



VEENSTRA & KIM, INC.
1201 W College Street, Suite 100
Liberty, MO 64068-1065

City Clerk's Office
110 West Maddux
Suite 205
Branson, MO 65616

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JUN 25 2019

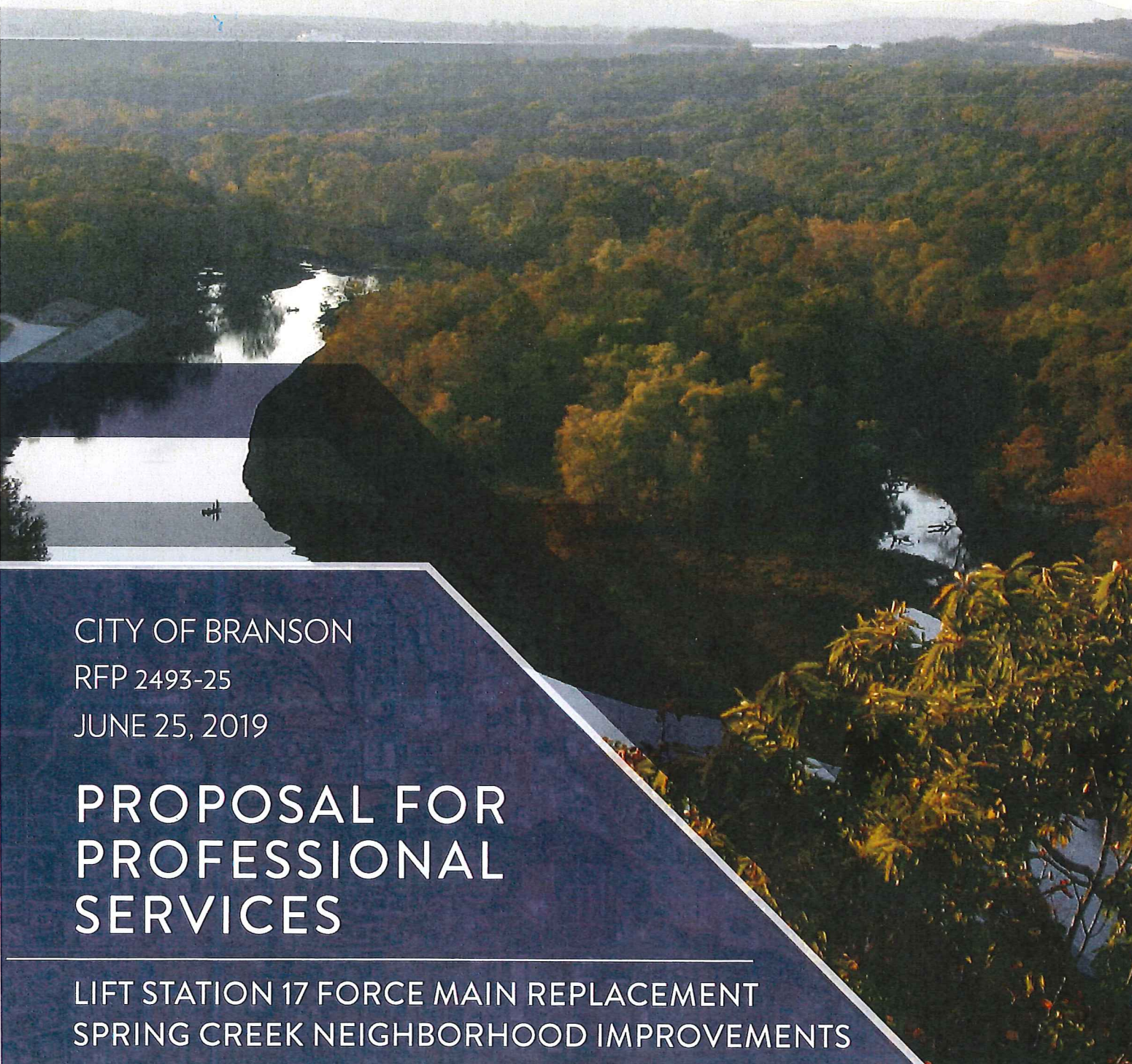
BY: _____

JM.
J. J. Maddux

PROPOSAL NUMBER 2493-25

ENGINEERING AND DESIGN SERVICES

DUE TUESDAY, JUNE 25, 2019 AT 3:00 PM

An aerial photograph of a lush, green forested valley. A river flows through the center of the valley, reflecting the surrounding trees. A large, dark rock formation is visible in the foreground, partially obscuring the river. The background shows rolling hills under a hazy sky.

