



Replace Bridge No. L8514 St. Andrews
Street over Tischer Creek Design Phase

Duluth City Offices

September 24, 2019

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September 24, 2019

Amanda Ashbach, Purchasing Agent
City Purchasing
Room 120 City Hall
Duluth, MN 55802

RE: REPLACE BRIDGE NO. L8514 ST. ANDREWS STREET OVER TISCHER CREEK DESIGN PHASE

LHB is pleased to submit our qualifications to the City of Duluth for the replacement of Bridge No. L8514. We have recently visited the site and our submittal has been carefully assembled to illustrate our project understanding and team capabilities to ensure successful delivery of this project. We are confident that you will agree LHB is uniquely qualified to assist with this project. All roadway and bridge design, survey and other project related services will be performed by LHB staff from our Duluth office.

We appreciate your consideration of LHB and would truly welcome the opportunity to assist with this project. Assisting the City of Duluth in the delivery of its road and bridge program is very important to LHB and we have tailored our services to ensure we are well suited to this role. We strive to meet and exceed the needs of the City when we are requested to assist and realize we must continuously work to ensure we understand the county’s needs and assure we meet expectations.

Again, we appreciate the opportunity to prepare this proposal and look forward to hearing from you soon. Please do not hesitate to call me at 218-279-2456 with any questions.

Thank you.

LHB

Jon Siiter, PE | Structures Group Lead

September 24, 2019

1. GOALS AND OBJECTIVES



The City of Duluth is requesting engineering services in connection with the replacement of Bridge No. L8514 (construction services may be added at a future date once project funding is secured).

Bridge No. L8514, built in 1950, consist of a set of three 72"x44" arch-pipe culverts each about 46 feet long with stone masonry headwalls. The bridge conveys Tischer Creek below St. Andrews Street in Duluth's Hunter's Park neighborhood. The bridge is considered to be in poor condition, mainly due to the severe through-corrosion of the culvert inverts.

Tischer Creek is a designated trout stream and therefore carries with it special design and construction considerations. The Minnesota Department of Natural Resources is responsible for regulating design and construction activity through its Protected Waters Permit Authorization. Through the permitting process, certain design and construction measures can be mandated to maintain and even improve fish habitat. While these requirements vary from project to project, typically these involve providing a natural stream bottom, adequate bank-full stream width, ensuring proper stream velocities at base flows and making sure the stream is not disturbed during critical periods of aquatic organism spawning and movement throughout the waterway reach.

This project is located in a FEMA mapped floodplain (Zone A2), therefore proper and accurate modeling of the waterway will be required to determine impacts of the replacement structure on the floodplain and adjacent structures. If hydraulic analysis of the new structure shows a material change in the base flood water surface elevation, then a LOMR will be required to ensure that the FEMA map products are accurate and up to date. The scope of this important part of the project is discussed further later in this proposal.

We understand the project must be designed in accordance with the City Standard Specifications and Engineering Guidelines as well

as State Aid and State Aid Bridge Office requirements. Construction funding for the project will come from State Bridge Bond funds with local city dollars used as the match. LHB acknowledges and is committed to the proposed project schedule, though we would note that if a LOMR is required it cannot be finished until the new structure is constructed and an as-built survey is completed.

INITIAL SITE VISIT AND CONSULTATION

The project scope will include an initial meeting with the City of Duluth to finalize project scope and confirm design standards and important features. At this time, existing data can be gathered from the City including utility files, existing bridge information, aerial photography. Of course, ongoing communication will be important and will be facilitated through written correspondence and/or electronic communications. LHB will provide documentation of all meetings and will field verify all information obtained from the City.

PUBLIC PARTICIPATION AND MEETINGS

LHB will lead and facilitate one public information meeting to communicate the project design goals and concepts to the immediate neighbors, local businesses and the general public at large. We understand the importance of clearly communicating the project goals and objectives with the public to gain stakeholder support and have the demonstrated technical expertise to ensure the City's overall project needs are met. The public involvement process must be one that is shared among the diverse interests involved including the traveling public, nearby residents, community partners, recreational users and businesses. While it is not anticipated that this project will be controversial, at the same time an engaged, well educated group of stakeholders oftentimes become project supported and advocates. Our vision for the public meeting is an informational setting where the well-defined scope of the project is communicated through graphics and one-on-one communication as needed. The meeting would be timed such that useful public input can be incorporated into the project as deemed applicable.



RECONNAISSANCE, FIELD SURVEYS, GEOTECHNICAL EXPLORATION & HYDRAULIC MODELING

Field Survey

LHB will perform all necessary field survey and mapping of the street, ROW, stream, utilities, existing bridge and general site topography as required to complete the design of the project. Special care will be taken to document existing structures up and down stream of the subject bridge to aid in modeling of the stream in preparation for FEMA analysis. Any monuments within the project limits will be preserved or re-set during the construction of the project if disturbed.



Coordination with DNR for Designated Trout Streams

It is understood that this project will directly affect Tischer Creek, which is a designated trout stream. LHB will draw upon our vast experience in coordinating with DNR Division of Fisheries personnel to start the project off on the right foot. We will make early contact with DNR personnel during preliminary design so that the anticipated design features can be confirmed and included in permit application documents. This process is proven to prevent pitfalls from popping up later in the process, causing potential schedule delays.

Waterway Hydraulics and Permit Applications

Since the project is located in a FEMA mapped floodplain, any changes to the base flood water surface elevation upstream of the proposed bridge will require a revision to the FEMA published flood maps. Since it is likely the new structure will have different capacity and inlet condition than the existing it is expected that a LOMR will be required. The process for officially update the FEMA published maps is known as LOMR (Letter of Map Revision). This is a defined process that involves, among other things, analysis of the original FEMA model, the current model with existing structure, proposed model with the proposed structure and the final as-built structure and model.

