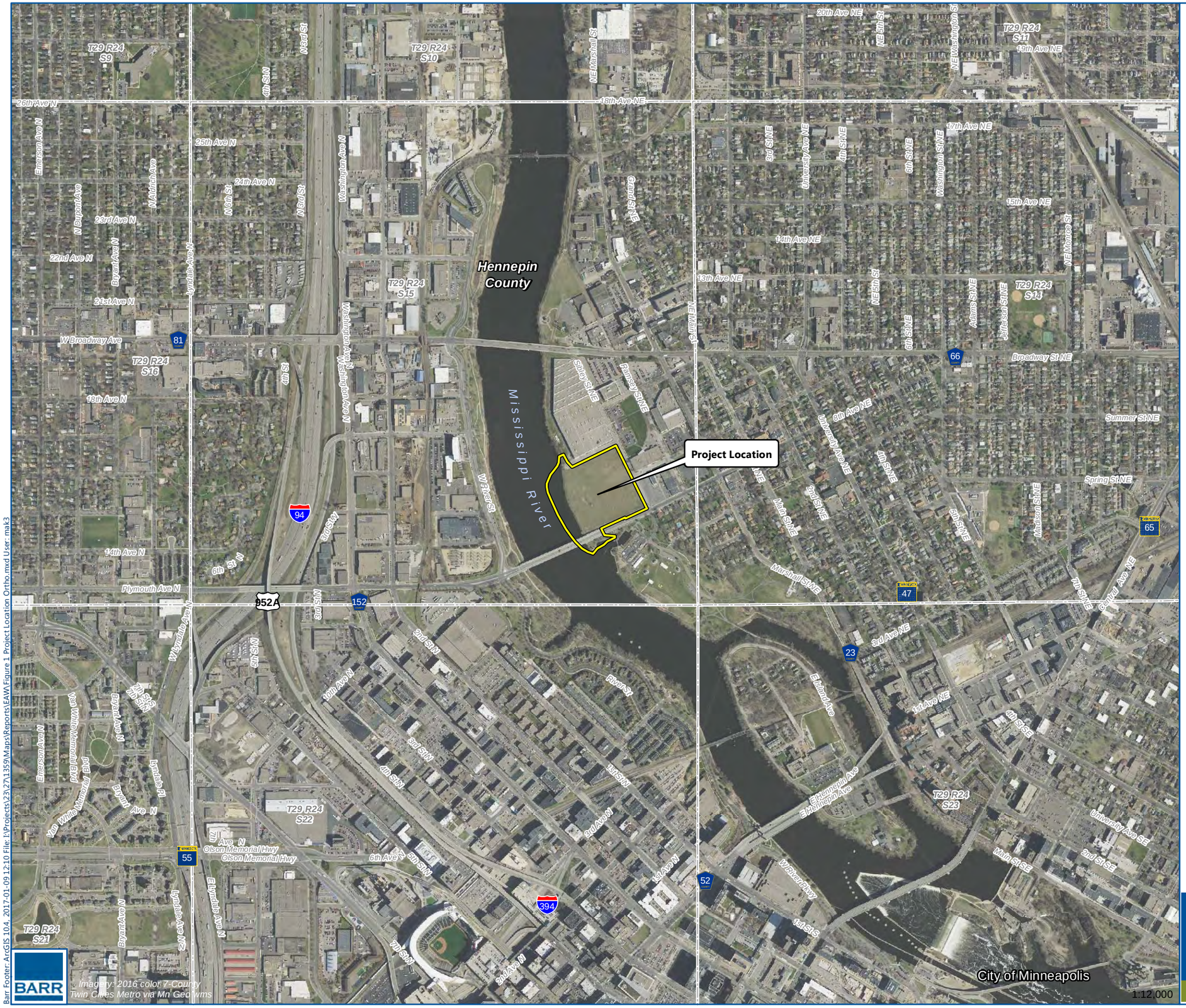
- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature: _____ **Date:** February 13, 2017

Michael Schroeder

Title: Assistant Superintendent for Planning Services
Minneapolis Park & Recreation Board

Figures



Project Area

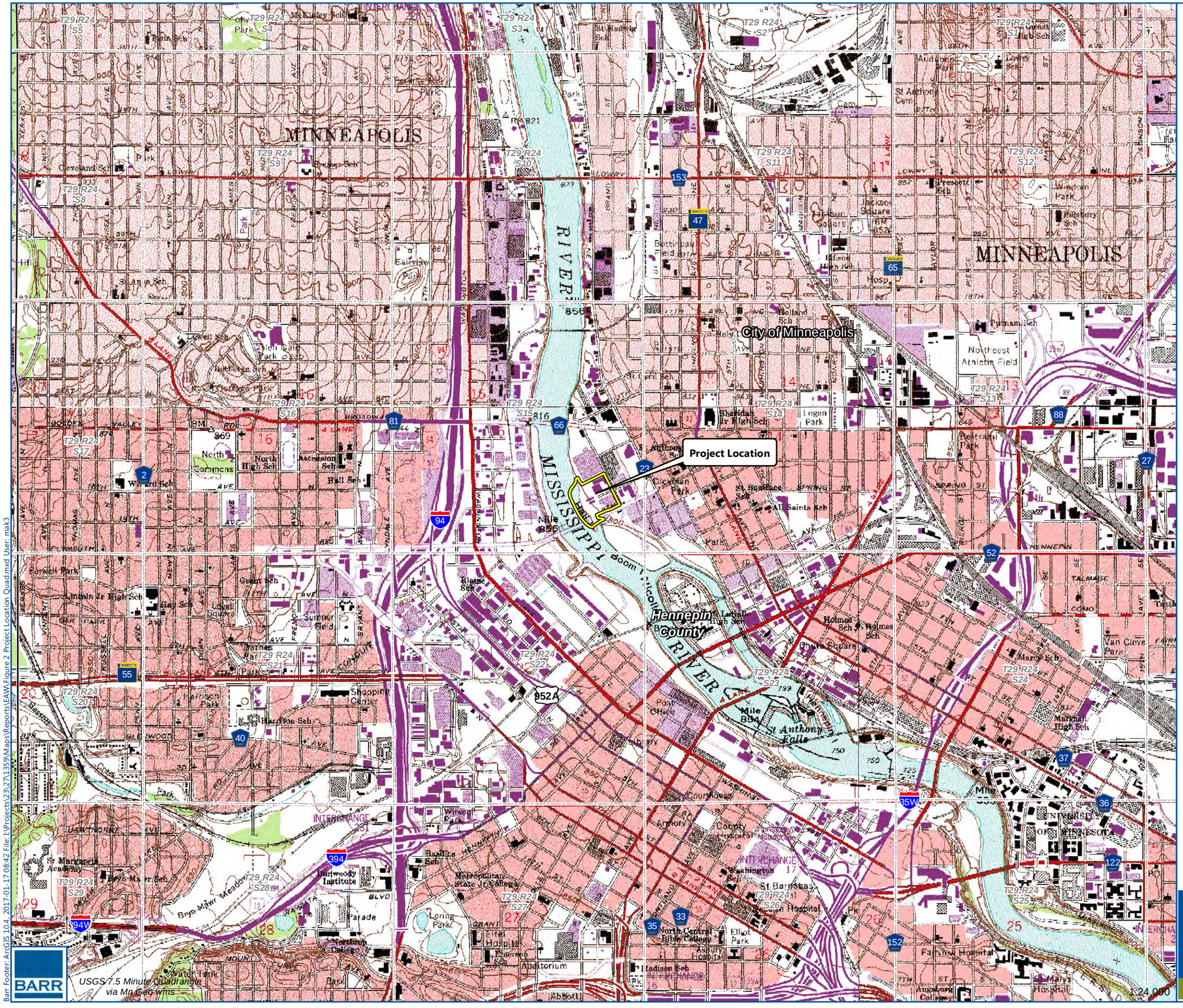
0 500 1,000 2,000
Feet

PROJECT LOCATION

Scherer Site and Hall's Island Reconstruction
Minneapolis, Minnesota

FIGURE 1

Barr Footer: ArcGIS 10.4, 2017-01-09 12:10 File: I:\Projects\23\27\1359\Maps\Reports\EAW\Figure 1 Project Location Ortho.mxd User: mak3



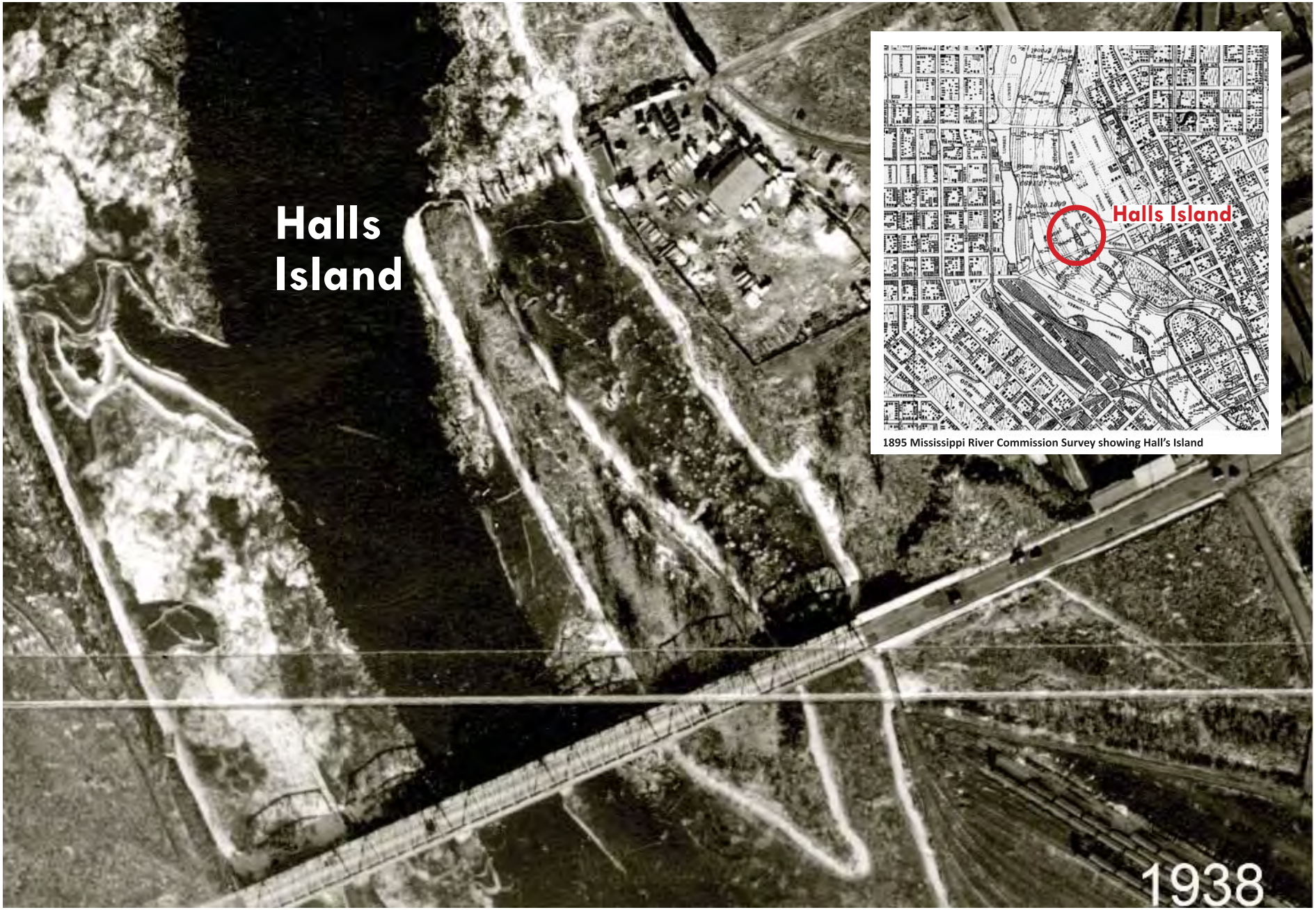
Project Area

0 1,000 2,000 4,000
Feet

U.S. GEOLOGICAL SURVEY
(7.5 MINUTE QUADRANGLE)
Scherer Site and Hall's Island Reconstruction
Minneapolis, Minnesota

FIGURE 2

Barr Footer: ArcGIS 10.4 2017-01-17 08:42 File: I:\Projects\23\2713359\Maps\Reports\EAW\Figure 2 Project Location Quad.mxd User: mak3



1895 Mississippi River Commission Survey showing Hall's Island

"The channel of the Mississippi River lying Northwesterly of the Plymouth Avenue bridge which is now land was created by the dredging of a portion of Halls Island and depositing the same into the channel" - Excert from registration of title by Scherer for property acquired in 1964.

Figure 3
Historic Aerial Imagery
Scherer Site and Hall's Island Reconstruction

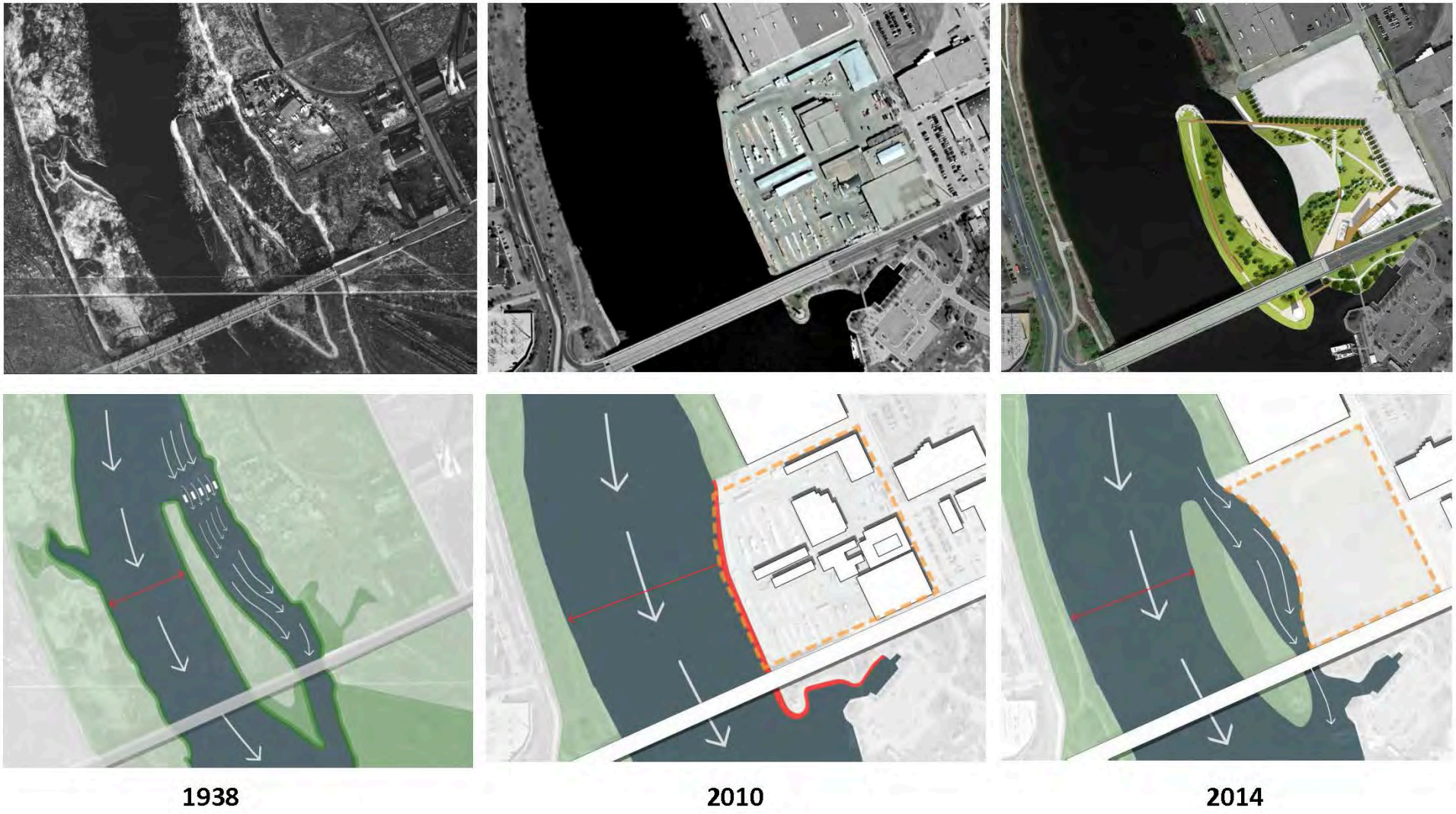
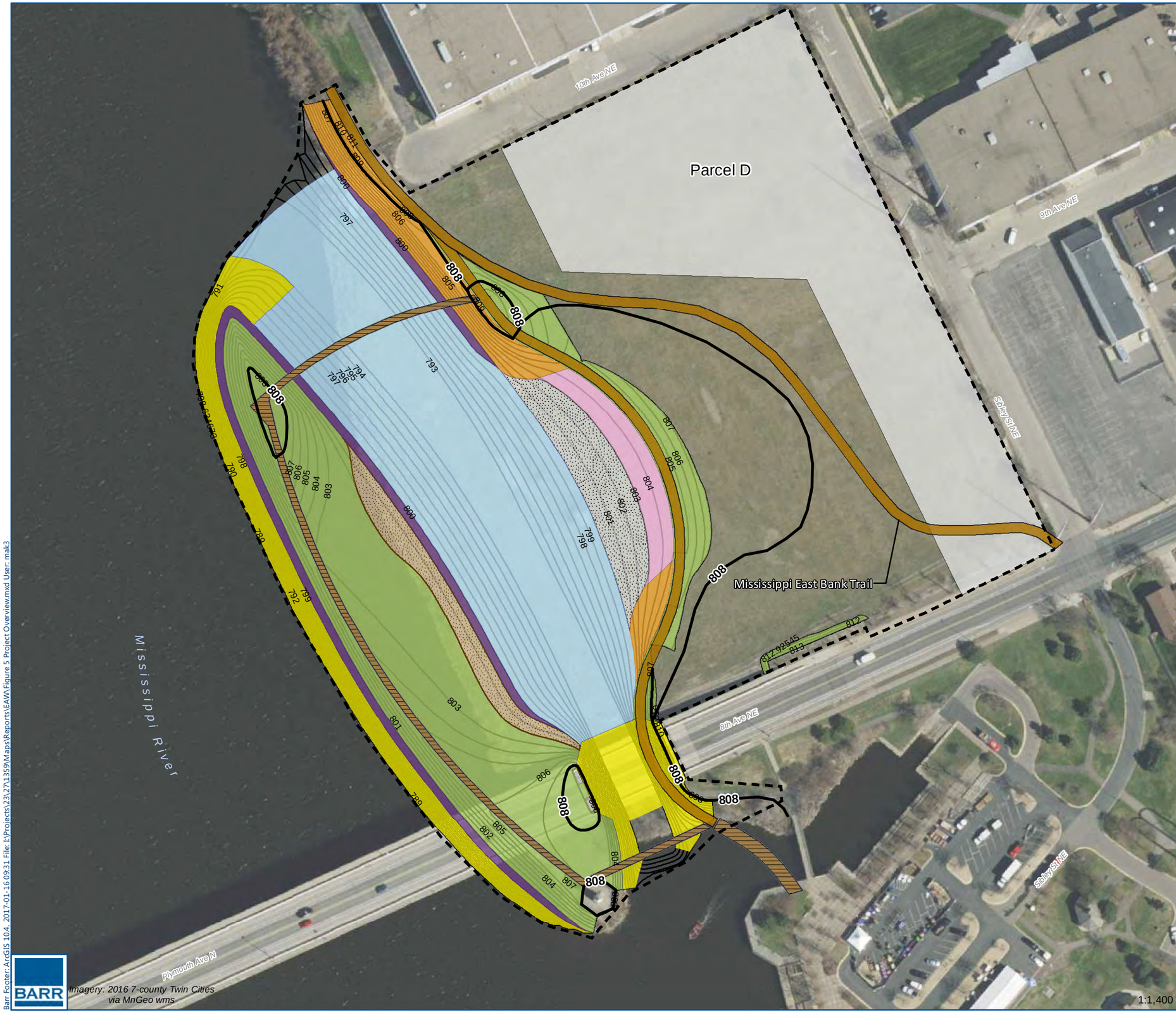


Figure 4
Island Progression History
Scherer Site and Hall's Island Reconstruction

Minneapolis Park & Recreation Board
RiverFirst



- Project Area
- Proposed Elevation
- 100-year Flood Elevation (Upon Full Site Completion)
- Cobble Back Channel
- Gravel Beach
- Island Beach
- Riparian Bench
- Riprap
- Sedges with Paths
- Topsoil
- Upland Slope
- Parcel D
- Combined-Use Trails
- Bridges

N

0 50 100 200
Feet

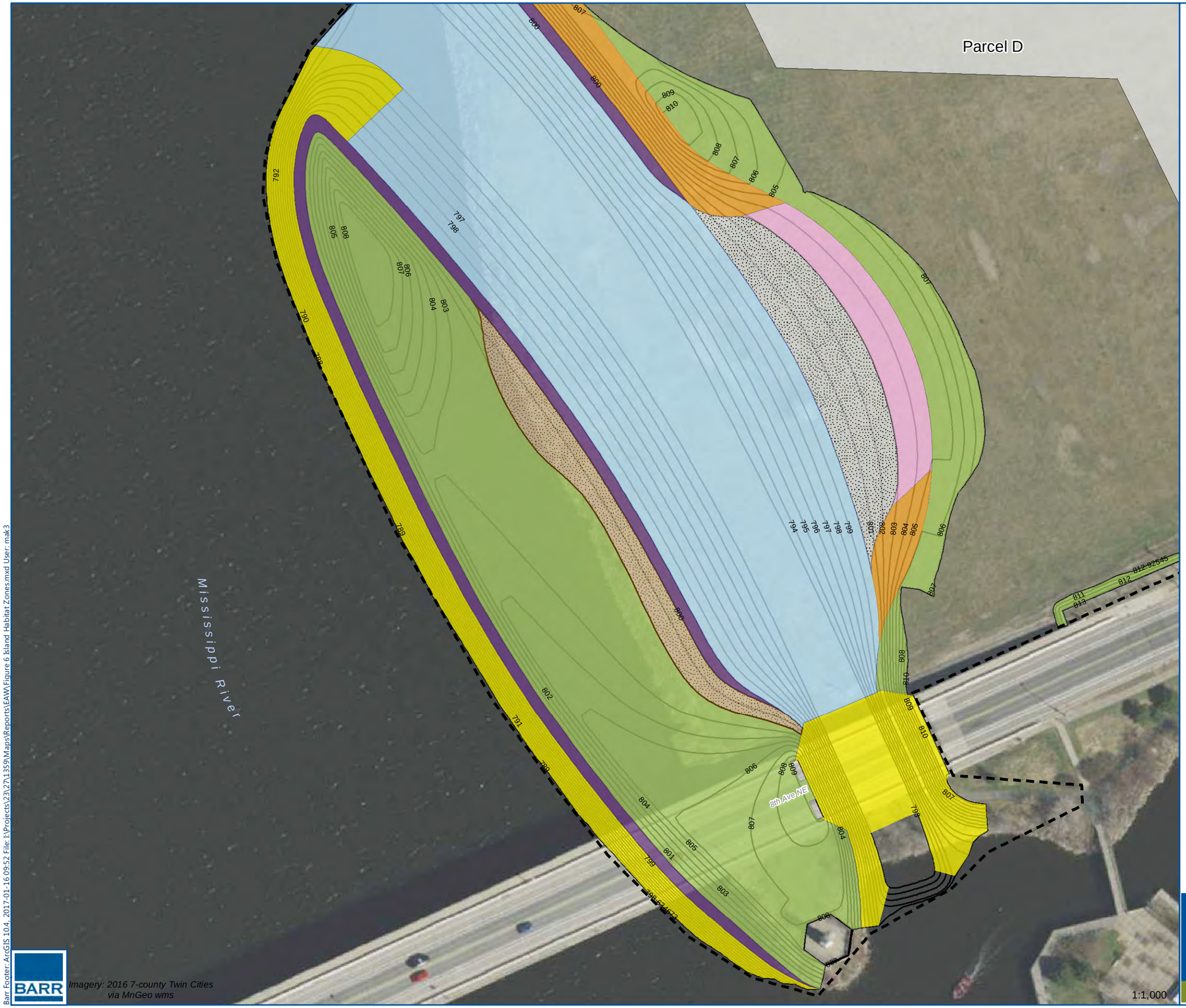
PROJECT OVERVIEW

Scherer Site and Hall's Island Reconstruction
Minneapolis, Minnesota

FIGURE 5

BARR

Barr Footer:ArcGIS 10.4, 2017-01-16 09:31 File: I:\Projects\23\27\1359\Maps\Reports\EAW\Figure 5 Project Overview.mxd User: mak3



- Project Area
- Proposed Elevation
- Cobble Back Channel
- Gravel Beach
- Island Beach
- Riparian Bench
- Riprap
- Sedges with Paths
- Topsoil
- Upland Slope
- Parcel D

N

0 50 100 200
Feet

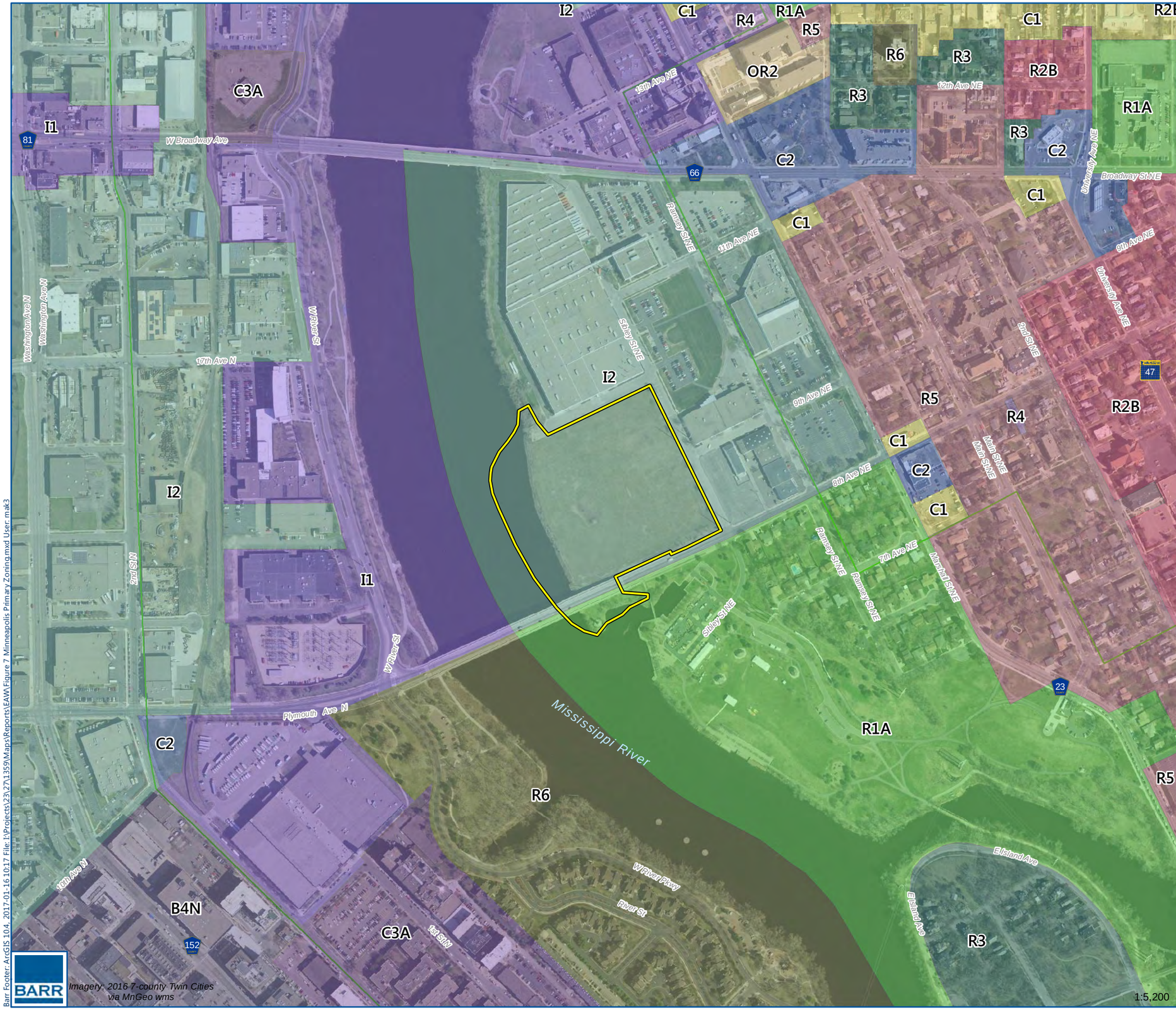
PROPOSED HABITAT ZONES

Scherer Site and Hall's Island Reconstruction
Minneapolis, Minnesota

FIGURE 6

BARR

Barr Footer: ArcGIS 10.4, 2017-01-16 09:52 File: I:\Projects\23\27\1359\Maps\Reports\EAW\Figure 6 Island Habitat Zones.mxd User: mak3



Project Area

Minneapolis Primary Zoning

- B4N, Downtown Neighborhood District
- B4S-1, Downtown Service District
- C1, Neighborhood Commerical District
- C2, Neighborhood Corridor Commerical District
- C3A, Community Activity Center District
- I1, Light Industrial District
- I2, Medium Industrial District
- OR2, High Density Office Residence District
- R1A, Single-family District (low density)
- R2B, Two-family District (low density)
- R3, Multiple-family District (medium density)
- R4, Multiple-family District (medium density)
- R5, Multiple-family District (high density)
- R6, Multiple-family District (high density)

N

0 125 250 500
Feet

MINNEAPOLIS PRIMARY ZONING

Scherer Site and Hall's Island Reconstruction
Minneapolis, Minnesota

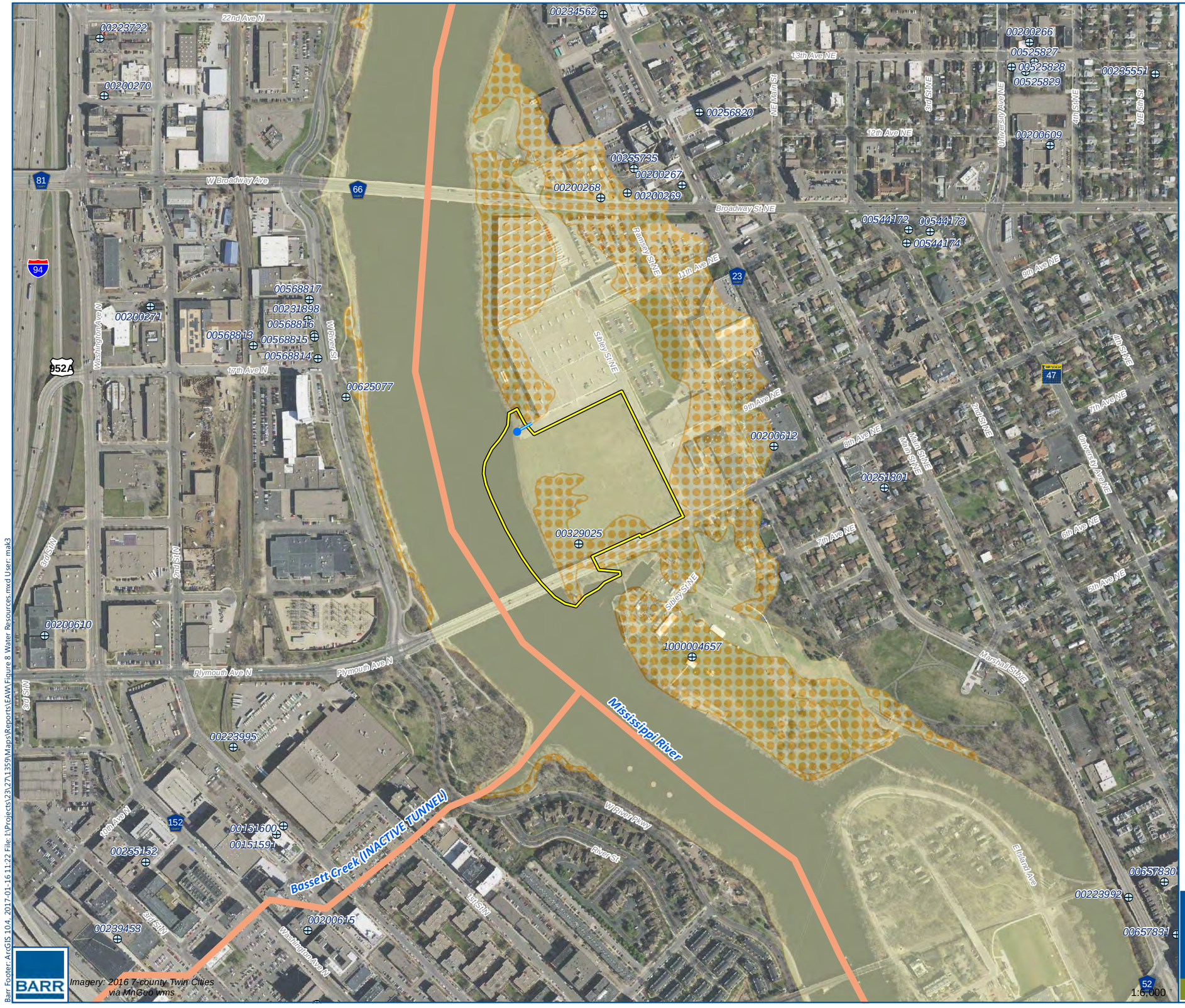
FIGURE 7

BARR

Imagery: 2016 7-county Twin Cities via MnGeo wms

1:5,200

Barr Footer: ArcGIS 10.4, 2017-01-16 10:17 File: I:\Projects\23\27\1359\Maps\Reports\EAW\Figure 7 Minneapolis Primary Zoning.mxd User: mak3



