
PROPOSAL TO PROVIDE DESIGN AND CONSTRUCTION SERVICES FOR:

# Kayak Bay Road, Utilities and Signal Project

**Prepared for:**
City of Duluth, MN
October 9, 2018

MSA

October 9, 2018

Eric Shaffer, PE
Chief Engineer of Utilities
City of Duluth - Engineering Division
411 W. 1st Street, Room 211 City Hall
Duluth, Minnesota 55802

**Re: Proposal to Provide Design and Construction Services for Kayak Bay Road**

Dear Eric,

It was great to meet with you, Cari and Tom to hear more about the planning development, current state, and needs for the Kayak Bay Road project. We are excited for the opportunity to help finish the work already started and deliver an award-worthy project that the community can be proud of.

Our goal for this project is to complete those critical tasks efficiently and ensure that you and the Engineering Division are confident in the progress of this project through timely communication and clear status reports. We believe that our fresh perspective on the preliminary work already completed, backed by experience delivering similar project types, will benefit the final project outcome through asking new questions, and confirming that the preliminary design solutions are the best-fit solutions for the City of Duluth.

We have assembled the enclosed project team and project work plan to deliver the Kayak Bay Road project as required in the RFP. The proposed team, supported by many technical experts here at MSA Professional Services, Inc. (MSA), is dedicated to successfully completing infrastructure improvement projects in our community. We appreciate the opportunity to present our qualifications and our approach to this important project. Please give me a call at (218) 499-3179 or email at jdipiazza@msa-ps.com to discuss our qualifications or ask any questions regarding the work plan. And, please do not hesitate to contact our references.

Sincerely,
MSA Professional Services, Inc.

Jason DiPiazza, PE
Project Manager

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**MSA PROFESSIONAL SERVICES, INC.**

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## Goals and Objectives

The goal of the proposed Kayak Bay Road, Utilities, and Signal project is to complete the public transportation and utility infrastructure necessary to realize key development elements of the 2006 City of Duluth Comprehensive Plan and Riverside Neighborhood Small Area Plan. The proposed road, Kayak Bay Drive, and underlying utilities will serve the proposed mixed-use, planned development known as Kayak Bay Village and a proposed City park that will provide recreational access to the St. Louis River. Partially completed project materials for the public infrastructure components are available; however, the plans need to be finalized and approved by three key agencies in order for the project to proceed. These three approvals are the initial key objectives for the project and are critical to the overall project schedule. The three approvals coincide with the three existing transportation facilities present within and adjacent to the proposed development site. The facilities are the BNSF railroad spur, Willard Munger State Bike Trail, and Grand Avenue (Trunk Highway 23).

1. **Objective 1** – Secure BNSF approval for the proposed at-grade road/railroad crossing. Final approval of this crossing is a requirement of the sale of land to the City for the development of the park. BNSF has approved the crossing concept but requires review of final plans in order to provide final approval and permtting.
2. **Objective 2** – Finalize DNR approval and obtain permitting for the road and utility crossing of the Munger State Trail. The DNR has approved the project concept but requires easement exhibits and final plans for review and approval.
3. **Objective 3** – Secure MnDOT approval of the Intersection Control Evaluation (ICE) for the proposed intersection with Grand Avenue. Update and resubmit the draft ICE report, addressing MnDOT's comments, and develop final plans for the addition of traffic signals at the Grand Avenue/Kayak Bay Drive/Warwick Street intersection.

   These objectives will be the primary focus of effort on this project for the first few weeks of work. Once deliverables are completed for all of these objectives, work can commence on the final objective.
4. **Objective 4** – Complete final plans, specifications, and permitting for a spring 2019 bid letting and 2019 summer construction.

We understand the schedule implications of Objectives 1-3 and that completing work on these objectives is critical to meeting the overall project goals. This will require our work to begin immediately, which we are poised to do utilizing the detailed project work plan enclosed. This work plan indicates our understanding of the required project tasks, highlights our readiness to begin work, and serves as the scope for the professional services contract. We have developed this work plan based on review of the project RFP, our meeting and discussions with City officials, a project site visit, and review of complete or partially complete project materials.

### AVAILABLE PROJECT MATERIAL

The following is a brief discussion of the applicability of the available project material used in the development of this proposal and further use in completion of the required project tasks and objectives.

**Environmental Assessment Worksheets (EAW)** were produced for proposed Kayak Bay Village development project. The EAW was published for public comment on October 30, 2017, and a record of decision was filed on January 17, 2018, finding that the project does not have the potential for significant environmental impact. The EAW encompasses the Kayak Bay public road and utilities that are the subject of this proposal.

**Preliminary road and utility plans** were developed and a draft PDF is available for use as a starting point for design. City staff has completed a preliminary review of these plans. Plan elements are not assumed to be complete, approved, or in compliance with standards, but may be used as a starting point for final plan development.

**Preliminary right-of-way plat** laying out the public road right of way has been completed and is under review. The plat, upon approval, will be recorded and serve as the basis for final road and utility locating. No additional right-of-way or temporary easement will be required for construction of the public road or utilities.

**Preliminary site grading plan** has been developed and the grading could be completed prior to bid letting. Topographic survey of the grade within the limits of the road improvements is included and may require updates to the design and estimated project quantities.

The City and developer are continuing to review and finalize the development plans. The City will provide final locations for driveways and utility service laterals.

**Grand Avenue/Kayak Bay Drive/Warwick Street ICE Report** is in final draft status. Our team will utilize the data available for the original report (traffic volumes, growth projects, crash data, etc.) to develop an updated report that addresses MnDOT's comments and concerns with the draft report.

## Experience

MSA is a full-service, multidisciplinary firm with core services matching the engineering requirements of the Kayak Bay Road, Utility and Signals project. This project will combine our transportation and municipal engineering programs to provide a well-balanced and locally based team to maximize project efficiency. We have chosen to supplement the MSA team with subconsultants in areas where we can enhance our own depth of services. These talented individuals have considerable local knowledge for specific elements of the design and construction phases of the project. The following examples of completed projects highlights the MSA team's experience, which we will draw on to meet the design and schedule challenges set forth in the project RFP.

### MUNICIPAL STATE AID EXPERIENCE

217th Avenue NW | Oak Grove, MN

MSA assisted the City in reconstructing approximately 0.35 miles of this road. The existing gravel road was widened and improved structurally before being paved to a bituminous surface. Additionally, ditches were improved and culverts installed to aid in the drainage of the corridor. A portion of this road saw urban aspects added in the form of a curb and gutter system, catch basins, as well as a storm sewer pond. With the improvements of this road came the need for a right turn lane which was constructed on the east end of the project where 217th Avenue NW intersects with County State Aid Highway 7 (Rum River Blvd NW). Another right turn lane was added for southbound County State Aid Highway 7 traffic accessing 217th Ave NW. Throughout the project, extensive neighborhood outreach was done in the form of weekly update letters as well as coordinating tree replacement for homeowners. This was done due to the initial clearing and grubbing of existing trees required to achieve State Aid standard travel-lane and clear-zone widths.

KEY STAFF

*James Watters - Design Engineer, Construction Inspection*

Nightingale St. NW Reconditioning | Oak Grove, MN

KEY STAFF

*James Watters - Design Engineer, Construction Inspection*

This nearly $1 million project encompassed 2.5 miles of Nightingale Street NW from County State Aid Highway 22 (Viking Boulevard NW) to Lake George Parkway NW. Along this corridor was access to City Hall as well as a popular soccer field complex. This project saw the existing road milled and then reclaimed, before being repaved to a bituminous surface. Additionally, existing turn lanes were lengthened and a bypass lane was constructed to meet State Aid standards. ADA compliant pedestrian ramps were installed where an existing trail crossed Nightingale Street NW near city hall. All signage throughout the corridor was replaced and upsized in trouble areas due to past accidents. Drainage in the area was improved by replacing an existing cross culvert with a 48-inch RCP culvert. This culvert maintains flow for an Anoka County ditch that ran through the corridor. County coordination was required in the form of wetland delineation, a drainage design memo and traffic control plans. These tasks were completed for Anoka County to review before a permit could be issued.

7th Avenue and 2nd Street Improvements | Newport, MN

MSA improved 7th Avenue and 2nd Street in the City of Newport to State Aid standards. This project was also part of MnDOT's TH 61/I494 improvements. The improvements consisted of grading, construction of water, sanitary and storm sewer utilities in rock, railroad at-grade crossing improvements, bituminous paving, watermain installation and concrete curb and gutter. Shown in the image on the right, MSA coordinated with the BNSF to drill in the watermain underneath an active rail line.

## MNDOT SIGNAL DESIGN

Traffic Signal Improvements | MnDOT District 1

Traffic engineering is a core transportation service at MSA with discipline experience that includes intersection analysis, traffic signal design and traffic impact analysis studies. Our lead design technician, Chris Smith, is a former traffic signal designer for MnDOT District 1 and provides over five years of traffic signal design, construction, and operation experience. Chris has worked on the design and implementation of traffic signals in and around the Duluth area, including the following intersections located on the same Grand Avenue (TH 23) corridor as the proposed Kayak Bay Drive intersection.