LHB will complete the MT-2 application, which is required for all LOMRs, along with all required supporting documentation. This includes: hydraulic calculations and models, a report to document modeling assumptions and results, shapefiles of any floodplain changes, topographic data, and cross-section locations used for modeling.

We are anticipating that water surface elevation for the proposed structure will be lower than the existing water surface elevation.

Therefore, a CLOMR and letter to affected owners should not be necessary. FEMA can be expected to make a final LOMR determination within 90 days after receiving the completed submittal, including as-built data.

We understand that the other goal of this task is to procure all permits required for this project, including a Protected Water Permit from the Minnesota DNR. The DNR permit application will need to satisfy both water resources and fisheries requirements. In order to comply with the FEMA and LOMR requirements as described above, LHB will coordinate with the Minnesota DNR Area Hydrologist regarding waterway hydraulics. Typically, this interactive process will involve sharing of hydraulic (HEC-RAS) models and collaboratively converging on a unique solution that satisfies the project goals.

Geotechnical Exploration



Our analysis of the site and with consideration given to the existing bridge leads us to conclude that the new structure will likely be a single, or double line box culvert. For projects such as this geotechnical exploration is usually not required unless obvious surface markers such as swamp/peat deposits or other evidence of subsurface difficulties present themselves. Therefore, we would not intend to perform any geotechnical exploration or reporting unless the it is determined that the new structure must be a bridge. In this case, the required geotechnical exploration and reporting would be completed as an additional service.

PLANS AND SPECIFICATIONS

Construction Drawings & Specifications

LHB will complete preliminary (30%), final (90%) and bid-ready certified plans and specifications. These plans and specifications will be designed and developed in accordance with City of Duluth and MnDOT State Aid and State Aid Bridge standards. LHB's staff are well versed in the various standards that will apply to this project, namely the MSAS and local street requirements.

The street and drainage plans, estimated quantities, bridge plans (precast concrete box culvert), utility plans, and hydraulic report will be prepared to State Aid Standards and to submittal to State Aid for review and approval to establish appropriate finding splits between local and State Bridge Bond funds as appropriate.

As part of the final state aid plan submittal, LHB will prepare and submit the completed plans, special provisions, Engineer’s Estimate including funding splits; state-aid review checklist; and laboratory testing and inspection services request forms, with City input. LHB will assist the city in preparation of the proposal and will provide bid review and input as desired.

The design phase will include developing typical sections for the street and bridge. Final plans will include removals, construction plan and profile sheets, Stormwater Pollution Prevention Plans (SWPPP) including temporary erosion control and final turf establishment, utility profiles, traffic control and staging plans, and cross sections. All project quantities will be tabulated and compiled into the project Statement of Estimate Quantities utilizing MnDOT and City of Duluth standard bid items, as applicable.

The project specifications will be developed in accordance with City of Duluth standards and formats and will include all the applicable sections for bidding, bonding, agreements and both general and special provisions.

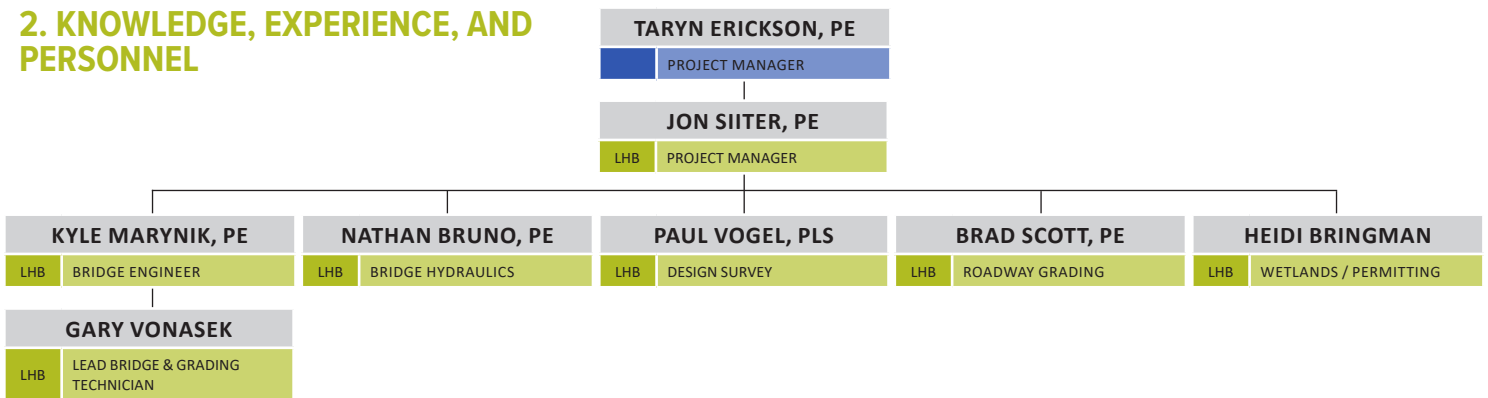
COST ESTIMATES

We will prepare and update construction cost estimates throughout the design process that mirror the project SEQ and appropriately split costs as required between project funding sources, as required. We rely on our past experience with similar projects and City provided cost data to provide reliable estimates of Contractor bid costs. Updated estimates will be provided with the 30%, 90%, and 100% design submittals.

PROJECT BIDDING

LHB will assist the City in the assembly of the bid package and remain available to answer any questions that may arise during bidding. If required, we will provide any formal clarifications or addenda that cannot be readily resolved by direct reference to the plans and special provisions. We will assist the City in the evaluation of bids.