Project Area

Storm Sewer Drain

Storm Sewer

Well - County Well Index

Impaired Streams (2016 Draft)

FEMA Floodplain

100 Year

500 Year

N

0 250 500 1,000

Feet

WATER RESOURCES

Scherer Site and Hall's Island Reconstruction
Minneapolis, Minnesota

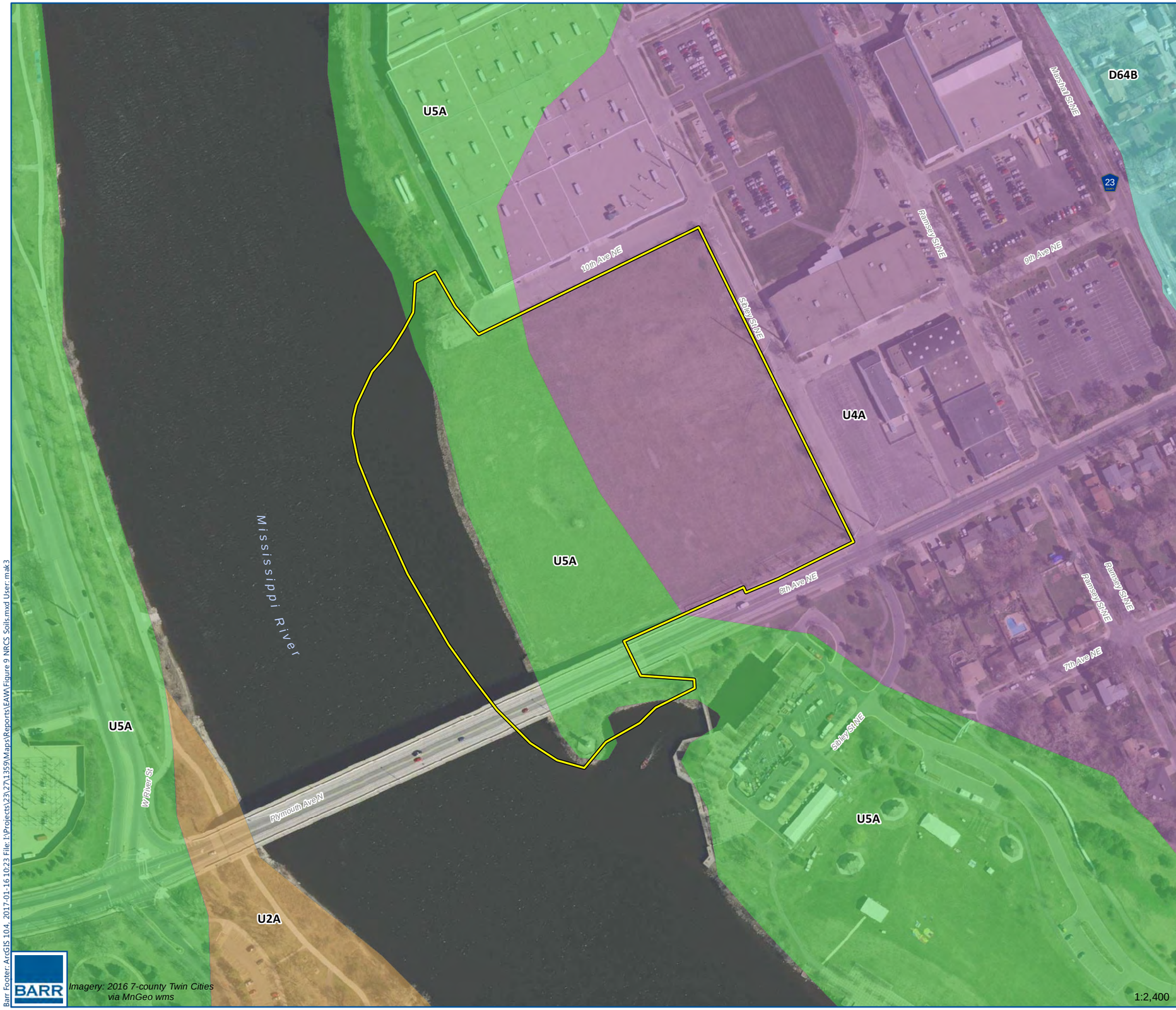
FIGURE 8

BARR

Imagery: 2016 7-county Twin Cities via MnGeo wms

1:6,000

Barr Footer: ArcGIS 10.4, 2017-01-16 11:22 File: I:\Projects\23\27\1359\Maps\Reports\EAW\Figure 8 Water Resources.mxd User: mak3



Imagery: 2016 7-county Twin Cities via MnGeo wms

Project Area

NRCS Map Unit Symbol

- D64B;Urban land-Hubbard complex, Mississippi River Valley
- U2A;Udorthents, wet substratum
- U4A;Urban land-Udipsamments (cut and fill land) complex
- U5A;Urban land-Udorthents, wet substratum, complex

N

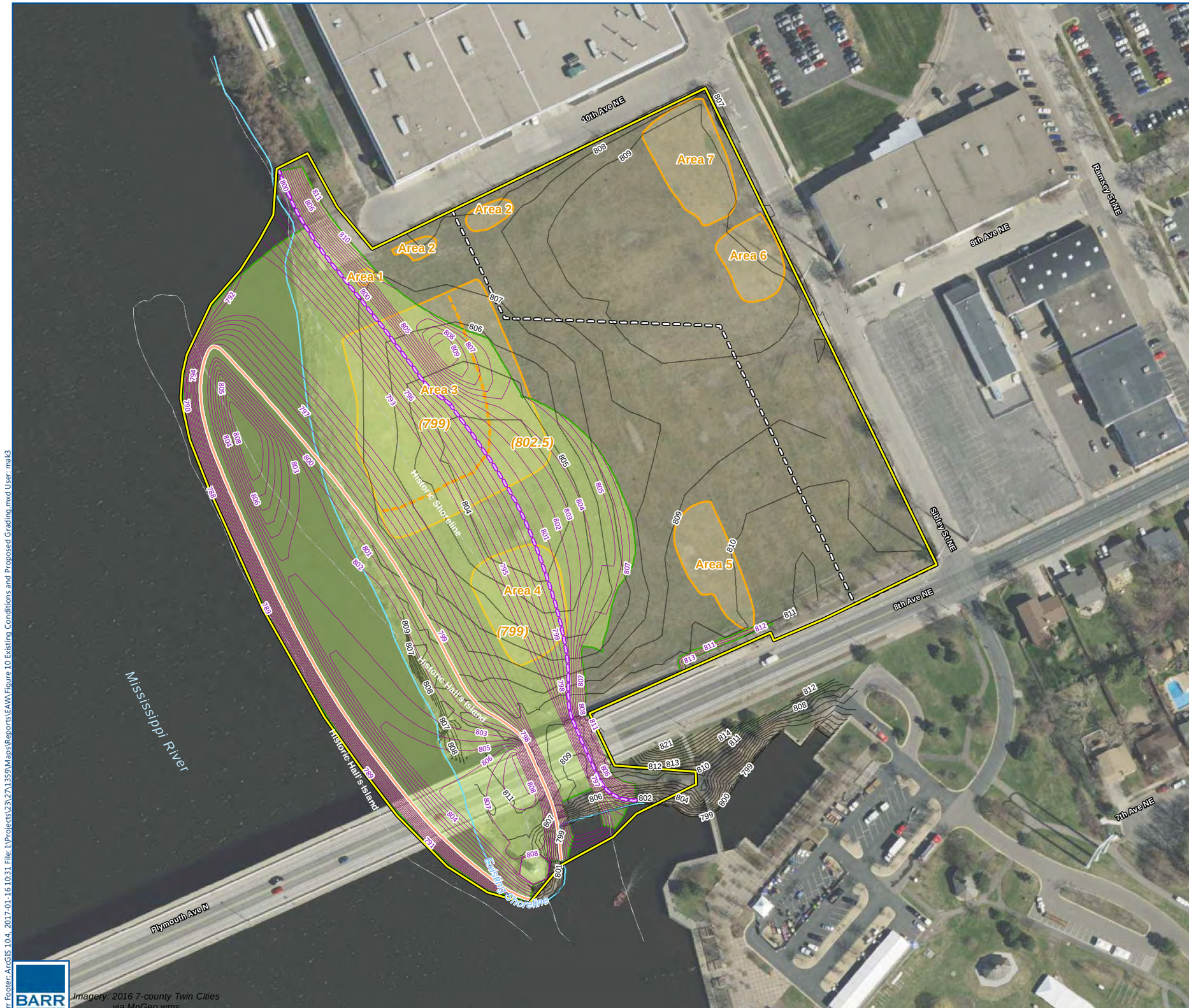
0 100 200 400
Feet

SOILS

Scherer Site and Hall's Island Reconstruction
Minneapolis, Minnesota

FIGURE 9

Barr Footer: ArcGIS 10.4, 2017-01-16 10:23 File: I:\Projects\23\27\1359\Maps\Reports\EAW\Figure 9 NRCS Soils.mxd User: mak3



Project Area

Proposed Island

Proposed Shoreline

Phase I Grading Extents

Proposed Elevation Contour (60% Design)

Existing Ground Surface Contours
(Based on 11-25-14 Survey)

Existing Shoreline

Historic Feature

Parcel D Boundary

Previous Excavation Areas

N

0 40 80 160 240
Feet

EXISTING SITE CONDITIONS AND PROPOSED GRADING

Scherer Site and Hall's Island Reconstruction
Minneapolis, Minnesota

FIGURE 10

BARR

Barr Footer: ArcGIS 10.4, 2017-01-16 10:31 File: I:\Projects\23\27\1359\Maps\Reports\EAW\Figure 10 Existing Conditions and Proposed Grading.mxd User: mak3

Project Area

Mussel Survey Area

2002 / 2014

2014

N

0 125 250 500

Feet

MUSSEL SURVEY AREA

Scherer Site and Hall's Island Reconstruction
Minneapolis, Minnesota

FIGURE 11

BARR

Barr Footer: ArcGIS 10.4, 2017-01-17 10:51 File: I:\Projects\23\27\1359\Maps\Reports\EAW\ Figure 11 Mussel Survey Area.mxd User: mak3

Project Area

NHIS Rare Natural Features - Element Occurances

Invertebrate Animal

0 250 500 1,000
Feet

SENSITIVE ECOLOGICAL RESOURCES

Scherer Site and Hall's Island Reconstruction
Minneapolis, Minnesota

FIGURE 12

Barr Footer: ArcGIS 10.4, 2017-01-16 11:05 File: I:\Projects\23\27\1359\Maps\Reports\EAW\Figure 12 Sensitive Ecological Resources.mxd User: mak3

Project Area

Archeological Site

Historical Site

1/2 Mile Radius

0 250 500 1,000

Feet

CULTURAL RESOURCES

Scherer Site and Hall's Island Reconstruction
Minneapolis, Minnesota

FIGURE 13

Barr Footer: ArcGIS 10.4, 2017-01-17 15:07 File: I:\Projects\23\27\1359\Maps\Reports\EAW\Figure 13 Cultural Survey.mxd User: mak3

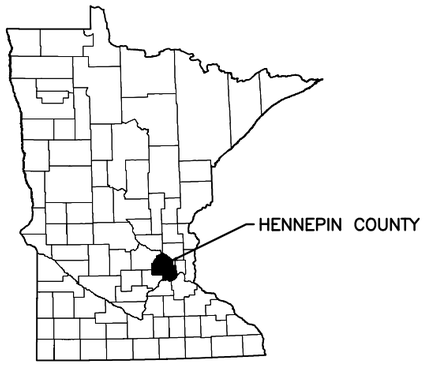
Appendix A

60% Design Plans

HALL'S ISLAND RECONSTRUCTION AND SCHERER SITE

MINNEAPOLIS PARKS AND RECREATION BOARD

MINNEAPOLIS, MN



MINNESOTA COUNTY MAP

PROJECT LOCATION MAP

INDEX OF SHEETS

G-01 . . . . TITLE SHEET AND SITE LOCATION MAP
G-02 . . . . EXISTING CONDITIONS AND REMOVALS PLAN
G-03 . . . . EROSION AND SEDIMENT CONTROL PLAN
G-04 . . . . EROSION AND SEDIMENT CONTROL DETAILS
G-05 . . . . SOIL BORING LOCATIONS

C-01 . . . . SITE PLAN
C-02 . . . . RIPRAP AND SOIL LIMITS PLAN
C-03 . . . . GRADING PLAN
C-04 . . . . GRADING SECTIONS A, B, C
C-05 . . . . GRADING SECTIONS D, E, F
C-06 . . . . EARTHWORK TYPICAL SECTIONS
C-07 . . . . SLOPE AND HABITAT TYPICAL SECTIONS
C-08 . . . . SLOPE AND HABITAT TYPICAL SECTIONS
C-09 . . . . STORM SEWER PLAN AND PROFILE
C-10 . . . . HALL'S ISLAND NORTH BRIDGE PLAN AND PROFILE
C-11 . . . . HALL'S ISLAND PEDESTRIAN BOARDWALK PLAN AND PROFILE
C-12 . . . . LIGHTHOUSE BRIDGE PLAN AND PROFILE
C-13 . . . . RIPARIAN BENCH DETAILS
C-14 . . . . MISCELLANEOUS DETAILS

S-01 . . . . STRUCTURAL SITE PLAN
S-02 . . . . NORTH BRIDGE & LIGHTHOUSE BRIDGE PLANS
S-03 . . . . SECTIONS AND DETAILS
S-04 . . . . SECTIONS AND DETAILS
S-05 . . . . ELEVATIONS

L-01 . . . . LANDSCAPE REFERENCE PLAN
L-02 . . . . LANDSCAPE DETAILS – ELEVATED BOARDWALK
L-03 . . . . LANDSCAPE DETAILS – NORTH OVERLOOK
L-04 . . . . PLANTING PLAN

E-01 . . . . ELECTRICAL PLAN

CONTACTS:

KURT LEUTHOLD, PE – CIVIL ENGINEER
BARR ENGINEERING CO.
PHONE: 952-832-2859
FAX: 952-832-2601
EMAIL: KLEUTHOLD@BARR.COM

JENNIFER BREKKEN, PE – CIVIL ENGINEER
BARR ENGINEERING CO.
PHONE: 952-832-2700
FAX: 952-832-2601
EMAIL: JBREKKEN@BARR.COM

COORDINATE SYSTEM: HENNEPIN COUNTY
HORIZONTAL DATUM: NAD83 (2011)
VERTICAL DATUM: NGVD88

GOPHER STATE ONE CALL

GOPHER STATE ONE CALL:
CALL BEFORE YOU DIG.
1-800-252-1166

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	PEB	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD
SIGNATURE
DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

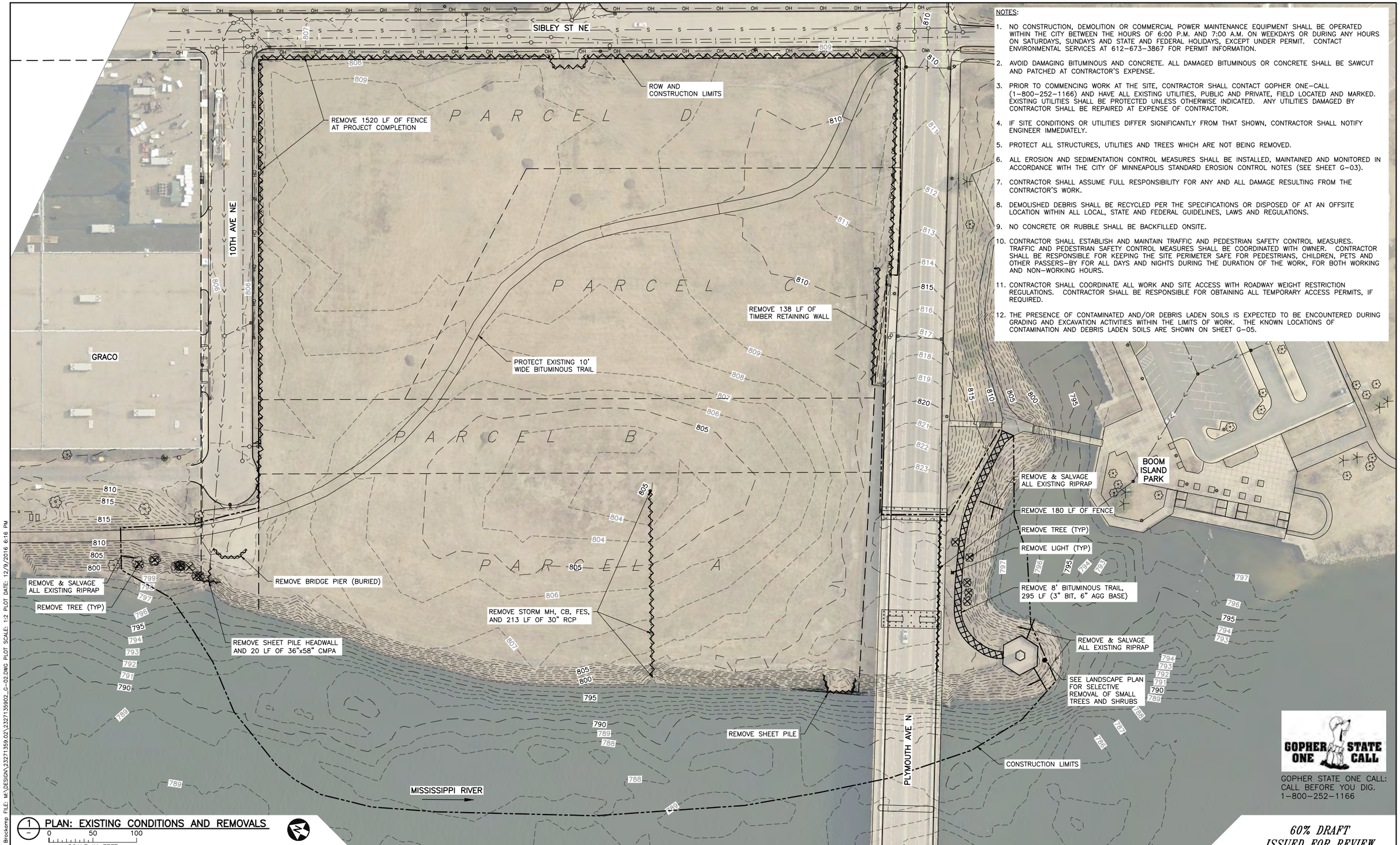
TITLE SHEET AND SITE LOCATION MAP

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. G-01
REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_G-01.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:41 PM

NOTES:

1. NO CONSTRUCTION, DEMOLITION OR COMMERCIAL POWER MAINTENANCE EQUIPMENT SHALL BE OPERATED WITHIN THE CITY BETWEEN THE HOURS OF 6:00 P.M. AND 7:00 A.M. ON WEEKDAYS OR DURING ANY HOURS ON SATURDAYS, SUNDAYS AND STATE AND FEDERAL HOLIDAYS, EXCEPT UNDER PERMIT. CONTACT ENVIRONMENTAL SERVICES AT 612-673-3867 FOR PERMIT INFORMATION.
2. AVOID DAMAGING BITUMINOUS AND CONCRETE. ALL DAMAGED BITUMINOUS OR CONCRETE SHALL BE SAWCUT AND PATCHED AT CONTRACTOR'S EXPENSE.
3. PRIOR TO COMMENCING WORK AT THE SITE, CONTRACTOR SHALL CONTACT GOPHER ONE-CALL (1-800-252-1166) AND HAVE ALL EXISTING UTILITIES, PUBLIC AND PRIVATE, FIELD LOCATED AND MARKED. EXISTING UTILITIES SHALL BE PROTECTED UNLESS OTHERWISE INDICATED. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED AT EXPENSE OF CONTRACTOR.
4. IF SITE CONDITIONS OR UTILITIES DIFFER SIGNIFICANTLY FROM THAT SHOWN, CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY.
5. PROTECT ALL STRUCTURES, UTILITIES AND TREES WHICH ARE NOT BEING REMOVED.
6. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED, MAINTAINED AND MONITORED IN ACCORDANCE WITH THE CITY OF MINNEAPOLIS STANDARD EROSION CONTROL NOTES (SEE SHEET G-03).
7. CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY AND ALL DAMAGE RESULTING FROM THE CONTRACTOR'S WORK.
8. DEMOLISHED DEBRIS SHALL BE RECYCLED PER THE SPECIFICATIONS OR DISPOSED OF AT AN OFFSITE LOCATION WITHIN ALL LOCAL, STATE AND FEDERAL GUIDELINES, LAWS AND REGULATIONS.
9. NO CONCRETE OR RUBBLE SHALL BE BACKFILLED ONSITE.
10. CONTRACTOR SHALL ESTABLISH AND MAINTAIN TRAFFIC AND PEDESTRIAN SAFETY CONTROL MEASURES. TRAFFIC AND PEDESTRIAN SAFETY CONTROL MEASURES SHALL BE COORDINATED WITH OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE SITE PERIMETER SAFE FOR PEDESTRIANS, CHILDREN, PETS AND OTHER PASSERS-BY FOR ALL DAYS AND NIGHTS DURING THE DURATION OF THE WORK, FOR BOTH WORKING AND NON-WORKING HOURS.
11. CONTRACTOR SHALL COORDINATE ALL WORK AND SITE ACCESS WITH ROADWAY WEIGHT RESTRICTION REGULATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL TEMPORARY ACCESS PERMITS, IF REQUIRED.
12. THE PRESENCE OF CONTAMINATED AND/OR DEBRIS LADEN SOILS IS EXPECTED TO BE ENCOUNTERED DURING GRADING AND EXCAVATION ACTIVITIES WITHIN THE LIMITS OF WORK. THE KNOWN LOCATIONS OF CONTAMINATION AND DEBRIS LADEN SOILS ARE SHOWN ON SHEET G-05.



1 PLAN: EXISTING CONDITIONS AND REMOVALS

0 50 100
SCALE IN FEET

60% DRAFT ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	PEB	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

EXISTING CONDITIONS AND REMOVALS PLAN

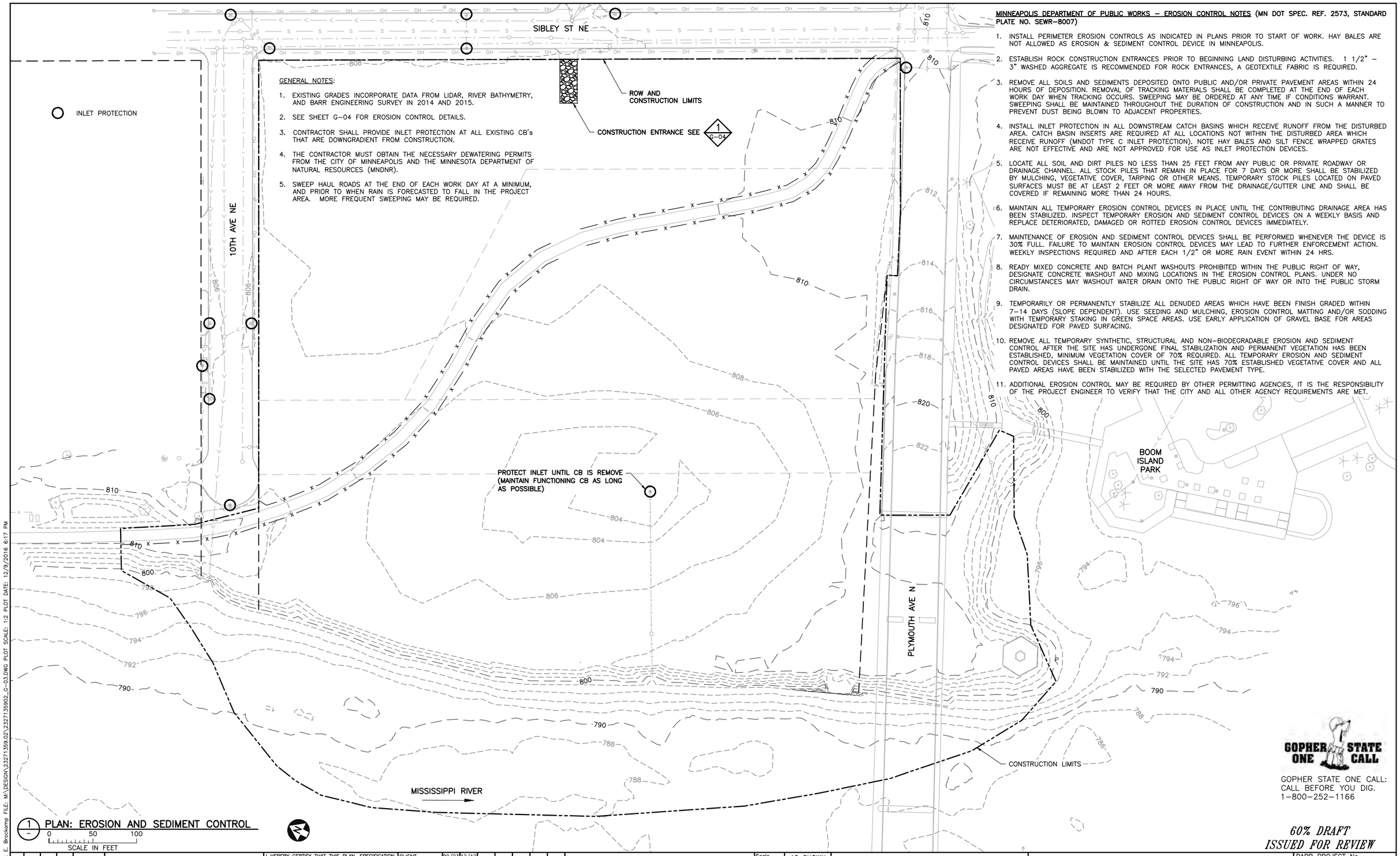
BARR PROJECT No. 23/27-1359.02

CLIENT PROJECT No.

DWG. No. G-02

REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_G-02.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:16 PM



GENERAL NOTES:

1. EXISTING GRADES INCORPORATE DATA FROM LIDAR, RIVER BATHYMETRY, AND BARR ENGINEERING SURVEY IN 2014 AND 2015.
2. SEE SHEET G-04 FOR EROSION CONTROL DETAILS.
3. CONTRACTOR SHALL PROVIDE INLET PROTECTION AT ALL EXISTING CB's THAT ARE DOWNGRADIENT FROM CONSTRUCTION.
4. THE CONTRACTOR MUST OBTAIN THE NECESSARY DEWATERING PERMITS FROM THE CITY OF MINNEAPOLIS AND THE MINNESOTA DEPARTMENT OF NATURAL RESOURCES (MNDNR).
5. SWEEP HAUL ROADS AT THE END OF EACH WORK DAY AT A MINIMUM, AND PRIOR TO WHEN RAIN IS FORECASTED TO FALL IN THE PROJECT AREA. MORE FREQUENT SWEEPING MAY BE REQUIRED.

MINNEAPOLIS DEPARTMENT OF PUBLIC WORKS – EROSION CONTROL NOTES (MN DOT SPEC. REF. 2573, STANDARD PLATE NO. SEWR-8007)

1. INSTALL PERIMETER EROSION CONTROLS AS INDICATED IN PLANS PRIOR TO START OF WORK. HAY BALES ARE NOT ALLOWED AS EROSION & SEDIMENT CONTROL DEVICE IN MINNEAPOLIS.
2. ESTABLISH ROCK CONSTRUCTION ENTRANCES PRIOR TO BEGINNING LAND DISTURBING ACTIVITIES. 1 1/2" – 3" WASHED AGGREGATE IS RECOMMENDED FOR ROCK ENTRANCES, A GEOTEXTILE FABRIC IS REQUIRED.
3. REMOVE ALL SOILS AND SEDIMENTS DEPOSITED ONTO PUBLIC AND/OR PRIVATE PAVEMENT AREAS WITHIN 24 HOURS OF DEPOSITION. REMOVAL OF TRACKING MATERIALS SHALL BE COMPLETED AT THE END OF EACH WORK DAY WHEN TRACKING OCCURS. SWEEPING MAY BE ORDERED AT ANY TIME IF CONDITIONS WARRANT. SWEEPING SHALL BE MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION AND IN SUCH A MANNER TO PREVENT DUST BEING BLOWN TO ADJACENT PROPERTIES.
4. INSTALL INLET PROTECTION IN ALL DOWNSTREAM CATCH BASINS WHICH RECEIVE RUNOFF FROM THE DISTURBED AREA. CATCH BASIN INSERTS ARE REQUIRED AT ALL LOCATIONS NOT WITHIN THE DISTURBED AREA WHICH RECEIVE RUNOFF (MNDOT TYPE C INLET PROTECTION). NOTE HAY BALES AND SILT FENCE WRAPPED GRATES ARE NOT EFFECTIVE AND ARE NOT APPROVED FOR USE AS INLET PROTECTION DEVICES.
5. LOCATE ALL SOIL AND DIRT PILES NO LESS THAN 25 FEET FROM ANY PUBLIC OR PRIVATE ROADWAY OR DRAINAGE CHANNEL. ALL STOCK PILES THAT REMAIN IN PLACE FOR 7 DAYS OR MORE SHALL BE STABILIZED BY MULCHING, VEGETATIVE COVER, TARPING OR OTHER MEANS. TEMPORARY STOCK PILES LOCATED ON PAVED SURFACES MUST BE AT LEAST 2 FEET OR MORE AWAY FROM THE DRAINAGE/GUTTER LINE AND SHALL BE COVERED IF REMAINING MORE THAN 24 HOURS.
6. MAINTAIN ALL TEMPORARY EROSION CONTROL DEVICES IN PLACE UNTIL THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED. INSPECT TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES ON A WEEKLY BASIS AND REPLACE DETERIORATED, DAMAGED OR ROTTED EROSION CONTROL DEVICES IMMEDIATELY.
7. MAINTENANCE OF EROSION AND SEDIMENT CONTROL DEVICES SHALL BE PERFORMED WHENEVER THE DEVICE IS 30% FULL. FAILURE TO MAINTAIN EROSION CONTROL DEVICES MAY LEAD TO FURTHER ENFORCEMENT ACTION. WEEKLY INSPECTIONS REQUIRED AND AFTER EACH 1/2" OR MORE RAIN EVENT WITHIN 24 HRS.
8. READY MIXED CONCRETE AND BATCH PLANT WASHOUTS PROHIBITED WITHIN THE PUBLIC RIGHT OF WAY, DESIGNATE CONCRETE WASHOUT AND MIXING LOCATIONS IN THE EROSION CONTROL PLANS. UNDER NO CIRCUMSTANCES MAY WASHOUT WATER DRAIN ONTO THE PUBLIC RIGHT OF WAY OR INTO THE PUBLIC STORM DRAIN.
9. TEMPORARILY OR PERMANENTLY STABILIZE ALL DENUDED AREAS WHICH HAVE BEEN FINISH GRADED WITHIN 7–14 DAYS (SLOPE DEPENDENT). USE SEEDING AND MULCHING, EROSION CONTROL MATTING AND/OR SODDING WITH TEMPORARY STAKING IN GREEN SPACE AREAS. USE EARLY APPLICATION OF GRAVEL BASE FOR AREAS DESIGNATED FOR PAVED SURFACING.
10. REMOVE ALL TEMPORARY SYNTHETIC, STRUCTURAL AND NON–BIODEGRADABLE EROSION AND SEDIMENT CONTROL AFTER THE SITE HAS UNDERGONE FINAL STABILIZATION AND PERMANENT VEGETATION HAS BEEN ESTABLISHED, MINIMUM VEGETATION COVER OF 70% REQUIRED. ALL TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES SHALL BE MAINTAINED UNTIL THE SITE HAS 70% ESTABLISHED VEGETATIVE COVER AND ALL PAVED AREAS HAVE BEEN STABILIZED WITH THE SELECTED PAVEMENT TYPE.
11. ADDITIONAL EROSION CONTROL MAY BE REQUIRED BY OTHER PERMITTING AGENCIES, IT IS THE RESPONSIBILITY OF THE PROJECT ENGINEER TO VERIFY THAT THE CITY AND ALL OTHER AGENCY REQUIREMENTS ARE MET.