- TH 23 and Raleigh Street
- TH 23 and S. 72nd Avenue West
- TH 23 and Arbor Street

KEY STAFF

*Chris Smith - Signal Design Technician*

## DESIGN AND INSPECTION OF HDPE WATERMAIN

Esko Industrial Park | Thomson, MN

The Town of Thomson has been proactive to position their community for future economic development opportunities and improve their tax base. With the aid of an AgStar grant, the Town of Thomson retained the engineering services of MSA to develop utility capacity projections and associated costs for water and wastewater improvements and complete a a feasibility study to determine costs of implementing the extended sewer and water and constructing buildings on a vacant property. MSA staff also developed a water and wastewater distribution plan that would meet the Town's needs by extending a nearly 9,000 feet of 12-inch HDPE watermain, 5,000 feet of 8-inch HDPE watermain and 5,000 feet of HDPE sanitary sewer for the industrial park. The 12-inch HDPE water line was directionally drilled to avoid disturbance of wetlands and a river. MSA also worked with Carlton County to procure a second business development grant that allowed the business park to upgrade to paved roads and include a turn lane on Highway 61. The business park is now home to freight logistics and manufacturing businesses.

MSA assisted with obtaining grants, site design, wetland delineation, stormwater, and utility design. The total utility project cost was $1,562,000.

In addition to the featured project, MSA staff have managed, designed and inspected the installation of HDPE water main at the following locations:

- **City of Platteville,** UW-Platteville Campus Water Main Replacement
- **City of Richland Center,** Collins Drive Water Replacement
- **Village of Kendall,** White Street Water Main Replacement
- **City of Baraboo,** Water Street Water Main Replacement
- **City of Rice Lake,** Sawyer Street Utility Crossing

## RAILROAD EXPERIENCE

Many of MSA's urban street and rural highway projects have included railroad coordination and at-grade rail crossing designs. The proposed MSA team has lead or been involved in each of the following projects with railroads.

### N. 28th Street Rehab | Superior, WI

N. 28th Street is a minor arterial on the south side of the City of Superior that carries 7,000 vehicles per day. It serves as a connection between WIS 35 and USH 53 and is a primary route for fuel trucks leaving the refinery south of the project limits. The existing roadway is a four-lane highway, with both curb and gutter as well as aggregate shoulder sections. Just to the west, the street includes a center left-turn lane for access to a shopping mall complex. There is one at-grade railroad crossing within the project limits.

The project purpose was to address the failing pavement condition. Project needs include addressing multi-modal transportation needs identified by various planning efforts and **reconstructing the at-grade railroad crossing to include gates and new signals.** MSA worked with the City of Superior to identify design solutions to maximize value. The current AADT supports a "road diet" approach that will allow for a reduction in the amount of overlay pavement area by eliminating a through travel lane and reducing turn lane lengths. This will allow more budget for a thicker pavement section to support the high volume of truck traffic. The "road diet" approach will also allow for addition of bicycle accommodations with paved shoulders.

The project is funded with Federal Funds through the STP Local Roads Program. MSA is managing the project delivery requirements required for this funding source.

*North 28th Street, existing at-grade railroad crossing.*

KEY STAFF

*Jason DiPiazza – Project Manager*
*James Watters – Design Engineer*
*Brian Huibregtse – Traffic Engineer*
*Chris Smith – Design Technician*

### WIS 16 Reconstruction
Oconomowoc, WI

KEY STAFF

*Brian Huibregtse – Project Manager*
*Jason DiPiazza – Design Engineeer*

### WIS 113 Reconstruction
Madison, WI

KEY STAFF

*Jason DiPiazza – Project Manager*
*Brian Huibregtse – Design Engineeer*

### WIS 58/82 Redesignation & Intersection
Madison, WI

KEY STAFF

*Brian Huibregtse – Project Manager*
*Jason DiPiazza – Design Engineer*

## RAIN GARDEN DESIGN EXPERIENCE

SAS + Associates

SAS+Associates have completed numerous landscape architectural projects that have included all phases of design including master planning, site planning, park design, grading and stormwater control. Below is a list of projects that are similar to the scope for this project.

| PROJECT | LOCATION |
|---|---|
| Rain Gardens | Duluth Township, MN |
| Rain Gardens | Grand Marais, MN |
| Stoney Point Cottages Rain Gardens | Duluth Township, MN |
| Tower Ave and Belknap Street Streetscape | Superior, WI |
| Silver Street Streetscape | Hurley, WI |

*Rain Garden Design, Grand Marais, MN*

## Jason DiPiazza, PE

**Project Manager**

***Project Role:*** *Jason will manage the overall project delivery process. He will coordinate completion of project deliverables, lead City staff and project stakeholder meetings, and is the primary point of contact for City of Duluth staff.*

Jason has experience both designing and constructing urban and rural highways, streets and municipal transportation projects. His expertise extends across all phases of these projects from project scoping, through preliminary and final design, and into construction. Project responsibilities include public involvement, environmental documentation, utility coordination, reports, and plans and specifications. His project management experience includes developing other technical aspects of these transportation projects, including stormwater infrastructure, municipal utilities, bridges, traffic analysis and real estate

### Education

B.S., Civil & Environmental Engineering
University of Wisconsin-Madison

### Registration

Professional Engineer, MN, WI

### Selected Project Experience

**N. 28th Street,** Superior, WI
Project Manager. Developing plans for the resurfacing of 1.2 miles of a minor arterial street and truck route that serves commercial and residential development.

**CSAH 17,** Cook County, MN
Project Manager. Managing the design and plan development for resurfacing of 10.5 miles of CSAH 17 near Grand Portage. The plans include replacement of Bridge 88513.

**20th Street,** Superior, WI
Project Manager. Developed plans for the reconstruction of 0.4 miles of residential street that will convert the existing rural section to an urban section and installed new storm sewer.

## James Watters, PE

**Roadway Design Engineer**

***Project Role:*** *James will lead the roadway design and plan development and provide construction management for State Aid compliance throughout project delivery.*

James is a member of MSA's transportation engineering group. His project involvement includes both design and construction phase engineering for both rural and urban street improvement projects for a variety of local, State Aid, and federally funded projects.

### Education

B.S., Civil Engineering
Iowa State University

### Registration

Professional Engineer, MN, IA
MnDOT Bituminous Street Level I & II
MnDOT Concrete Field Level I & II
MnDOT Grading and Base Level I & II
MnDOT Aggregate Production
University of Minnesota Design of Construction SWPPP
MnDOT 2018 ADA Construction Inspection Training

### Selected Project Experience

**S.A.P. 223-108-001 2016 Nightingale St. NW Reconditioning,** Oak Grove, MN
Completed the roadway design, stormwater management, construction plans, and SWPP. Completed necessary forms required for materials testing/certification and labor compliance laws including certified payroll review and onsite construction personel interviews.

**S.A.P. 223-113-001 2014 - 217th Ave NW Improvements,** Oak Grove, MN
Construction inspection/administration. Completed necessary forms required for materials testing/certification and labor compliance laws including certified payroll review and onsite construction personel interviews.

**N. 28th Street,** Superior, WI
Design Engineer. Completed designs for ADA-compliant sidewalk ramp improvement.

## Brian Huibregtse, PE

**Traffic/Railroad Engineer**

***Project Role:*** *Brian will provide traffic engineering services including ICE report completion and traffic signal design. Brian will assist with railroad coordination and at-grade crossing design.*

Brian's project experience includes traffic signal design, intersection control evaluations, preliminary and final intersection design, microsimulation modeling, construction staging, public involvement, crash and safety analyses, and signage and pavement markings for both rural and urban projects. Brian has been the lead design engineer for a variety of projects types that have included improvements to a number of rail crossings.

### Education

B.S., Civil Engineering
University of Wisconsin-Madison

### Registration

Professional Engineer, MN, WI

### Selected Project Experience

**WIS 58/82 Redesignation,** Mauston, WI
Project manager, lead roadway designer, traffic engineer, railroad coordination manager.

**WIS 16 (Wisconsin Avenue),** Oconomowoc, WI
Lead roadway designer, railroad coordination manager.

**N. 28th Street,** Superior, WI
Assisted with railroad coordination.

**USH 151,** Manitowoc County, WI
Project manager, railroad coordination manager.

**Intersection Study,** Independence, MN
Traffic engineer.

**Rum River Ridge Intersection Study,** Oak Grove, MN
Traffic engineer.

## Andrew Barnebey, PE

**Sr. Stormwater Engineer**

***Project Role:*** *Andrew will provide stormwater design services and assist in permit development.*

Andrew has more than 18 years of experience with municipal engineering, project management, SWMM stormwater modeling and analysis, stormwater BMP design, planning and design for site development projects, as well as cost estimating and permitting.

### Education

B.S., Civil Engineering
Purdue University

### Registration

Professional Engineer, MN, CO, MI, WI

### Selected Project Experience

**Rice Lake Water Main Improvements,** Rice Lake, MN
Stormwater collection network design and analysis using a SWMM 5 model in Autodesk Storm and Sanitary Analysis and AutoCad Civil 3D.