2. KNOWLEDGE, EXPERIENCE, AND PERSONNEL



**Jon W. Siiter, PE
Project Manager**

Jon has been responsible for the design, construction and investigation/inspection of bridges and structures for over 28 years. His experience includes new design, historic rehabilitation design and inspection of structures utilizing steel, reinforced concrete, prestressed concrete, post tensioned concrete, stone masonry, brick masonry and timber. Jon has been responsible for design engineering for numerous bridge structure types including haunched steel plate girder, flared continuous steel plate girder, rolled steel beam, steel truss, prestressed concrete girder, stone and brick masonry and concrete slab spans for various state, county and municipal agencies. He has also investigated and rated over 1,200 existing bridges and structures from simple timber spans to complex movable steel trusses.

As a project administrator, Jon’s responsibilities have included the supervision of construction for various new and rehabilitation projects including historic bridges, buildings, parking structures and various other special structures. He is experienced in the supervision of the erection of structural steel, installation of cast in place concrete, prestressed concrete, foundation piling and caissons. Jon also has significant experience in the planning and rehabilitation design for stone masonry retaining walls and brick and stone masonry bridge structures.

Registration

Licensed Professional Engineer in Minnesota

Certification

MnDOT Bridge Construction Certification Level II

MnDOT Certified Bridge Inspection Program Administrator

MnDOT Certified Bridge Inspection Team Leader

Education

Bachelor of Science, Civil Engineering, North Dakota State University

2. KNOWLEDGE, EXPERIENCE, AND PERSONNEL



Brad P. Scott, PE **Roadway/Site Engineer**

As LHB's Roadway Design Leader, Brad has over 22 years of experience in roadway and trail design, construction management, and civil engineering. His project management abilities include design team leadership for complex projects, construction planning, CPM project scheduling, quality control and construction administration. Brad has extensive experience in the design and construction of shared use path systems for a variety of clients including MnDNR, MnDOT, Counties, Parks, and Cities throughout Minnesota.

In his role as project manager, Brad is responsible for the day-to-day supervision and direction of survey and CADD technicians, internal design staff and sub consultants on traditional project delivery and fast track projects. His experience also includes project QA/QC planning and management to ensure high quality projects that achieve design, timeline and budget requirements.

Registration

Licensed Professional Engineer
in Minnesota and Alaska

Construction Documents Technologist
(CDT)

Education

Bachelor of Science, Civil Engineering,
University of Alaska, Fairbanks



Nathan J. Bruno, PE **Hydraulic Engineer**

Nathan has 11 years of design experience in civil engineering specializing in water resource engineering. He has extensive experience designing: storm water treatments ponds, storm sewer and other conveyance systems, bridge hydraulic, sanitary sewers, water mains, site grading and drainage plans, and SWPPP's for both public and private clients.

He has designed numerous storm water conveyance and ponding systems of various size and complexity. He was part of a team that developed a city wide storm sewer and ponding plan, including cost estimates and recommendations for a storm water utility.

Nathan holds a certification for the design of SWPPP's and uses structural and non-structural BMP to meet treatment goal and design standards. He past design experience includes work on an award-winning city and county projects.

He has also been the hydraulics engineer for bridge replacements located in several counties and cities. Nathan has performed waterway hydraulics design for approximately 50 culvert and bridge structures throughout northern Minnesota and has performed the necessary calculation and modeling required for completing a FEMA LOMR.

Registration

Professional Engineer
in Minnesota

Certification

Stormwater Pollution Prevention Plan
(SWPPP)

Education

Bachelor of Science, Civil Engineering,
University of Minnesota

2. KNOWLEDGE, EXPERIENCE, AND PERSONNEL



Kyle D. Marynik, PE **Bridge Engineer**

Kyle has been a structural engineer for LHB, where he is part of the public works/structures group, for seven years. His educational background in civil engineering and industrial technology paired with his design software skills make him a valuable asset to the projects he is a part of. He brings over five years of experience.

Kyle's engineering experience includes design and plan preparation for a wide-variety of bridge and structural engineering projects from box culvert and single-span bridges to complex interchanges on the State Trunk Highway system. Kyle also possesses strong skills in construction administration projects and inspection of in-service facilities.

Registration

Licensed Professional Engineer in Minnesota

Education

Bachelor of Science, Civil Engineering, Michigan Technological University

Bachelor of Science, Industrial Technology, University of North Dakota



Heidi S. Bringman, PLA, LEED AP BD+C, CDT, CCCA, WDCP **Landscape Architect**

Heidi is a licensed LA with 16 years of experience working in LHB's Landscape Architecture and Planning Group. Heidi's areas of specialization include public engagement, site and regional master planning with an emphasis on health benefits and the design of trails, parks, and public spaces for a variety of communities. She enjoys working on both small and large-scale projects and has assisted many clients with establishing implementation standards that improve public health through design.

Heidi also serves as a Wetland Resource Specialist, allowing her to bring a unique perspective to planning and development projects. Specialty skills that compliment urban design, public health planning and natural resource related work include her attention to detail, excellent report writing, graphic illustrations, and her ability to communicate effectively with a wide variety of people, ranging from regulatory officials, municipal decision-makers and practitioners to neighborhood residents.

For this project, Heidi will be responsible for leading the wetland delineation / reporting process as well as completing and submitting the various required permit applications.