GOPHER STATE ONE CALL

GOPHER STATE ONE CALL:
CALL BEFORE YOU DIG.
1–800–252–1166

1 PLAN: EROSION AND SEDIMENT CONTROL

0 50 100
SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	PEB	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD
SIGNATURE
DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

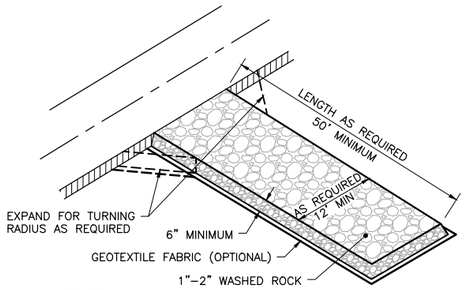
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

EROSION AND SEDIMENT CONTROL PLAN

BARR PROJECT No. 23/27–1359.02
CLIENT PROJECT No.
DWG. No. G–03
REV. No. B

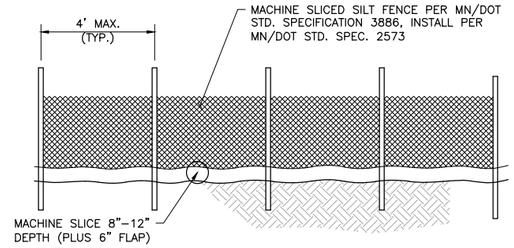
CADD USER: Patrick E. Brockemp FILE: M:\DESIGN\23271359.02\23271359.02_G-03.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:17 PM



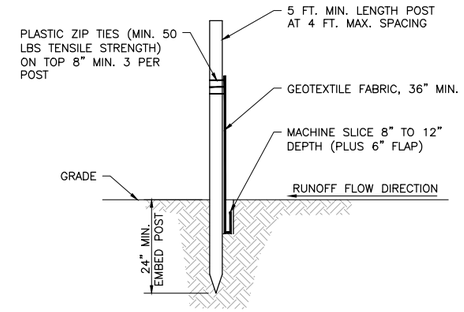
NOTES:

1. MAINTAIN ENTRANCE THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIR OR REPLACE AS REQUIRED TO PREVENT TRACKING OFFSITE.
2. REMOVE ENTRANCE IN CONJUNCTION WITH FINAL GRADING AND SITE STABILIZATION.

1 DETAIL: CONSTRUCTION ENTRANCE – ROCK
NOT TO SCALE



DOWNSTREAM VIEW

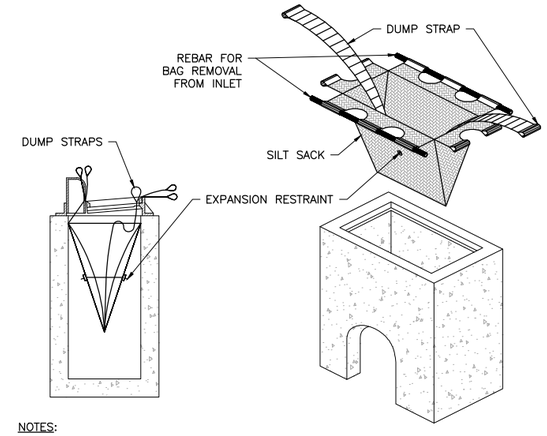


SECTION VIEW

NOTES:

1. INSTALL SILT FENCE PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED AND MAINTAIN THROUGHOUT THE CONSTRUCTION PERIOD. REMOVE SILT FENCE AND ANY ACCUMULATED SEDIMENT IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.
2. SILT FENCE MATERIALS AND INSTALLATION SHALL MEET THE REQUIREMENTS OF MN/DOT SPECIFICATIONS 2573 AND 3886.
3. NO HOLES OR GAPS SHALL BE PRESENT IN/UNDER SILT FENCE. PREPARE AREA AS NEEDED TO SMOOTH SURFACE OR REMOVE DEBRIS.
4. REMOVE ACCUMULATED SEDIMENT WHEN BUILD UP REACHES 1/3 OF FENCE HEIGHT. OR INSTALL A SECOND SILT FENCE DOWNSTREAM OF THE ORIGINAL FENCE AT A SUITABLE DISTANCE.
5. WHEN SPLICES ARE NECESSARY MAKE SPLICE AT POST ACCORDING TO SPLICE DETAIL. PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE. ROTATE BOTH POSTS TOGETHER AT LEAST 180 DEGREES TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL. CUT THE FABRIC NEAR THE BOTTOM OF THE POSTS TO ACCOMMODATE THE 6 INCH FLAP, THEN DRIVE BOTH POSTS AND BURY THE FLAP AND COMPACT BACKFILL.

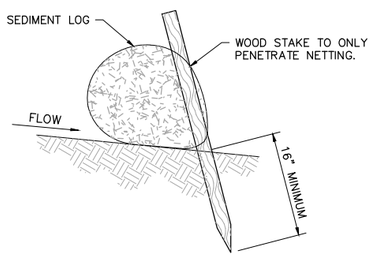
2 DETAIL: SILT FENCE – MACHINE SLICED
NOT TO SCALE



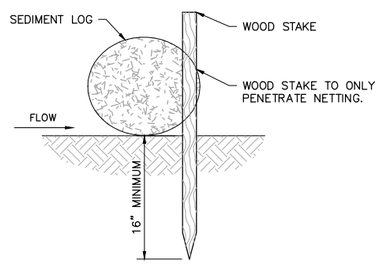
NOTES:

1. INSTALL INLET PROTECTION PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED OR IMMEDIATELY FOLLOWING ANY CATCHBASIN INSTALLATION AND MAINTAIN THROUGHOUT THE CONSTRUCTION PERIOD.
2. MATERIALS SHALL BE SUFFICIENT TO ALLOW FLOW WHILE BLOCKING SEDIMENT. NO HOLES OR GAPS SHALL BE PRESENT IN/AROUND FILTER SACK.
3. CLEAN FILTER SACK AND REMOVE ACCUMULATED SEDIMENT AS REQUIRED TO ALLOW FLOW INTO THE CATCHBASIN AND PREVENT SEDIMENT FROM LEAVING THE DEVICE.
4. REMOVE DEVICE AND ANY ACCUMULATED SEDIMENT IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.

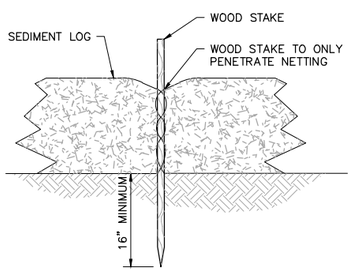
3 DETAIL: INLET PROTECTION – FILTER SACK
NOT TO SCALE



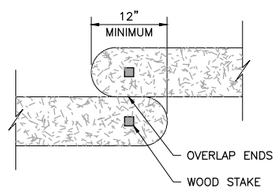
SIDE VIEW ON SLOPE



SIDE VIEW FLAT



FRONT VIEW

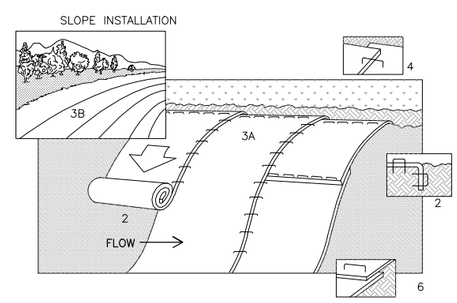


TOP VIEW

NOTES:

1. INSTALL SEDIMENT LOG ALONG CONTOURS (CONSTANT ELEVATION).
2. NO GAPS SHALL BE PRESENT UNDER SEDIMENT LOG. PREPARE AREA AS NEEDED TO SMOOTH SURFACE OR REMOVE DEBRIS.
3. REMOVE ACCUMULATED SEDIMENT WHEN REACHING 1/3 OF LOG HEIGHT.
4. MAINTAIN SEDIMENT LOG THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIR OR REPLACED AS REQUIRED.

4 DETAIL: EROSION LOG – STAKING
NOT TO SCALE



NOTES:

1. REFER TO MANUFACTURER RECOMMENDATIONS FOR STAPLE PATTERNS FOR SLOPE INSTALLATIONS.
2. PREPARE SOIL BY LOOSENING TOP 1–2 INCHES AND APPLY SEED (AND FERTILIZER WHERE REQUIRED) PRIOR TO INSTALLING BLANKETS. GROUND SHOULD BE SMOOTH AND FREE OF DEBRIS.
3. BEGIN (A) AT THE TOP OF THE SLOPE AND ROLL THE BLANKETS DOWN OR (B) AT ONE END OF THE SLOPE AND ROLL THE BLANKETS HORIZONTALLY ACROSS THE SLOPE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 6" OVERLAP, WITH THE UPHILL BLANKET ON TOP.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
6. BLANKET MATERIALS SHALL BE AS SPECIFIED OR AS APPROVED BY ENGINEER.

5 DETAIL: EROSION CONTROL BLANKET – INSTALLATION
NOT TO SCALE

60% DRAFT ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	PEB	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD
SIGNATURE
DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							
DATE RELEASED							

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

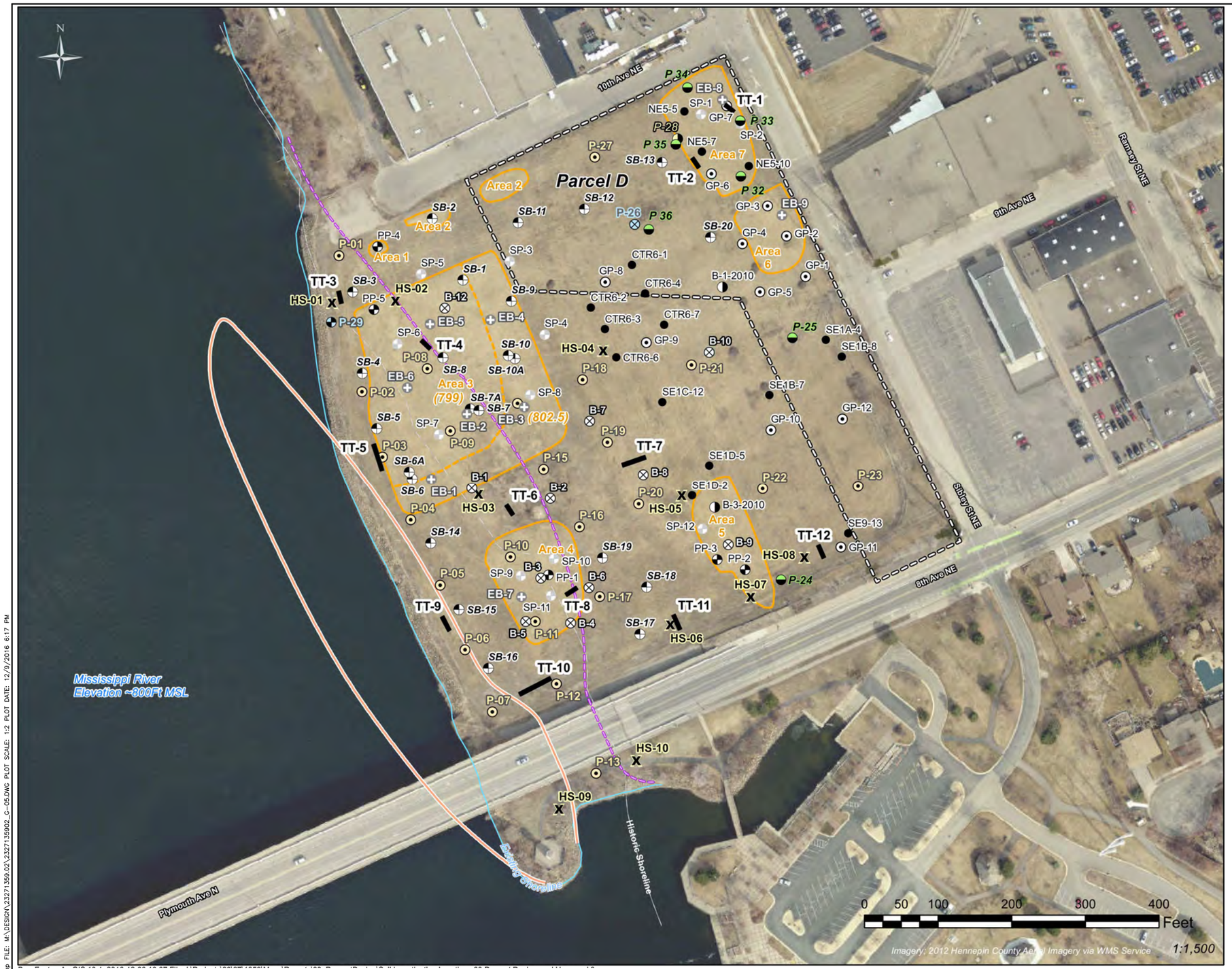
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

EROSION AND SEDIMENT CONTROL DETAILS

BARR PROJECT No. 23/27–1359.02
CLIENT PROJECT No.
DWG. No. G–04
REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_G-04.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:17 PM



Proposed Island
Proposed Shoreline
Existing Shoreline
Historic Shoreline
Parcel D Boundary
Previous Excavation Areas
Contour
2015 Test Trenches

(Approximate Elevation of Base of Previous Excavation, Ft MSL)

Barr 2014-2015 Sample Locations
- Hollow Stem Auger
- Soil Probe (Soil Sample)
- Soil Probe (Groundwater Sample)
- Soil Probe (Soil Gas Sample)
- Soil Probe (GW,Soil)
- Soil Probe (Soil, Groundwater and Soil Gas Sample)

Previous Sample Locations
- Liesch Soil Boring, July 2009
- Peer Excavation Soil Sample, July 2012
- Peer HSA Boring, April 2010
- Peer Hand Auger Boring, October 2011
- Peer Soil Boring, April 2010
- Peer Soil Boring, August 2011
- Peer Soil Boring, September 2010
- RJR Soil Boring, March 2010

SOIL INVESTIGATION REPORTS

- BARR ENGINEERING CO., 2015A. PRE–DESIGN ENVIRONMENTAL INVESTIGATION REPORT, HALL'S ISLAND PROJECT (VP26370). PREPARED FOR MINNEAPOLIS PARK & RECREATION BOARD, MINNEAPOLIS, MINNESOTA. FEBRUARY 2015.
- BARR ENGINEERING CO., 2015B. TEST TRENCH FILL CHARACTERIZATION REPORT, HALL'S ISLAND PROJECT (VP26370). PREPARED FOR MINNEAPOLIS PARK & RECREATION BOARD, MINNEAPOLIS, MINNESOTA. AUGUST 2015.

1 – PLAN: SOIL BORING LOCATIONS

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	PEB	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD
SIGNATURE
DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							
	DATE RELEASED						

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

SOIL BORING LOCATIONS

BARR PROJECT No. 23/27–1359.02
CLIENT PROJECT No.
DWG. No. G–05
REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\2327135902_G-05.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:17 PM

NOTES:

1.

SIBLEY ST NE

PARCEL D

ROW AND CONSTRUCTION LIMIT

10TH AVE NE

PLYMOUTH AVE N

GRACO

EXISTING BITUMINOUS TRAIL INSTALL CHAIN LINK FENCE ALONG BOTH SIDES

CONSTRUCTION ACCESS

PARCEL C

BOOM ISLAND PARK

COMBINED-USE TRAIL FUTURE NOT IN CONTRACT

PLYMOUTH AVE BRIDGE EAST ABUTMENT, EXISTING

BOOM ISLAND BRIDGE (FUTURE, NOT IN CONTRACT)

PARCEL B

GRAVEL BEACH

PARCEL A

BACK CHANNEL

LIGHTHOUSE BRIDGE (FUTURE, NOT IN CONTRACT)

HALL'S ISLAND NORTH BRIDGE (FUTURE, NOT IN CONTRACT)

CONSTRUCTION LIMITS

PLYMOUTH AVE BRIDGE PIER 4, EXISTING

EXISTING LIGHTHOUSE

BOARDWALK

MISSISSIPPI RIVER

MAIN CHANNEL

HALL'S ISLAND PEDESTRIAN BOARDWALK, SEE SHEET C-12

CONSTRUCTION LIMIT

PLYMOUTH AVE BRIDGE

1 HALL'S ISLAND NORTH BRIDGE EAST ABUTMENT

2 HALL'S ISLAND NORTH BRIDGE WEST ABUTMENT

3 LIGHTHOUSE BRIDGE WEST ABUTMENT

4 LIGHTHOUSE BRIDGE EAST ABUTMENT

5 BOOM ISLAND BRIDGE ABUTMENT (FUTURE)

1 PLAN: SITE PLAN OVERALL

0 50 100

SCALE IN FEET

60% DRAFT ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	GGN	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	GGN	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	GGN
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

SITE PLAN

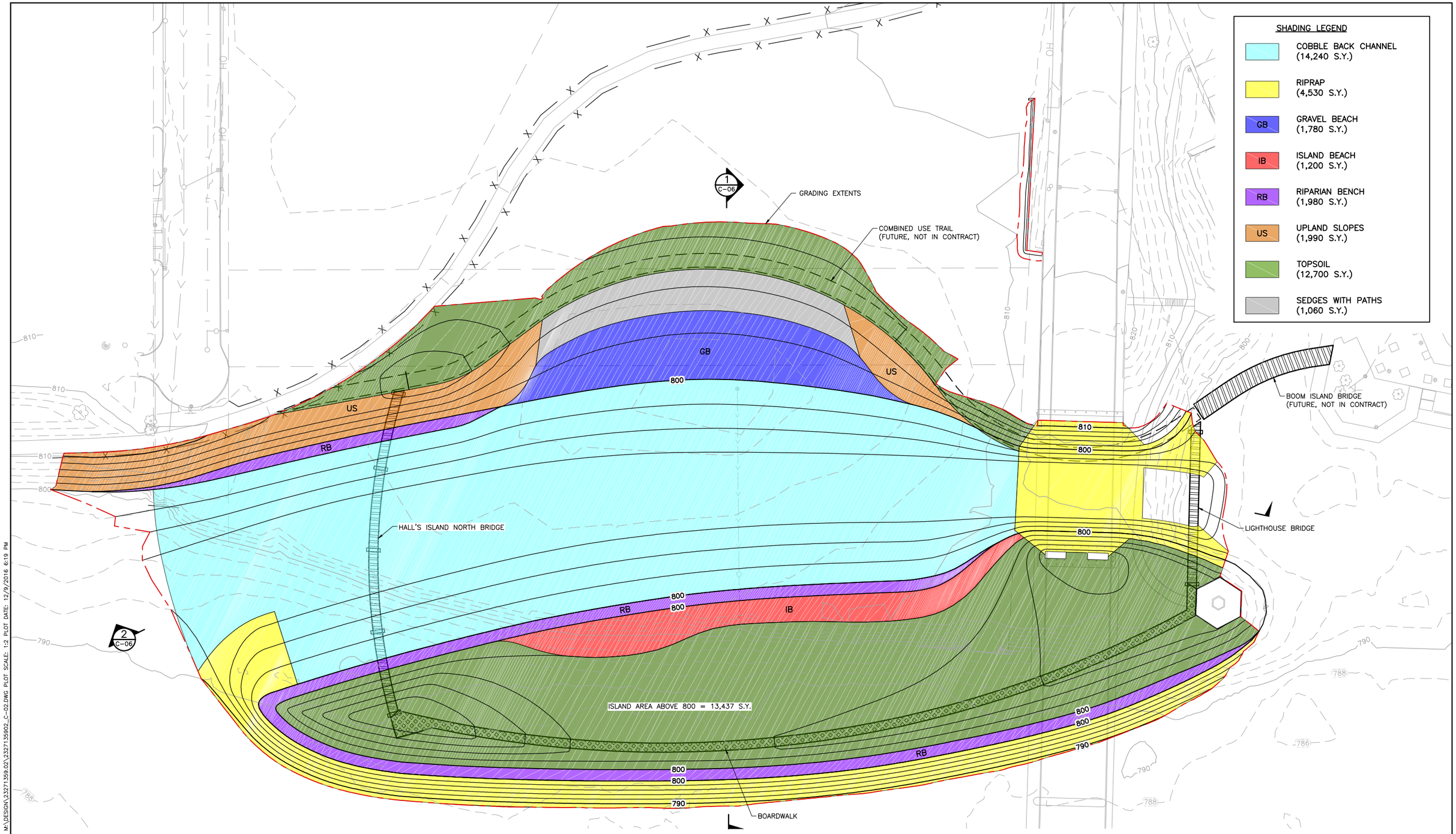
BARR PROJECT No. 23/27-1359.02

CLIENT PROJECT No.

DWG. No. C-01

REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\2327135902_C-01.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:18 PM



1 PLAN: RIPRAP AND SOILS PLAN

0 40 80
SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_C-02.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:19 PM

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	GGN	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	GGN	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

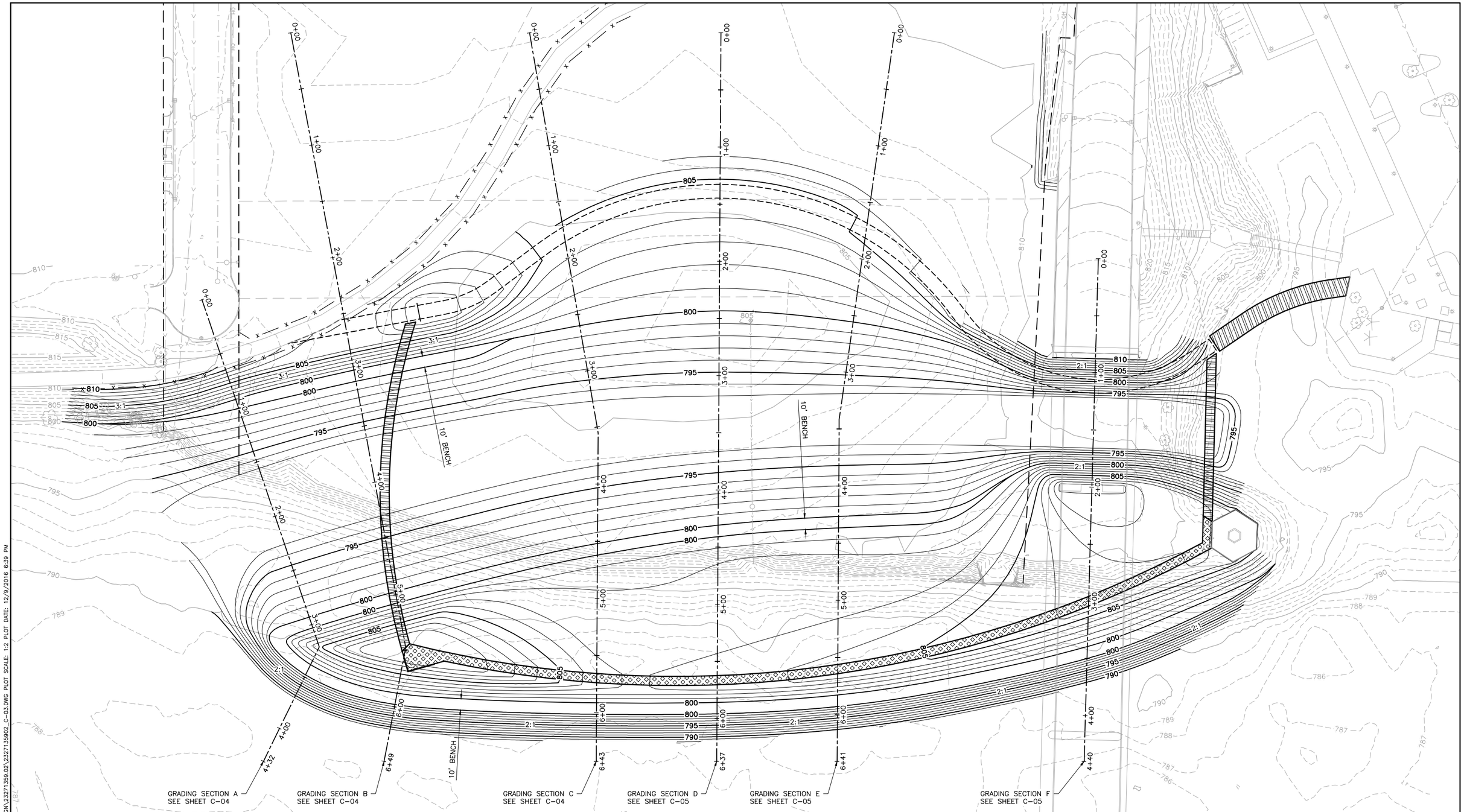
RIPRAP AND SOIL LIMITS PLAN

BARR PROJECT No. 23/27-1359.02

CLIENT PROJECT No.

DWG. No. C-02

REV. No. B



1 PLAN: GRADING WEST

0 40 80
SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	GGN	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	GGN	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							
	DATE RELEASED						

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

GRADING PLAN

BARR PROJECT No. 23/27-1359.02

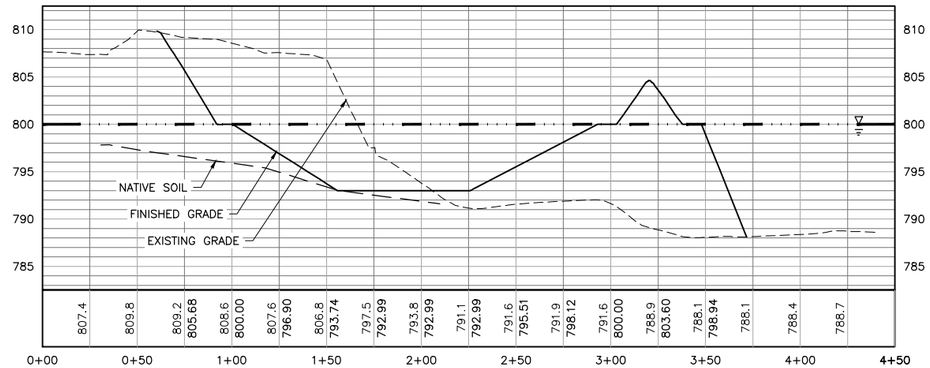
CLIENT PROJECT No.

DWG. No. C-03

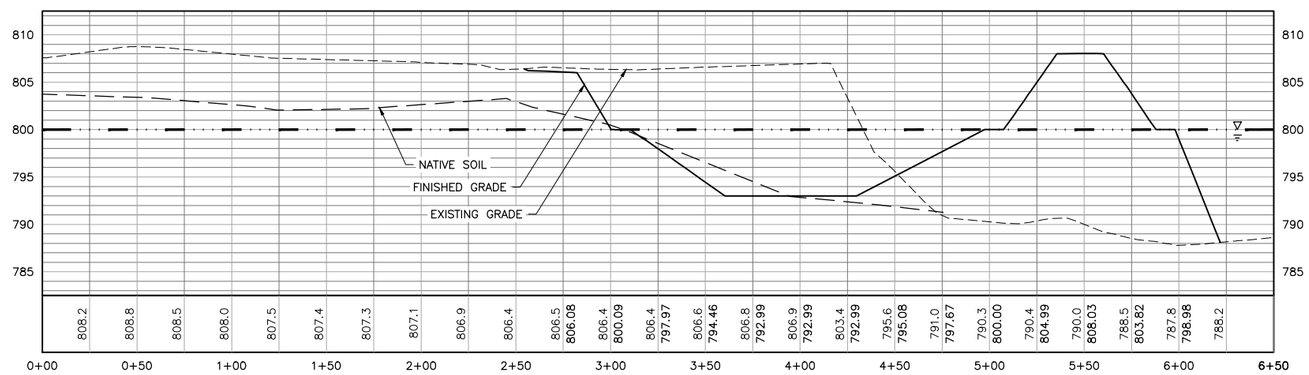
REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_C-03.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:39 PM

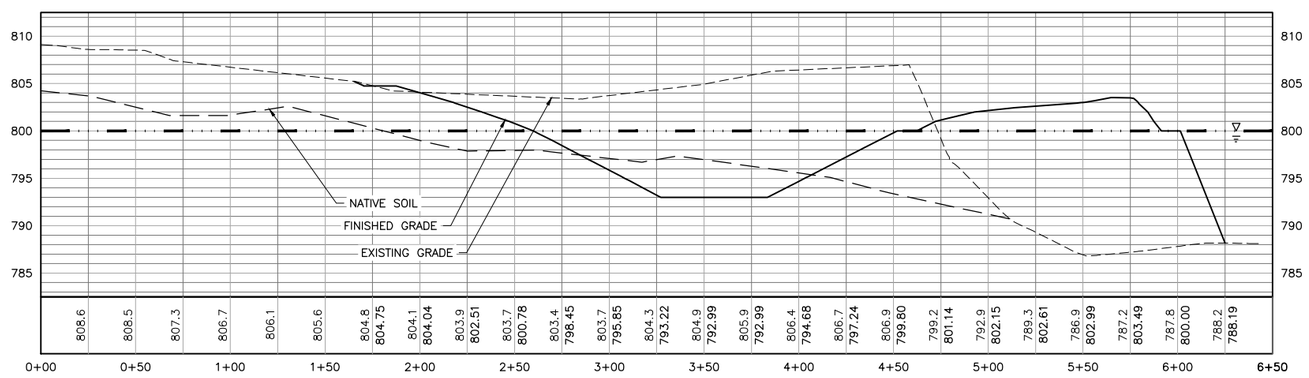
GRADING SECTION A



GRADING SECTION B



GRADING SECTION C



0 40 80
HORIZONTAL SCALE IN FEET

0 4 8 12 16
VERTICAL SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_C-04.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:20 PM

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	GGN	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

GRADING SECTIONS
A, B, C

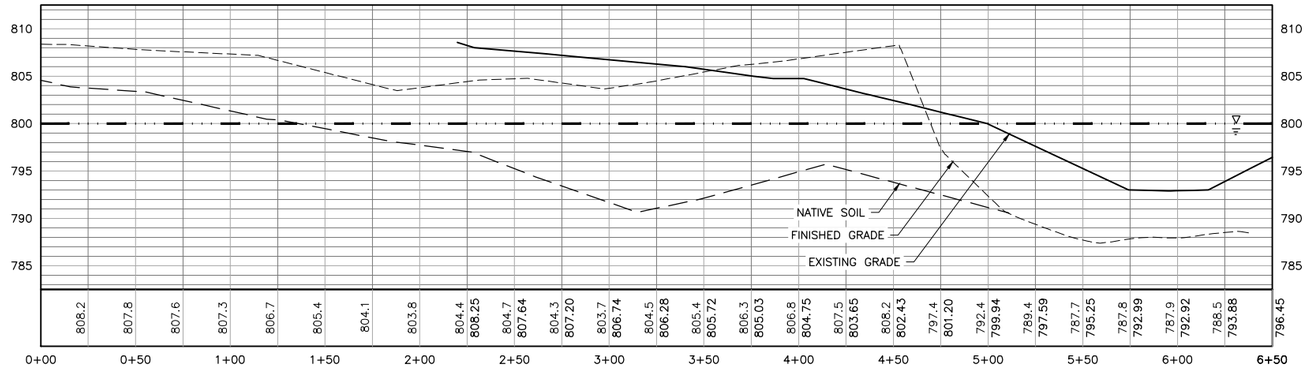
BARR PROJECT No. 23/27-1359.02

CLIENT PROJECT No.