**Fort Crk. Aqueduct Bypass/John St. Reconstruction,** Sault Ste. Marie, ON*
Performed general project management and coordination with in house structural engineers, surveyors, designers and inspectors; as well as project coordination and management with the City of Sault Ste. Marie. Responsible for hydraulic design of aqueduct and associated minor stormwater structures and piping. Also responsible for road design of all other aspects of civil design work.

**Ontario Finnish Resthome Association-Uusi Koti Expansion,** Sault Ste. Marie, ON*
Project manager and project engineer for all civil and site design work. Modeled and analyzed existing campus and all proposed future development with a SWMM 5 model to design stormwater facilities capable of handling all future development. Designed entry road and site improvements at and for the Uusi Koti residential building, and to allow for an additional high rise residential building in the future and future nursing home expansion.

**Denotes experience prior to MSA.*

# PERSONNEL

## Joe Jurewicz, PE

**Utility Design Engineer**

***Project Role:*** *Joe will lead the design effort for the HDPE watermain extension and sanitary sewer replacement.*

Joe has more than 16 years of experience completing multi-discipline engineering projects, including water distribution and sewer collection systems, sewer condition evaluations and rehabilitation, site paving and grading, stormwater management, and management and negotiation of planning and zoning issues.

### Education

B.S., Civil and Environmental Engineering
University of Wisconsin-Madison

### Registration

Professional Engineer, MN, WI, FL

### Selected Project Experience

- **Esko Industrial Park**, Thomson, MN
- **Westgate Boulevard Flood Repairs,** Duluth, MN
- **E. Calvary Watermain Replacement and Looping,** Rice Lake, MN
- **LS 6 and 7 Elimination,** Rice Lake, MN
- **Metering Station Improvements,** Rice Lake, MN
- **Chicago Avenue Reconstruction,** Rice Lake, MN
- **School Avenue Reconstruction,** Carlton, MN

## Erik Cooper, EIT

**Project Engineer**

***Project Role:*** *Erik will assist with utility plan development and provide construction inspection services.*

Erik recently joined MSA after graduating from the University of Minnesota Duluth in 2014. He has experience in a variety of municipal engineering projects. Prior to MSA, he worked on the survey crew for the City of Duluth.

### Education

B.S., Civil Engineering
University of Minnesota-Duluth

### Registration

Engineer in Training, MN

### Selected Project Experience

- **2015 Road Overlay,** Thomson, MN
- **Birch Point Wastewater Collection System**, Grand Lake Township, MN
- **School Avenue,** Carlton, MN
- **PLAWCS Lift Station Rehabilitation**, Duluth, MN
- **Culvert Survey Phase II,** St. Louis County, MN
- **Lift Station 6,** Rice Lake, MN
- **DNSSD, Ryan Road Manhole Rehabilitation,** Knife River, MN

## Chris Smith

Senior Engineering Technician

*Project Role: Chris will lead overall plan development and lead the traffic signal design effort.*

Chris is an experienced civil engineering technician with more than 10 years of experience working in the transportation engineering industry on MnDOT projects. He routinely works with project managers and engineers to draft and develop project plans consistent with project requirements.

### EDUCATION

A.A.S., Civil Engineering Technology
Lake Superior College

### SELECTED PROJECT EXPERIENCE

- **TH 61,** Two Harbors, MN*
- **TH 23,** Duluth, MN*
- **TH 53 from Haines Road to Midway Road,** Hermantown, MN*
- **TH 33,** Cloquet, MN
- **TH 169,** Grand Rapids, MN

**Denotes experience prior to MSA.*

## Phil Lockett

Construction Technician

*Project Role: Phil will provide construction inspection and administration services.*

Phil has been with MSA since 1998 and has worked in the industry since 1993. Over this period, he has worked on a wide variety of projects for clients in Minnesota. In addition to construction inspection and management experience, he provides experience in the collection of topographic data for the completion of design surveys and surveys for construction staking projects.

### EDUCATION

B.S., Geology & Environmental Hydrogeology, University of Minnesota-Duluth

### REGISTRATION

MnDOT Bituminous Street
MnDOT Concrete Field Level I & II
MnDOT Grading and Base Level I & II
MnDOT Aggregate Production
Certified MnDOT Inspector
Certified Erosion Control Installer
MDH Asbestos Inspector
MDH Asbestos Site Supervisor

### SELECTED PROJECT EXPERIENCE

- **Street Improvement Project Lakeside Upper,** Lower and Central, Duluth, MN
- **Lift Station No. 8,** Duluth, MN
- **Street Improvements Project Lakeside - Congdon, Denfeld, Morgan Park, Norton Park,** Duluth, MN
- **East Interceptor SSO**, Duluth, MN

SAS + ASSOCIATES

## SAS and Associates

Planting Plan and Rain Garden Details

*Project Role: SAS will develop the rain garden planting plans and will provide tree species selection and planting plan details for boulevard trees.*

SAS+Associates offers expertise in all phases of site design and landscape architecture, from conceptual plans to design details and careful monitoring of construction. Their expertise in all aspects of master planning, site planning, park design, grading and storm water control and landscape design makes SAS+Associates among the most well-regarded and successful site design firms in the Northland. SAS's history of demonstrated project success is only possible with its highly motivated and creative staff. Each member of the firm has expertise in facilitating public input, completing public and private design work, master planning, construction detailing, site and parks master planning and project management. Being based in Duluth, SAS understands the challenges and opportunities the unique climate brings, especially when selecting plant materials and site elements best suited for the region.

## Knowledge of Duluth Requirements

MSA has been located in the City of Duluth and developing design and plans to the City Street and Utility Standards for more than 20 years. Highlighting this knowledge and expertise, MSA's lead construction inspector proposed for the project, Phillip Lockett, has been a key member of the MSA Duluth team throughout that time period. The MSA team will utilize this experience and know-how by involving Phillip in the project as early as survey and preliminary street and utility plan development. Phillip's role is to assure that the plans and specs are biddable, buildable, and meet the City's expectations for plan content and format per the requirements of the Street and Utility Standards.

# WORK PLAN

## Work Plan - Scope of Services

MSA has developed a work plan specifically tailored to this project. The work plan generally follows the Scope of Services outlined in the RFP. Additional detail, emphasis and support for the level of effort included in the work plan hours summary (and separate cost proposal) are included here to highlight MSA's understanding of the project scope, goals and objectives.



### 100 - INITIAL SITE VISIT AND CONSULTATION

The primary purpose or objective of this phase is to set the project for success right from the beginning. MSA will gather project data including system maps, record drawings, and reports, and formulate any questions that need to be answered and assumptions that need to be confirmed or converted into direction. We will then meet with City staff at a project kickoff meeting to finalize the project scope and delivery requirements. Agency, railroad and private utility representatives will be invited as an introduction to the project and allow a head start for permit, design reviews, and any necessary utility relocations. This phase is crucial for avoiding re-work and lost time, in order to meet the project schedule.

**Deliverables**

- Project Kickoff Meeting

**City-Provided Deliverables**

- Project materials (See List in Work Plan)
- Key staff participation in the Kickoff Meeting

### 200 - PLANS AND SPECIFICATIONS

MSA will develop road and utility design and construction plans per the provided schedule in this proposal. Following key deliverable submittals, MSA will lead a design review meeting with City and other agency review staff one to two weeks after submittal to review comments and next steps in the delivery process. This phase includes the four objectives identified as well as other tasks necessary to meet those objectives and the overall project goal. These tasks are identified in the work plan spreadsheet with expanded scope detail as follows:

#### INITIAL SITE SURVEY

MSA will convert the platted right of way into CAD line work file to use in plans and easement exhibits. The design will be based on, and tie into the established survey control coordinates and right of way description depicted in the final plat. MSA will conduct a limited topographic survey of these facilities where they cross the established right of way. Topographic survey will include a check of plat control points to verify coordinate systems. The plan location and elevations of these facilities will set the vertical design for the road and location for utilities:

- Grand Avenue
- Munger Trail
- BNSF railroad
- WLSSD interceptor manhole
- Sanitary sewer manhole SA0150101
- 12-inch water main, south side of Grand Ave
- 16-inch gas main, between Munger Trail and Grand Ave

**Assumptions**

- City will obtain access permission for survey on developer owned property and BNSF railroad.
- City will locate field locate utilities.

## PRELIMINARY EXHIBITS - BNSF RAILROAD & MUNGER TRAIL:

Once the location and elevation of the critical facilities listed above are surveyed, MSA will proceed to 60% plan level design for the road and utilities and develop a preliminary plan set and exhibit showing improvements at the BNSF and Munger Trail crossings. These exhibits will include:

- Plan and elevation designs for the road, sidewalk/path, and utilities.
- Roadway sections and grading slope intercepts.
- Permanent traffic control and ADA pedestrian facilities.
- Stormwater management (storm sewer).
- Easement details (obtained from the right-of-way plat) for the road right away easement across MnDNR right of way for the Munger Trail.

**Assumptions**

The at-grade railroad crossing of the BNSF tracks will not have active warning devices (gates/signals) and will only have passive devices (signs & pavement markings), thus a raised median is not required. Kayak Bay Drive will be stop controlled at the tracks. MSA will review and provide exhibits for available sight distances and required improvements to provide adequate sight lines. The rail line is a spur and only supports one train per week.