CITY OF BRANSON
RFP 2493-25
JUNE 25, 2019

PROPOSAL FOR PROFESSIONAL SERVICES

LIFT STATION 17 FORCE MAIN REPLACEMENT
SPRING CREEK NEIGHBORHOOD IMPROVEMENTS

VEENSTRA & KIMM, INC.

1201 West College, Suite 100 • Liberty, Missouri 64068

816-781-6182 (WATS)

June 25, 2019

City of Branson
Purchasing Office
110 W. Maddux, Suite 200
Branson, Missouri 65616

**CITY OF BRANSON, MISSOURI
PROPOSAL NUMBER 2493-25
ENGINEERING AND DESIGN SERVICES**

In response to the recent request by the City of Branson, Veenstra & Kimm, Inc. is submitting our Proposal in regards to your Proposal Number 2493-25 - Engineering and Design Services. This proposal is for the three projects involving the Lift Station 17 Force Main Project, the Spring Creek Neighborhood Water Distribution Project and the Spring Creek Neighborhood Sanitary Sewer Collection Project.

The Proposal addresses the selection criteria as outlined in your Request for Proposals. Veenstra & Kimm, Inc. has provided a narrative description of our understanding of the projects and the challenges for these projects.

Veenstra & Kimm, Inc. would like to thank the City of Branson for the opportunity to submit our Proposal and we look forward to the opportunity to work with the City on these challenging and interesting projects.

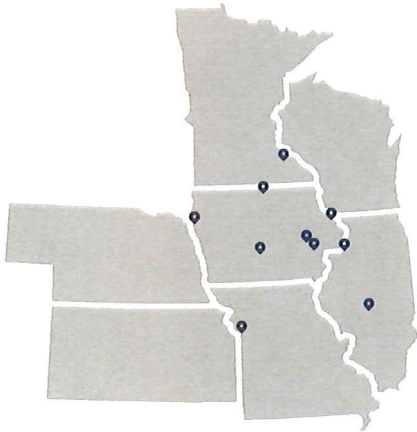
If you have any questions or need additional information concerning our submittal, please contact us at 816-781-6182 or dmcdonald@v-k.net.

VEENSTRA & KIMM, INC.



David H. McDonald, P.E.
Project Administrator/Office Manager

FIRM PROFILE



**Engineering Solutions
Since 1961**

LOCAL OFFICE

PRIMARY CONTACT

Dave McDonald, P.E.
1201 West College, Suite 100
Liberty, MO 64069
816-781-6182 (p)
dmcdonald@v-k.net

Founded on the principle of providing quality services to municipal clients at a fair and reasonable price, Veenstra & Kimm, Inc. has grown to a staff level of more than 150 employees in 10 locations, serving in excess of 100 cities and counties in Iowa and the surrounding states.

Our services are centered on the needs of our clients. We assist in project delivery through planning, conceptualization, budget and finance, preliminary and final design, easement procurement, construction administration and observation and record drawings.

Veenstra & Kimm, Inc. is partnering with Palmerton & Parrish, Inc. and CJW Engineering to provide a full suite of local services needed to complete this project.



Geotechnical Services



Civil & Survey Services

RELEVANT EXPERIENCE

Veenstra and Kimm, Inc has an extensive resume of completing utility pipeline replacements, extensions, and rehabilitation throughout the upper Midwest. Our 60 years of experience has lead us to become a recognized leader in this area. Our staff has completed utility projects in large urban areas as well as small rural areas. We currently have large pipeline projects ongoing in Omaha, NE, several of the Des Moines metro communities, the Quad Cities in Illinois and Iowa as well as Liberty and Lathrop, MO.

Included in this section are 5 representative projects that contain elements in part or in whole of the project that the City of Branson is about to embark upon.