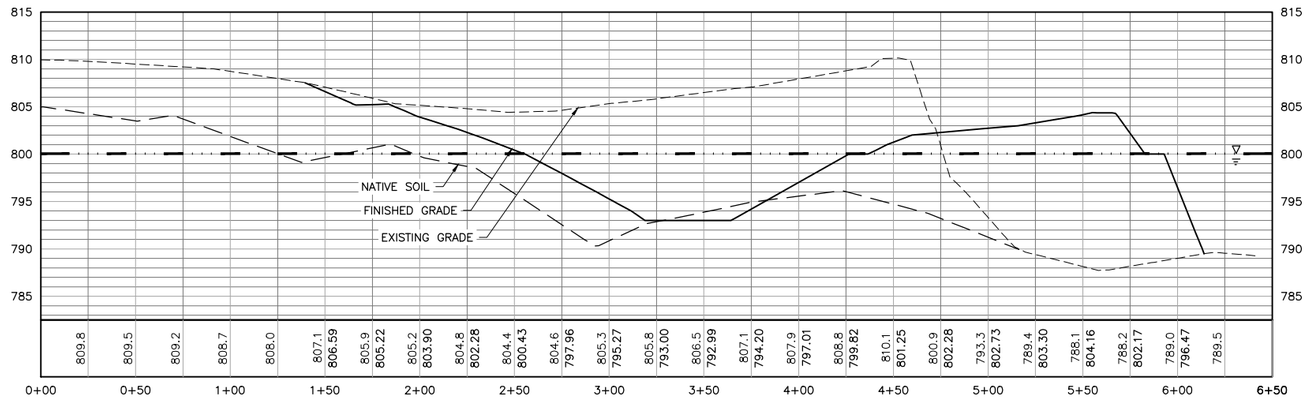
DWG. No. C-04

REV. No. B

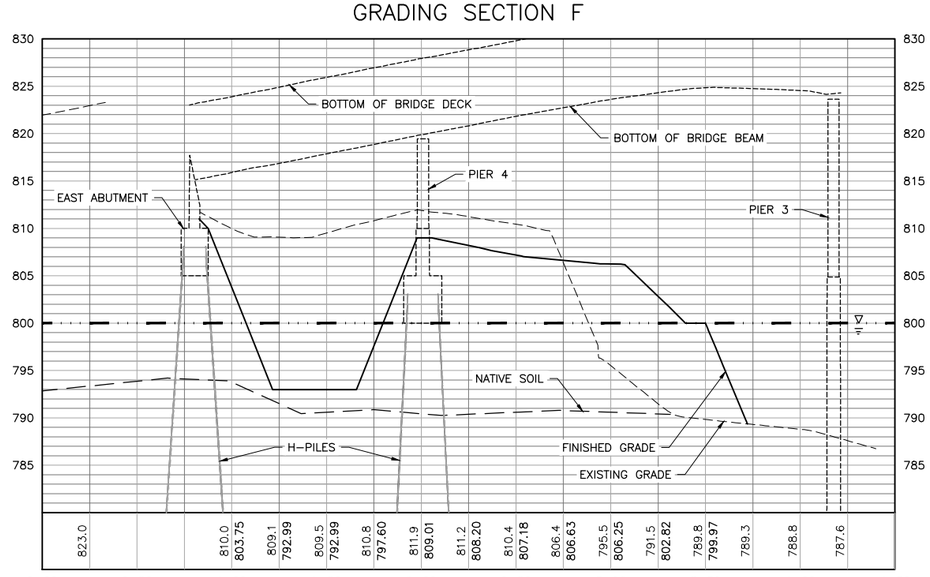
GRADING SECTION D



GRADING SECTION E



GRADING SECTION F



0 40 80
HORIZONTAL SCALE IN FEET

0 4 8 12 16
VERTICAL SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	GGN	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

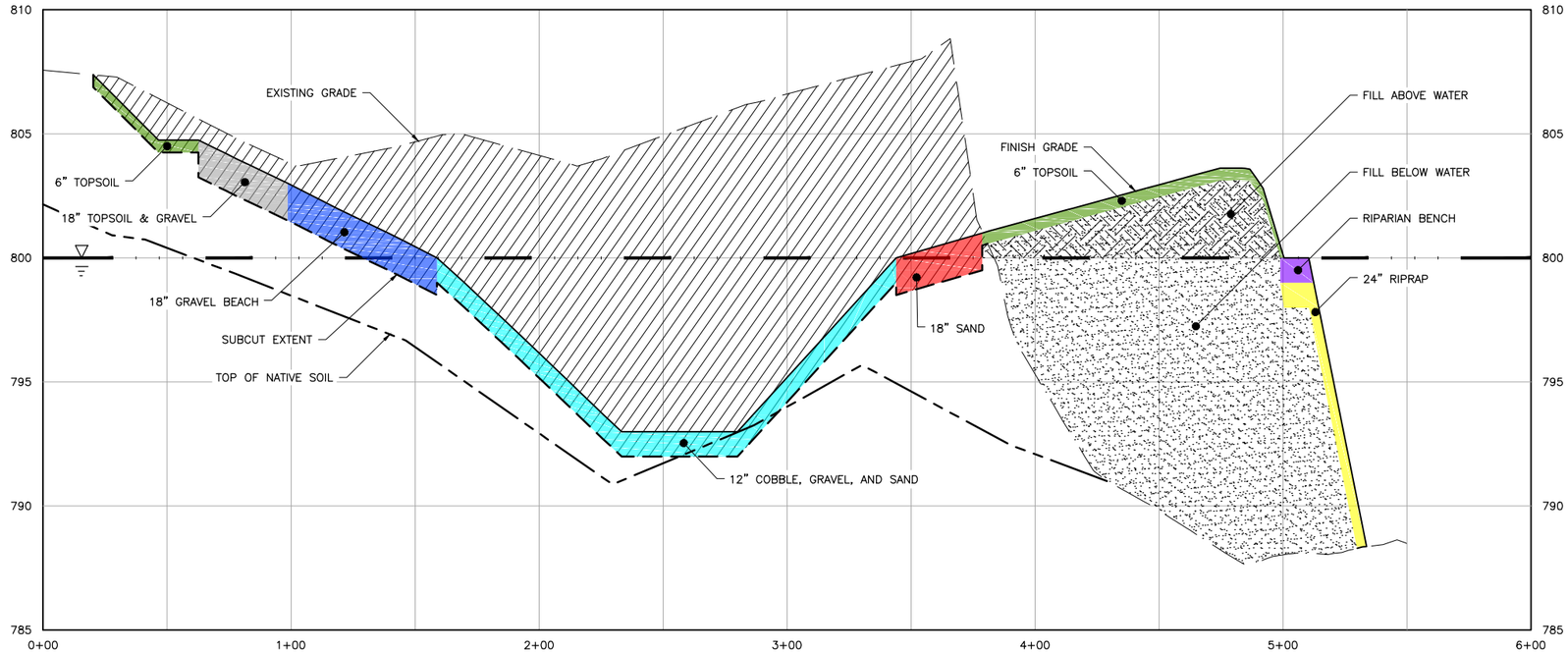
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

GRADING SECTIONS
D, E, F

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. C-05
REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\2327135902_C-05.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:21 PM

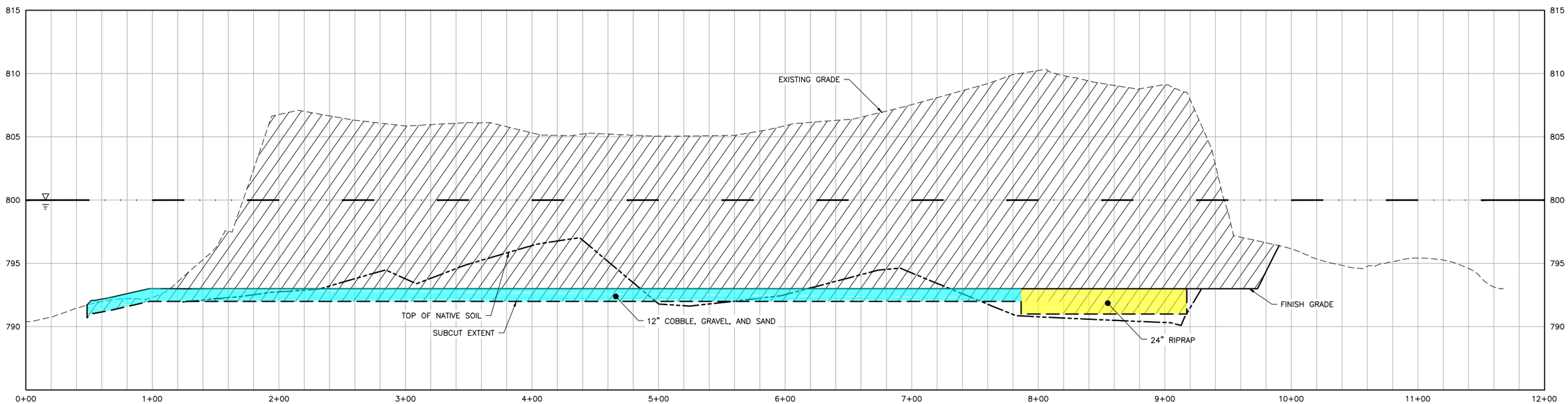


SHADING LEGEND

- COBBLE BACK CHANNEL
- RIPRAP
- GRAVEL BEACH
- ISLAND BEACH
- RIPARIAN BENCH
- TOPSOIL
- SEDGES WITH PATHS
- TOTAL CUT
- FILL BELOW WATER
- FILL ABOVE WATER

1 SECTION: TYPICAL CUT/FILL

0 30 60
SCALE IN FEET



2 SECTION: CUT/FILL ℄ OF CHANNEL

0 40 80
SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

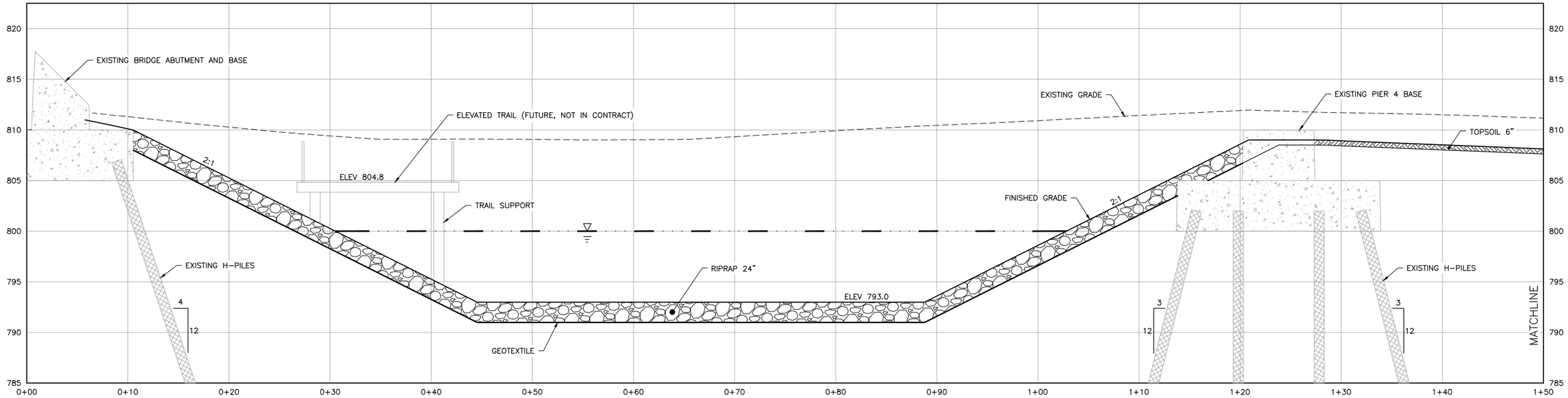
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

EARTHWORK
TYPICAL SECTIONS

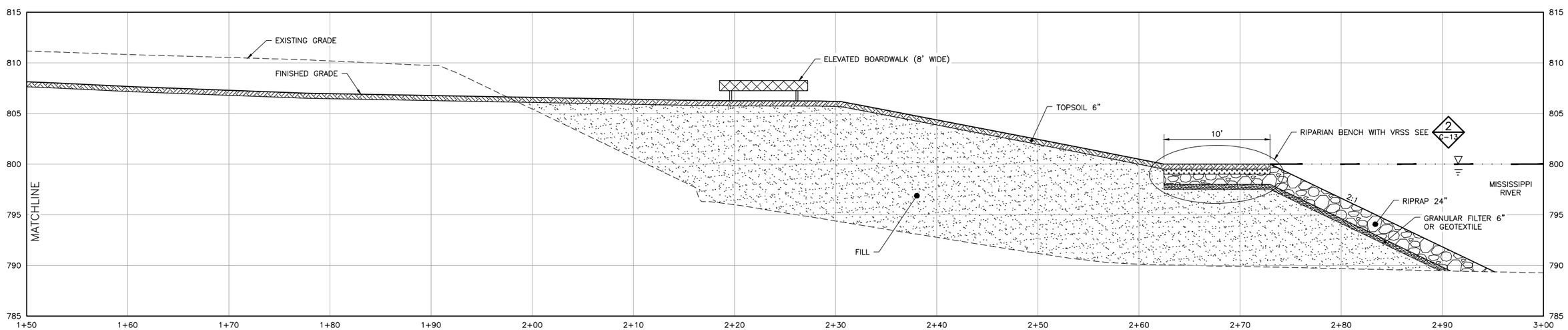
BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. C-06
REV. No. A

CADD USER: Patrick E. Brocksamp FILE: M:\DESIGN\23271359.02\2327135902_C-06.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:22 PM



1 C-02 SECTION: CENTERLINE UNDER PLYMOUTH AVE BRIDGE

0 5 10
SCALE IN FEET



2 C-02 SECTION: CENTERLINE UNDER PLYMOUTH AVE BRIDGE

0 5 10
SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_C-07.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:23 PM

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD
SIGNATURE
DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	12/12						
BID							
CONSTRUCTION							
	DATE RELEASED						

TLS Landscape Architecture
BARR

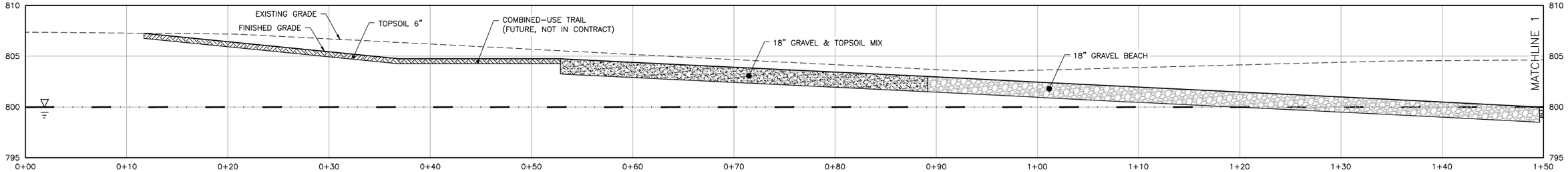
Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

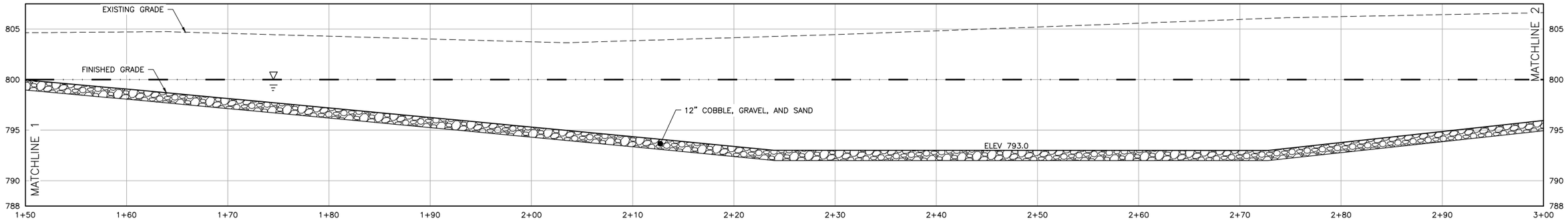
Minneapolis Park & Recreation Board

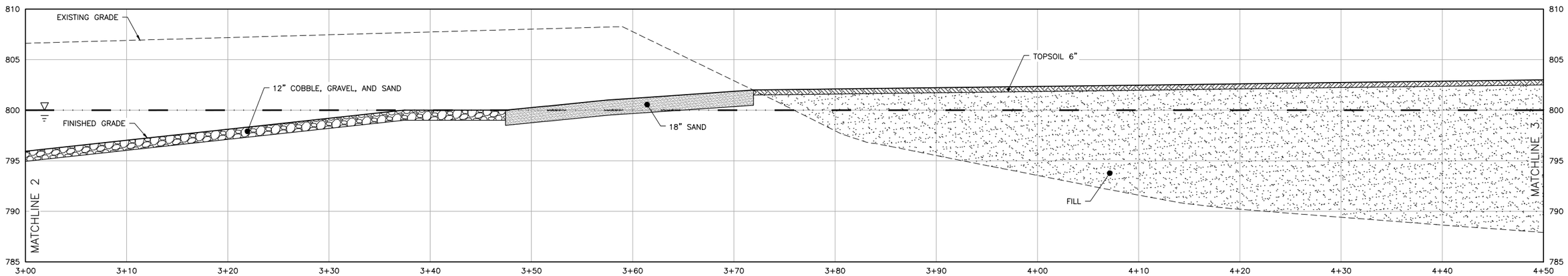
HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

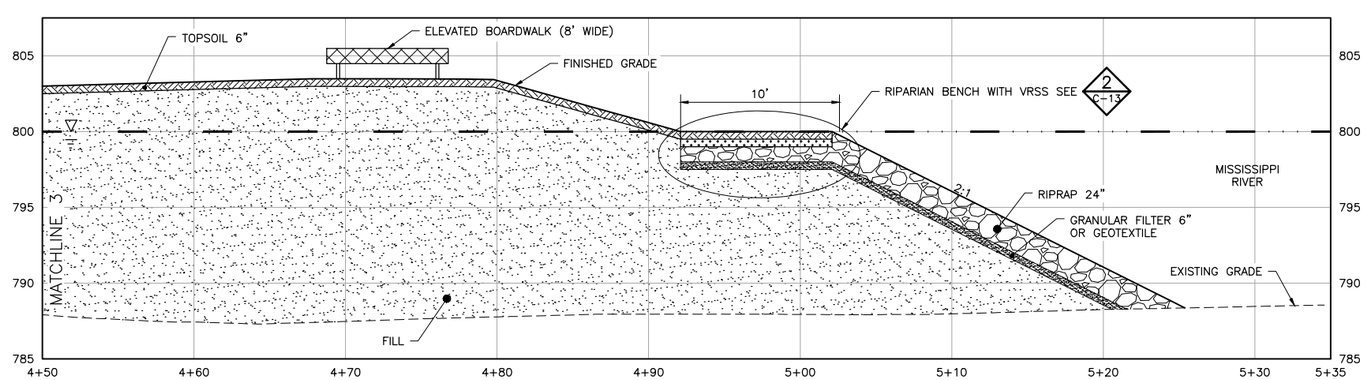
SLOPE AND HABITAT
TYPICAL SECTIONS

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. C-07
REV. No. A









1 C-02 SECTION: BEACHES AND CHANNEL

0 5 10
SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	12/12						
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

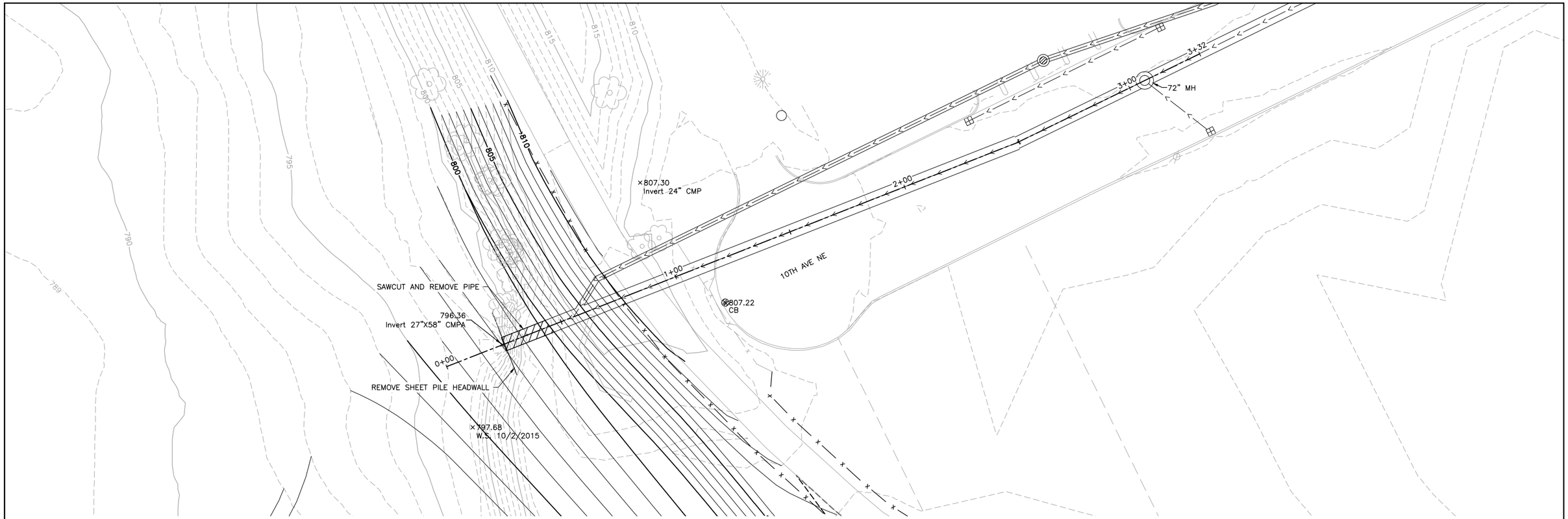
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

SLOPE AND HABITAT
TYPICAL SECTIONS

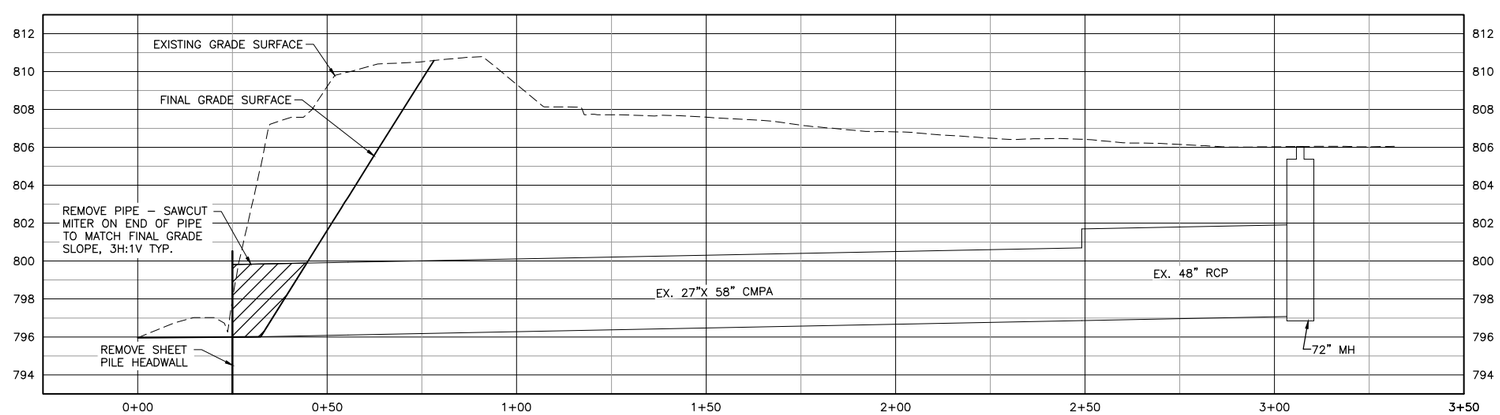
BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. C-08
REV. No. A

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\2327135902_C-08.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:24 PM



1 PLAN: STORM SEWER

0 20 40
SCALE IN FEET



2 PROFILE: STORM SEWER

0 20 40
SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	GGN	PEB	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	12/12						
BID							
CONSTRUCTION							
DATE RELEASED							

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	GGN
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

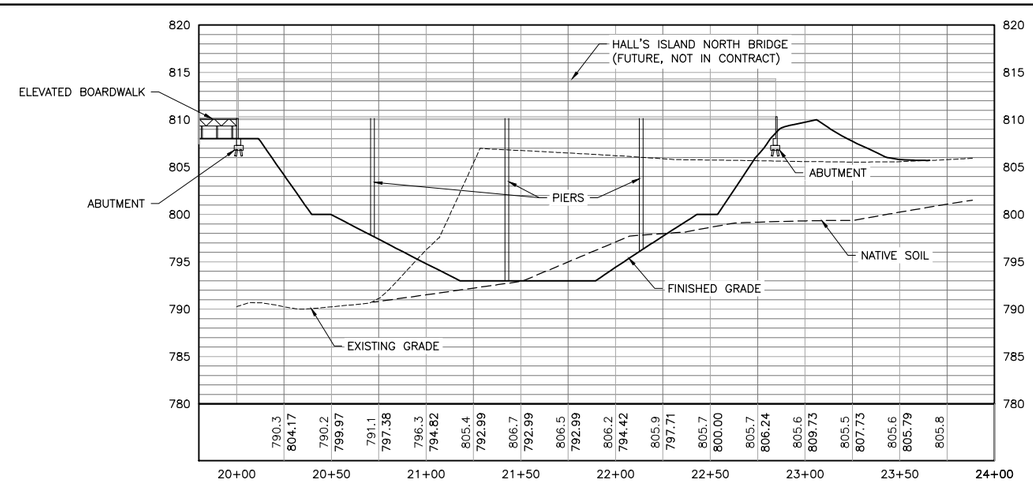
STORM SEWER
PLAN AND PROFILE

BARR PROJECT No. 23/27–1359.02
CLIENT PROJECT No.
DWG. No. C–09
REV. No. A

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_C-09.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:25 PM

1 PLAN: HALL'S ISLAND NORTH BRIDGE

0 40 80
SCALE IN FEET



2 PROFILE: HALL'S ISLAND NORTH BRIDGE

0 40 80 — HORIZONTAL SCALE IN FEET
0 4 8 12 16 — VERTICAL SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_C-10.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:40 PM

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	GGN	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD
SIGNATURE
DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture
BARR

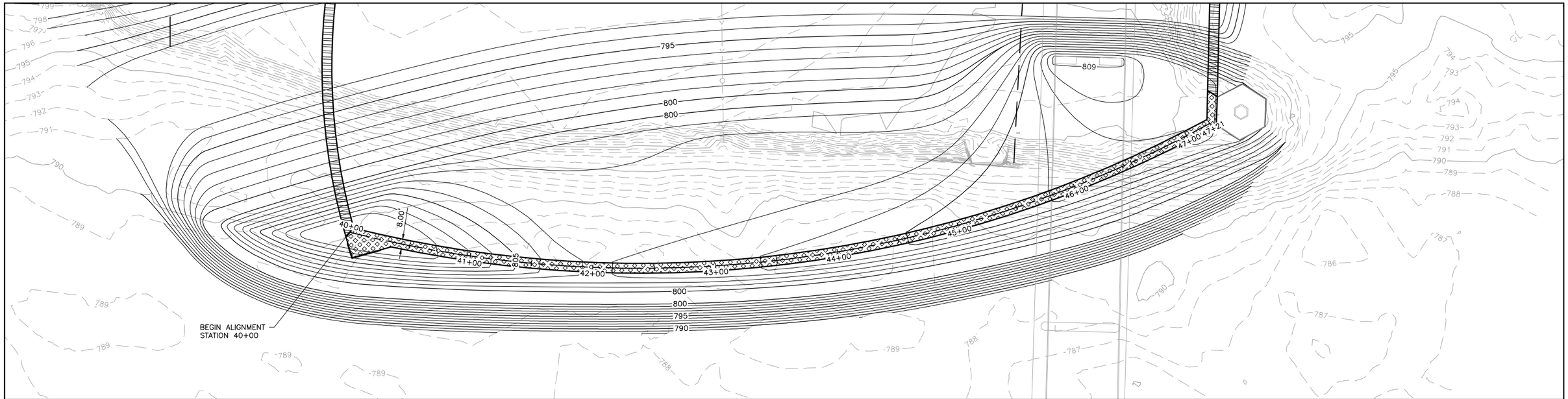
Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

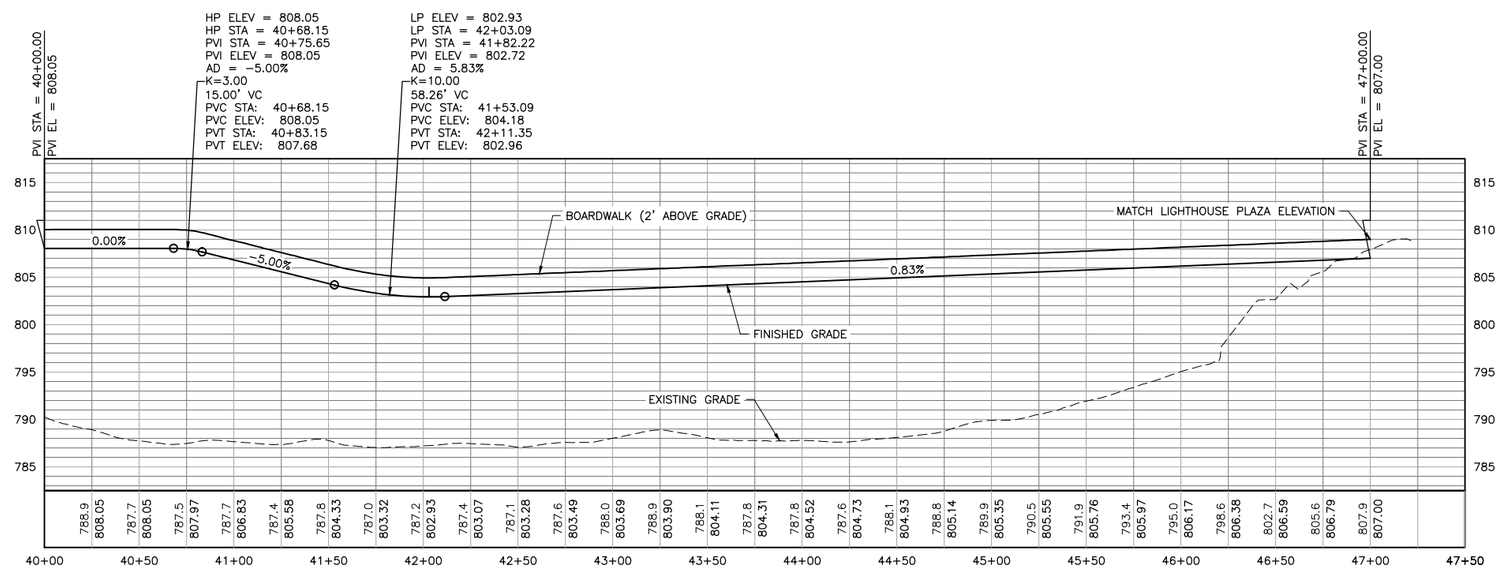
HALL'S ISLAND NORTH BRIDGE
PLAN AND PROFILE

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. C-10
REV. No. B



1 PLAN: HALL'S ISLAND PEDESTRIAN BOARDWALK

0 40 80
SCALE IN FEET



2 PROFILE: HALL'S ISLAND PEDESTRIAN BOARDWALK

0 40 80
HORIZONTAL SCALE IN FEET

0 4 8 12 16
VERTICAL SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_C-11.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:26 PM

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	GGN	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture

BARR

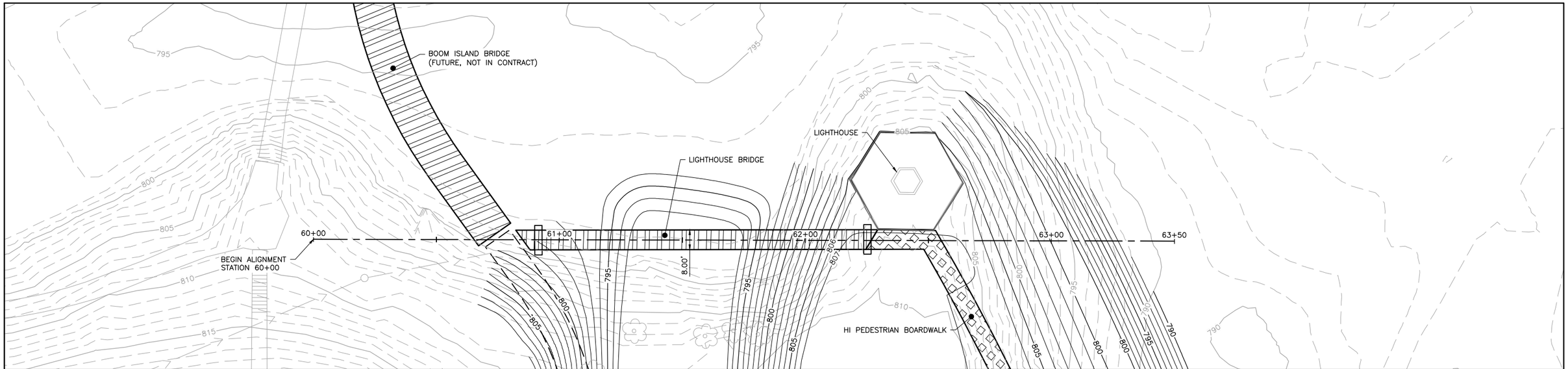
Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

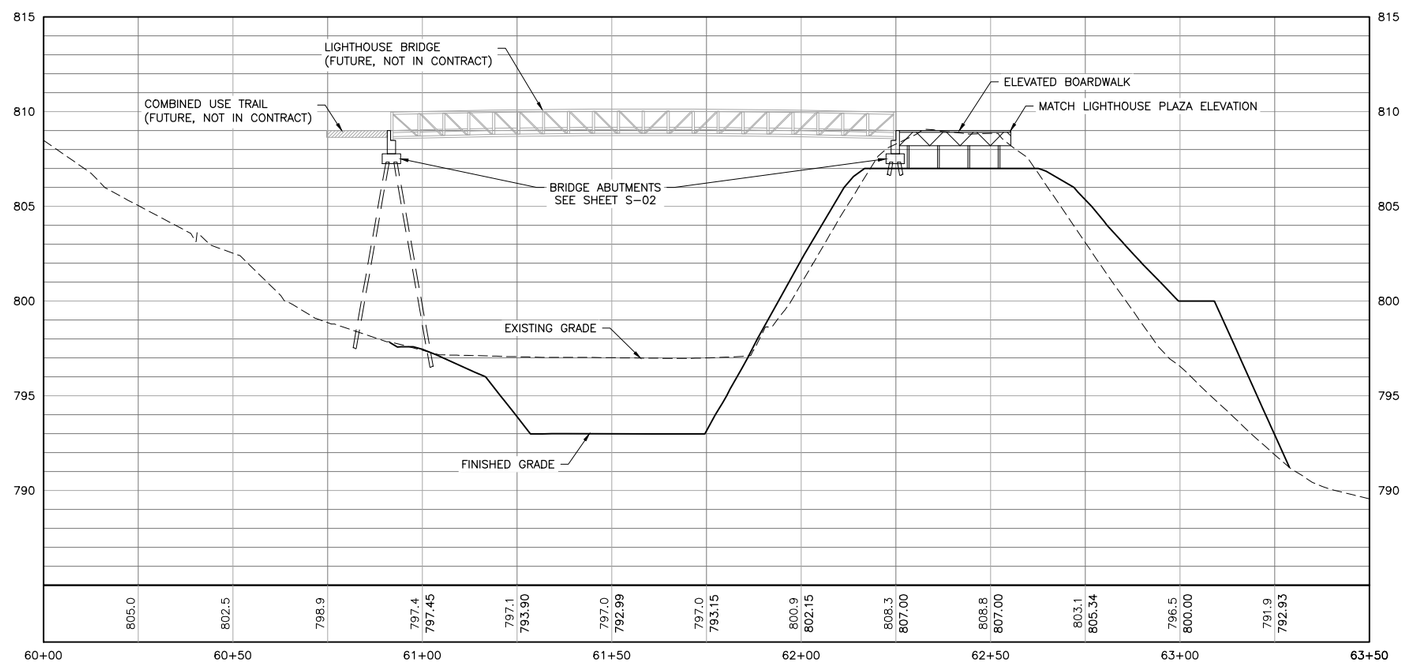
HALL'S ISLAND PEDESTRIAN BOARDWALK
PLAN AND PROFILE

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. C-11
REV. No. B



1 PLAN: LIGHTHOUSE BRIDGE

0 20 40
SCALE IN FEET



2 PROFILE: LIGHTHOUSE BRIDGE

0 20 40 — HORIZONTAL SCALE IN FEET
0 4 8 12 16 — VERTICAL SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	GGN	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD
SIGNATURE
DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