## ROADWAY DESIGN & PLANS – KAYAK BAY DRIVE

- **Roadway alignment and profile:** Match the alignment of the recorded right of way and confirm that State Aid Standards are met. The preliminary profile includes a significant deflection at the Munger Trail crossing and a tangent grade of 5.7% from the rail to the rail crossing. Improve on this profile at the trail crossing and attempt to lower the profile at the Munger trail to reduce the tangent slope to five-percent or less for ADA conformance. Determine the impacts to the Munger Trail and balance impacts and ADA requirements. Earthwork balance is not a priority objective. The profile design will assume that the 16-inch gas main north of the Munger Trail is sufficiently deep, or will be relocated if necessary, to provide adequate cover during construction and at final completion. Re-design of the roadway profile to account for the gas main elevation is considered Extra Services.

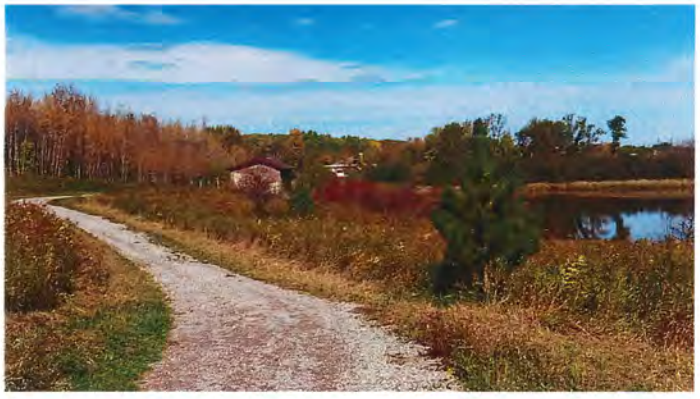
- **Roadway Sections:** 28-foot wide urban street design, normal crown section, review super elevation needs (reverse crown) with City staff (300' radius curves in preliminary plat). Parallel 10-foot-wide paved path, except for path alignment adjustments at the Munger Trail crossing. Utilize 4:1 H:V max match slopes for grading intercepts. Plans will include cross sections at 25-foot spacing and key intersection/driveway points. Driveway locations will be provided by the City. Use standard City street section. The existing surface for grading intercepts will be based off City provided LIDAR data, unless grading is completed by the Kayak Bay Village Developer (see Supplemental Survey task).

**Assumptions**

- The right-of-way plat will be approved and no changes made.
- Soil borings will not encounter bedrock or unsuitable soils, requiring design modifications. Assume the standard City roadway structure is sufficient for the native soil types.
- 16-inch gas main is at sufficient depth for minimum cover requirements.

## ROADWAY DESIGN & PLANS – KAYAK BAY DRIVE – PARK LOOP

- **Roadway alignment and profile:** Design an alignment and vertical profile to avoid existing utility structures and the Western Waterfront Trail, provide adequate sight distance to



the railroad crossing and generally match the concept drawing provided with the RFP. The loop road will be one-way traffic. Verify roadway alignment and section width to accommodate passenger vehicles with trailers, SU truck, and bus or fire truck turning templates.

- **Roadway Sections:** Provide a 15- to 20-foot, monosloped roadway (one [1] travel lane, increase width for dropoff areas at locations provided by the City). The section will be rural with roadway stromwater drainage directed towards a rain garden stormwater area in the center of the loop road. Plans will include cross sections at 25-foot spacing. The existing surface for grading intercepts will be based off City-provided topo data.

## ROADWAY DESIGN & PLANS – OVERFLOW PARKING LOT & LOOP ROAD PARKING

- Provide a plan layout and site-grading plan for an overflow parking lot on the north side of Kayak Bay Drive.
- Provide plan layout for two parking areas along the loop road. One area will be an accessible parking location. City will provide locations and design requirements (i.e. number of stalls).

### City Provided Deliverables

- Coordination with the developer and designers of the proposed City park for design review.
- Parking lot locations and design requirements (i.e. number of stalls, need for trailer accommodations, and accessibility requirements.

## STORMWATER DESIGN & PLANS – KAYAK BAY DRIVE

**Storm Sewer Design:** Develop stormwater calculations and design a storm sewer system for Kayak Bay Drive, meeting State Aid and City Standards.

- For offsite water, design inlet capacity for street and offsite overland flow to meet current, undeveloped conditions.
- Size the trunk system for developed conditions by accommodating the existing pre-development flow rate and timing at an entry point to the system that is provided by the City.
- Water quality treatment is required and should be provided by a sedimentation and floating debris, low flow bypass vault system downstream of the railroad crossing.
- Provide water quality calculations for the vault system. Rate and volume attenuation is not required.
- The system outlet, downstream of the water quality vault, shall be at the St. Louis River, above the ordinary high water mark. The City will provide the ordinary high water mark elevation.
- Provide plans for modification to MnDOT's storm sewer system on Grand Avenue to collect and contain that stormwater on that system, if necessary.
- Prepare and submit required stormwater discharge permits.
- Prepare the standard City drainage report

### City-Provided Deliverables

- Locations for offsite storm sewer connections.
- Standard or sample details for desired storm water quality, low flow bypass vault.

### Assumptions

- Design and construction details will be City standard
- Additional offsite, overland flow will be created by the development.

## STORMWATER DESIGN & PLANS – KAYAK BAY DRIVE – PARK LOOP

- Provide design calculations for stormwater volumes and rates and develop a design and construction plans for a rain garden, stormwater basin on the inside of the park road loop.
- Avoid grading, cover, and infiltration impacts above the WLSSD sanitary sewer interceptor.
- Include construction details and a planting plan for review and approval by the City Engineering and Parks departments.

## UTILITY PLANS

**Water main:** 8-inch HDPE main, connecting at Grand Avenue, dead end at BNSF. Casing pipe is required under the Munger Trail.

**Sanitary sewer:** 8-inch sewer main between MH SA0150101 at Grand Avenue and WLSSD interceptor manhole within the future park property. Provide construction details and permit applications for casing and sewer installation below BNSF tracks.

### City-Provided Deliverables

- Construction detail and special provisions for the proposed odor trap on the sewer main, near the WLSSD connection.
- Service lateral locations.

### Assumptions

- Standard City construction details and specifications (no special provisions or additional construction details).

## INTERSECTION DESIGN AND PLANS

**ICE Report -** Develop a new Intersection Control Evaluation (ICE) and report for submittal to MnDOT. A draft ICE report has been reviewed by MnDOT and the City has provided the comments that require action to address. Utilize the following traffic data:

- Grand Avenue traffic volume: Obtain current Grand Avenue volumes from MnDOT. Updated traffic counts are not included and are considered Extra Services.
- Turning movements. Utilize the traffic projections for the development provided in the draft ICE report. Review the data for any errors, but assume the development conditions (i.e. land use, distribution) remain the same.
- Review and reanalyze modeling and analysis in the original report. Discuss any concerns or discrepancies with City staff and review any proposed changes beyond the MnDOT required changes with City staff, then MnDOT traffic engineering.
- The ICE shall analyze traffic signal, single lane roundabout, and two-way stop control alternatives for the existing and future conditions.

**City Provided Deliverables**

- Current draft ICE report (already provided) and MnDOT comments.

**Assumptions**

- The existing extrapolated traffic projections for Warwick Street (Spirt Mountain Chalet) is acceptable to the City and MnDOT. MSA will discuss any concerns with these volumes.
- The development land use and traffic generation data in the draft ICE report is consistent with the current plan for development. Changes or modifications to the development and resulting traffic generations changes will require Extra Services to update that data.

## TRAFFIC SIGNAL PLANS

Develop traffic signal design plans for MnDOT review and approval using MnDOT standard designs.

**City-Provided Deliverables**

- City specific traffic signal hardware specs and requirements for system compatibility
- City preferred layouts, wiring, or cabinet set ups

**Assumptions**

- Any City provided requirements for signal hardware, layouts, wiring, cabinet set up etc. are approved and acceptable to MnDOT.

## SUPPLEMENTAL SURVEY

Provide a topographic survey of the road right of way between the Munger Trail and BNSF after the developer grades the site this fall. Incorporate this data into the existing surface model.

**Assumptions**

- Survey work will be performed in above-zero temperatures and with less than 12 inches of snow cover.
- No grading work is anticipated between the Munger Trail and Grand Avenue. (Note – grading work is shown on the site plan, but not included in the RFP.)

**Project Submittals**

Required plan submittals:

- MnDOT District 1 Traffic – Signal Design approval
- MnDOT State Aid Office – Final plan approval
- MnDNR – Munger Trail crossing
- BNSF – At-grade road crossing and utility permitting

## UTILITY COORDINATION

- Verify utilities present in the area with a Gopher One Call planning ticket.
- Notify utility companies present of the proposed project, request system maps, as-builts etc.
- Send utilities preliminary (60%) plans and review potential utility conflicts.
- Review utility relocation plans, if necessary. Review relocation progress between final design and construction start.
- Invite utilities to project progress meetings, pre-bid conference, and pre-construction conference, as appropriate.

**Assumptions**

Utilities within the project area are limited to:

- City-owned utilities shown on the GIS mapping.
- Buried or overhead telecom facilities located within the MnDOT, MnDNR, or BNSF rights of way.
- Buried telecom facilities located within City owned utility easement.
- Overhead Minnesota Power transmission facility – no conflicts are anticipated.