SANITARY SEWER COLLECTION SYSTEM IMPROVEMENTS

LATHROP, MISSOURI

The City of Lathrop, Missouri contracted with V&K to provide design and construction engineering services for this project. The project consists of approximately 2000 feet of 6" diameter forcemain and a combined 7,800 feet of 8-inch and 10-inch gravity sewer lines. The forcemain will have flow provided to it by the new lift station which is being constructed to replace the existing four lift stations which are outdated. The project also consists of video inspection of over 40,000 feet of pipe as well as the necessary repairs including CIPP lining, grouting of service connections and spot repairs as necessary in addition to the upgrades at the City's Treatment Facility. This project is being funded through the State Revolving Fund (SRF) and is currently awaiting issuance of the construction permit by the Missouri DNR. We anticipate issuance of the construction permit within the next month.

Design of the project was completed within a six month timeframe and then submitted to all necessary agencies for approval. No design cost increases were required during the design phase.

Total estimated cost for all aspects of this project is \$6,200,000.

Contact: Bob Burns, City Administrator, lathropcity@grm.net

I-80 WEST INDUSTRIAL PARK LIFT STATION

WAUKEE, IOWA

Veenstra & Kimm, Inc. provided design and construction services for the I-80 West Industrial Park Lift Station just south of Interstate 80. The lift station was completed in May of 2018. The lift station was designed and constructed re-using the submersible pumps, control building and standby generator salvaged from the original Little Walnut Creek Lift Station. The installation includes 2,900 LF of 6-inch pvc force main including 310 linear feet installed in steel casing pipe under Interstate 80. The project also included a gravity sewer extension downstream of the new lift station. The new manholes for this extension were precast with Conshield admixture to prevent corrosion from hydrogen sulfide gas. Our project team completed the design of the I-80 West Industrial Park Lift Station on time and well below the allotted budget of \$165,000.

Contact: Rudy Koester, Public Works Director, rkoester@waukee.org

WELLS NO. 14, 15 AND 16

DENISON MUNICIPAL UTILITIES, IOWA

Veenstra & Kimm, Inc. designed construction services for 3 new shallow wells including raw water main, wells, masonry block well houses, sitework, access roads and controls for the Well Nos. 14, 15 and 16 project for Denison Municipal Utilities. The project included 5,580 feet of 8-inch and 10-inch diameter raw water main pipe and 3 shallow wells, each with a capacity of 500 gpm including well houses and controls.

Veenstra & Kimm, Inc. was responsible for the design, construction services and resident review for the project. The project was completed in January 2018 at a project cost of \$1,313,550. Our project team completed design of the project on time and within the allotted budget of \$49,700.

Contact: Rory Weis, General Manager, rweis@dmuonline.com

RIVER BEND & KING IRVING SEWER SEPARATION

DES MOINES, IOWA

Veenstra & Kimm, Inc. is working with the City of Des Moines on a project located north of the downtown area of the City. The primary purpose of the project is to eliminate intakes connected to the City's combined sewer system. In older areas of the City both stormwater and sanitary sewer are both served by a single sewer system that causes overflows to the river during rainfall events.

The primary purpose of the River Bend and King Irving project is to construct a new stormwater drainage system to eliminate almost all of the stormwater flow to the combined sewer system in order to eliminate overflows to the Des Moines River.

The City of Des Moines has a strong focus on the use of green infrastructure in all of its stormwater drainage projects. The City of Des Moines' goal is to achieve a balance of gray infrastructure and green infrastructure.

The River Bend and King Irving project achieves this balance by incorporating green infrastructure in conjunction with the conventional gray infrastructure.

The elements of green infrastructure that are incorporated in the project include the following:

- *Tree Trenches. In select areas new trees are being planted behind the curb of residential and commercial streets. Stormwater is diverted underground to modified soil in the area of the trees. The tree trenches work by diverting water to these areas so the trees use the water and uptake the nutrients from the stormwater.*
- *Permeable Pavers. In select areas permeable pavers are used both in the parking area along streets and as the primary paving material in low traffic volume residential streets.*
- *Infiltration Basin. The infiltration basin is a small detention basin located near 5th Avenue and Forest Avenue. The runoff from small rainfall is diverted to the detention basin and the water allowed to absorb or soak into the soil. In larger rainfall events water is allowed to fill the basin and then drain slowly to the traditional storm sewer system. This approach achieves the balance of improving water quality while still addressing the runoff from larger stormwater events.*



Due to the large magnitude of the project and its impact on the neighborhood the River Bend and King Irving project is being constructed in five phases. The first phase started in 2018 and the final phase will be completed in 2021.