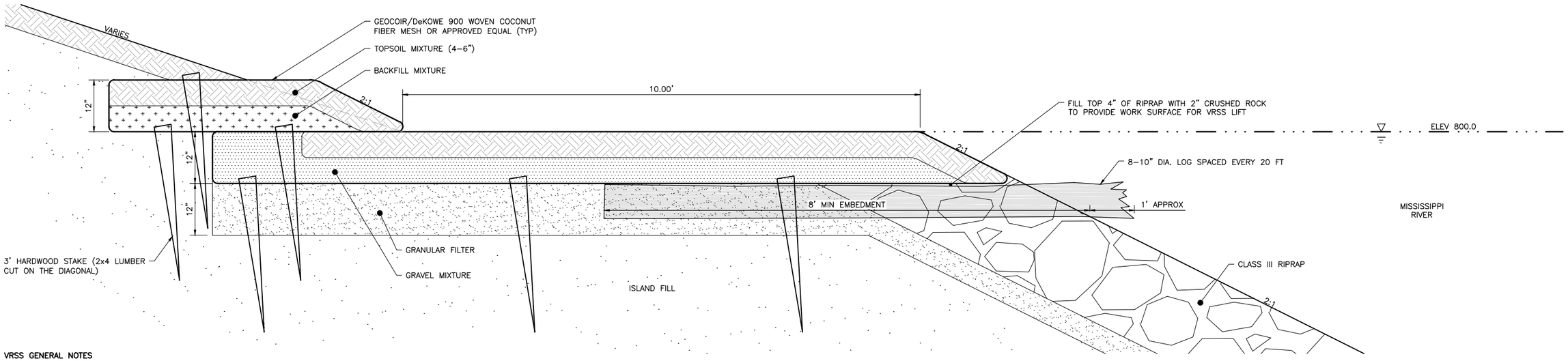
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

LIGHTHOUSE BRIDGE
PLAN AND PROFILE

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. C-12
REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359C2_C-12.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:40 PM



VRSS GENERAL NOTES

1. THE ENGINEER MUST BE NOTIFIED AT LEAST 3 DAYS PRIOR TO VRSS INSTALLATION AND MUST BE ON SITE DURING INSTALLATION.
2. INSTALL RIPRAP AND BEDDING AGGREGATE AS SPECIFIED IN SECTION 35 31 00 AND AS SHOWN ON THE DRAWINGS.
3. LAY NATURAL FIBER MATTING ON BOTTOM OF THE BENCH, OVERLAPPING ADJACENT MATTING BY 1 FOOT. THE OUTER EXPOSED FIBER MATTING LAYER OF EACH SOIL LIFT SHALL BE GEOCOIR/DEKOWE 900 WOVEN COCONUT FIBER MESH, BIOD–MATTM 90, OR AN ENGINEER APPROVED EQUIVALENT.
4. THE INNER LAYER OF EACH SOIL LIFT SHALL BE BIONET C125BN OR AN ENGINEER APPROVED EQUIVALENT. LAY THE INNER LAYER OF BIONET ON TOP OF NATURAL FIBER MATTING OF EACH SOIL LIFT. FABRIC SHOULD BE INSTALLED SMOOTH WITH NO UNNECESSARY FOLDS OR WRINKLES. STAKE THE SHOREWARD END OF THE FIBER MATTING IN PLACE WITH WOODEN STAKES SPACED EVERY THREE FEET AS SHOWN ON THE DRAWINGS.
5. THE FIRST 6 TO 8 INCHES OF THE BOTTOM SOIL LIFT SHALL BE FILLED WITH GRAVEL AND SAND MATERIAL EXCAVATED FROM THE STREAM BED. THE TOP 6 TO 8 INCHES ON THE FRONT OF SURFACE LAYER SHOULD BE COMPRISED OF TOPSOIL MIX AS SHOWN ON THE DRAWINGS.
6. THE TOPSOIL LAYER SHALL BE SEEDED WITH THE VRSS SEED MIX AT 0.7 POUNDS PER 1,000 SQUARE FEET OF LIFT SURFACE AREA AS SHOWN ON THE DRAWINGS.
7. FOLD THE FIBER MATTING OVER THE FILL MATERIAL AND STAKE IN PLACE SO THE FABRIC IS TAUT AND SMOOTH WITH NO UNNECESSARY FOLDS OR WRINKLES. BACKFILL BEHIND THE BOTTOM SOIL LIFT WITH GRANULAR FILTER MATERIAL TO MEET THE EXISTING SLOPE AS SHOWN ON THE DRAWINGS.
8. THE FACE OF THE SECOND SOIL LIFT SHALL BE OFFSET SHOREWARD BY ONE FOOT FROM THE FACE OF THE BOTTOM SOIL LIFT. THE FIRST 6 INCHES OF THE SECOND SOIL LIFT SHALL BE FILLED WITH COMMON FILL AND TOPSOIL MATERIAL AS SHOWN ON THE DRAWINGS. THE TOP 6 TO 8 INCHES ON THE FRONT AND TOP LAYER SHOULD BE COMPRISED OF TOPSOIL MIX AS SHOWN ON THE DRAWINGS. COMMON FILL AND TOPSOIL SHALL BE HAND TAMPED AND NOT MECHANICALLY COMPACTED TO ENSURE VEGETATIVE SUCCESS.
9. THE TOPSOIL LAYER SHALL BE SEEDED WITH THE VRSS SEED MIX AT 0.7 POUNDS PER 1,000 SQUARE FEET OF LIFT SURFACE AREA AS SHOWN ON THE DRAWINGS.
10. FOLD THE FIBER MATTING THE FILL MATERIAL AND STAKE IN PLACE SO THE FABRIC IS TAUT AND SMOOTH WITH NO UNNECESSARY FOLDS OR WRINKLES. BACKFILL BEHIND THE SOIL LIFT WITH COMMON FILL MATERIAL TO MEET THE EXISTING SLOPE AS SHOWN ON THE DRAWINGS. FILL PLACED BEHIND THE SECOND AND THIRD SOIL LIFTS SHOULD BE PLACED IN EIGHT INCH LIFTS AND PROPERLY COMPACTED; HAND TAMPED AND NOT MECHANICALLY COMPACTED TO ENSURE VEGETATIVE SUCCESS.
11. ON BOTH TERMINAL ENDS OF THE SOIL LIFTS, EXCESS MATTING SHALL BE USED TO FOLD OVER THE ENDS OF THE LIFT AND STAKED FIRMLY. ON THE FIRST LIFT LAYER BACKFILL WITH OR FILL ADJACENT TO THE END OF THE LIFT AND COMPACT TO SECURE IT FIRMLY.
12. THE FINAL SLOPE SHALL BE SHAPED ABOVE THE TOP SOIL LIFT AS SHOWN ON THE DRAWINGS. COMMON FILL WITH A 4 TO 6 INCH TOPSOIL LAYER SHALL BE USED TO FORM THE FINAL SLOPE. THE SLOPE SHALL BE SEEDED WITH THE VRSS SEED MIX.

1 / C–09 **SECTION: VEGETATED REINFORCED SOIL SLOPE (VRSS)**
NOT TO SCALE

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	EPF	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD
SIGNATURE
DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							
DATE RELEASED							

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

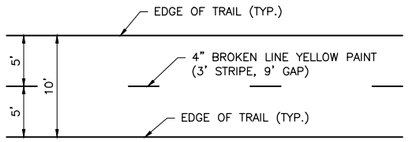
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

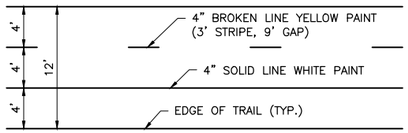
RIPARIAN BENCH DETAILS

BARR PROJECT No. 23/27–1359.02
CLIENT PROJECT No.
DWG. No. C–13
REV. No. B

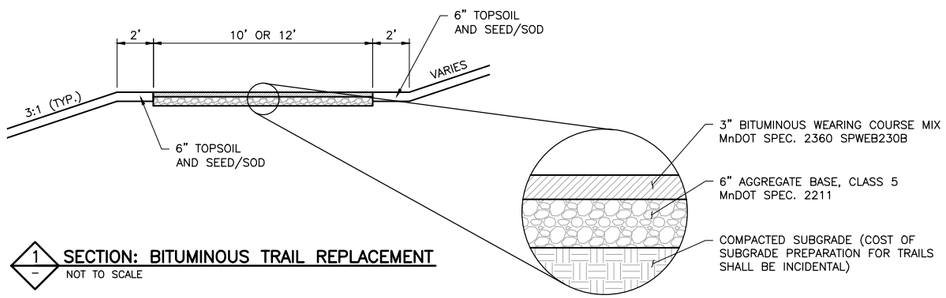
CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\2327135902_C–13.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:28 PM



TYPICAL TRAIL STRIPING DETAIL (10' TRAIL)



TYPICAL TRAIL STRIPING DETAIL (12' TRAIL)



1 SECTION: BITUMINOUS TRAIL REPLACEMENT
NOT TO SCALE

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	PEB	MAK	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW
A	EPF	MAK	KAL	09/23/2016	30% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23	12/12					
BID							
CONSTRUCTION							
DATE RELEASED							

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

MISCELLANEOUS DETAILS

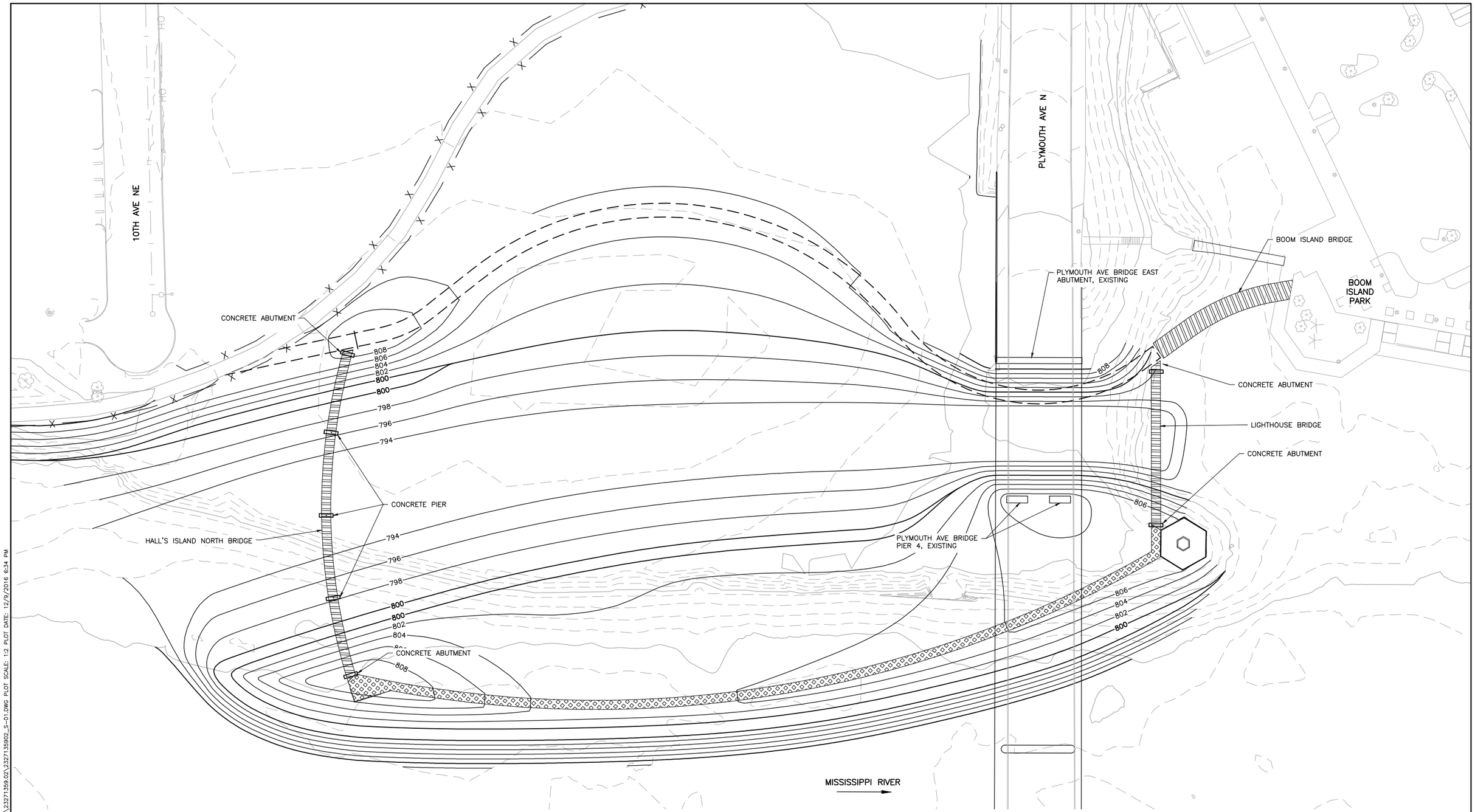
BARR PROJECT No. 23/27-1359.02

CLIENT PROJECT No.

DWG. No. C-14

REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_C-14.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:28 PM



1 PLAN: STRUCTURAL SITE

0 40 80
SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	KLT	EPB	MBJ	12/12/2016	60% DRAFT FOR REVIEW
A	KLT	EPB	MBJ	09/23/2016	30% DRAFT FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME _____
SIGNATURE _____
DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	9/23/16	12/12/16					
BID							
CONSTRUCTION							
	DATE RELEASED						

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	PEB
Checked	MAK
Designed	PEB
Approved	KAL

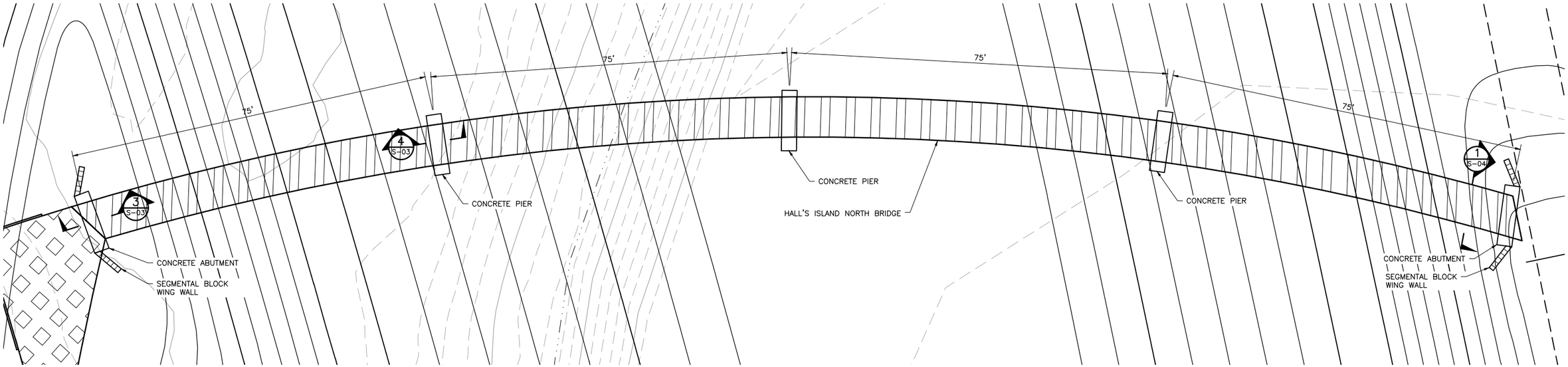
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

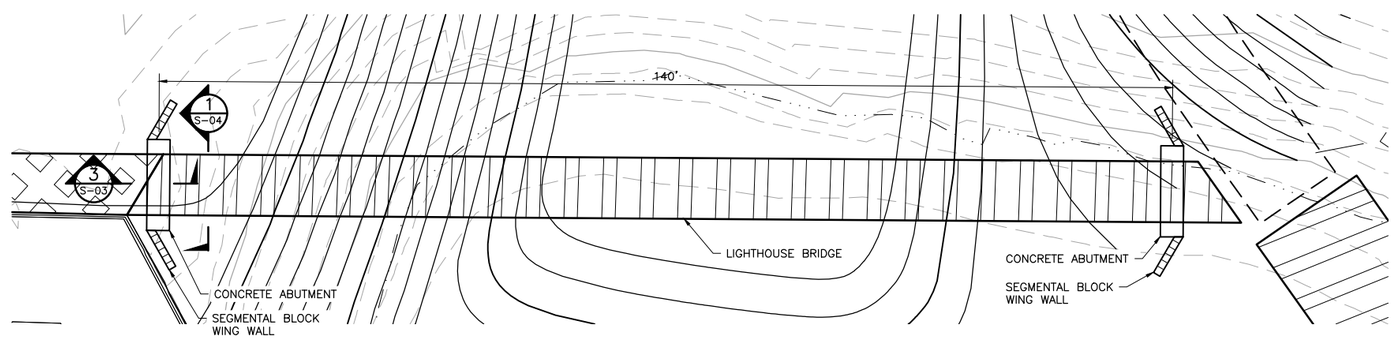
STRUCTURAL SITE PLAN

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. S-01
REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\2327135902_S-01.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:34 PM



1 -- PLAN: NORTH BRIDGE
1"=20'-0"
0 10 20
SCALE IN FEET



2 -- PLAN: LIGHTHOUSE BRIDGE
1"=20'-0"
0 10 20
SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	KLT	EPB	MBJ	12/12/2016	60% DRAFT FOR REVIEW
A	KLT	EPB	MJB	09/23/2016	30% DRAFT FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME _____
SIGNATURE _____
DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	09/23/16	12/12/2016					
BID							
CONSTRUCTION							
DATE RELEASED							

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	KLT
Checked	EPB
Designed	EPB
Approved	KAL

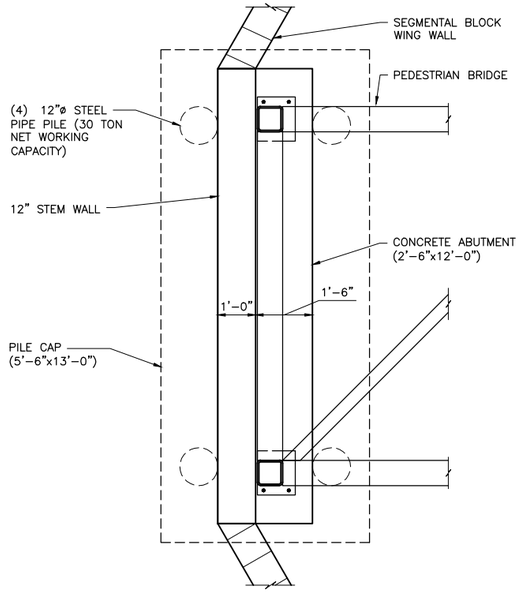
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

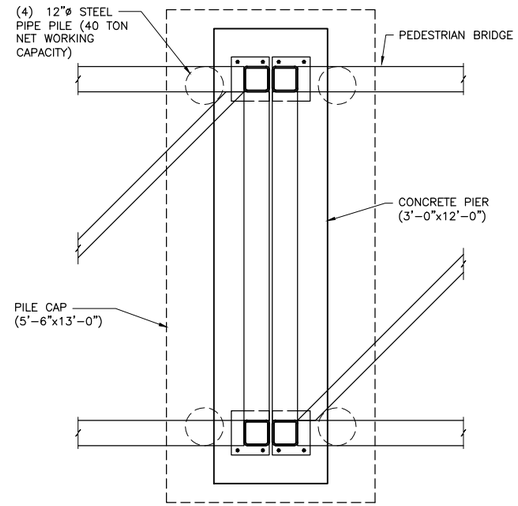
NORTH BRIDGE & LIGHTHOUSE BRIDGE PLANS

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. S-02
REV. No. B

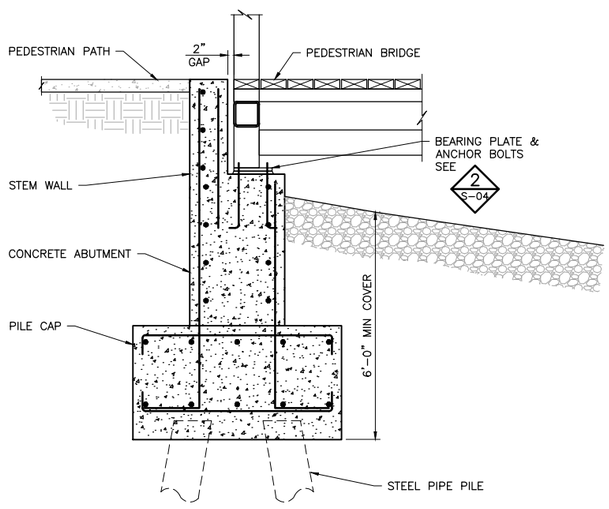
CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_S-02.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:29 PM



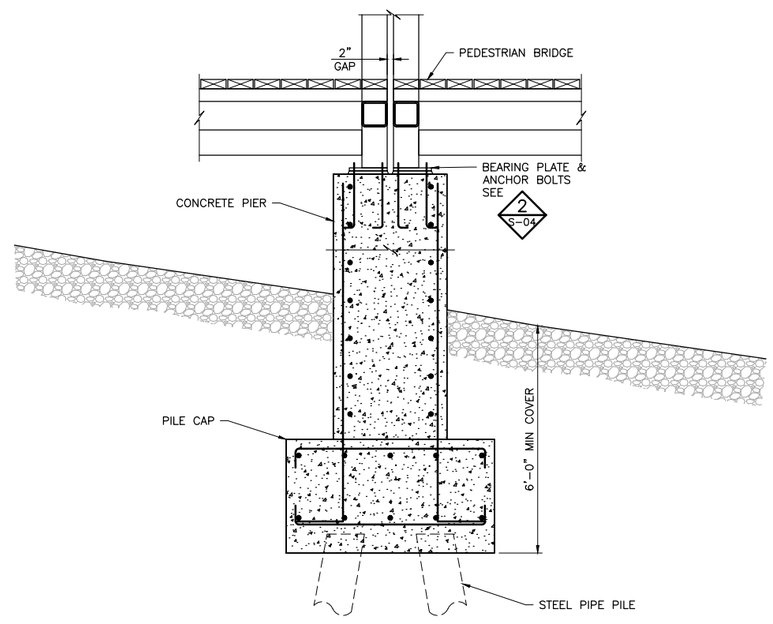
1 PLAN: CONC ABUTMENT
1/4"=1'-0"



2 PLAN: CONC PIER
1/4"=1'-0"



3 SECTION: CONC ABUTMENT
1/4"=1'-0"



4 SECTION: CONC PIER
1/4"=1'-0"

BUILDING AND DESIGN CODES:

INTERNATIONAL BUILDING CODE 2012, INTERNATIONAL CODE COUNCIL.
BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318-11, AMERICAN CONCRETE INSTITUTE.
SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AISC 360-10, AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES, 2ND EDITION, AASHTO.

BRIDGE DESIGN CRITERIA:

BRIDGE SHALL BE DESIGNED FOR THE FOLLOWING LOAD CONDITIONS:
AASHTO H-5 VEHICLE LOADING
100 PSF PEDESTRIAN LIVE LOAD (NON-REDUCIBLE)

PREFABRICATED STEEL BRIDGE SUPERSTRUCTURE:

THE PREFABRICATED STEEL SUPERSTRUCTURE SHALL BE A TRUSS CONFIGURATION DESIGNED FOR THE SPECIFIED LOAD CONDITIONS BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MINNESOTA.

STEEL SHAPES, PLATES, AND BARS SHALL BE WEATHERING STEEL CONFORMING TO AASHTO M270, GRADE 50W (ASTM A588 OR ASTM A242) OR ASTM A847 FOR SQUARE OR RECTANGULAR TUBING. HIGH STRENGTH BOLTS SHALL CONFORM TO AASHTO M164 (ASTM A325), TYPE 3.

THE PREFABRICATED STEEL SUPERSTRUCTURE SHALL BE FABRICATED BY AN AISC CERTIFIED PLANT-SIMPLE STEEL BRIDGES.

MATERIAL SPECIFICATIONS:

MINIMUM 28-DAY COMPRESSIVE STRENGTH OF CONCRETE:

5,000 PSI

COARSE AGGREGATE GRADATION REQUIREMENTS:

ASTM C33 (SIZE NUMBER 6, OR 67) WITH A MINIMUM OF 2% RETAINED ON ¾-INCH SIEVE

MINIMUM YIELD POINT STRENGTH OF REINFORCING BAR:

60 KSI U.N.O.

ABBREVIATIONS:

@	AT	PL.	PLATE
B.O.	BOTTOM OF	RAD.	RADIUS
B.C.	BOLT CENTER	SCH.	SCHEDULE
C.C.C.	CLEAR CONCRETE COVER	STD.	STANDARD
℄	CENTER LINE	T&B	TOP AND BOTTOM
EL.	ELEVATION	T.O.C.	TOP OF CONCRETE
E.W.	EACH WAY	TYP	TYPICAL
EX.	EXISTING	U.N.O.	UNLESS NOTED OTHERWISE
I.D.	INSIDE DIAMETER	VERTS.	VERTICAL BARS
MAX.	MAXIMUM	W/	WITH
MIN.	MINIMUM	&	AND
NOM.	NOMINAL	ø	DIAMETER
O.C.	ON CENTER		
O.D.	OUTSIDE DIAMETER		

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	KLT	EPB	MBJ	12/12/2016	60% DRAFT FOR REVIEW
A	KLT	EPB	MBJ	09/23/2016	30% DRAFT FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME
SIGNATURE
DATE LICENSE #

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	9/23/16	12/12/16					
BID							
CONSTRUCTION							
DATE RELEASED							

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	KLT
Checked	EPB
Designed	EPB
Approved	MBJ

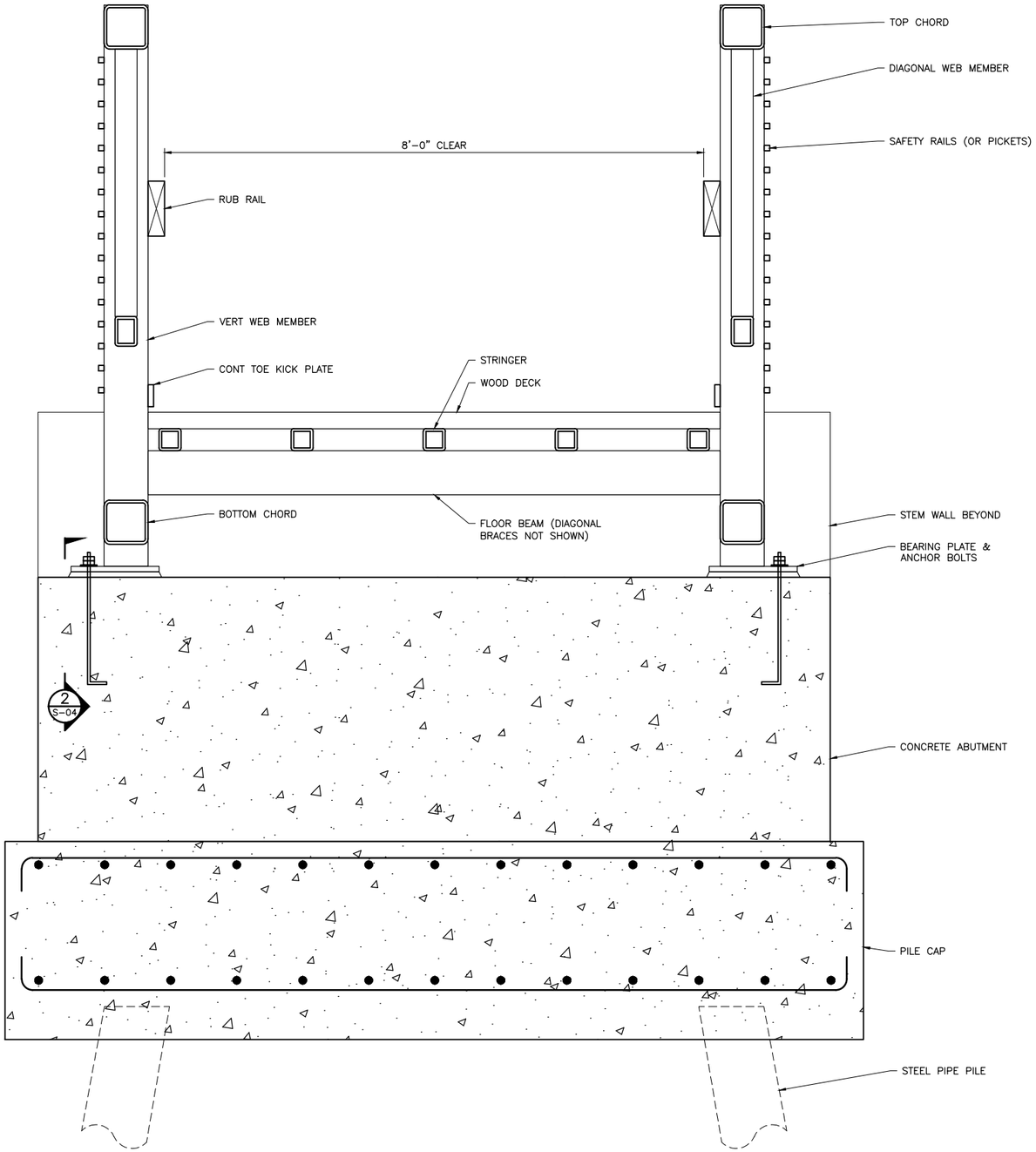
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

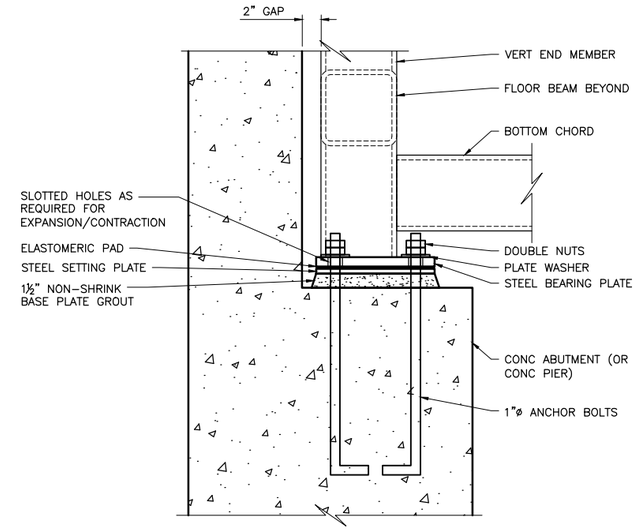
SECTIONS AND DETAILS

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. S-03
REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\2327135902_S-03.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:35 PM



1 -- SECTION: BRIDGE/ABUTMENT
1/2"=1'-0"



2 -- DETAIL: BEARING PLATE
3/4"=1'-0"

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	KLT	EPB	MBJ	12/12/2016	60% DRAFT FOR REVIEW
A	KLT	EPB	MBJ	09/23/2016	30% DRAFT FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME _____
SIGNATURE _____
DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	9/23/16	12/12/16					
BID							
CONSTRUCTION							
DATE RELEASED							

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	KLT
Checked	EPB
Designed	EPB
Approved	MBJ

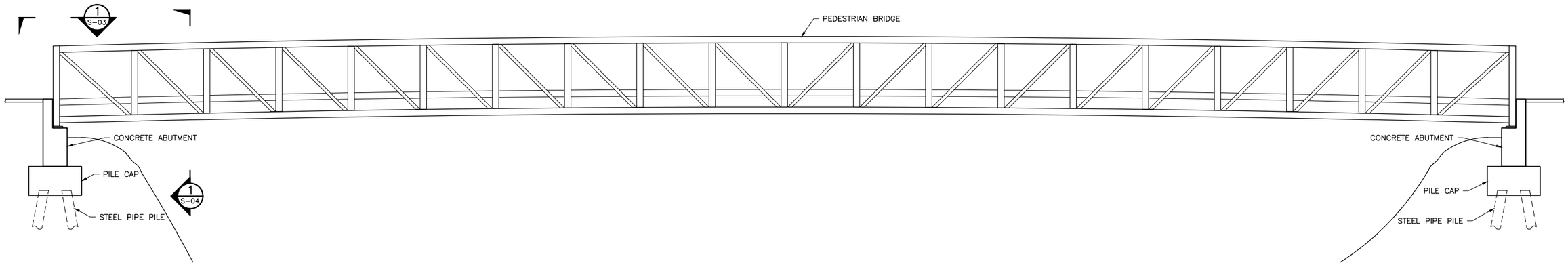
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