**City-Provided Deliverables**

- Plan review and permitting for new private utility facilities within the street or utility right of way

## PERMITTING & AGENCY COORDINATION

Coordinate permit approval requirements and develop permit applications with the following agencies and the required permits.

MnDNR:

- Construction Stormwater NOI
- Public Waters Work Permit (erosion protection below OHWL for storm sewer discharge)

MPCA:

- Stormwater Discharge Permit

WLSSD:

- Sanitary Sewer Extension Application Form

St. Louis County:

- Coordination only due to funding source

**Assumptions**

- Coordination and preliminary permitting discussion with USACE is covered under the EAW. Permits and mitigation for wetland fill is being addressed by the developer for the entire site, including the roadway.
- City permits will be addressed by City staff.

**Phase 200 Deliverables**

- Munger Trail crossing exhibit for MnDNR coordination.
- BNSF at-grade railroad crossing exhibit for BNSF coordination.
- 60% plan review set (roadway, stormwater, and utilities).
- 90% plan review set (roadway, stormwater, and utilities), includes special provisions and cost estimate.
- Final plans and specifications for City and MnDOT review and signatures.

## 300 - MEETINGS & PUBLIC PARTICIPATION

MSA understands that effective communication is critical to the success of this project. The objective for the MSA team is to assemble and understand the communications and agreements to date and execute the tentative agreements and conditional approvals with a completed plan bid set. The work plan includes one public meeting to coordinate and communicate with residents and businesses.

The public has had opportunity to review and provide comment on the proposed project and preliminary designs through the EAW process, so a public meeting should focus on design details and construction impacts and schedule.

This phase also includes meetings with the facility and land owners within the project limits that have a large impact on the design of the project. Two meetings are included with MnDNR regarding the Munger Trail crossing and two meetings are included with BNSF regarding the railroad crossing. These meetings are assumed to be onsite, or at City Hall. Two meetings are also included with MnDOT to review the updated ICE report and review traffic signal plans to help push those towards approval. These meetings are assumed to be at the MnDOT District One office in Duluth.

This phase also includes planning and progress meetings with city staff. During the design phase of the project, monthly meetings are included to review project progress, discuss review comments on deliverables, and confirm next steps in the delivery process. Due to the short time period for design, these monthly meetings may not be regular enough to keep the project on track. Bi-weekly progress reports are also included in this which will be emailed reports. This regular communication will continue through construction however communication efforts during construction are included in Phase 600 Construction Administration.

For all meetings, MSA will coordinate schedules, prepare meeting materials (agendas, handouts, roster sheets), lead the meetings, and document meeting minutes.

**Assumptions**

- City will be the primary point of contact for the developer and coordinate review of plans, if necessary.

**City-Provided Deliverables**

- Meeting locations at City Hall.
- Participation in regular status meetings by key City staff.
- Coordination and communication with the developer and land owner.

- Media contacts.
- Meeting invitation mailings to residents and businesses.

**Phase Deliverables**

- Public engagement meetings (one)
- Meetings with DNR (two)
- Meetings with BNSF (two)
- Meetings with MnDOT (two)
- Monthly status meetings with City staff (five)
- Bi-weekly status reports

## 400 - COST ESTIMATE

Detailed Cost estimates will be prepared and updated for 60%, 90%, and final bidding document submittals.

**Phase Deliverables**

- Cost Estimates (three)

## 500 - PROJECT BIDDING

MSA will prepare project specific final bidding document deliverables and will lead a pre-bid conference with prospective bidders. MSA will also be available to answer bid questions related to the plan details and specifications as requested by City staff.

**Phase Deliverables**

- Final plans and special provisions.
- Answers to bid questions on plan details/special provisions.
- Pre-bid conference meeting materials (agenda, sign-in sheet, exhibits).

**City-Provided Deliverables**

- Recent bid street project bid results.
- Project advertising for bidding.

## 600 - CONSTRUCTION ADMINISTRATION

Hours provided in the work plan assume a weekly construction meeting with the contractor, MnDOT State Aid, and City staff that MSA will lead and provide the necessary materials. The work plan also includes hours for construction staking and layout by a survey technician; however, MSA's lead inspector has the experience and survey grade equipment to provide supplemental stake out during construction. This reduces risk of project delay from issues with scheduling and completing staking based on the contractor's schedule.

**Phase Deliverables**

- Weekly construction meeting agendas and notes
- Weekly progress reports
- Shop drawing review
- Materials testing (subconsultant)
- State Aid required project documentation
- Staking/layout for roadway and utility construction
- Project close out records
- Record drawings

## 700 - CONSTRUCTION INSPECTION

Construction inspection matches the RFP estimation of 60 hours per week of construction activity for a 10-week construction period. Phillip Lockett and Erik Cooper will be the primary inspectors for the project. James Watters will provide additional inspection support when needed. James will also manage the State Aid Documentation requirements.

**Phase Deliverables**

- On-site construction inspection during active work operation
- Inspection diaries of daily work activities

## 800 - CONTRACT ADMINISTRATION & PROJECT MANAGEMENT

We believe that effective internal project management starts with clear and consistent communication with the City. To emphasize our commitment to this objective, we have explicitly included these efforts as a separate phase. This phase includes the time and effort to provide regular project invoicing, contract scope management, and schedule management. The goal is to assure City project managers are kept current on project progress and understand the relationship with progress and invoicing.

**Phase Deliverables**

- Regular project invoicing and project status reports with each invoice

## CONCLUSION

We have developed this work plan based on the RFP, our review of the project site and already available project materials, and the assumptions listed within each of the phases. We recognize that the City is looking for a project consultant who will manage and provide the remainder of project delivery. However, the City still intends to take an active role in this process, as indicated in the lists in each of the phases.

| Kayak Bay Road Design, Utilties and Signal Design and Construction - City Project 1403 (Bid Number: 18-17AA) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phase | | | DiPiazza | Watters | Huibregtse | Barnebey | Jurewicz | Cooper | Smith | Lockett | Schley | TOTAL HOURS |
| Phase No. | Task / Deliverable | Task No. | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | |
| (Notes) | *Subtasks/Task notes & details* | | | | | | | | | | | |
| **100** | **Initial Site Visit & Consultation** | | **10** | **5** | **2** | **2** | **1** | **3** | **1** | **3** | **0** | **27** |
| | **Site Review & Site Research** | 101 | 2 | 4 | 1 | 1 | | 2 | | 2 | | 12 |
| | *Conduct site review, take photos, identify utilities, gather and prep LIDAR* | | | | | | | | | | | |
| *M* | **Project Kickoff Meeting (w/ City, Agencies, MnDOT, Utilities, RR)** | 102 | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 15 |
| | *Confirm schedule, scope, deliverables, procedures - includes internal project kickoff meeting - includes follow up correspondence with city staff* | | | | | | | | | | | |
| **200** | **Plans and Specifications** | | **38** | **162** | **103** | **53** | **15** | **45** | **260** | **6** | **46** | **728** |
| | **Initial Field Survey** | 201 | | | | | | | | | 24 | 24 |
| | *Survey topo for critical connections (Grand Ave, Munger Trail, BNSF, utility connection points, potential utility conflicts)* | | | | | | | | | | | |
| | **Munger Trail Crossing Design/Exhibit** | 202 | 1 | 2 | | | | | 4 | | 4 | 11 |
| | *Develop exhibits for coordination -include road/utility/storm sewer layouts and elevations, pedestrian facilities, permanent traffic control, road sections and grading intercepts* | | | | | | | | | | | |
| | **BNSF Crossing Design/Documentation** | 203 | 1 | 2 | 8 | | | 2 | 4 | | | 17 |
| | *Develop exhibits for coordination -include road/utility/storm sewer layouts and elevations, pedestrian facilities, permanent traffic control, road sections and grading intercepts* | | | | | | | | | | | |
| | **Roadway Design & Plans** | 204 | 13 | 105 | 9 | 3 | 2 | 0 | 113 | 2 | 4 | 251 |
| | *Roadway alignment, profile, cross section design. Includes parking lot layout (1) and parallel path* | | | | | | | | | | | |
| | **Stormwater Design & Plans** | 205 | 4 | 4 | 0 | 48 | 0 | 0 | 27 | 1 | 0 | 84 |
| | *Develop urban roadway storm sewer system, outlet to river. Develop stormwater calcs for rain garden sizing interior to park loop road* | | | | | | | | | | | |
| | **Utility Plans** | 206 | 3 | 3 | 0 | 0 | 6 | 31 | 58 | 2 | 0 | 103 |
| | *Sanitary sewer plan sheets, watermain plan sheets, gas main sheets* | | | | | | | | | | | |
| | **Intersection Design & Plans** | 207 | 6 | 24 | 80 | 0 | 0 | 0 | 48 | 1 | 0 | 159 |
| | *Includes ICE report and traffic signal design and plans* | | | | | | | | | | | |
| *S* | **Supplemental Survey** | 208 | | | | | | | | | 14 | 14 |
| | *Topo survey - Munger Trail to BNSF (after mass grading)* | | | | | | | | | | | |
| | **Roadway Design/Quantity Update** | 209 | 1 | 4 | | | | | 4 | | | 9 |
| | *Update existing ground and update design and estimated quantity calculations after mass grading* | | | | | | | | | | | |
| | **Project Specifications** | 210 | 2 | 4 | 4 | | 2 | 2 | | | | 14 |
| | *General and special provisions* | | | | | | | | | | | |
| | **Submittals** | 211 | 3 | 6 | 2 | 2 | 1 | 2 | 2 | | | 18 |
| | *MnDOT State Aid Office, MnDOT District 1 Traffic, BNSF, MnDNR (Munger Trail Crossing), 60% & 90% Plan Reviews* | | | | | | | | | | | |
| | **Utility Coordination** | 212 | 2 | 4 | | | 2 | 4 | | | | 12 |
| | *Coordinate project with private utilities (Minnesota Power, Telecom). Coordinate review of utility conflicts and utility relocations, if necessary* | | | | | | | | | | | |
| | **Permitting & Agency Coordination** | 213 | 2 | 4 | | | 2 | 4 | | | | 12 |
| | *Permits: Construction Stormwater, Stormwater Discharge - Agency Coordination: MNDNR, MPCA* | | | | | | | | | | | |
| **300** | **Meetings & Public Participation** | | **45** | **0** | **0** | **0** | **0** | **4** | **4** | **0** | **0** | **53** |
| *M* | **Public meeting** | 301 | 6 | | | | | 4 | 4 | | | 14 |
| | *1 meeting - Schedule, exhibits, coordinate invites, attend, document* | | | | | | | | | | | |
| *M* | **DNR Meetings** | 302 | 6 | | | | | | | | | 6 |
| | *2 meetings (onsite)* | | | | | | | | | | | |
| *M* | **BNSF Meetings** | 303 | 6 | | | | | | | | | 6 |
| | *2 meetings (onsite)* | | | | | | | | | | | |
| *M* | **MnDOT Meetings** | 304 | 6 | | | | | | | | | 6 |
| | *2 meetings (MnDOT District 1 office)* | | | | | | | | | | | |
| *M* | **Progress and planning meetings** | 305 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| | *Bi-weekly status updates and monthly progress or design review meetings (design phase)* | | | | | | | | | | | |
| **400** | **Cost Estimate** | | **2** | **8** | **3** | **3** | **0** | **6** | **6** | **0** | **0** | **27** |
| | **Cost Estimates** | 401 | 2 | 8 | 3 | 3 | 0 | 6 | 6 | 0 | 0 | 27 |
| | *Develop and update construction cost estimate at 60%, 90% & final plan submittals* | | | | | | | | | | | |