Registration

Licensed Landscape Architect in Minnesota and Wisconsin

Certification

MN Certified Wetland Delineator (CWD)

Construction Documents Technologist (CDT)

Certified Construction Contract Administrator (CCCA)

Education

Master of Landscape Architecture, College of Design, University of Minnesota

Bachelor of Arts, St. Olaf College; Minnesota

2. KNOWLEDGE, EXPERIENCE, AND PERSONNEL



Paul A. Vogel, PLS **Professional Land Surveyor**

Paul has 31 years of surveying experience and has provided services for various private and public clients. Paul's role is to complete and oversee a variety of professional assignments to facilitate the completion of roads, building sites, recreational areas, developments, and bridges. He performs ALTA/ACSM, boundary, cadastral, topographic, environmental site, route surveys, which involve section subdivision, right-of-way acquisition, and preparation of appropriate legal description. Paul prepares design, concept plats, preliminary plats, final plats, site maps, and a variety of exhibits for land transfers, right-of-way acquisition, easements, and utility infrastructure. He also provides research, computations, layout, field work, drafting, and correspondence.

He performs surveys involving the location, alignment, and associated infrastructure for railroads and railroad bridges, layout of pipelines, primary and secondary roads, sewer and water lines, curb and gutter, and buildings. As a surveyor, Paul performs corner searches, traversing, interpreting WPA, railroad right-of-way, MnDOT commissioner orders for right-of-way takings and turnbacks, and other relevant maps. Paul is knowledgeable in GPS surveying (Trimble and Leica survey grade receivers) and has researched horizontal and vertical control data from the NGS, USGS, DOT and many local coordinate systems. He has performed reconnaissance of existing control stations and the layout of photo control networks.

Registration

Licensed Professional Land Surveyor in
Alaska, Minnesota and Wisconsin

Education

Bachelor of Science, Chemistry,
University of Minnesota, Duluth

Land Surveyor Coursework, Metropolitan
State College of Denver



Gary A. Vonasek **Lead Bridge & Grading Technician**

Gary has over 32 years of experience in bridge and civil engineering design, CAD drafting, and construction inspection. Gary has extensive experience in both preliminary design and final geometric layout for road and bridge projects from simple rural crossings to highly complex urban overpasses and flyovers. He has successfully completed preliminary and final bridge design and layout using continuous steel girder, single and multi-span prestressed concrete beam, cast-in-place concrete and timber type bridges. Gary excels in problem solving, with skills that are especially valuable for projects that are staged or feature complex geometry and is able to efficiently harness the power of the advanced software and data processing tools available to him.

Gary oversees the LHB Bridge Department CAD Standards and has extensive knowledge with assembly creation, application and modification using AutoCAD Civil 3D as well as MicroStation.

Gary's knowledge of MnDOT, City and State Aid standards ensures that projects are properly set up for success from Day One so that project goals, expectations and schedules are met, from initial preliminary design and review all the way through final approvals and construction.

Certification

Engineering Concepts, Federal Highway
Administration

MnDOT Grading and Base
I & II

MnDOT Aggregate Production

MnDOT Bituminous Street I

MnDOT Concrete Field I

Education

Architectural Drafting Diploma, Thief
River Falls Technical College

2. KNOWLEDGE, EXPERIENCE, AND PERSONNEL

Project Type

- Survey
- Permitting
- Wetland Delineation & Reporting
- Bridge Design
- Fish Passage & Habitat Design
- City Street Design
- Utility Design
- Construction Administration

Key Personnel / Roles

- Jon Siiter, Project Manager / Bridge Engineer
- Nathan Bruno, Hydraulic Engineer
- Heidi Bringman, Wetland & Permitting Specialist
- Paul Vogel, Design Survey, Construction Staking
- Gary Vonasek, Lead Bridge & Grading Technician

Client

City of Duluth; Duluth, MN

Project Type

- Survey
- Permitting
- Wetland Delineation & Reporting
- Bridge Design
- Fish Passage & Habitat Design
- City Street Design
- Utility Design
- Construction Administration

Key Personnel / Roles

- Jon Siiter, Project Manager / Bridge Engineer
- Nathan Bruno, Hydraulic Engineer
- Heidi Bringman, Wetland & Permitting Specialist
- Paul Vogel, Design Survey, Construction Staking
- Gary Vonasek, Lead Bridge & Grading Technician

Client

City of Duluth; Duluth, MN

Toledo Street Bridge Replacement



Severe flooding in 2012 completely washed out the existing multiple pipe-culvert type bridge carrying Toledo Street over Chester Creek in Duluth, MN. LHB was hired to perform a hydraulic study and preliminary and final design of the new structure. Based on hydraulic performance, durability and cost a precast concrete box culvert was chosen as the most appropriate structure for this

site. For fish habitat considerations, the culvert was depressed 2 feet below the stream bed (which necessitated relocation of a water main) and native stone was placed inside the culvert to mimic a natural streambed. Large boulders were also placed at regular intervals inside the box culvert to provide fish shelter and resting places out of the fast current of Chester Creek.

Triggs Avenue Bridge Replacement



LHB provided the design and construction administration for replacement of the existing bridge carrying Triggs Avenue over Chester Creek in the City of Duluth. The old structure was damaged during a 500 year flood event which hit Duluth in June of 2012. The project site is in a FEMA Flood Zone and thus required extensive flood plain analysis and documentation.