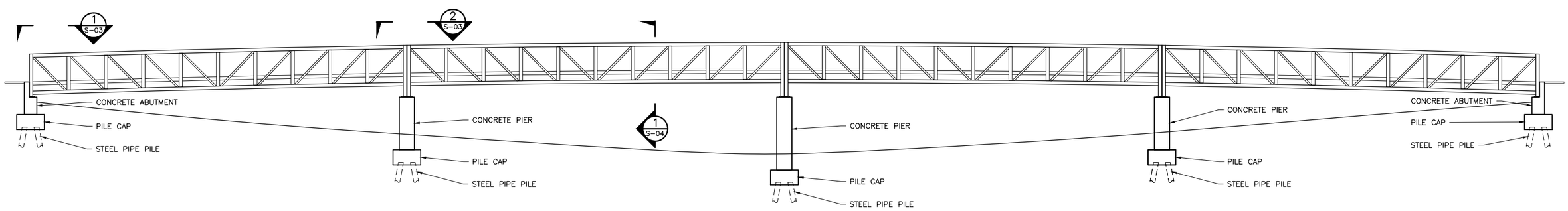
SECTIONS & DETAILS

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. S-04
REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\2327135902_S-04.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:35 PM



1 -- ELEVATION: LIGHTHOUSE BRIDGE
3/32"=1'-0"



2 -- ELEVATION: NORTH BRIDGE
1"=20'-0"
0 10 20
SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
B	KLT	EPB	MBJ	12/12/2016	60% DRAFT FOR REVIEW
A	KLT	EPB	MBJ	09/23/2016	30% DRAFT FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME _____
SIGNATURE _____
DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	9/23/16	12/12/16					
BID							
CONSTRUCTION							
DATE RELEASED							

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	KLT
Checked	EPB
Designed	EPB
Approved	MBJ

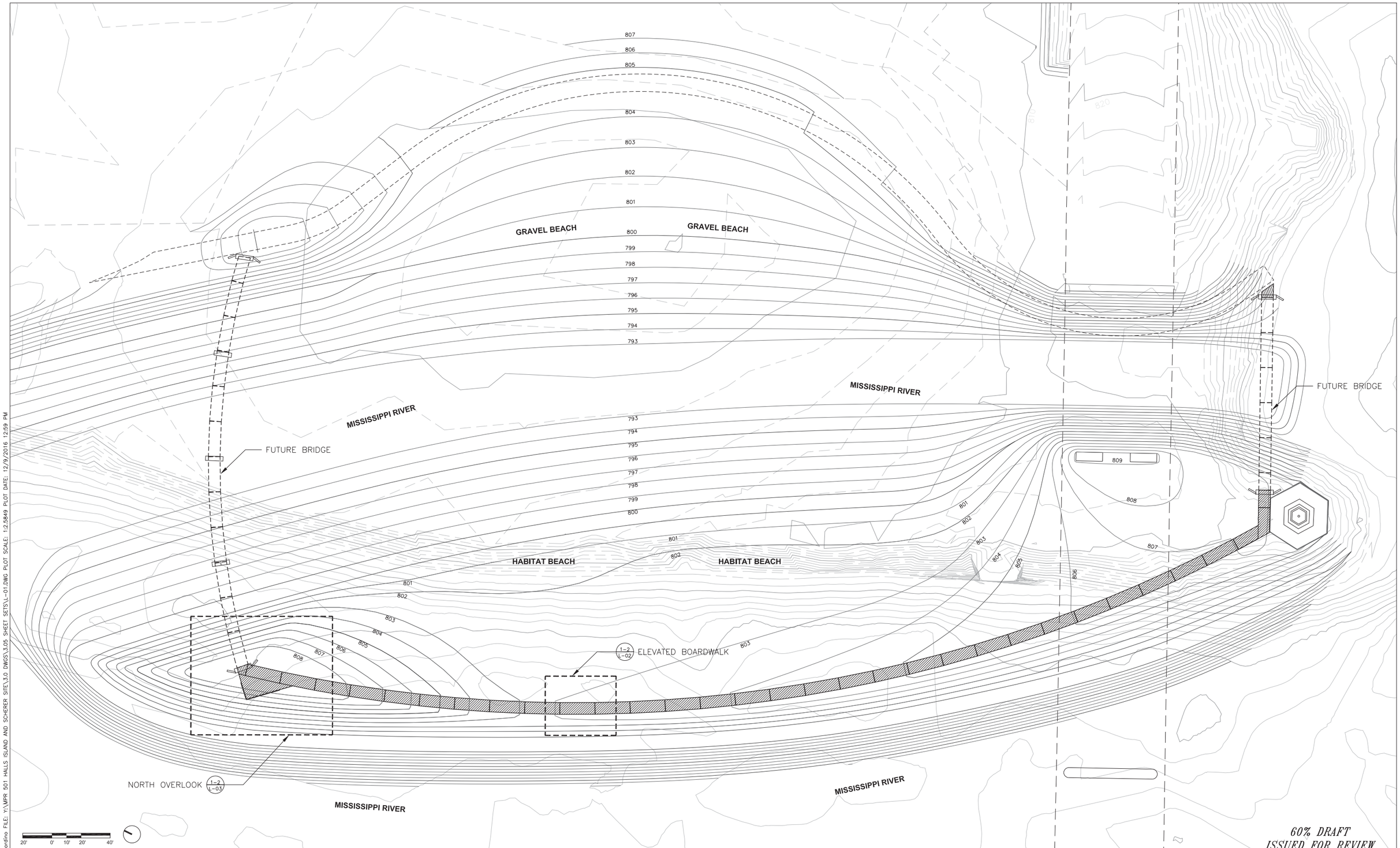
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

ELEVATIONS

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. S-05
REV. No. B

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\23271359.02_S-05.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:36 PM



60% DRAFT
ISSUED FOR REVIEW

CADD USER: Mario Accardino FILE: Y:\MPR 501 HALLS ISLAND AND SCHERER SITE\3.0 DWGS\3.05 SHEET SETS\L-01.DWG PLOT SCALE: 1:2.5849 PLOT DATE: 12/9/2016 12:59 PM

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	---	---	---	12/12/2016	60% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	12/12						
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	.
Checked	.
Designed	.
Approved	.

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

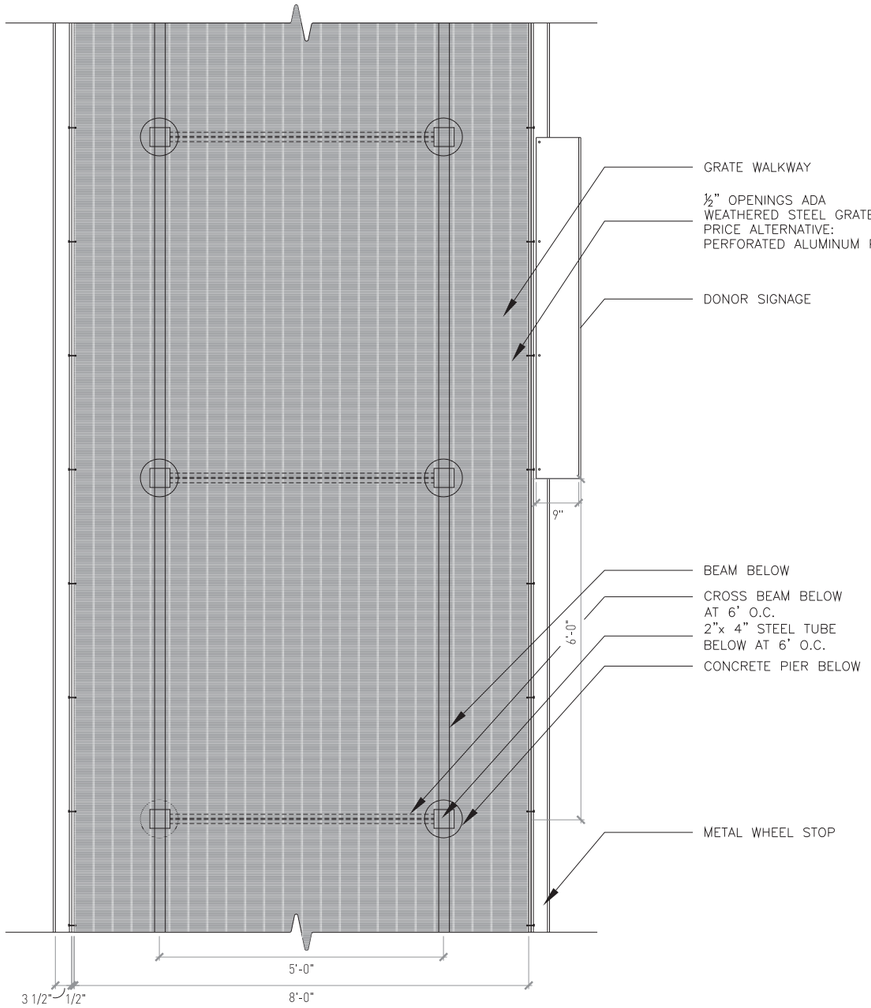
LANDSCAPE REFERENCE PLAN
1"=30'-0"

BARR PROJECT No. 23/27-1359.02

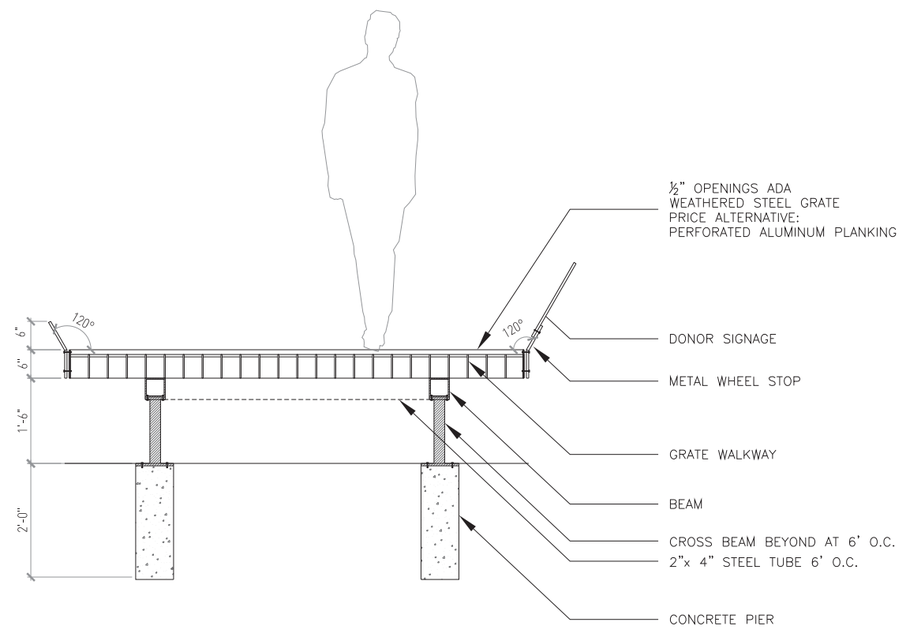
CLIENT PROJECT No.

DWG. No. L-01

REV. No. A



1 L-02 BOARDWALK - PLAN
SCALE: 3/4" = 1'-0"



2 L-02 BOARDWALK - SECTION
SCALE: 3/4" = 1'-0"

ALUMINUM

WEATHERED STEEL

FIBERGLASS / RESIN BOND

3 L-02 MATERIAL REFERENCE OPTIONS
SCALE: NTS

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	---	---	---	12/12/2016	60% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	12/12						
BID							
CONSTRUCTION							
	DATE RELEASED						

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	.
Checked	.
Designed	.
Approved	.

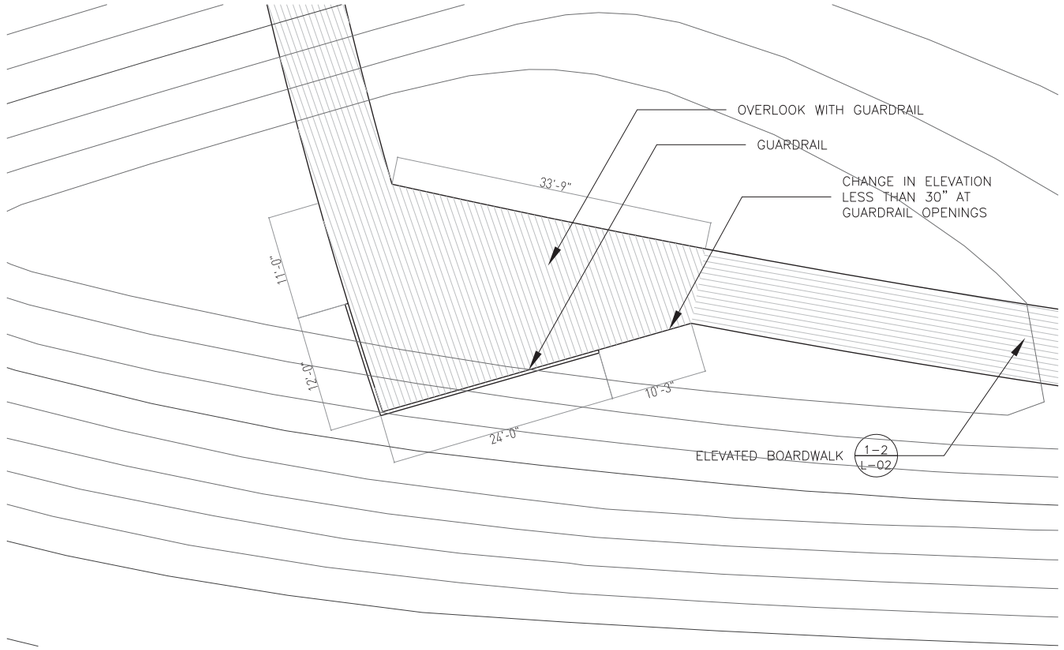
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

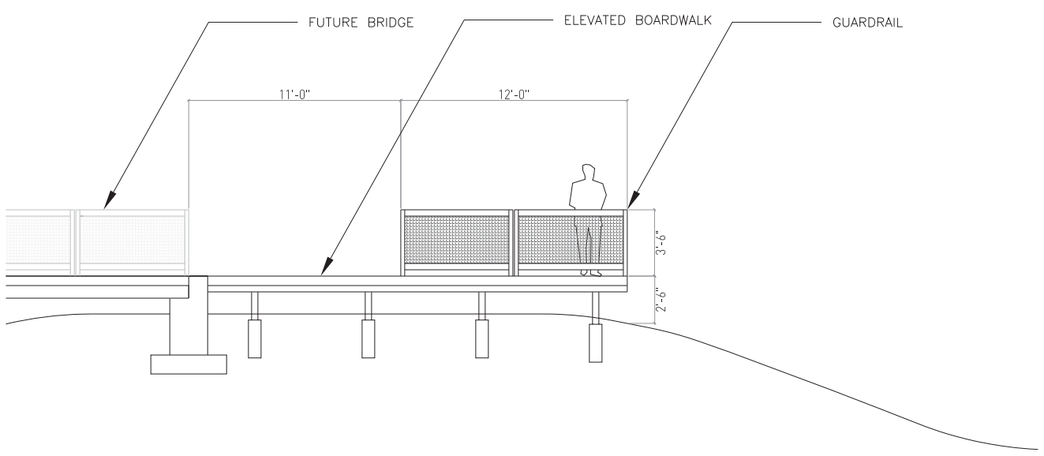
LANDSCAPE DETAILS – ELEVATED BOARDWALK
3/4"=1'-0"

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. L-02
REV. No. A

CADD USER: Mario Accardino FILE: Y:\MPR 501 HALLS ISLAND AND SCHERER SITE\3.0 DWGS\3.05 SHEET SETS\L-02.DWG PLOT SCALE: 1:2.5849 PLOT DATE: 12/9/2016 12:59 PM



1 / L-03 OVERLOOK - PLAN
SCALE: 1/8" = 1'-0"



2 / L-03 OVERLOOK - SECTION
SCALE: 1/4" = 1'-0"

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	---	---	---	12/12/2016	60% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME _____

SIGNATURE _____

DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	12/12						
BID							
CONSTRUCTION							
DATE RELEASED							

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	.
Checked	.
Designed	.
Approved	.

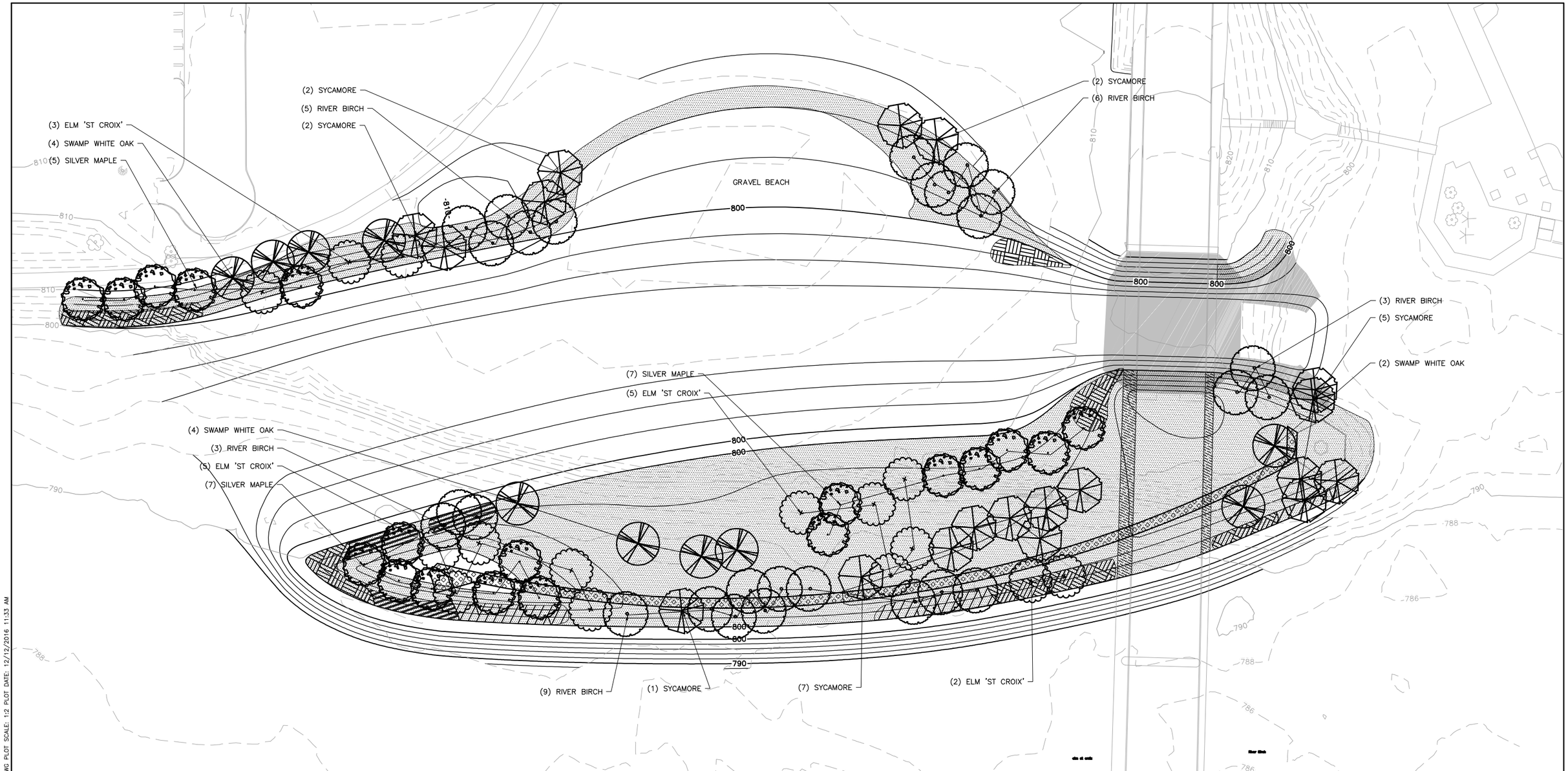
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

LANDSCAPE DETAILS – NORTH OVERLOOK
SCALE:VARIES

BARR PROJECT No. 23/27-1359.02
CLIENT PROJECT No.
DWG. No. L-03
REV. No. A

CADD USER: Mario Accordino FILE: Y:\MPR 501 HALLS ISLAND AND SCHERER SITE\3.0 DWGS\3.05 SHEET SETS\L-03.DWG PLOT SCALE: 1:2.5849 PLOT DATE: 12/9/2016 12:59 PM



LEGEND

- 800 — EXISTING 10' CONTOUR
- EXISTING 1' CONTOUR
- 800 — PROPOSED 10' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED SANDBAR WILLOW PLANTING
- PROPOSED RED TWIG DOGWOOD PLANTING
- PROPOSED BUTTON BUSH PLANTING
- PROPOSED BWSR SEED MIX 34–261, RIPARIAN SOUTH AND WEST
- PROPOSED VIRGINIA CREEPER VINE PLANTING
- BOARDWALK

1 PLAN: PLANTING PLAN OVERALL

0 40 80
SCALE IN FEET

Common Name	Scientific Name	Quant.	Spacing	Size
Trees				
Silver Maple	*Acer Saccharinum*	19	AS SHOWN	2" B&B
River Birch	*Betula nigra*	26	AS SHOWN	2" B&B
Sycamore	*Platanus occidentalis*	19	AS SHOWN	2" B&B
Swamp White Oak	*Quercus bicolor*	10	AS SHOWN	2" B&B
Elm St Croix	*Ulmus americana St. Croix*	15	AS SHOWN	2" B&B

Common Name	Scientific Name	Quant.	Spacing	Size
Shrubs				
Button Bush	*Cephalanthus occidentalis*	97	5' o.c.	#2 Pot
Red Twig Dogwood	*Cornus sericea*	133	5' o.c.	#2 Pot
Sandbar Willow	*Salix exigua*	266	5' o.c.	#2 Pot

PLANTING NOTES:
1. ALLOW COTTONWOODS TREES TO NATURALLY REGENERATE ON LOWEST AREAS.
2. PLUGS SHALL BE PLANTED IN A 10' BAND ALONG ALL SHORELINES EXCEPT WHERE SHRUBS ARE PLANTED.

60% DRAFT
ISSUED FOR REVIEW

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	AKH2	FJR	FJR	12/12/2016	60% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME _____
SIGNATURE _____
DATE _____ LICENSE # _____

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	12/12						
BID							
CONSTRUCTION							
DATE RELEASED							

TLS Landscape Architecture
BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	AKH2
Checked	FJR
Designed	FJR
Approved	FJR

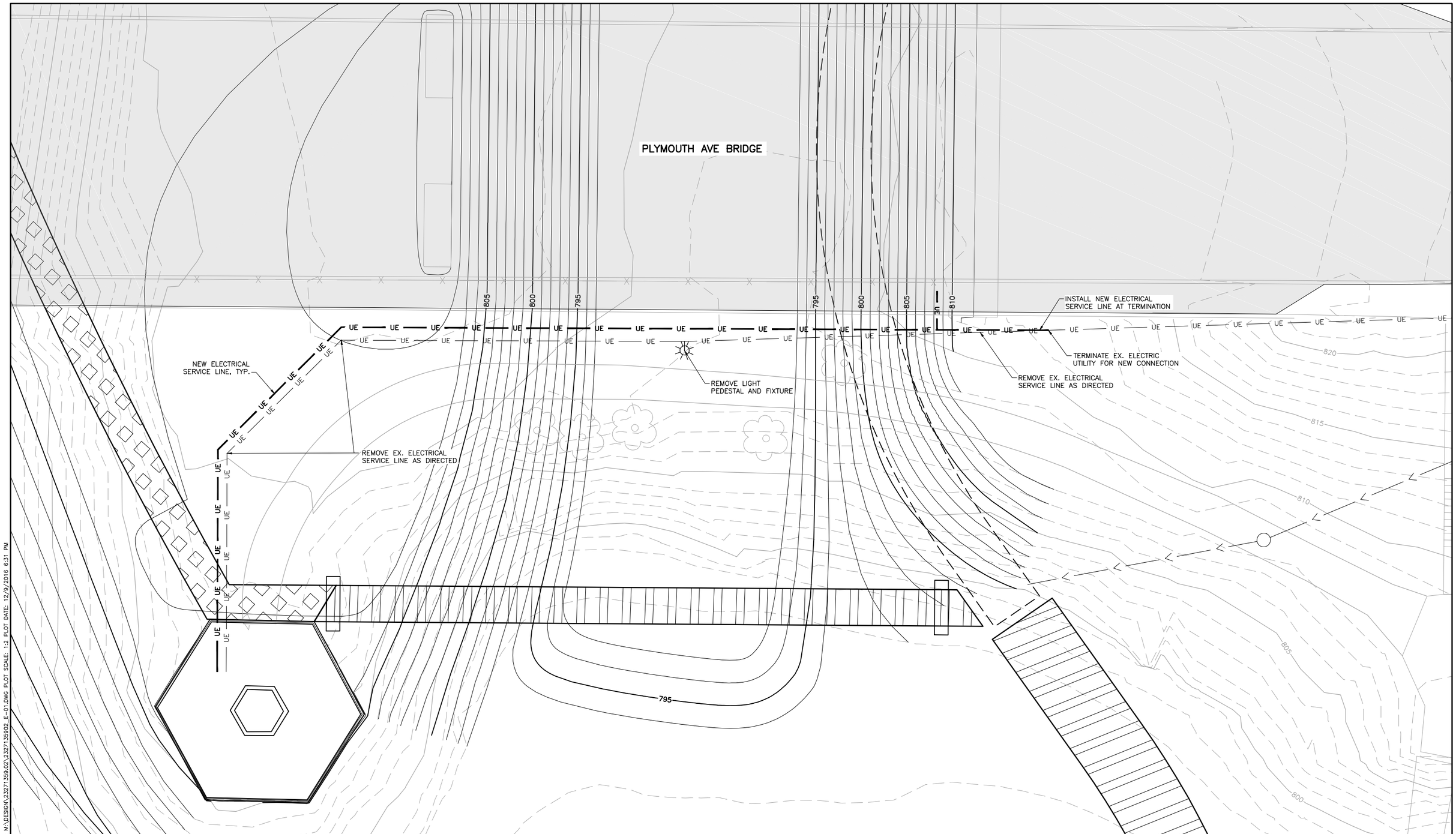
Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

PLANTING PLAN

BARR PROJECT No. 23/27–1359.02
CLIENT PROJECT No.
DWG. No. L–04
REV. No. A

CADD USER: Aimee Hackett FILE: M:\DESIGN\23271359.02\2327135902_L-01.DWG PLOT SCALE: 1:2 PLOT DATE: 12/12/2016 11:33 AM



1 PLAN: ELECTRIC SERVICE

0 10 20
SCALE IN FEET

60% DRAFT
ISSUED FOR REVIEW

CADD USER: Patrick E. Brockamp FILE: M:\DESIGN\23271359.02\2327135902_E-01.DWG PLOT SCALE: 1:2 PLOT DATE: 12/9/2016 6:31 PM

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	GGN	PEB	KAL	12/12/2016	60% DRAFT ISSUED FOR REVIEW

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME KURT A. LEUTHOLD

SIGNATURE

DATE LICENSE # 22225

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	12/12						
BID							
CONSTRUCTION							

DATE RELEASED

TLS Landscape Architecture

BARR

Scale	AS SHOWN
Date	12/12/2016
Drawn	GGN
Checked	MAK
Designed	PEB
Approved	KAL

Minneapolis Park & Recreation Board

HALL'S ISLAND RECONSTRUCTION & SCHERER SITE
MINNEAPOLIS, MN

ELECTRICAL PLAN

BARR PROJECT No. 23/27-1359.02

CLIENT PROJECT No.

DWG. No. E-01

REV. No. A

Appendix B

Mussel Survey Report

Final Report:
Unionid Survey for the Hall's Island Reconstruction/Restoration Project, Mississippi River Mile 855

Prepared for:

Barr Engineering
Minneapolis, MN

Prepared by:

Ecological Specialists, Inc.
O'Fallon, Missouri

November 2014

(ESI Project No. 14-026)

Acknowledgements

This project was funded by the Minneapolis Park and Recreation Board (MPRB) and coordinated by Barr Engineering Company (Barr). Ms. Jessica Butler coordinated the mussel survey component of the project for Barr. Emily Grossman of Ecological Specialists, Inc. (ESI) was the project manager, field team leader, and primary author of this report. Mr. Robert Williams, Mr. Nate Badgett, and Mr. Matt Schaefer (all of ESI) assisted with the fieldwork. Ms. Heidi Dunn and Mr. Ryan Foley (ESI) assisted with report preparation.

Table of Contents

1.0 Introduction....1
2.0 Methods....2
3.0 Results....3
3.1 LDB Survey Area....3
3.2 RDB Survey Area....3
4.0 Discussion....4
5.0 Literature Cited....6

List of Figures

Figure 1-1. Proposed plan for the Hall's Island reconstruction/rehabilitation project and associated mussel survey areas, Mississippi River mile 855....8
Figure 2-1. Division of LDB and RDB survey areas into sampling cells, September-October 2014....9
Figure 3-1. Depth in qualitative searches, September-October 2014....10
Figure 3-2. Substrate composition in qualitative searches, September-October 2014....11
Figure 3-3. Live unionids collected in qualitative searches, September-October 2014....12
Figure 4-1. Cumulative species curve, LDB survey area, August-September 2014....13
Figure 4-2. Cumulative species curve, RDB survey area, September-October 2014....14

List of Tables

Table 1-1. Unionid species reported from the Upper St. Anthony Falls Pool, Mississippi River....15
Table 3-1. Unionids collected in the vicinity of the Hall's Island reconstruction project, September-October 2014....16

Appendix A. GPS coordinates of qualitative searches, August 2014.
Appendix B. Representative photographs of unionid species collected at the Hall's Island reconstruction project, September-October 2014.

1.0 Introduction

Barr Engineering is assisting the Minneapolis Park and Recreation Board (MPRB) with reconstruction/rehabilitation of Hall's Island, located on the left descending bank (LDB) of the Mississippi River at river mile 855 (Figure 1-1). This site historically featured a small island separated from the LDB by a side channel. The side channel was filled in the 1960s, connecting the island to the bank. MPRB acquired the property in 2010, and now proposes re-excavating the side channel and depositing the material off the bank to recreate the island (see Figure 1-1). The LDB will be converted into a public park.

Unionids (freshwater mussels) are known to occur in the Upper St. Anthony Falls Pool of the Mississippi River. A total of 18 species have been reported from this pool, including the Minnesota threatened species *Truncilla donaciformis* and species of special concern *Pleurobema sintoxia* and *Ligumia recta* (Table 1-1). Kelner and Davis (2002) surveyed a site on the right descending bank (RDB) at mile 855.2 (within the RDB survey area in the present study). Six species were collected live at this site, all of which are considered "common" or "abundant" in the Upper St. Anthony Falls Pool. Two additional species were collected as dead shells, including *L. recta* (see Table 1-1).

Reconstruction of Hall's Island may affect resident unionids in several ways. Excavation of the side channel should not directly affect unionids, as this portion of the project area has been above water for many years. Direct impacts to unionids may result from placement of fill material to reconstruct the island, as unionids may be buried or crushed beneath the fill material. Placement of fill may also increase turbidity and sedimentation downstream, which may inhibit unionid respiration. Finally, unionids may be affected by changes in local hydraulics caused by reconstruction of the island. Hydraulic changes may extend upstream, downstream, or across the river from the island site. Hydraulic modeling will occur prior to construction to aid in minimizing project impacts and to explore opportunities to create mussel habitat as part of the project.

Due to the potential impacts of island reconstruction on resident unionids, a Level I mussel survey was conducted along the LDB at the island site. Unionids were known to occur on the RDB across from the island as well. Therefore, the RDB was included in this survey for 2 reasons: to document unionid communities near the island project to aid in mussel habitat creation efforts, and because hydraulic changes (to be determined by modeling) could potentially extend to this bank. The objective of the mussel survey was to determine unionid distribution and species composition in areas that may be directly and/or indirectly affected by reconstructing the island.

2.0 Methods

Methods for the Level I mussel survey were developed following the Minnesota Freshwater Mussel Survey and Relocation Protocol (MN survey protocol; MNDNR & USFWS, 2013). The LDB survey area extended from the Boom Island Park boat launch to approximately 400 m upstream of the Plymouth Avenue bridge, and covered an area of approximately 47,600 m^2 (11.8 acres). The RDB survey area extended from approximately 50 m upstream of the Plymouth Avenue bridge to 400 m upstream, and covered an area of 36,000 m^2 (8.9 acres; Figure 2-1). The MN survey protocol calls for at least 20 minutes of qualitative search time per 2000 m^2 of impact area. Thus, the LDB survey area was divided into 24 2000-m^2 cells, and the RDB survey area was divided into 18 cells (see Figure 2-1). Each cell was qualitatively searched for unionids for 20 minutes. Qualitative searches entailed a diver searching the substrate visually and tactually, collecting all unionids and shells encountered. The 20-min search period was divided into 5-min intervals to enable better coverage of the area and to facilitate development of a cumulative species curve. The starting point of each search was recorded with a Trimble Nomad GPS unit (Appendix A). Depth and substrate composition were also recorded at the start of each search.