| Kayak Bay Road Design, Utilties and Signal Design and Construction - City Project 1403 (Bid Number: 18-17AA) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phase | | | DiPiazza | Watters | Huibregtse | Barnebey | Jurewicz | Cooper | Smith | Lockett | Schley | TOTAL HOURS |
| Phase No. (Notes) | Task / Deliverable<br>*Subtasks/Task notes & details* | Task No. | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | |
| **500** | **Project Bidding** | | **5** | **6** | **1** | **1** | **1** | **0** | **0** | **2** | **0** | **16** |
| | **Bidding documents**<br>*Prepare final plan bid set and contract bidding/bonding provisions* | 501 | 1 | 6 | | | | | | | | 7 |
| *M* | **Pre-bid conference**<br>*Attend meeting (City Hall)* | 502 | 2 | | | | | | | 2 | | 4 |
| *B* | **Bid support**<br>*Answer bidder questions* | 503 | 2 | | 1 | 1 | 1 | | | | | 5 |
| **600** | **Construction Administration (10 weeks)** | | **12** | **45** | **2** | **2** | **0** | **23** | **12** | **23** | **104** | **223** |
| | **Construction contract management**<br>*Process change orders, review submittals, prepare for and attend precon* | 601 | 5 | 10 | | | | | | 5 | | 20 |
| | **State Aid documentation & reporting**<br>*Certified payroll review/tracking, field interview* | 602 | | 10 | | | | | | | | 10 |
| | **Progress reports**<br>*Weekly - 10 weeks, includes schedule management* | 603 | | 5 | | | | 5 | | | | 10 |
| | **Shop drawing review** | 604 | | 5 | 2 | 2 | | 2 | | 1 | | 12 |
| | **Materials testing (Sub-Consultant)**<br>*Scheduling, materials acceptance forms, subconsultant management* | 605 | | 5 | | | | | | | | 5 |
| *M* | **Weekly Construction Meetings**<br>*10 weeks* | 606 | 5 | 10 | | | | 10 | | 5 | | 30 |
| | **Survey & layout (Staking)**<br>*Storm sewer, utilities, roadway, control, pond, ADA, signals* | 606 | | | | | | | | | 100 | 100 |
| | **Project close out**<br>*Punchlist, acceptance review, record drawings, reports, final payments* | 607 | 2 | | | | | 6 | 12 | 12 | 4 | 36 |
| **700** | **Construction Inspection** | | **0** | **0** | **0** | **0** | **0** | **450** | **0** | **150** | **0** | **600** |
| | **Construction inspection**<br>*10 weeks, 60 hours per week* | 701 | | | | | | 450 | | 150 | | 600 |
| **800** | **Contract Admin & Project Management** | | **24** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **24** |
| | **Contract Admin. & Proj. Mgmt.**<br>*12 month contract, 3 internal QA QC reviews* | 801 | 24 | | | | | | | | | 24 |
| | **GRAND TOTAL** | | **136** | **226** | **111** | **61** | **17** | **531** | **283** | **184** | **150** | **1698** |

Additional Notes

*M* Meeting Deliverables identified include: Coordinate meeting schedules, prepare meeting materials (agendas, handouts, exhibits), and document meeting minutes.

Assumed meeting location is onsite or at City Hall unless otherwise noted

*S* Survey: Railroad flagging fees are not included

*B* City will advertise and manage bid submittals and bid opening.

# WORK SCHEDULE

## Work Schedule

| DATE | TASK |
|---|---|
| October 22, 2018 | Council Approval to Award Contract |
| October 24, 2018 | Project Kick-off Meeting |
| October 26, 2018 | Initial Survey Complete |
| November 12, 2018 | Exhibits submitted for Munger Trail and BNSF crossings; ICE Report submitted to MnDOT |
| December 3, 2018 | 60% plans, cost estimate submitted for City review |
| December, 2018 | Public Meeting |
| January 7, 2019 | 90% plans, cost estimate submitted for City review |
| January 27, 2019 | 100% Plans and Specifications to City and State to review |
| February 11, 2019 | Plans and Specifications submitted to State Aid for signature |
| February 21, 2019 | Advertise for bids |
| March 14, 2019 | Receive bids |
| June 2019 | Start Construction |
| September, 2019 | Construction Completion |
| December, 2019 | Submittal of record drawings |

# REFERENCES

## References

**City of Superior, WI**
**Todd Janigo**
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51 East First Street
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**City of Oak Grove, MN**
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**Thomson Township, MN**
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**Lake and Cook County, MN**
**Krysten Foster**
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krysten.foster@co.lake.mn.us


COST PROPOSAL FOR:

# Kayak Bay Road, Utilities and Signal Project

**Prepared for:**
City of Duluth, MN
October 9, 2018

ORIGINAL

MSA

October 9, 2018

Eric Shaffer, PE
Chief Engineer of Utilities
City of Duluth - Engineering Division
411 W. 1st Street, Room 211 City Hall
Duluth, Minnesota 55802

**Re: Kayak Bay Road, Utilities, Signal Design and Construction Phase**
**City Project No. 1403**
**SAP 118-118-600-001 (Road)**
**SP 118-010-028 (Signal at TH 23)**
**Bid Number: 18-17AA**

Dear Eric,

Below and enclosed is the cost proposal from MSA Professional Services, Inc. (MSA) for the Kayak Bay Road, Utilities, and Signal project. The cost proposal is based on the following:

- The breakdown of hours by task and employee, which matches the Work Plan included in the project proposal
- Direct expesnses and unit cost rates, which are summarized in the cost proposal and broken out with cost rates on the last page.

MSA will subconsult the following services:

- Landscape design to SAS+Associates of Duluth, MN. SAS will be responsible for providing the planting plan, planting details, and planting specs for the rain garden and boulevard trees, including plant selection.

| COST PROPSAL | |
|---|---|
| MSA Fees | $153,951.00 |
| Direct Expenses | $5,173.93 |
| SAS+Associates *(subconsultant)* | $4,300.00 |
| **TOTAL PROJET COST (Design & Construction Engineering Services - not to exceed)** | **$163,424.93** |

The labor rates included in this proposal will remain in effect through project completion, which is expected before December 31, 2019.

Sincerely,
MSA Professional Services, Inc.