2. KNOWLEDGE, EXPERIENCE, AND PERSONNEL

Project Type

- Survey
- Permitting
- Wetland Delineation & Reporting
- Bridge Design
- Fish Passage & Habitat Design
- City Street Design
- Utility Design
- Construction Administration

Key Personnel / Roles

- Brad Scott, Project Manager
- Jon Siiter, Bridge Engineer
- Nathan Bruno, Hydraulic Engineer
- Heidi Bringman, Wetland & Permitting Specialist
- Paul Vogel, Design Survey, Construction Staking
- Gary Vonasek, Lead Bridge & Grading Technician

Client

Aspenwood; Duluth, MN

Chester Creek Bridge Replacement and Natural Stream Design



Aspenwood Condominiums is a multi-unit residential housing community located in Duluth's Kenwood neighborhood accessed off Arrowhead Road and Rice Lake Road. Chester Creek (a trout stream) bisects Aspenwood and flows beneath Madison Avenue, the primary roadway for the community that connects the north and south halves of the development. As a result of the 2012 floods and subsequent heavy rain, flood events that followed, the existing 60-year old multi-pipe, metal culvert system that conveyed Chester Creek beneath Madison Avenue was damaged and began to fail such that Madison Avenue had to be closed due to roadway material loss and subsidence failures. The closure of Madison Avenue presented a major and pressing issue to the Aspenwood community in terms of community connection, access to residences, delivery and waste management services, and safety.

LHB was hired by Aspenwood and the South Saint Louis County Soil and Water Conservation District (SLSWCD) to provide design plans for the replacement of the Chester Creek crossing. The project replaced the existing crossing which consisted of five arch pipes with a new precast box culvert.

The project was partially funded by a grant through Minnesota Trout Unlimited (MTU). Aspenwood Condominiums was originally constructed as military housing

and, when built, the original project re-routed Chester Creek from its natural course to instead follow the property boundary of Aspenwood in a non-natural channel geometry that was constructed at right angles. A condition of the MTU grant funds was re-establishing the natural stream morphology of Chester Creek including re-meandering the creek to a more natural, curvilinear geometry and watercourse. The project also provided for restoration of native plantings along the creek to provide shade and fish habitat and removed invasive species. Stream restoration also included design and construction of riffles, pools, habitat shelves, habitat logs and other stream features to provide and support fish habitat. The project design was also coordinated and permitted with MnDNR.

LHB provided design for the box culvert including culvert hydraulics and floodplain analysis. The project included utility replacement for sanitary, water, and gas main along Madison Avenue within the limits of the box culvert replacement including plans for a temporary water system during the work. Other work included new bituminous roadway, walks, landscaping and lighting along Madison Avenue.

LHB provided engineering design and construction administration for the project which was completed in 2018.



2. KNOWLEDGE, EXPERIENCE, AND PERSONNEL

Project Type

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- Utility Design
- Construction Administration

Key Personnel / Roles

- Jon Siiter, Project Manager / Bridge Engineer
- Nathan Bruno, Hydraulic Engineer
- Heidi Bringman, Wetland & Permitting Specialist
- Paul Vogel, Design Survey, Construction Staking
- Gary Vonasek, Lead Bridge & Grading Technician

Client

City of Proctor; Proctor, MN

Pionk Drive Culverts and Road Improvements



Pionk Drive serves to link the Proctor Community with the Proctor City Hall/Community Center and the Proctor Recreational Center. LHB worked with the City and St. Louis County to procure

State Bridge Bond Funding for the construction of Bridge No. 69J53, which carries Pionk Drive over Kingsbury Creek. LHB performed complete design and construction services for the project.

Project Type

- Survey
- Permitting
- Wetland Delineation & Reporting
- Bridge Design
- Fish Passage & Habitat Design
- City Street Design
- Utility Design
- Construction Administration

Key Personnel / Roles

- Jon Siiter, Project Manager
- Kyle Marynik, Bridge Engineer
- Nathan Bruno, Hydraulic Engineer
- Heidi Bringman, Wetland & Permitting Specialist
- Paul Vogel, Design Survey, Construction Staking
- Gary Vonasek, Lead Bridge & Grading Technician

Client

St. Louis County Public Works Department; Duluth, MN

Bridge 14 over Keene Creek



In the aftermath of the 2012 Flood in the Duluth and the surrounding area, LHB was hired by the St. Louis County Highway Department to design and oversee construction for 15 different damaged structures. One was St. Louis County Bridge No. 14 that carries Ugstad Road over Kingsbury Creek in Proctor, MN near the entrance to the CN Railroad yard. The old structure was a series of metal pipes that had corroded over the

years and partially collapsed after the flood, causing erosion of the roadway and restricting access to the rail yard.

LHB designed a cost effective solution that included two precast concrete box culverts, each with a 14 foot span. In order to comply with DNR requirements associated with stream trout habitat, each of the culvert floors were depressed at least one foot below the natural stream bottom.

2. KNOWLEDGE, EXPERIENCE, AND PERSONNEL

Little Knife River Bridges

Project Type

- Survey
- Permitting
- Wetland Delineation & Reporting
- Bridge Design
- Fish Passage & Habitat Design
- City Street Design
- Utility Design
- Construction Administration

Key Personnel / Roles

- Jon Siiter, Project Manager
- Kyle Marynik, Bridge Engineer
- Nathan Bruno, Hydraulic Engineer
- Heidi Bringman, Wetland & Permitting Specialist
- Paul Vogel, Design Survey, Construction Staking
- Gary Vonasek, Lead Bridge & Grading Technician

Client

St. Louis County Public Works Department



Bridge No. 68 - County Rd. 253

Following the June 2012 Flood, LHB was hired to coordinate design and construction for 15 flood damaged structures in Saint Louis County. Three of those structures (Bridges 67, 68 and 846) are located within a few miles of each other and all cross the Little Knife River. Based on site conditions, low traffic volume, and hydraulic demands, LHB

chose precast, concrete box culverts as a durable and economical bridge solution. In order to improve fish habitat, the culvert inverts were depressed well below the stream bottom and natural cobble and stones were placed inside the culverts. The twin box structures had individual spans from 10 to 16 feet.