All unionids encountered in qualitative searches were identified to species and counted. State-listed species were also measured (length in mm) and aged (external annuli count). At least one individual of each species collected was photographed (Appendix B). Dead shells were identified and categorized as either fresh (FD; nacre shiny, hinge line flexible, periostracum in similar condition as live unionids, likely died within the past few months), weathered (WD; nacre chalky, hinge line brittle, valves may or may not be attached, likely died months to years ago), or subfossil (SF; single valves, generally no or discolored periostracum, shells very chalky, likely dead decades to centuries). At least one shell of each species encountered (if available) was retained as a voucher. After consulting with MNDNR, all unionids collected in the LDB survey area were relocated to the opposite bank immediately upstream of the RDB survey area. Unionids collected in the RDB survey area were returned to the river near their original collection locations, as no direct impacts will occur on this bank.

Fieldwork for the Level I survey was conducted on September 30 – October 2, 2014. Results of the Level I survey were discussed with the Minnesota Department of Natural Resources (MNDNR) to determine if a Level II survey was necessary. Based on the results of the Level I survey, MNDNR determined that a Level II survey was not necessary at this site.

.

3.0 Results

3.1 LDB Survey Area

Habitat characteristics were variable throughout the survey area. Along the 3 upstream-most cells, the bank was more naturally sloping and vegetated. The bank was steep and lined with rip-rap throughout the rest of the area. Depth ranged from 1.2 m (4 ft) near the bank to 4.0 m (13 ft) in the upstream riverward cell (Figure 3-1). Cobble, gravel, and sand were the dominant substrate constituents in most of the shoreward cells (Figure 3-2). Cell 12, located in the mouth of the Boom Island Park boat launch, contained only silt and detritus, while substrate in the riverward cells was almost exclusively loose sand (see Figure 3-2).

A total of 79 live unionids of 11 species were collected in the LDB survey area (Table 3-1). *Quadrula quadrula* was by far the most abundant species, comprising nearly 50% of the total catch. *Fusconaia flava* (10.1%) was also common; the remaining 9 species each comprised <10% of the total. One Minnesota threatened *Quadrula nodulata* was collected near the riverward edge of the area (Figure 3-3). This individual was an adult approximately 7 years old. One additional species, *L. recta,* was collected as a fresh dead shell (see Table 3-1).

Unionids were scattered throughout the area, but were somewhat more abundant in the shoreward cells. Abundance was highest (31 unionids) in Cell 10 beneath the Plymouth Avenue bridge, though unionids were present in 17 of the 24 sampling cells (see Figure 3-3). Catch per unit effort (CPUE) averaged over the whole survey area was only 0.16 mussels/minute (9.9 mussels/hour; see Table 3-1).

3.2 RDB Survey Area

Habitat in the RDB survey area was fairly similar to the LDB survey area. The bank was gradually sloping above the waterline, but depth increased rapidly in the river itself, ranging from 2.4 m (8 ft) near the bank to 4.9 m (16 ft) riverward (see Figure 3-1). Substrate in the shoreward cells was a mixture of boulder, cobble, gravel, and sand in varying proportions. Substrate in the riverward cells was almost entirely loose sand, except for a small patch of more heterogeneous substrate in Cell 15 (see Figure 3-2).

A total of 113 unionids of 10 species were collected in the RDB survey area (see Table 3-1). *Quadrula quadrula* was again the most abundant species at 55.8% of the total catch. *Obliquaria reflexa* (17.7%) was also common. The remaining 8 species each comprised <10% of the total. One *Q. nodulata* was collected in Cell 10, at the downstream end of the area (see Figure 3-3). This individual was a juvenile approximately 4 years old. Two additional species were collected as dead shells (see Table 3-1).

Unionids were present in 15 of the 18 survey cells, but were much more abundant in the shoreward cells than in the riverward cells (see Figure 3-3). CPUE was nearly twice that in the LDB survey area at 0.31 mussels/minute (18.8 mussels/hour; see Table 3-1).

4.0 Discussion

Unionids were present in low abundance in both the LDB and RDB survey areas. A total of 192 unionids of 12 species were collected from both areas combined. Unionid abundance appeared to correlate with substrate composition. In both areas, unionids were generally more abundant near the banks, where substrate was a more heterogeneous mix of cobble, gravel, and sand. Few unionids were collected in the riverward cells, where substrate was primarily loose, shifting sand. This substrate type is likely too unstable to allow unionids to maintain their position on the river bottom, thus precluding unionid colonization.

Species composition was fairly similar in the LDB and RDB survey areas. Two species, *Pyganodon grandis* and *Lampsilis cardium,* were collected only in the LDB survey area, and 1 species (*Lasmigona complanata*) was collected only in the RDB survey area. All other species were collected in both areas. Both areas were dominated by *Q. quadrula,* and relative abundance of most other species was similar. The cumulative species curve for the LDB survey area suggests that there may be a few more species in this area that were not collected in the survey, as new species were still being collected in the last few samples (Figure 4-1). In contrast, the cumulative species curve for the RDB survey area suggests that most of the species in this area were collected, as only 1 new species was collected in the last 20 5-min searches (Figure 4-2). Although overall abundance and CPUE were lower on the LDB, this area may have higher species richness.

Two Minnesota-threatened *Q. nodulata* were collected in the survey: 1 adult in the LDB survey area, and 1 juvenile in the RDB survey area. Both individuals were collected from riverward cells in loose sand substrate, rather than near the bank where unionids were more abundant. This species had not been previously reported from the Upper or Lower St. Anthony Falls Pools, but is known to occur in Pool 1 (Kelner, 2011). Recent survey results suggest that the range of this species is expanding in the upper Mississippi River and tributaries such as the St. Croix River (Hove et al., 2014; M. Davis, MNDNR, pers. comm).

Kelner and Davis (2002) surveyed a site at river mile 855.2, which falls within the RDB survey area in the present survey. Species richness was appreciably higher in the present study; Kelner and Davis collected only 6 live species, compared to 10 species in the RDB survey area and 11 species in the LDB survey area. CPUE in the previous study (10.5 mussels/hour) was comparable to CPUE in the LDB survey area in the present study (9.9 mussels/hour).

Reconstruction of Hall's Island may provide opportunities to create mussel habitat as part of the project. Numerous studies have been conducted that examine habitat characteristics with respect to unionid presence/absence or abundance (ESI, 2014). In general, unionids appear to be constrained to flow refugia, stable areas of a river that maintain some current velocity during low flow, but are protected from high current velocity during high discharge (Strayer et al., 2004; Gagnon et al., 2006; Strayer, 2008; Haag, 2012). This led to studies examining the relationship of unionid presence and abundance to complex hydraulic variables, such as shear stress and Reynolds number (Hardison and Layzer, 2001; Howard and Cuffey, 2003; Peck, 2005; Morales et al., 2006a and 2006b; Gangloff and Feminella, 2007; Rahm, 2008;

Steuer et al., 2008; Zigler et al., 2008; Randklev et al., 2009; Allen and Vaughn, 2010). A combination of these hydraulic variables and other physical variables, such as depth, substrate, and current velocity, appear to be most useful in predicting mussel distribution. However, the values of these parameters that correlate with unionid presence or higher abundance vary among rivers and within different river reaches. Thus, there is not a common combination of values that defines unionid presence/absence in a given river reach. The most suitable approach for creating habitat at Hall's Island may therefore be to find other nearby sites that support healthy unionid communities, measure hydraulic and physical variables at these sites, and attempt to reproduce these measurements at the island site.

Unionids were present in both the LDB and RDB survey areas. Among these were 2 Minnesota threatened *Q. nodulata,* a species which had not previously been reported from the Upper St. Anthony Falls Pool. However, overall unionid abundance was relatively low, and CPUE was less than 1 mussel/minute in both survey areas. All unionids collected in the LDB survey area, where direct impacts will occur, were relocated to the opposite bank. Some unionids may remain within the direct impact area, but are likely scarce. Therefore, few unionids are likely to be directly affected by the island reconstruction project. Measures to minimize sedimentation and turbidity, if possible, may help reduce indirect impacts to nearby unionids. Opportunities to create mussel habitat will also be considered in the construction process to add to the value of the reconstructed island as wildlife habitat.

5.0 Literature Cited

Allen, D. C., and C. C. Vaughn. 2010. Complex hydraulic and substrate variables limit freshwater mussel species richness and abundance. JNABS 29:383-394.

Ecological Specialists, Inc. (ESI). 2014. Final report: unionid mussel habitat construction/creation summary. Prepared for U.S. Army Corps of Engineers, St. Louis District. 64pp + appendices.

Gagnon, P., Michener, W., Freeman, M., and J. Brim Box. 2006. Unionid habitat and assemblage composition in Coastal Plain tributaries of Flint River (Georgia). Southeastern Naturalist 5:31-52.

Gangloff, M. M., and J. W. Feminella. 2007. Stream channel geomorphology influences mussel abundance in southern Appalachian streams, U.S.A. Freshwater Biology 52:64-74.

Haag, W. R. 2012. North American Freshwater Mussels. Natural History, Ecology, and Conservation. Cambridge University Press. New York, New York. 505pp.

Hardison, B. S., and J. B. Layzer. 2001. Relations between complex hydraulics and the localized distribution of mussels in three regulated rivers. Regulated Rivers: Research & Management 17:77-84.

Hove, M., Kelner, D., McFarlane, A., Davis, M., Sietman, B., Edgcumbe, A., Londo, A., Luebke, C., Marr, S., Schroeder, L., Secrist, Z., Eckert, N., Buening, J., Smith, T., Delphey, P., Karns, B., Blann, K., Heath, D., and L. Kitchel. 2014. St. Croix River *Quadrula nodulata.* Ellipsaria 16:25-26.

Howard, J. K., and K. M. Cuffey. 2003. Freshwater mussels in a California North Coast Range river: occurrence, distribution, and controls. JNABS 22:63-77.

Kelner, D. 2011. Upper Mississippi River mussel species accounts. U.S. Army Corps of Engineers, St. Paul District. 19pp.

Kelner, D., and M. Davis. 2002. Final report: mussel (Bivalvia: Unionidae) survey of the Mississippi National River and Recreation Area Corridor, 2000-01. Prepared for the National Park Service, Mississippi National River and Recreation Area, and The Great Lakes Network Inventory and Monitoring Program. 44pp + appendices.

Minnesota Department of Natural Resources (MNDNR). 2013. Minnesota's list of endangered, threatened, and special concern species. http://files.dnr.state.mn.us/natural_resources/ets/endlist.pdf.

Minnesota Department of Natural Resources (MNDNR) and U.S. Fish & Wildlife Service (USFWS). 2013. Minnesota freshwater mussel survey and relocation protocol. 6pp.

Morales, Y., Weber, L. J., Mynett, A. E., and T. J. Newton. 2006a. Mussel dynamics model: a hydroinformatics tool for analyzing the effects of different stressors on the dynamics of freshwater mussel communities. Ecological Modelling 197:448-460.

Morales, Y., Weber, L .J., Mynett, A. E., and T. J. Newton. 2006b. Effects of substrate and hydrodynamic conditions on the formation of mussel beds in a large river. JNABS 25:664-676.

Peck, A. J. 2005. A reach scale comparison of fluvial geomorphological conditions between current and historic freshwater mussel beds in the White River, Arkansas. M.S. Thesis – Arkansas State University.

Rahm, E. J. 2008. Spatial distribution and microhabitat of adult and juvenile mussels (Bivalvia: Unionidae) within a bed. M.S. Thesis, Tennessee Technological University.

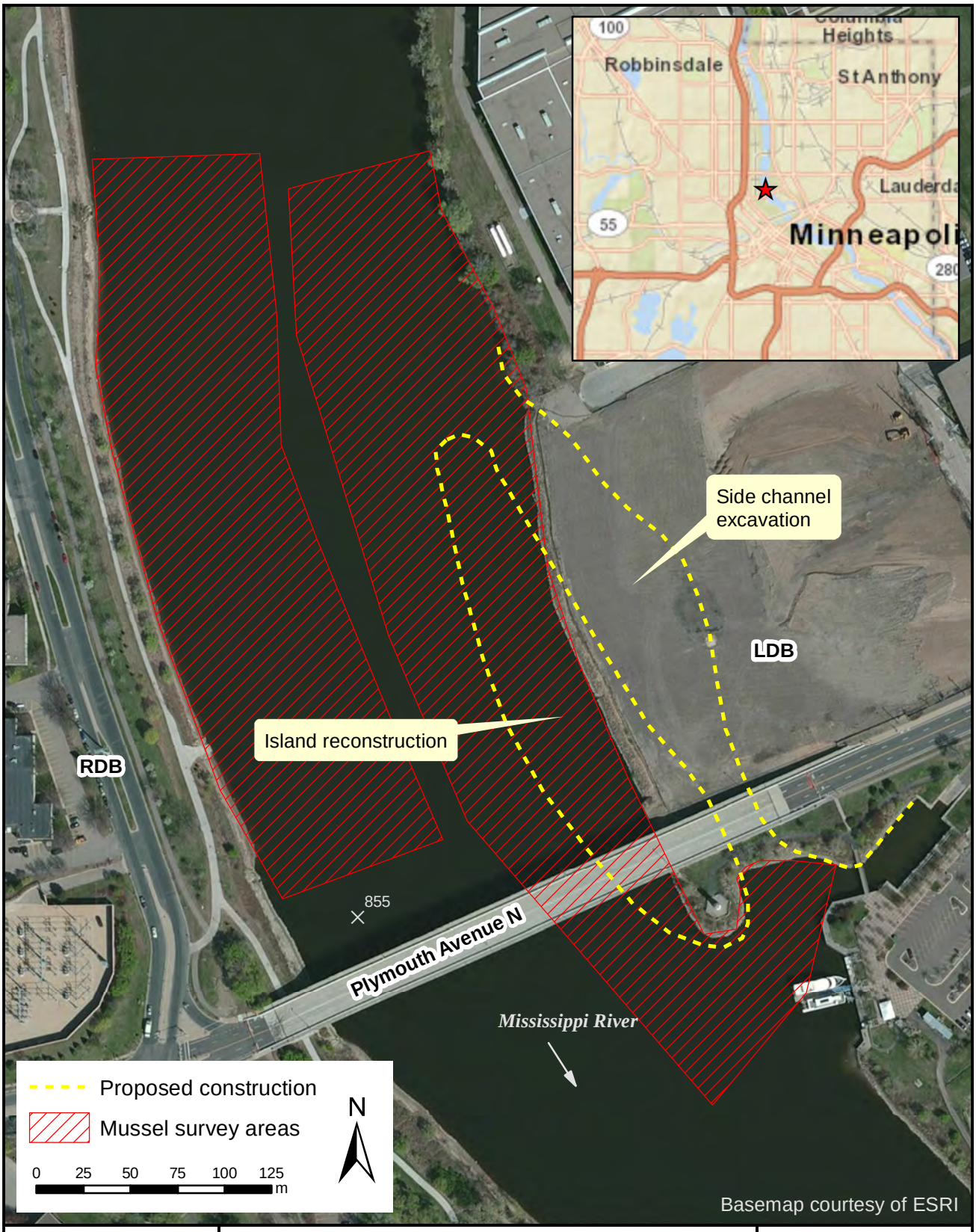
Randklev, C. R., Kennedy, J. H., and B. Lundeen. 2009. Distributional survey and habitat utilization of freshwater mussels (Family Unionidae) in the Lower Brazos and Sabine River basins. Prepared for the Texas Water Development Board.

Steuer, J. J., Newton, T. J., and S. J. Zigler. 2008. Use of complex hydraulic variables to predict the distribution and density of unionids in a side channel of the Upper Mississippi River. Hydrobiologia 610:67-82.

Strayer, D. L. 2008. Freshwater mussel ecology, a multifactor approach to distribution and abundance. University of California Press. 204pp.

Strayer, D. L., Downing, J. A., Haag, W. R., King, T. L., Layzer, J. B., Newton, T. J., and S. J. Nichols. 2004. Changing perspectives on pearly mussels, North America's most imperiled animals. BioScience 54:429-439.

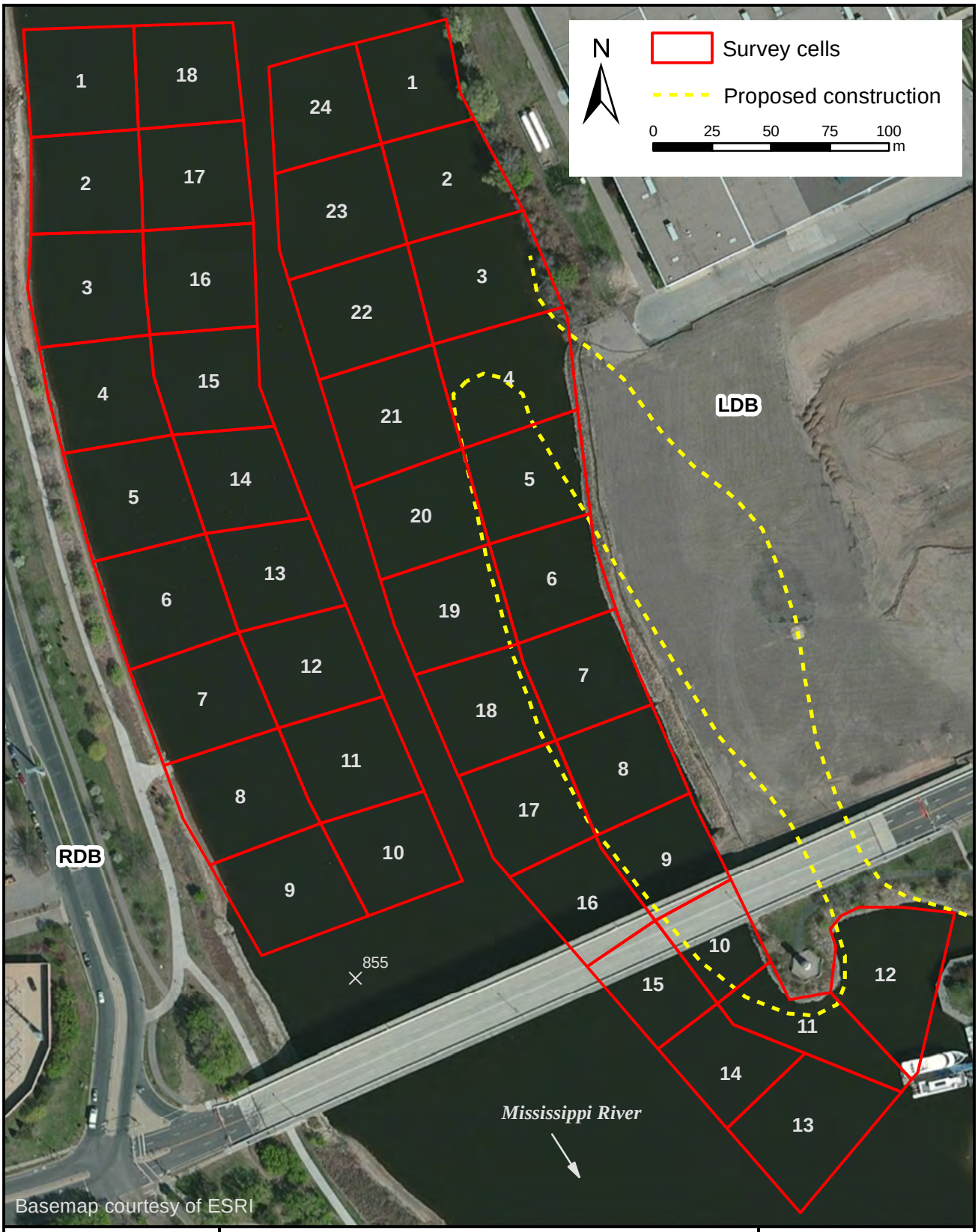
Zigler, S. J., Newton, T. J., Steuer, J. J., Bartsch, M. R., and J. S. Sauer. 2008. Importance of physical and hydraulic characteristics to unionid mussels: a retrospective analysis in a reach of large river. Hydrobiologia 598:343-360.



ECOLOGICAL SPECIALISTS, INC.

Figure 1-1. Proposed plan for the Hall's Island reconstruction/rehabilitation project and associated mussel survey areas, Mississippi River mile 855.

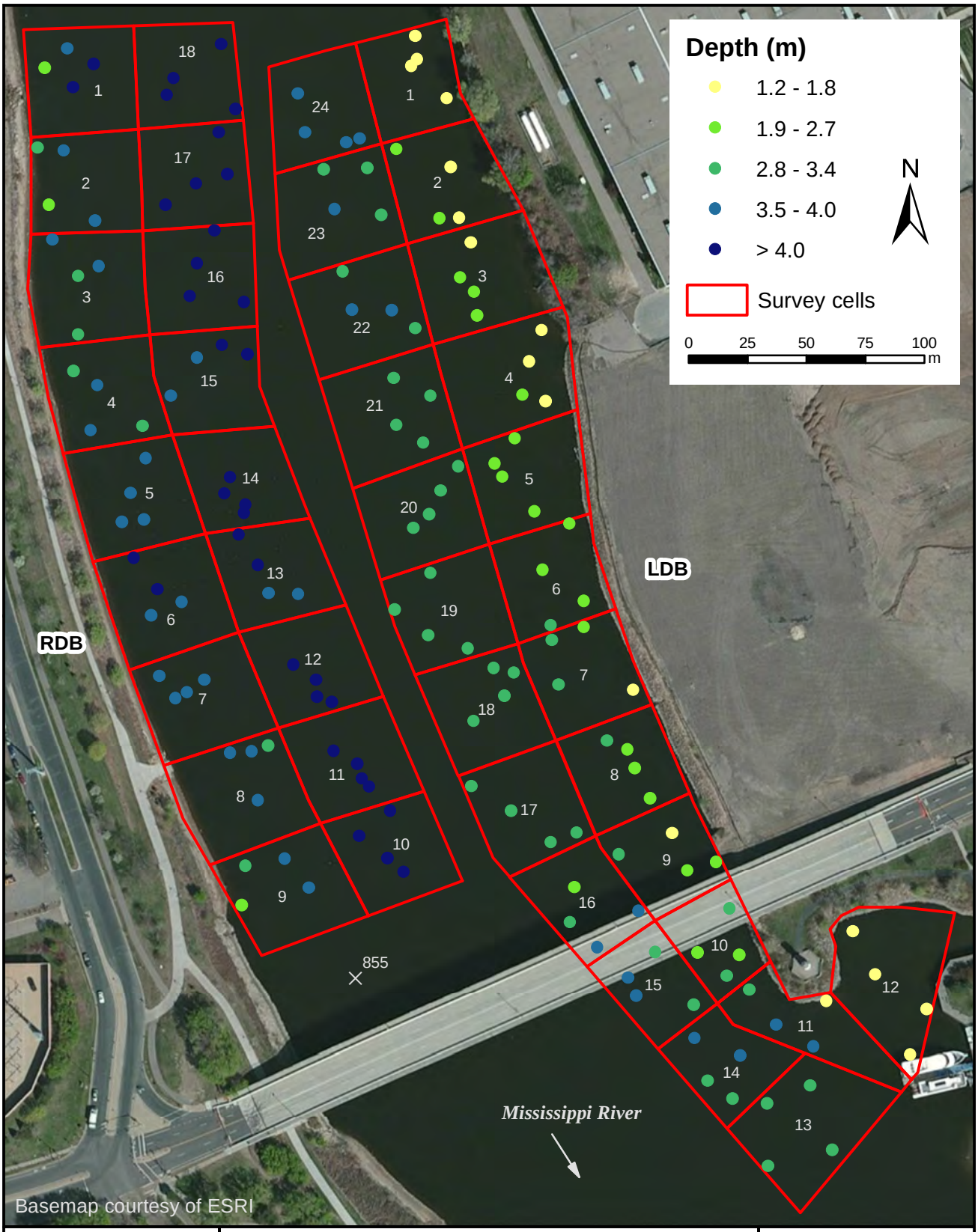
ESI



ECOLOGICAL SPECIALISTS, INC.

Figure 2-1. Division of LDB and RDB survey areas into sampling cells, September-October 2014.

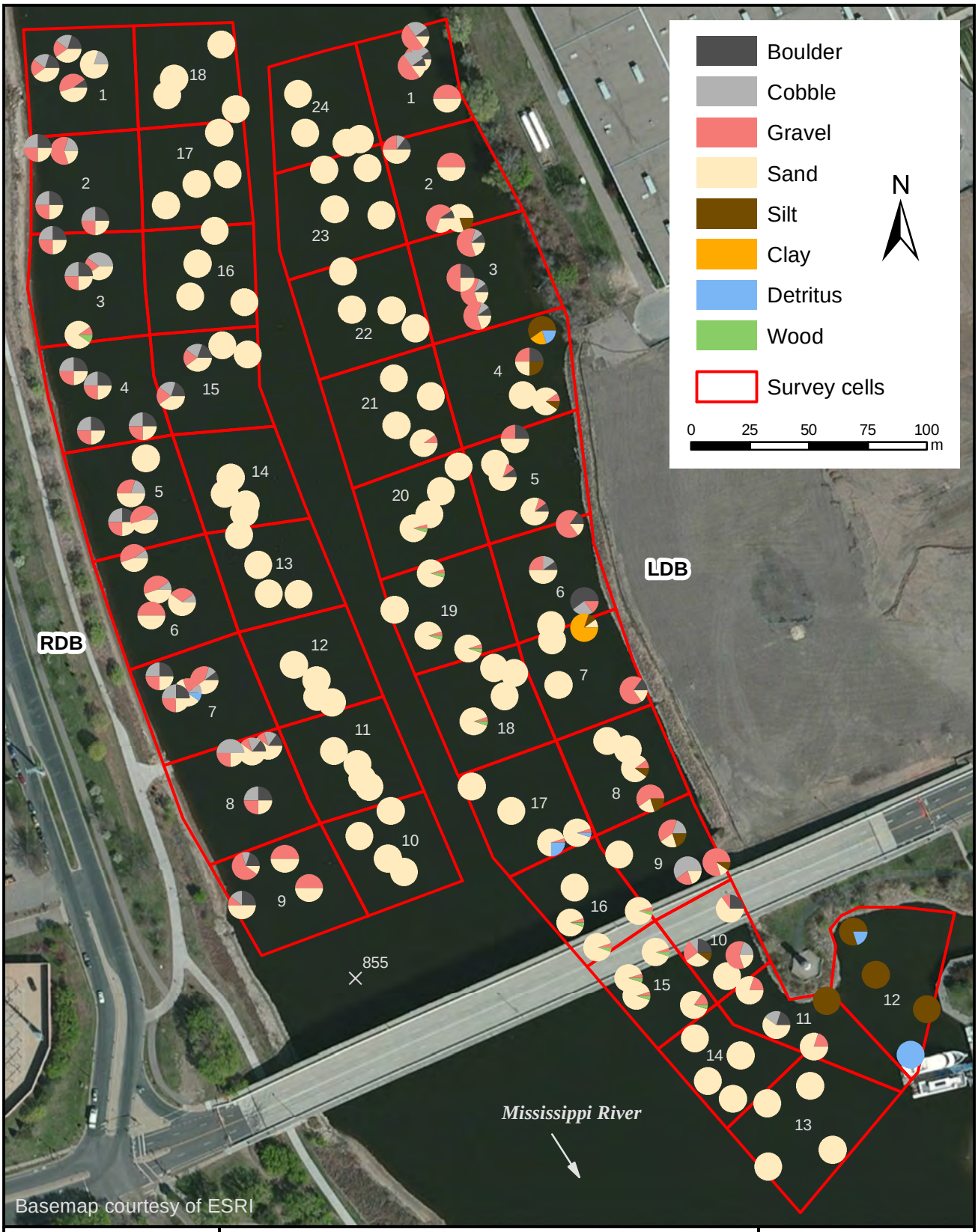
ESI



ECOLOGICAL SPECIALISTS, INC.

Figure 3-1. Depth in qualitative searches, September-October 2014.

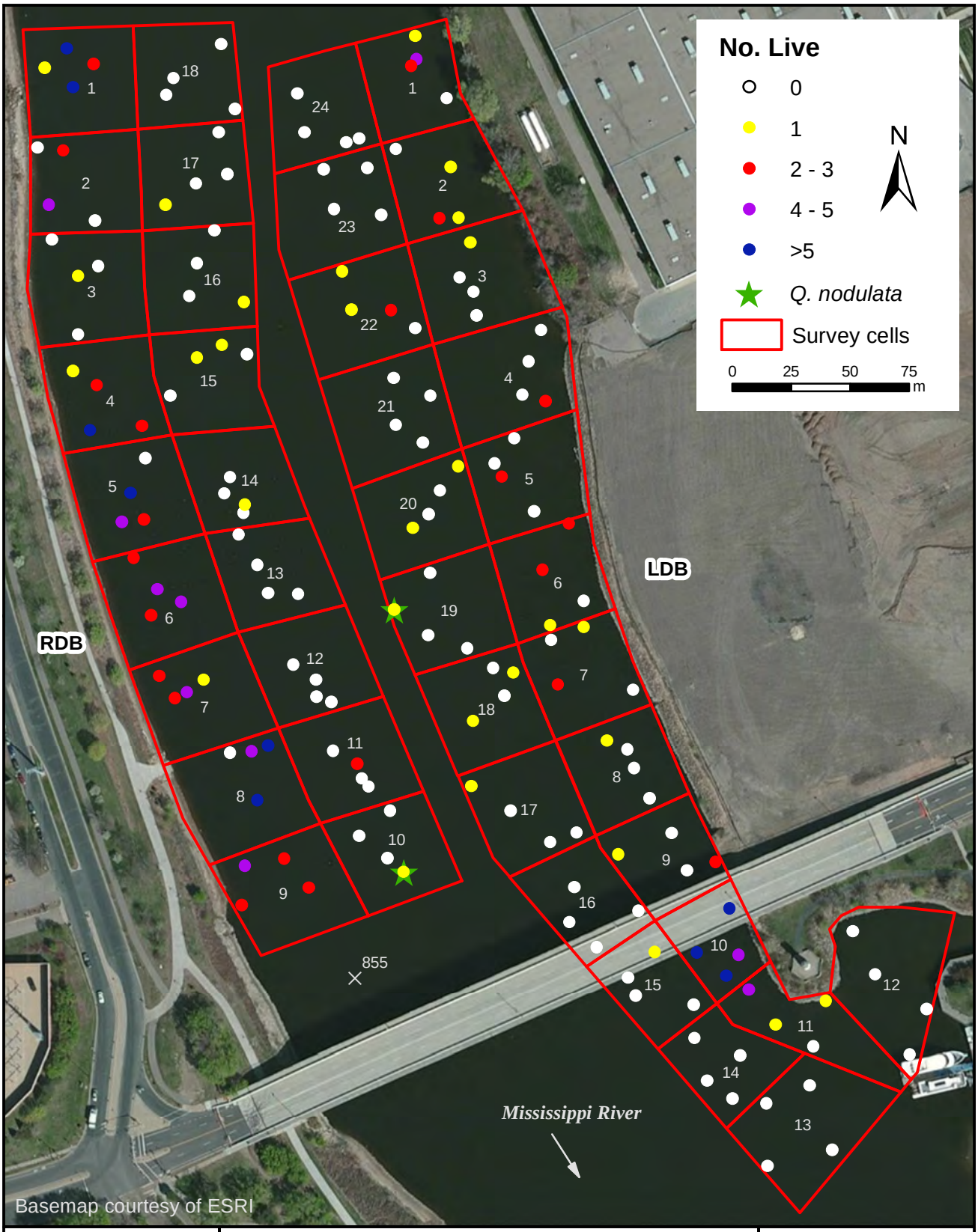
ESI



ECOLOGICAL SPECIALISTS, INC.

Figure 3-2. Substrate composition in qualitative searches, September-October 2014.

ESI



ECOLOGICAL SPECIALISTS, INC.

Figure 3-3. Live unionids collected in qualitative searches, September-October 2014.