Jason DiPiazza, PE
Project Manager

Joe Jurewicz, PE
Team Leader

## Cost Proposal

**Kayak Bay Road Design, Utilties and Signal Design and Construction - City Project 1403 (Bid Number: 18-17AA)**

| Phase | | | Project Manager | Project Engineer Roadway | Project Engineer Traffic | Project Engineer Stormwater | Project Engineer Utilities | Staff Engineer | Engineering Technician Design | Engineering Technician Construction | Surveyor | Total Hours | Labor Cost | Direct Expenses | Subconsultant Fees | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hourly Rate | $124.00 | $98.00 | $119.00 | $117.00 | $118.00 | $77.00 | $87.00 | $85.00 | $77.00 | | | | | |
| Phase No. (Notes) | Task / Deliverable<br>*Subtasks/Task notes & details* | Task No. | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | | | | | |
| **100** | **Initial Site Visit & Consultation** | | **10** | **5** | **2** | **2** | **1** | **3** | **1** | **3** | **0** | **27** | **$ 2,893.00** | **$ 28.18** | **$ -** | **$2,921.18** |
| | **Site Review & Site Research**<br>*Conduct site review, take photos, identify utilities, gather and prep LIDAR* | 101 | 2 | 4 | 1 | 1 | 0 | 2 | 0 | 2 | 0 | 12 | $1,200.00 | $8.18 | | **$1,208.18** |
| *M* | **Project Kickoff Meeting (w/ City, Agencies, MnDOT, Utilities, RR)**<br>*Confirm schedule, scope, deliverables, procedures - includes internal project kickoff meeting - includes follow up correspondence with city staff* | 102 | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 15 | $1,693.00 | $20.00 | | **$1,713.00** |
| **200** | **Plans and Specifications** | | **38** | **162** | **103** | **53** | **15** | **45** | **260** | **6** | **46** | **728** | **$ 70,953.00** | **$ 793.18** | **$ 3,300.00** | **$ 75,046.18** |
| | **Initial Field Survey**<br>*Survey topo for critical connections (Grand Ave, Munger Trail, BNSF, utility connection points, potential utility conflicts)* | 201 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 24 | $1,848.00 | $338.68 | | **$2,186.68** |
| | **Munger Trail Crossing Design/Exhibit**<br>*Develop exhibits for coordination -include road/utility/storm sewer layouts and elevations, pedestrian facilities, permanent traffic control, road sections and grading intercepts* | 202 | 1 | 2 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 11 | $976.00 | $12.00 | | **$988.00** |
| | **BNSF Crossing Design/Documentation**<br>*Develop exhibits for coordination -include road/utility/storm sewer layouts and elevations, pedestrian facilities, permanent traffic control, road sections and grading intercepts* | 203 | 1 | 2 | 8 | 0 | 0 | 2 | 4 | 0 | 0 | 17 | $1,774.00 | $12.00 | | **$1,786.00** |
| | **Roadway Design & Plans**<br>*Roadway alignment, profile, cross section design. Includes parking lot layout (1) and parallel path* | 204 | 13 | 105 | 9 | 3 | 2 | 0 | 113 | 2 | 4 | 251 | $23,869.00 | $40.00 | $600.00 | **$24,509.00** |
| | **Stormwater Design & Plans**<br>*Develop urban roadway storm sewer system, outlet to river. Develop stormwater calcs for rain garden sizing interior to park loop road* | 205 | 4 | 4 | 0 | 48 | 0 | 0 | 27 | 1 | 0 | 84 | $8,938.00 | $5.00 | $2,100.00 | **$11,043.00** |
| | **Utility Plans**<br>*Sanitary sewer plan sheets, watermain plan sheets, gas main sheets* | 206 | 3 | 3 | 0 | 0 | 6 | 31 | 58 | 2 | 0 | 103 | $8,977.00 | $5.00 | | **$8,982.00** |
| | **Intersection Design & Plans**<br>*Includes ICE report and traffic signal design and plans* | 207 | 6 | 24 | 80 | 0 | 0 | 0 | 48 | 1 | 0 | 159 | $16,877.00 | $0.00 | | **$16,877.00** |
| *S* | **Supplemental Survey**<br>*Topo survey - Munger Trail to BNSF (after mass grading)* | 208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 | $1,078.00 | $330.50 | | **$1,408.50** |
| | **Roadway Design/Quantity Update**<br>*Update existing ground and update design and estimated quantity calculations after mass grading* | 209 | 1 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 9 | $864.00 | $0.00 | | **$864.00** |
| | **Project Specifications**<br>*Bidding, bonding, general and special provisions* | 210 | 2 | 4 | 4 | 0 | 2 | 2 | 0 | 0 | 0 | 14 | $1,506.00 | $0.00 | $600.00 | **$2,106.00** |
| | **Submittals**<br>*MnDOT State Aid Office, MnDOT District 1 Traffic, BNSF, MnDNR (Munger Trail Crossing), 60% & 90% Plan Reviews* | 211 | 3 | 6 | 2 | 2 | 1 | 2 | 2 | 0 | 0 | 18 | $1,878.00 | $20.00 | | **$1,898.00** |
| | **Utility Coordination**<br>*Coordinate project with private utilities (Minnesota Power, Telecom). Coordinate review of utility conflicts and utility relocations, if necessary* | 212 | 2 | 4 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 12 | $1,184.00 | $20.00 | | **$1,204.00** |
| | **Permitting & Agency Coordination**<br>*Permits: Construction Stormwater, Stormwater Discharge - Agency Coordination: MNDNR, MPCA* | 213 | 2 | 4 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 12 | $1,184.00 | $10.00 | | **$1,194.00** |
| **300** | **Meetings & Public Participation** | | **45** | **0** | **0** | **0** | **0** | **4** | **4** | **0** | **0** | **53** | **$ 6,236.00** | **$ 151.33** | **$ -** | **$ 6,387.33** |
| *M* | **Public meeting**<br>*1 meeting - Schedule, exhibits, coordinate invites, attend, document* | 301 | 6 | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 0 | 14 | $1,400.00 | $38.18 | | **$1,438.18** |
| *M* | **DNR Meetings**<br>*2 meetings (onsite)* | 302 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | $744.00 | $36.35 | | **$780.35** |
| *M* | **BNSF Meetings**<br>*2 meetings (onsite)* | 303 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | $744.00 | $36.35 | | **$780.35** |
| *M* | **MnDOT Meetings**<br>*2 meetings* | 304 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | $744.00 | $15.45 | | **$759.45** |
| *M* | **Progress and planning meetings**<br>*Bi-weekly status updates and monthly progress meetings (design) - includes plan review meetings* | 305 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | $2,604.00 | $25.00 | | **$2,629.00** |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **400** | **Cost Estimate** | | **2** | **8** | **3** | **3** | **0** | **6** | **6** | **0** | **0** | **27** | **$ 2,613.00** | **$ 5.00** | **$ - $ 2,618.00** |
| | **Cost Estimates** | 401 | 2 | 8 | 3 | 3 | 0 | 6 | 6 | 0 | 0 | 27 | $2,613.00 | $5.00 | **$2,618.00** |
| | *Develop and update construction cost estimate at 60%, 90% & final plan submittals* | | | | | | | | | | | | | | |
| **500** | **Project Bidding** | | **5** | **6** | **1** | **1** | **1** | **0** | **0** | **2** | **0** | **16** | **$ 1,732.00** | **$ 15.00** | **$ - $ 1,747.00** |
| | **Bidding documents** | 501 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | $712.00 | $5.00 | **$717.00** |
| | *Prepare final plans and contract general and special provisions* | | | | | | | | | | | | | | |
| ***M*** | **Pre-bid conference** | 502 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 4 | $418.00 | $10.00 | **$428.00** |
| | *Attend* | | | | | | | | | | | | | | |
| ***B*** | **Bid support** | 503 | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 5 | $602.00 | $0.00 | **$602.00** |
| | *Answer questions, develop addendum* | | | | | | | | | | | | | | |
| **600** | **Construction Administration (10 weeks)** | | **12** | **45** | **2** | **2** | **0** | **23** | **12** | **23** | **104** | **223** | **$ 19,148.00** | **$ 3,425.00** | **$ - $ 22,573.00** |
| | **Construction contract management** | 601 | 5 | 10 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 20 | $2,025.00 | $0.00 | **$2,025.00** |
| | *Process change orders, review submittals, prepare for and attend precon* | | | | | | | | | | | | | | |
| | **State Aid documentation & reporting** | 602 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | $980.00 | $10.00 | **$990.00** |
| | *Certified payroll review/tracking, field interview* | | | | | | | | | | | | | | |
| | **Progress reports** | 603 | 0 | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 10 | $875.00 | $10.00 | **$885.00** |
| | *Weekly - 10 weeks, includes schedule management* | | | | | | | | | | | | | | |
| | **Shop drawing review** | 604 | 0 | 5 | 2 | 2 | 0 | 2 | 0 | 1 | 0 | 12 | $1,201.00 | $10.00 | **$1,211.00** |
| | **Materials testing (Sub-Consultant)** | 605 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | $490.00 | $0.00 | **$490.00** |
| | *Scheduling, materials acceptance forms, subconsultant management* | | | | | | | | | | | | | | |
| ***M*** | **Weekly Construction Meetings** | 606 | 5 | 10 | 0 | 0 | 0 | 10 | 0 | 5 | 0 | 30 | $2,795.00 | $20.00 | **$2,815.00** |
| | *10 weeks* | | | | | | | | | | | | | | |
| | **Survey & layout (Staking)** | 606 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 100 | $7,700.00 | $3,355.00 | **$11,055.00** |
| | *Storm sewer, utilities, roadway* | | | | | | | | | | | | | | |
| | **Project close out** | 607 | 2 | 0 | 0 | 0 | 0 | 6 | 12 | 12 | 4 | 36 | $3,082.00 | $20.00 | **$3,102.00** |
| | *Punchlist, acceptance review, record drawings, reports, final payments* | | | | | | | | | | | | | | |
| **700** | **Construction Inspection** | | **0** | **0** | **0** | **0** | **0** | **450** | **0** | **150** | **0** | **600** | **$ 47,400.00** | **$ 751.25** | **$ 1,000.00 $ 49,151.25** |
| | **Construction inspection** | 701 | 0 | 0 | 0 | 0 | 0 | 450 | 0 | 150 | 0 | 600 | $47,400.00 | $751.25 | $1,000.00 **$49,151.25** |
| | *10 weeks, 60 hours per week* | | | | | | | | | | | | | | |
| **800** | **Contract Admin & Project Management** | | **24** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **24** | **$ 2,976.00** | **$ 5.00** | **$ - $ 2,981.00** |
| | **Contract Admin. & Proj. Mgmt.** | 801 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | $2,976.00 | $5.00 | **$2,981.00** |
| | *12 month contract* | | | | | | | | | | | | | | |
| **GRAND TOTAL** | | | **136** | **226** | **111** | **61** | **17** | **531** | **283** | **184** | **150** | **1698** | **$ 153,951.00** | **$ 5,173.93** | **$ 4,300.00 $ 163,424.93** |