Bridge No. 846 - Township Rd. 2406



Bridge No. 67 - County Rd. 266

2. KNOWLEDGE, EXPERIENCE, AND PERSONNEL

Project Type

- Survey
- Permitting
- Wetland Delineation & Reporting
- Bridge Design
- Fish Passage & Habitat Design
- City Street Design
- Utility Design
- Construction Administration

Key Personnel / Roles

- Jon Siiter, Project Manager
- Kyle Marynik, Bridge Engineer
- Nathan Bruno, Hydraulic Engineer
- Heidi Bringman, Wetland & Permitting Specialist
- Paul Vogel, Design Survey, Construction Staking
- Gary Vonasek, Lead Bridge & Grading Technician

Client

St. Louis County Public Works Department

Bridge 709 over Willow River



LHB provided preliminary and final design services for the replacement of St. Louis County Bridge No. 709, carrying County Road 769 over the Willow River south of Orr, MN. The old bridge, built in 1970, was a single steel beam span with timber plank deck and timber abutments. During annual safety inspections, it was observed that the timber abutment

pilings were decayed, and the steel beams were beginning to show loss of section due to corrosion. The new bridge design, chosen by LHB after the hydraulic design was completed, includes two precast concrete box culverts with spans of 14 feet each. This structure provides the necessary waterway area for adequate flow, and fits seamlessly with the existing stream bank.

Bridge 09J32 over Little Net River

Project Type

- Survey
- Permitting
- Wetland Delineation & Reporting
- Bridge Design
- Fish Passage & Habitat Design
- City Street Design
- Utility Design
- Construction Administration

Key Personnel / Roles

- Jon Siiter, Project Manager
- Kyle Marynik, Bridge Engineer
- Nathan Bruno, Hydraulic Engineer
- Heidi Bringman, Wetland & Permitting Specialist
- Paul Vogel, Design Survey, Construction Staking
- Gary Vonasek, Lead Bridge & Grading Technician

Client

Carlton County Transportation Department



The Carlton County Highway Department was planning the reconstruction of CSAH 8 and needed a plan to safely and efficiently accommodate the Little Net River crossing. Among the planned upgrades to CSAH 8 was improving the vertical alignment of the route at the bridge crossing which resulted in a grade raise of over 20-feet. Rather than extend or otherwise modify the old twin 12-foot by 12-foot cast-in-place concrete box culverts, originally built in 1926, the

decision was made to replace them. Since the Little Net River is a designated trout stream, an open bottom structure was sought leading to the choice of the earth filled precast arch structure. The new buried arch, spanning 32-feet, rising 11-feet from the stream bottom and reaching over 200-feet in length is founded on the native exposed bedrock, ensuring it will be at least another 90 years before the third bridge at this location will need to be built.

3. WORK PLAN

The following is a general project work plan. Included, where applicable, are project deliverables and the required City responsibilities & action items. A detailed project work plan itemizing tasks and associated hours with designated LHB staff is included on the pages following.

Task 1 – Initial Site Visit & Consultations	
LHB	<ul style="list-style-type: none"> • Information gathering including any existing structure plan information, street plans etc. • Coordinate at least one meeting with the City to review scope, identify project specific difficulties etc. • Prepare and distribute project meeting minutes and follow up information as needed
City	<ul style="list-style-type: none"> • Furnish existing project information and other relevant project data • Attend coordination meeting and provide input • Review meeting minutes
Deliverables	<ul style="list-style-type: none"> • Meeting discussion materials, exhibits and minutes

Task 2 – Public Participation & Meetings	
LHB	<ul style="list-style-type: none"> • Attend and facilitate one public meetings with residents and businesses – prepare and mail meeting notices, prepare meeting exhibits and presentation, facilitate discussion with residents and prepare meeting minutes • One meeting with DNR to discuss permitting and waterway design
City	<ul style="list-style-type: none"> • Attend and lend input at public meeting • Attend and lend input at DNR meeting • Provide mailing list for residents and businesses invited to attend public input meeting
Deliverables	<ul style="list-style-type: none"> • Mail meeting notices and letters • Meeting minutes/summaries • Public meeting exhibits and materials

Task 3 – Reconnaissance, Field Surveys, Geotechnical Exploration and Hydraulic Modeling	
LHB	<ul style="list-style-type: none"> • Information gathering for existing utilities and ROW • Field survey and mapping • ROW and TE recommendations as required • Hydraulic study and risk analysis for new bridge structure as required to determine adequate waterway opening • Perform analysis, survey and prepare forms and documents per FEMA requirements for LOMR • Wetland delineation and reporting • Project permitting and regulatory plan set preparation
City	<ul style="list-style-type: none"> • Provide in digital format the existing ROW, property boundaries, and utility information • Right-of-way exhibits, documents, descriptions and acquisition if/as required • Input and reviews as required to FEMA LOMR • Permit signatures and reviews
Deliverables	<ul style="list-style-type: none"> • Complete site map suitable for project design • Certified hydraulic report and State Aid approved Risk Assessment Worksheet for bridge structure • Approved wetland report • FEMA approved LOMR • All required permits

3. WORK PLAN

Task 4 – Plans and Specifications	
LHB	<ul style="list-style-type: none"> • Develop and submit preliminary bridge plan to MnDOT State Aid Bridge Office as required depending on structure type • Preparation of detailed construction plans addressing all aspects required to construct the project including bypass plans if needed (30%, 90% and final) • Provide all required structural analysis and design required for development of final bridge plans • In-house quality control • Prepare and submit final plans for review/approval to MnDOT State Aid Office • MnDOT review submittals and approvals • Preparation of specifications including all needed contract and bidding language and special provisions. • Packaging of plan, checklists, bridge bond fund application form and other required documents for proper electronic submittal to MnDOT State Aid.
City	<ul style="list-style-type: none"> • Review and sign plans • Review special provisions
Deliverables	<ul style="list-style-type: none"> • Complete MnDOT State Aid submittal packet (grading and bridge plan, bridge bond fund application form, State Aid checklist etc.) • Bid-ready final plans and specifications