ESI

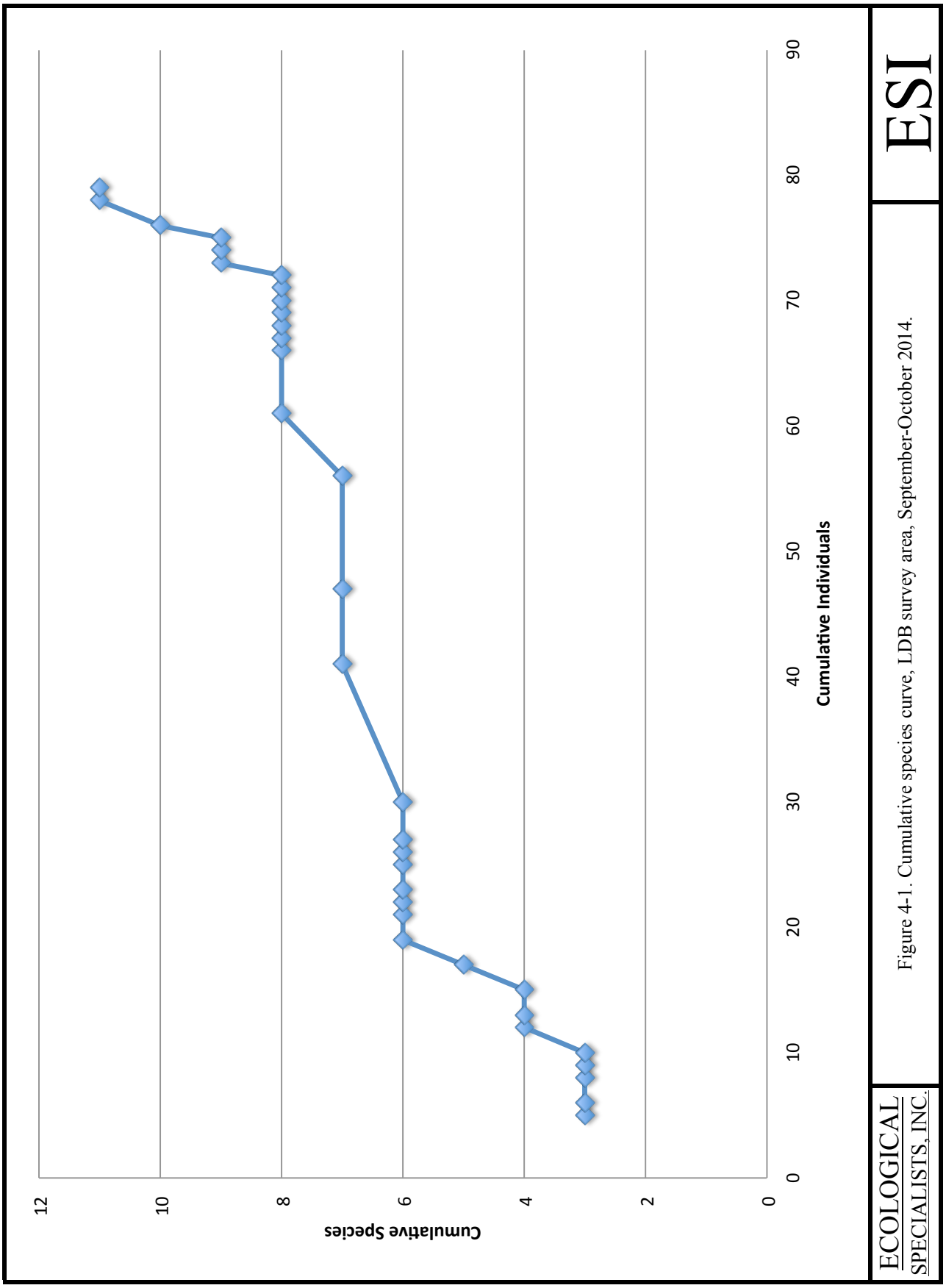


Figure 4-1. Cumulative species curve, LDB survey area, September-October 2014.

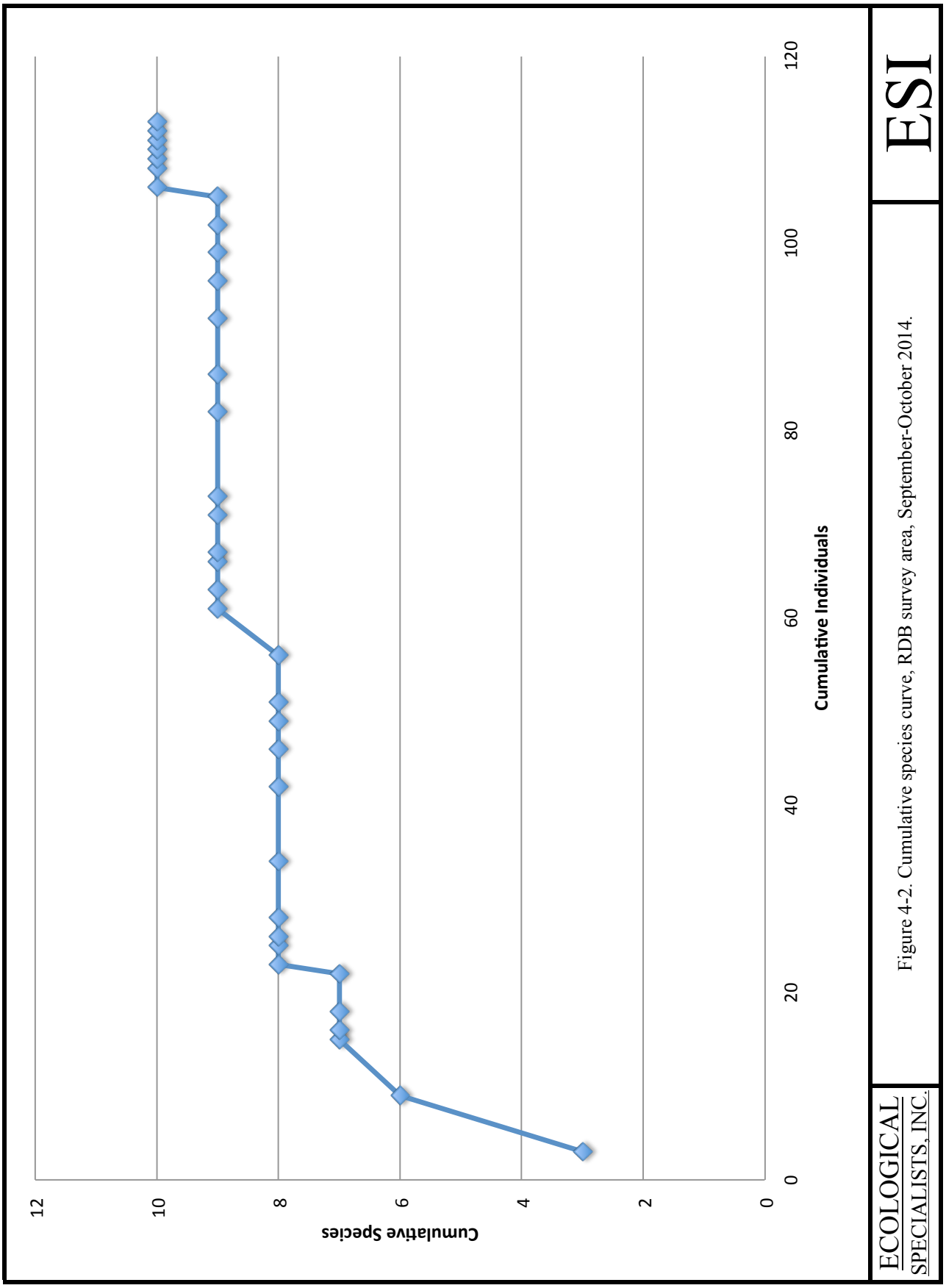


Figure 4-2. Cumulative species curve, RDB survey area, September-October 2014.

Table 1-1. Unionid species reported from the Upper St. Anthony Falls Pool, Mississippi River.

Species	MN Status [1]	Upper SAF Pool [2]	RM 855.2 (RDB) [3]
Amblemini			
Amblema plicata		C	-
Pleurobemini			
Fusconaia flava		A	-
Pleurobema sintoxia	SC	R	-
Quadrulini			
Quadrula quadrula		A	Live
Anodontini			
Lasmigona complanata		R	-
Pyganodon grandis		C	Live
Strophitus undulatus		A	-
Utterbackia imbecillis		R	-
Lampsilini			
Lampsilis cardium		A	Dead
Lampsilis siliquoidea		C	-
Leptodea fragilis		A	Live
Ligumia recta	SC	C	Dead
Obliquaria reflexa		A	Live
Potamilus alatus		A	Live
Potamilus ohiensis		R	-
Toxolasma parvus		R	-
Truncilla donaciformis	T	R	-
Truncilla truncata		A	Live
Live species		18	6
Historic		0	2
Total species		18	8

[1] Minnesota listing status; T = threatened, SC = special concern; MNDNR (2013)
[2] R = Rare, does not usually appear in sample collections, populations are small either naturally or have declined and may or may not be near extirpation; C = Commonly taken in most samples, can make up a large portion of some samples; A = Abundantly taken in most samples. Kelner (2011).
[3] Kelner and Davis (2002)

Table 3-1. Unionids collected in the vicinity of the Hall's Island reconstruction project, September-October 2014.

	LDB			RDB		
Species	No. Live	Relative Abundance (%)	Dead Shells [1]	No. Live	Relative Abundance (%)	Dead Shells [1]
Amblemini						
Amblema plicata	4	5.1	-	4	3.5	1 WD
Pleurobemini						
Fusconaia flava	8	10.1	3 FD	11	9.7	1 WD
Quadrulini						
Quadrula nodulata	1	1.3	1 WD	1	0.9	-
Quadrula quadrula	38	48.1	2 FD, 5 WD	63	55.8	10 WD
Anodontini						
Lasmigona complanata	-	-	-	2	1.8	-
Pyganodon grandis	7	8.9	2 FD, 2 WD	-	-	-
Strophitus undulatus	5	6.3	1 FD, 8 WD	7	6.2	-
Lampsilini						
Lampsilis cardium	1	1.3	2 FD, 5 WD	-	-	2 WD
Lampsilis siliquoidea	-	-	-	-	-	1 WD
Leptodea fragilis	3	3.8	1 FD, 8 WD	1	0.9	3 WD
Ligumia recta	-	-	1 FD	-	-	-
Obliquaria reflexa	5	6.3	3 WD	20	17.7	-
Potamilus alatus	5	6.3	2 FD, 4 WD	1	0.9	5 FD, 9 WD
Truncilla truncata	2	2.5	1 FD, 4 WD	3	2.7	1 WD
Total	79	100.0	55	113	100.0	33
Live species	11			10		
Total species	12			12		
Search time (min.)	480			360		
Avg. mussels/min.	0.16			0.31		

[1] FD = fresh dead shell, WD = weathered dead shell

Appendix A

GPS coordinates of qualitative searches, September-October 2014

Appendix A. GPS coordinates of qualitative searches, September-October 2014.

Survey Area	Cell	Replicate	Latitude	Longitude
LDB	1	1	44.99656	-93.27385
LDB	1	2	44.99665	-93.27386
LDB	1	3	44.99654	-93.27388
LDB	1	4	44.99641	-93.27369
LDB	2	1	44.99622	-93.27396
LDB	2	2	44.99615	-93.27367
LDB	2	3	44.99596	-93.27362
LDB	2	4	44.99596	-93.27372
LDB	3	1	44.99586	-93.27356
LDB	3	2	44.99568	-93.27354
LDB	3	3	44.99559	-93.27352
LDB	3	4	44.99573	-93.27361
LDB	4	1	44.99553	-93.27318
LDB	4	2	44.99541	-93.27324
LDB	4	3	44.99528	-93.27328
LDB	4	4	44.99526	-93.27315
LDB	5	1	44.99502	-93.27342
LDB	5	2	44.99512	-93.27332
LDB	5	3	44.99497	-93.27338
LDB	5	4	44.99484	-93.27321
LDB	6	1	44.99479	-93.27302
LDB	6	2	44.99462	-93.27316
LDB	6	3	44.99450	-93.27294
LDB	6	4	44.99440	-93.27312
LDB	7	1	44.99435	-93.27312
LDB	7	2	44.99440	-93.27294
LDB	7	3	44.99418	-93.27308
LDB	7	4	44.99416	-93.27268
LDB	8	1	44.99396	-93.27282
LDB	8	2	44.99393	-93.27271
LDB	8	3	44.99386	-93.27267
LDB	8	4	44.99374	-93.27258
LDB	9	1	44.99353	-93.27275
LDB	9	2	44.99350	-93.27223
LDB	9	3	44.99347	-93.27238
LDB	9	4	44.99361	-93.27246
LDB	10	1	44.99332	-93.27215
LDB	10	2	44.99316	-93.27233
LDB	10	3	44.99307	-93.27217
LDB	10	4	44.99315	-93.27210
LDB	11	1	44.99301	-93.27205
LDB	11	2	44.99288	-93.27190
LDB	11	3	44.99280	-93.27170
LDB	11	4	44.99297	-93.27163
LDB	12	1	44.99324	-93.27149
LDB	12	2	44.99307	-93.27137
LDB	12	3	44.99294	-93.27109
LDB	12	4	44.99277	-93.27118

All coordinates are in NAD83 datum.

Appendix A. GPS coordinates of qualitative searches, September-October 2014.

Survey Area	Cell	Replicate	Latitude	Longitude
LDB	13	1	44.99241	-93.27160
LDB	13	2	44.99265	-93.27172
LDB	13	3	44.99258	-93.27195
LDB	13	4	44.99234	-93.27194
LDB	14	1	44.99260	-93.27213
LDB	14	2	44.99276	-93.27209
LDB	14	3	44.99283	-93.27234
LDB	14	4	44.99267	-93.27227
LDB	15	1	44.99316	-93.27255
LDB	15	2	44.99306	-93.27270
LDB	15	3	44.99299	-93.27266
LDB	15	4	44.99296	-93.27234
LDB	16	1	44.99340	-93.27299
LDB	16	2	44.99327	-93.27301
LDB	16	3	44.99318	-93.27287
LDB	16	4	44.99331	-93.27264
LDB	17	1	44.99379	-93.27354
LDB	17	2	44.99370	-93.27333
LDB	17	3	44.99357	-93.27312
LDB	17	4	44.99361	-93.27298
LDB	18	1	44.99424	-93.27343
LDB	18	2	44.99422	-93.27332
LDB	18	3	44.99413	-93.27337
LDB	18	4	44.99404	-93.27353
LDB	19	1	44.99460	-93.27377
LDB	19	2	44.99446	-93.27396
LDB	19	3	44.99436	-93.27378
LDB	19	4	44.99431	-93.27357
LDB	20	1	44.99501	-93.27362
LDB	20	2	44.99492	-93.27372
LDB	20	3	44.99483	-93.27378
LDB	20	4	44.99477	-93.27386
LDB	21	1	44.99535	-93.27397
LDB	21	2	44.99528	-93.27377
LDB	21	3	44.99517	-93.27396
LDB	21	4	44.99510	-93.27381
LDB	22	1	44.99575	-93.27425
LDB	22	2	44.99560	-93.27398
LDB	22	3	44.99561	-93.27420
LDB	22	4	44.99554	-93.27385
LDB	23	1	44.99614	-93.27435
LDB	23	2	44.99615	-93.27412
LDB	23	3	44.99599	-93.27429
LDB	23	4	44.99597	-93.27404
LDB	24	1	44.99643	-93.27449
LDB	24	2	44.99624	-93.27423
LDB	24	3	44.99628	-93.27445
LDB	24	4	44.99626	-93.27416

All coordinates are in NAD83 datum.

Appendix A. GPS coordinates of qualitative searches, September-October 2014.

Survey Area	Cell	Replicate	Latitude	Longitude
RDB	1	1	44.99654	-93.27559
RDB	1	2	44.99645	-93.27570
RDB	1	3	44.99660	-93.27573
RDB	1	4	44.99653	-93.27585
RDB	2	1	44.99621	-93.27575
RDB	2	2	44.99622	-93.27589
RDB	2	3	44.99594	-93.27558
RDB	2	4	44.99600	-93.27583
RDB	3	1	44.99577	-93.27556
RDB	3	2	44.99587	-93.27581
RDB	3	3	44.99573	-93.27567
RDB	3	4	44.99551	-93.27567
RDB	4	1	44.99516	-93.27532
RDB	4	2	44.99537	-93.27569
RDB	4	3	44.99531	-93.27556
RDB	4	4	44.99514	-93.27560
RDB	5	1	44.99504	-93.27530
RDB	5	2	44.99490	-93.27538
RDB	5	3	44.99479	-93.27543
RDB	5	4	44.99480	-93.27531
RDB	6	1	44.99466	-93.27536
RDB	6	2	44.99454	-93.27524
RDB	6	3	44.99449	-93.27511
RDB	6	4	44.99444	-93.27527
RDB	7	1	44.99420	-93.27523
RDB	7	2	44.99419	-93.27498
RDB	7	3	44.99414	-93.27507
RDB	7	4	44.99412	-93.27514
RDB	8	1	44.99394	-93.27464
RDB	8	2	44.99392	-93.27473
RDB	8	3	44.99391	-93.27484
RDB	8	4	44.99373	-93.27469
RDB	9	1	44.99348	-93.27476
RDB	9	2	44.99351	-93.27455
RDB	9	3	44.99333	-93.27478
RDB	9	4	44.99340	-93.27442
RDB	10	1	44.99346	-93.27391
RDB	10	2	44.99351	-93.27399
RDB	10	3	44.99369	-93.27398
RDB	10	4	44.99360	-93.27415
RDB	11	1	44.99379	-93.27410
RDB	11	2	44.99382	-93.27413
RDB	11	3	44.99387	-93.27416
RDB	11	4	44.99392	-93.27429
RDB	12	1	44.99413	-93.27438
RDB	12	2	44.99411	-93.27430
RDB	12	3	44.99419	-93.27438
RDB	12	4	44.99425	-93.27450

All coordinates are in NAD83 datum.

Appendix A. GPS coordinates of qualitative searches, September-October 2014.

Survey Area	Cell	Replicate	Latitude	Longitude
RDB	13	1	44.99452	-93.27448
RDB	13	2	44.99452	-93.27464
RDB	13	3	44.99463	-93.27470
RDB	13	4	44.99475	-93.27480
RDB	14	1	44.99483	-93.27477
RDB	14	2	44.99486	-93.27477
RDB	14	3	44.99490	-93.27488
RDB	14	4	44.99496	-93.27485
RDB	15	1	44.99547	-93.27489
RDB	15	2	44.99544	-93.27476
RDB	15	3	44.99542	-93.27503
RDB	15	4	44.99528	-93.27517
RDB	16	1	44.99591	-93.27494
RDB	16	2	44.99578	-93.27503
RDB	16	3	44.99566	-93.27507
RDB	16	4	44.99563	-93.27478
RDB	17	1	44.99628	-93.27491
RDB	17	2	44.99612	-93.27487
RDB	17	3	44.99609	-93.27504
RDB	17	4	44.99600	-93.27520
RDB	18	1	44.99649	-93.27516
RDB	18	2	44.99662	-93.27490
RDB	18	3	44.99642	-93.27519
RDB	18	4	44.99637	-93.27483

All coordinates are in NAD83 datum.

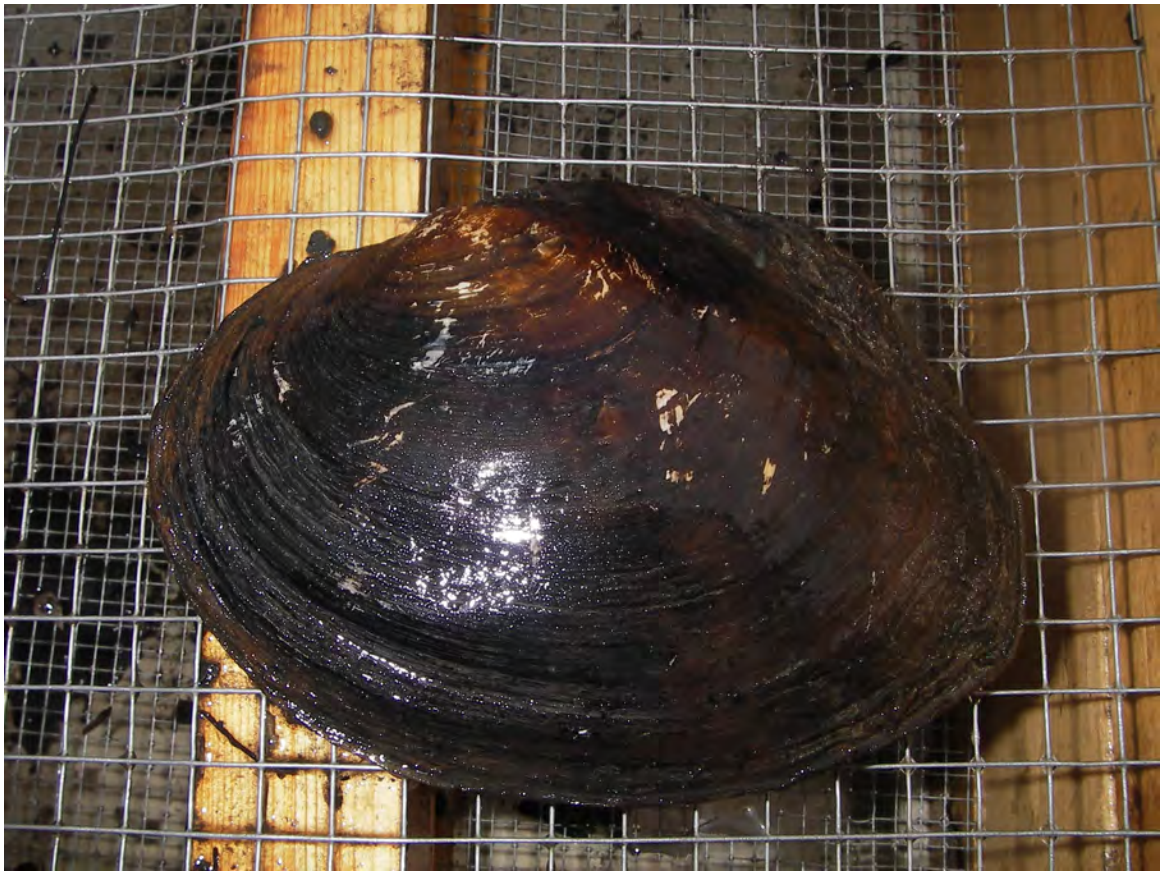
Appendix B

Representative photographs of unionid species collected at the Hall's Island reconstruction project, September-October 2014

Above: *Amblema plicata.* Below: *Fusconaia flava.*

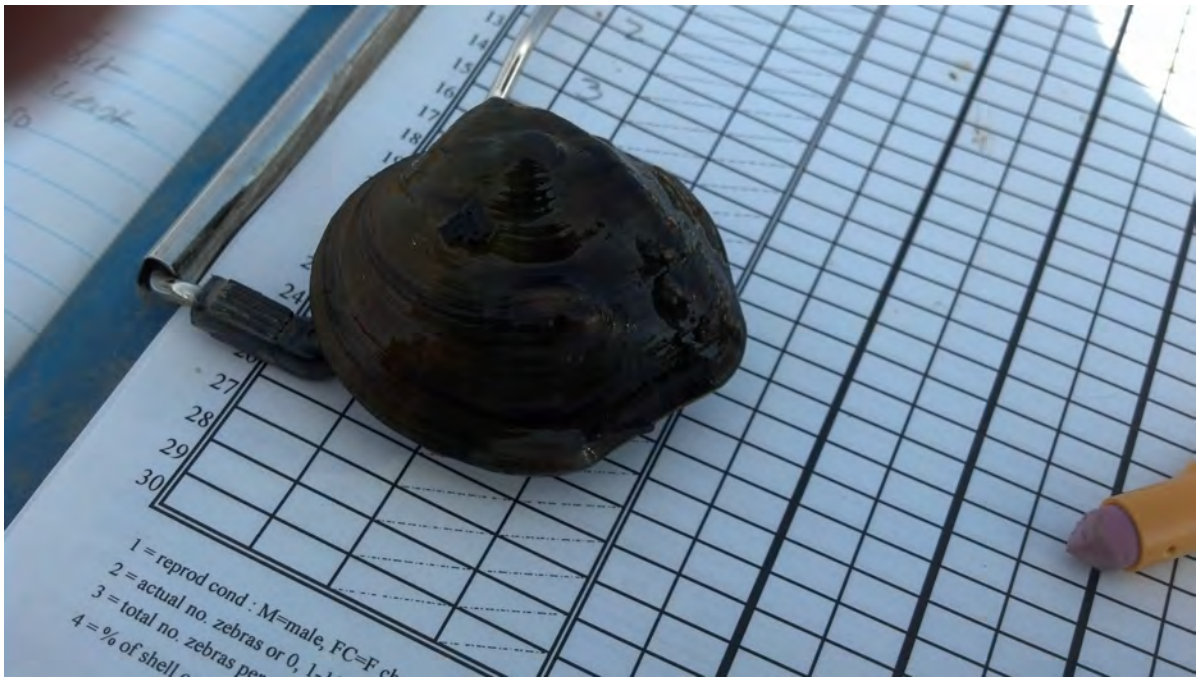
Quadrula nodulata

Above: *Quadrula quadrula.* Below: *Lasmigona complanata.*



Above: *Pyganodon grandis*. Below: *Strophitus undulatus.*

Above: *Lampsilis cardium.* Below: *Leptodea fragilis.*



Above: *Obliquaria reflexa.* Below: *Potamilus alatus.*

Truncilla truncata

From: Baker, Richard (DNR)
To: Emily Grossman
Cc: Davis, Mike J (DNR); Jessica L. Butler
Subject: RE: Halls Island mussel survey
Date: Thursday, October 16, 2014 4:50:09 PM

Emily,

I have reviewed the results of your surveys and have concluded that no further mussel surveys, nor any mussel relocation, will be necessary for this project.

I'll look forward to receiving a full final report on the surveys for the Hall's Island project.

Regards,

Rich

<><><><><><><><><><><><><><><><><><><>
Richard J. Baker
Minnesota Endangered Species Coordinator
Division of Ecological and Water Resources
Minnesota Department of Natural Resources
500 Lafayette Rd., Box 25
St. Paul, MN 55155
Phone: 651/259-5073
E-mail: richard.baker@state.mn.us
http://www.dnr.state.mn.us/eco/nhnrp
<><><><><><><><><><><><><><><><><><><>

From: Emily Grossman [mailto:egrossman@ecologicalspecialists.com]
Sent: Thursday, October 02, 2014 5:31 PM
To: Baker, Richard (DNR)
Cc: Davis, Mike J (DNR)
Subject: Re: Halls Island mussel survey

Rich,

Here are updated documents with our final Level I results for the Halls Island project. As anticipated, we didn't find many more mussels today. We had 4 cells left to survey on the RDB, and found 4 more mussels there (no new species). We had 10 cells remaining on the LDB side, and collected 11 more mussels in those cells. Among those were one species we had not yet collected live (*Lampsilis cardium)* and one more *Q. nodulata.*

I spoke to Mike Davis today and he mentioned you and he were planning to discuss our results Friday afternoon. If you could give me a call when you've decided whether Level II is necessary, that would be great - my cell number is 847-269-4159.

Thanks,

Emily Grossman

On Wed, Oct 1, 2014 at 9:12 PM, Emily Grossman <egrossman@ecologicalspecialists.com>

wrote:
Hi Rich,

As you know, we've been out working on the mussel survey for the Halls Island construction project this week. I wanted to pass along our results so far for you to start considering if we may need to do a Level II survey. We do still have a full day of work to do Thursday, but we will be out near mid-channel all day and thus far have found very few mussels that far off the bank (all loose sand substrate), so I don't expect to have very much to add after Thursday's work is complete. We will plan to go home to St. Louis on Friday if possible, if Level II is not needed, so I figured sending these partial results now would be preferable to sending you everything Thursday afternoon.

I have attached a map depicting our survey cells and the number of live mussels per cell, as well as tables of number live by species for each bank. In summary, we have found 68 mussels of 8 species on the left descending bank (direct impact area) so far. *Quadrula quadrula* was by far the most abundant species. No listed species were collected live; however, we did collect one fresh dead *Ligumia recta* shell (species of special concern). In general, mussels were fairly scattered throughout most of this area. We did encounter a small patch where mussels were more abundant in Cell 10 (see map), and did exceed 1 mussel per minute in this cell.

On the right descending bank, we have collected 109 mussels of 10 species. As on the left bank, *Q. quadrula* was the most abundant species. We did collect what looks like one threatened *Quadrula nodulata* at the downstream-riverward end of this area. I sent pictures to Mike Davis and Bernard Sietman to get their opinion, and also sent them to Heidi, who agrees that it appears to be *Q. nodulata.* Mussels were somewhat more abundant on the right bank as compared to the left bank - we averaged slightly under 1 mussel per minute in many of the cells along the bank, though we did not exceed 1 mussel/minute in any of the cells.

Please review these results as you have time and advise if we may need to do any Level II survey work. I will try to get in touch with you when we finish up Thursday afternoon to let you know what the final result is, but as I mentioned above, we'll be working mid-channel and are not expecting to find much more out there.

Thank you,

Emily Grossman
Aquatic Biologist
Ecological Specialists, Inc.
1417 Hoff Industrial Drive
O'Fallon, MO 63366
636 281-1982
egrossman@ecologicalspecialists.com

--
Emily Grossman
Aquatic Biologist
Ecological Specialists, Inc.
1417 Hoff Industrial Drive
O'Fallon, MO 63366
636 281-1982

Appendix C

References

References

Barr Engineering Co. 2014. Memo: Hall's Island (Scherer Brothers) Wetland/Other Waters Assessment. October 2014.

—. 2015a. *Pre-Design Environmental Investigation Report, Hall's Island Project (VP26370), Prepared for Minneapolis Park and Recreation Board.* Minneapolis : s.n., 2015a.

—. 2015b. *Test Trench Fill Characterization Report, Hall's Island Project (VP26370), Prepared for Minneapolis Park and Recreation Board.* Minneapolis : s.n., 2015b.

Chanen, D. 2012. Herons Settle in a New Home. *Star Tribune Newspaper.* [Online] June 2, 2012. http://www.startribune.com/herons-settle-in-at-a-new-home/156837465/.

Davis, M. 2007. *Population Estimates of Native Freshwater Mussels in Upper Pool 2 of the Upper Mississippi River.* St. Paul : U.S. Army Corps of Engineers, St. Paul District, 2007.

Ecological Specialists Inc. 2014. *Final Report: Unionid Survey for the Hall's Island Reconstruction/Restoration Project, Mississippi River Mile 855, Prepared for Barr Engineering Co.* 2014.

Kelner, D. 2011. *Upper Mississippi River Mussel Species Accounts.* s.l. : U.S. Army Corps of Engineers, St. Paul District, 2011. p. 19 pp.

Kelner, D.E. and Davis, M. 2002. *Final Report: Mussel (Bivalvia: Unionidae) Survey of the Mississippi National River and Recreation Area Corridor, 2000-01.* St. Paul : Minnesota Department of Natural Resources, Division of Ecological Services, 2002. p. 43 pp.

Lafrancois, B.M.; Vana-Miller, D.L.; Johnson, S.P. 2007. *Water Resources Information and Issues Overview, Mississippi River and Recreation Area, Natural Resource Technical Report NPS/NRWRD/NRTR-2007/364.* Fort Collins, Colorado : National Park Service, Water Resources Division, 2007.

Minnesota Department of Natural Resources. 2009. Fisheries Lake Survey, St. Anthony Falls Pool. *Minnesota Department of Natural Resources.* [Online] 2009. [Cited: January 13, 2015.] http://www.dnr.state.mn.us/lakefind/showreport.html?downum=27003300.

Minnesota Department of Natural Resources. 2009. Fisheries Lake Survey, St. Anthony Falls Pool. *Minnesota Department of Natural Resources.* [Online] 2009. [Cited: January 13, 2015.] http://www.dnr.state.mn.us/lakefind/showreport.html?downum=27003300.

—. 2006. *Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife - Comprehensive Wildlife Conservation Strategy.* s.l. : Minnesota Department of Natural Resources, Division of Ecological Services, 2006.

Minnesota Geologic Survey. 2017. Hennepin County Geologic Atlas, Atlas C-4, Plate 6 of 9. [Online] January 2017. http://conservancy.umn.edu/bitstream/handle/11299/58491/plate6_bdrk_hydro.pdf?sequence=96&isAllowed=y..

—. 2016. Minnesota Wells Index GiS Shapefile. October 2016.

Minnesota Geological Survey. 1989. Geologic Atlas Of Hennepin County. *Minnesota Department of Natural Resources.* [Online] 1989. http://www.dnr.state.mn.us/waters/programs/gw_section/mapping/platesum/henncga.html.

Minnesota Pollution Control Agency. 2012. *Best Management Practices for Off-Site Reuse of Unregulated Fill.* 2012.

—. 2012. Letter from Lynne Grigor to Cliff Swenson, Minneapolis Park and Recreation Board, Regarding Scherer Bros – Minneapolis Site, MPCA Project Number VP26370, No Further Action Determination for Soil . October 9, 2012.

—. 2016. Minnesota's Proposed 2016 Impaired Waters List. *Minnesota Pollution Control Agency.* [Online] 2016. https://www.pca.state.mn.us/water/minnesotas-impaired-waters-list.

Ohio State University. Molluscs Division of the Museum of Biological Diversity, Mussel/Host Database. *Ohio State University.* [Online] [Cited: January 20, 2015.] http://140.254.118.11/MusselHost/FMPro.

Peer. 2012. *Response Action Implementation Report, Former Scherer Bros. Lumber, Minneapolis, Minnesota, MPCA VIC# 26370, Prepared for Minneapolis Park and Recreation Board.* 2012.

Schmidt, K and Prolux, N. 2009. *Status and Critical Habitat of Rare Fish Species in the Mississippi River from the Coon Rapids Dam to the Iowa Border, State Wildlife Grant Final Report.* 2009. p. 29 pp.

U.S. Department of Agriculture, Natural Resources Conservation Service. Web Soil Survey of Hennepin County. *U.S. Department of Agriculture.* [Online] https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.