Additional Notes/Assumptions

***M*** Meeting Deliverables identified include: Coordinate meeting schedules, prepare meeting materials (agendas, handouts, exhibits), and document meeting minutes.
Assumed meeting location is onsite or at City Hall

***S*** Survey: Railroad flagging fees are not included

***B*** City will advertise and manage bid submittals and bid opening.

The above identifies labor hours and associated design fee for professional services. Hourly personnel rates will remain in effect until project completion or 12/31/19.

By: _____

Joe Jurewicz, P.E., Team Leader

**MSA Professional Services, Inc.**

# Direct Cost Detail

| Kayak Bay Road Design, Utilties and Signal Design and Construction - City Project 1403 (Bid Number: 18-17AA) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Prints / Copies | Mileage | Plots | Postage | Survey GPS | Survey Truck | Misc (Postage, survey supplies) | TOTAL EXPENSE |
| **Phase** | | **Unit Cost** | **$0.10** | **$0.545** | **$10.00** | **$1.00** | **$40.00** | **$0.70** | **$1.00** | |
| Phase No. | Task / Deliverable<br>*Subtasks/Task notes & details* | Unit Task | Each | Miles | Each | Dollars | Hours | Miles | Dollars | |
| **100** | **Initial Site Visit & Consultation** | | **100** | **15** | **1** | **0** | **0** | **0** | **0** | **$28.18** |
| | Site Review & Site Research | 101 | | 15 | | | | | | $8.18 |
| *M* | Project Kickoff Meeting (w/ City, Agencies, MnDOT, Utilities, RR) | 102 | 100 | | 1 | | | | | $20.00 |
| **200** | **Plans and Specifications** | | **840** | **15** | **4** | **0** | **16** | **30** | **0** | **$793.18** |
| | Initial Field Survey | 201 | | 15 | | | 8 | 15 | | $338.68 |
| | Munger Trail Crossing Design/Exhibit | 202 | 20 | | 1 | | | | | $12.00 |
| | BNSF Crossing Design/Documentation | 203 | 20 | | 1 | | | | | $12.00 |
| | Roadway Design & Plans | 204 | 200 | | 2 | | | | | $40.00 |
| | Stormwater Design & Plans | 205 | 50 | | | | | | | $5.00 |
| | Utility Plans | 206 | 50 | | | | | | | $5.00 |
| | Intersection Design & Plans | 207 | | | | | | | | $0.00 |
| *S* | Supplemental Survey | 208 | | | | | 8 | 15 | | $330.50 |
| | Roadway Design/Quantity Update | 209 | | | | | | | | $0.00 |
| | Project Specifications | 210 | | | | | | | | $0.00 |
| | Submittals | 211 | 200 | | | | | | | $20.00 |
| | Utility Coordination | 212 | 200 | | | | | | | $20.00 |
| | Permitting & Agency Coordination | 213 | 100 | | | | | | | $10.00 |
| **300** | **Meetings & Public Participation** | | **750** | **85** | **3** | **0** | **0** | **0** | **0** | **$151.33** |
| *M* | Public meeting | 301 | 200 | 15 | 1 | | | | | $38.18 |
| *M* | DNR Meetings | 302 | 100 | 30 | 1 | | | | | $36.35 |
| *M* | BNSF Meetings | 303 | 100 | 30 | 1 | | | | | $36.35 |
| *M* | MnDOT Meetings | 304 | 100 | 10 | | | | | | $15.45 |
| *M* | Progress and planning meetings | 305 | 250 | | | | | | | $25.00 |
| **400** | **Cost Estimate** | | **50** | **0** | **0** | **0** | **0** | **0** | **0** | **$5.00** |
| | Cost Estimates | 401 | 50 | | | | | | | $5.00 |
| **500** | **Project Bidding** | | **150** | **0** | **0** | **0** | **0** | **0** | **0** | **$15.00** |
| | Bidding documents | 501 | 50 | | | | | | | $5.00 |
| *M* | Pre-bid conference | 502 | 100 | | | | | | | $10.00 |
| *B* | Bid support | 503 | | | | | | | | $0.00 |
| **600** | **Construction Administration (10 weeks)** | | **700** | **0** | **0** | **0** | **80** | **150** | **50** | **$3,425.00** |
| | Construction contract management | 601 | | | | | | | | $0.00 |
| | State Aid documentation & reporting | 602 | 100 | | | | | | | $10.00 |
| | Progress reports | 603 | 100 | | | | | | | $10.00 |
| | Shop drawing review | 604 | 100 | | | | | | | $10.00 |
| | Materials testing (Sub-Consultant) | 605 | | | | | | | | $0.00 |
| *M* | Weekly Construction Meetings | 606 | 200 | | | | | | | $20.00 |
| | Survey & layout (Staking) | 606 | | | | | 80 | 150 | 50 | $3,355.00 |
| | Project close out | 607 | 200 | | | | | | | $20.00 |
| **700** | **Construction Inspection** | | **200** | **1250** | **0** | **0** | **0** | **0** | **50** | **$751.25** |
| | Construction inspection | 701 | 200 | 1250 | | | | | 50 | $751.25 |
| **800** | **Contract Admin. & Proj. Mgmt.** | | **50** | **0** | **0** | **0** | **0** | **0** | **0** | **$5.00** |
| | Contract Admin. & Proj. Mgmt. | 801 | 50 | | | | | | | $5.00 |
| | **TOTALS** | | **2840** | **1365** | **8** | **0** | **96** | **180** | **100** | **$5,173.93** |

# Extra Services

**Kayak Bay Road Design, Utilties and Signal Design and Construction - City Project 1403 (Bid Number: 18-17AA)**

**EXTRA SERVICES COST ESTIMATE**

| Phase | | | Project Manager DiPiazza | Project Engineer Roadway Watters | Project Engineer Traffic Huibregtse | Engineering Technician Design Smith | Engineering Technician Construction Lockett | Surveyor Schley | Total Hours | Labor Cost | Direct Expenses | Subconsultant Fees | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hourly Rate | $124.00 | $98.00 | $119.00 | $87.00 | $85.00 | $77.00 | | | | | |
| Phase No. (Notes) | Task / Deliverable<br>*Subtasks/Task notes & details* | Task No. | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | Estimated Hours | | | | | |
| **200** | | | **3** | **15** | **8** | **2** | **0** | **0** | **28** | **$ 2,968.00** | **$ 735.00** | **$ -** | **$3,703.00** |
| | **Traffic Counts** | 251 | 2 | 10 | 8 | 0 | 0 | 0 | 20 | $2,180.00 | $735.00 | | **$2,915.00** |
| | *Deliver and set up video counting equipment, coordinate and process data, update traffic numbers for ICE Report (Direct Costs are for mileage and video processing)* | | | | | | | | | | | | |
| | **Profile Redesign (Utility Conflict)** | 102 | 1 | 5 | 0 | 2 | 0 | 0 | 8 | $788.00 | $0.00 | | **$788.00** |
| | *Redesign the roadway profile and Munger Trail profile to address potential conflict with 16" gas main* | | | | | | | | | | | | |
| **800** | **Contract Admin & Project Management** | | **2** | **0** | **0** | **0** | **0** | **0** | **2** | **$ 248.00** | **$ -** | **$ -** | **$ 248.00** |
| | **Contract Admin. & Proj. Mgmt.** | 801 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | $248.00 | $0.00 | | **$248.00** |
| | *Additional contract administration for contract change order* | | | | | | | | | | | | |
| **GRAND TOTAL** | | | **5** | **15** | **8** | **2** | **0** | **0** | **30** | **$ 3,216.00** | **$ 735.00** | **$ -** | **$ 3,951.00** |