Task 5 – Cost Estimates	
LHB	<ul style="list-style-type: none"> • Complete and submit 30% and 90% Engineer’s Estimate of Cost • Complete and submit Final Engineer’s Estimate of Cost
City	<ul style="list-style-type: none"> • Furnish recent cost data and bid tabs • Review and provide feedback on 30% & 90% Engineer’s Estimate of Cost, if desired • Review and provide feedback on Final Engineer’s Estimate of Cost, if desired
Deliverables	<ul style="list-style-type: none"> • 30%, 90% and Final Engineer’s Estimate of Cost

Task 6 – Project Bidding	
LHB	<ul style="list-style-type: none"> • Answer City and Contractor questions during bidding • Attend bid opening • Assist with the preparation of the proposal
City	<ul style="list-style-type: none"> • Management, advertising, bidding and letting • Clarifications or addenda, as required
Deliverables	<ul style="list-style-type: none"> • Clarifications or addenda, as required

3. WORK PLAN

Project Breakdown Task Description	LHB								Total Hours
	Jon Siiter	Brad Scott	Nathan Bruno	Heidi Bringman	Paul Vogel	Kyle Marynik	Gary Vonasek		
	Project Manager	Roadway Engineer	Hydraulic Engineer	Landscape Arch	Land Surveyor	Bridge Engineer	Lead Tech	Survey Technician	
Task 1 - Initial Site Visit & Consultations									
Gather Information							1		1
Meet with City/DNR to Review Scope etc.	3								3
Meeting Documentation	1								1
Task 2 - Public Participation & Meeting									
Prepare Exhibits, Meeting Materials etc.	2					4	4		10
Public Meeting	4								4
Task 3 - Recon, Field Survey, Geotech, Hydraulics									
Review City files for Utility Information etc.							3		3
Field Survey & Mapping	2				4			12	18
ROW Recommendations	1								1
Bridge Hydraulic Study and Risk Analysis			14						14
Prepare Hydraulic Models for LOMR (up to 5 Required)			80						80
Prepare FEMA Reports and Forms			20						20
FEMA & DNR Communications & Correspondence			16						16
FEMA Floodplain Exhibits and Maps			24						24
As-Built Survey to Finalize LOMR			4					8	12
Wetland Delineation & Reporting				12					12
Permitting, Regulatory Coordination				4					4
Task 4 - Plans & Specifications									
Title Sheet & Index Map							2		2
Statement of Estimated Quantities		2					6		8
Earthwork Quantities and Typical Sections		4					6		10
Erosion Control Plan and Details (3 Shts.)		1					4		5
Traffic Control Plan- Detour		1					2		3
Traffic Control Details							2		2
Precast Box Culvert Details (3 Shts)		1				3	1		5
Riprap Details							2		2
Bridge Survey		2				2	2		6
Stream Bypass and Dewatering Details		1					1		2
Plan & Profile (1 Sheet, 400 feet)		6					12		18
Cross Sections (6 Sheets)		6					10		16
Project Specifications		4				4			8
Task 5 - Cost Estimates		8							8
Task 6 - Project Bidding		2							2
Total Hours	13	38	158	16	4	13	58	20	320

4. PROJECT SCHEDULE

Task / Deliverable	Length (days)	Start	Finish	2019				2020	
				SEPT	OCT	NOV	DEC	JAN	FEB
RFP Issued	1	9/3/19	9/3/19	█					
Proposals Due	1	9/24/19	9/24/19		█				
Selection of Consultant	5	9/25/19	10/1/19		█				
Council Approval to Award Contract	1	10/14/19	10/14/19			█			
Notice to Proceed	1	10/16/19	10/16/19			█			
Task 1 - Initial Site Visit and Consult.									
Gather Information	4	10/22/19	10/25/19			█			
Meet with City to Review Scope	1	10/28/19	10/28/19			█			
Task 2 - Public Participation & Meeting									
Prepare Exhibits & Meeting Materials	5	11/11/19	11/15/19				█		
Prepare Mailings & Notifications	5	11/18/19	11/22/19				█		
Public Meeting #1	1	11/25/19	11/25/19				█		
Review Public Input and Feedback	4	11/26/19	11/29/19				█		
Task 3 - Recon, Field Survey, Geotech, Hydraulics									
Review City Files	9	10/22/19	11/1/19			█			
Field Survey & Mapping	10	10/28/19	11/8/19			█			
ROW Recommendations	5	11/18/19	11/22/19				█		
Hydraulic Study & Risk Assessment for Bridge	10	11/18/19	11/29/19				█		
LOMR	51	11/18/19	1/27/20				█		
Wetland Delineation & Reporting	23	10/16/19	11/15/19			█			
Permitting, Regulatory, Coordination	55	10/16/19	12/31/19			█			
Task 4 - Plans and Specifications									
Preliminary Design & Plan Preparation	16	11/1/19	11/22/19				█		
30% Plan & Estimate Submittal to City	1	11/25/19	11/25/19				█		
City Review of 30% Plan	7	11/26/19	12/4/19				█		
Final Design and Plan Preparation	34	12/9/19	1/23/20				█		
90% Plan & Estimate Submittal to City	1	1/24/20	1/24/20					█	
City Review of 90% Plan	10	1/27/20	2/7/20					█	
Plan Edits and Updates	5	2/10/20	2/14/20					█	
Final Plan & Estimate to City for Review & Signature	1	2/14/20	2/14/20					█	
Final PS&E with Forms and Checklist to MnDOT State Aid	1	2/28/20	2/28/20						█

5. REFERENCES

Dave Conkel, PE
 State Aid Bridge Engineer
 MnDOT
 3485 Hadley Avenue North
 Oakdale, MN 55128 | 651.366.4493
 dave.conkel@dot.state.mn.us

Matt Hemmila, PE
 St. Louis County Public Works Department
 Central Range Public Works Facility
 1425 East 23rd Street
 Hibbing, MN 55746 | 218.262.0153
 hemmilam@stlouiscountymn.gov

Krysten Foster, PE
 County Engineer
 Cook / Lake County
 604 Third Avenue
 Two Harbors, MN 55616
 krysten.foster@co.cook.mn.us



CITY OF DULUTH
PURCHASING DIVISION
Room 120 City Hall
411 West First Street
Duluth, Minnesota 55802-1199
218/730-5340
purchasing@duluthmn.gov

Addendum 1
File # 19-16AA
RFP Eng Svcs L8514 Bridge Replacement, Project 1861

This addendum serves to notify all bidders of the following changes to the solicitation documents:

1. See attached Plan Sheet for St. Andrews Street from 2001. No work was done on Bridge L8514 with this project. Plans for the bridge are not available.
2. See attached GIS utilities map.

Please acknowledge receipt of this Addendum by returning it with your proposal. This page will not be included in the proposal page limitation.

Posted: **9/18/19**

An Equal Opportunity Employer



**PERFORMANCE
DRIVEN DESIGN.**
LHBcorp.com

September 24, 2019

Amanda Ashbach, Purchasing Agent
City Purchasing
Room 120 City Hall
Duluth, MN 55802

RE: REPLACE BRIDGE NO. L8514 ST. ANDREWS STREET OVER TISCHER CREEK DESIGN PHASE

LHB is pleased to submit our cost proposal for design services for the replacement of Bridge No. L8514. We are excited to assist the City with the project. We look forward to hearing from you and remain available should you have any questions concerning our proposal.

Thank you.

LHB

Jon Siiter, PE | Structures Group Lead

2019 FEE ESTIMATE WORKSHEET
LHB Labor Summary

Project Name
Client
Preparer

Replace Bridge No. L8514
City of Duluth
JWS

Project Number
Date

190671
September 24, 2019



Project Breakdown Task Description	P1	P4	P5	P8	P9	P12	T3	T4	T6	T9	T10	T11	T12	Total Labor Costs (\$)
	Project Principal \$	Profess. Eng. \$	Profess. Eng. \$	Profess. Eng. \$	Profess. Eng. \$	Profess. Eng. \$	Senior Tech. \$	Senior Tech. \$	Lead Tech. \$	Inter. Tech. \$	Tech. \$	Tech. \$	Tech. \$	
Task 1 - Initial Site Visit & Consultations														
Gather Information														\$ 100.00
Meet with City/DNR to Review Scope etc.		3						1						\$ 480.00
Meeting Documentation		1												\$ 160.00
Task 2 - Public Participation & Meeting														
Prepare Exhibits, Meeting Materials etc.		2						8						\$ 1,120.00
Public Meeting		4												\$ 640.00
Task 3 - Recon, Field Survey, Geotech, Hydraulics														
Review City files for Utility Information etc.								3						\$ 300.00
Field Survey & Mapping		2						16						\$ 1,920.00
ROW Recommendations		1												\$ 160.00
Bridge Hydraulic Study and Risk Analysis				14										\$ 1,680.00
Prepare Hydraulic Models for LOMR (up to 5 Required)				80										\$ 9,600.00
Prepare FEMA Reports and Forms				20										\$ 2,400.00
FEMA & DNR Communications & Correspondence				16										\$ 1,920.00
FEMA Floodplain Exhibits and Maps				24										\$ 2,880.00
As-Built Survey to Finalize LOMR				4				8						\$ 1,280.00
Wetland Delineation & Reporting					12									\$ 1,320.00
Permitting, Regulatory Coordination					4									\$ 440.00
Task 4 - Plans & Specifications														
Title Sheet & Index Map								2						\$ 200.00
Statement of Estimated Quantities		2						6						\$ 920.00
Earthwork Quantities and Typical Sections		4						6						\$ 1,240.00
Erosion Control Plan and Details (3 Shts.)		1						4						\$ 560.00
Traffic Control Plan- Detour		1						2						\$ 360.00
Traffic Control Details								2						\$ 200.00
Precast Box Culvert Details (3 Shts)		1						4						\$ 560.00
Riprap Details								2						\$ 200.00
Bridge Survey		2						4						\$ 720.00
Stream Bypass and Dewatering Details		1						1						\$ 260.00
Plan & Profile (1 Sheet, 400 feet)		6						12						\$ 2,160.00
Cross Sections (6 Sheets)		6						10						\$ 1,960.00
Project Specifications		8												\$ 1,280.00
Task 5 - Cost Estimates														
		8												\$ 1,280.00
Task 6 - Project Bidding														
		2												\$ 320.00
Total Hours		55		158	16			91						\$ 38,620.00
Travel Expenses	Qty	Rate	Cost	Other Direct Expenses		Cost	Labor Cost		Travel Costs		Direct Costs			
Travel Exp (Airfare, Meals, Hotel, Rental Car, Gas, etc.)		\$ -	\$ -	Mail / Delivery			Travel Costs							\$ 8,000.00
		\$ -	\$ -	Printing			Direct Costs							\$ 8,000.00
		\$ -	\$ -	FEMA LOMR Application Fee										\$ 8,000.00
Total Travel Costs		\$ -	\$ -	Total Direct Costs			Subconsultants 4							\$ 46,620.00
		\$ -	\$ -				Total Estimated Cost							\$ 46,620.00