Our project team completed the design of all five phases on time and within the combined budget of \$828,400.

*Contact: Corey Bogenreif, City Engineer,
CDBogenreif@dmgov.org*

WATER SUPPLY IMPROVEMENTS

STORM LAKE, IOWA

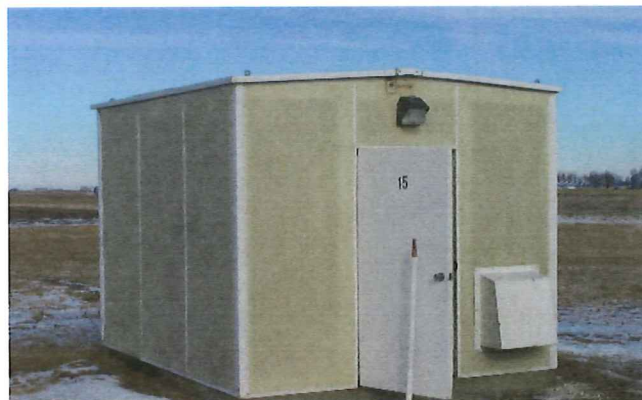
The City of Storm Lake is unusual in its water supply includes wells located in the shallow alluvial aquifer, the intermediate Dakota sandstone aquifer and the deeper Jordan sandstone aquifer. The water quality in the shallower wells is much better and the water quality decreases with the greater depth to the aquifer. Conversely, the deeper Jordan sandstone aquifer has a much higher pumping rate. The City of Storm Lake must balance the advantages of the lower capacity higher quality shallow wells with the higher capacity and poorer water quality Jordan well. The Dakota sandstone wells lay in the middle both as to water quality and capacity.

The City of Storm Lake has identified the advantages of using the best water possible. In late 2012 and continuing this year the City has been undertaking a well field exploration program designed to identify sites for new wells that would improve the water quality.

The results of the well field exploration program were mixed. The City identified one good shallow well site and has identified one or two new Dakota well sites. Based on the results of the well field exploration program the City decided there was not a suitable site for a new shallow well. The City decided to move forward with the design and construction of a new Dakota sandstone well.

Veenstra & Kimm, Inc. completed the design of the well in the fall of 2014, within the agreed upon schedule and budget. Construction of the new Well No. 20 started in early 2015 and the well was placed in service in September 2015. The new Well No. 20 drilled to the Dakota sandstone aquifer will allow the City to replace an existing Dakota well that has relatively poor water quality due to high radio nuclide levels.

Contact: David Derragon, Assistant City Manager, derragon@stormlake.org



PROJECT TEAM



DAVE McDONALD, P.E.

B.S. CIVIL ENGINEERING, UNIVERSITY OF MISSOURI
PROFESSIONAL ENGINEER: MO, KS, AZ

Dave McDonald will serve as Project Principal and provide all the experienced engineers required with the assets and tools needed to perform all work specified.

- *Project manager or project engineer for off system bridge programs in 19 counties and 5 cities.*
- *Project manager for county wide bridge inspections and load posting projects in 7 counties.*
- *Lead design role for steel superstructure and piers for Highway 36 Missouri River Bridge at St. Joseph, Missouri.*

Mr. McDonald has been extensively involved in computer programming and applications for the design, analysis, rating and detailing of bridges and hydraulic analysis. During his career as a consulting engineer, he has written computer programs to aid in the design of framed structures, prestressed concrete members of various sections, continuous beam analysis, hydrologic and hydraulic analysis, steel truss rating and various types of simple span bridge analysis. He has experience with service bureau software applications and communications when the design problem warrants the use of proprietary software. Most recently he has become familiar with commercially available software which has become available to aid the firm in the design and analysis of bridges, roadways, civil and hydrologic and hydraulic projects.

The Lathrop, Missouri Wastewater Treatment Plant project currently under design has Mr. McDonald in an active role as Principal overseeing design efforts in the Liberty office of all aspects of the work.



SCOTT McDONALD, P.E.

B.S. CIVIL ENGINEERING, MISSOURI S&T
PROFESSIONAL ENGINEER: MISSOURI

Mr. McDonald was involved with the technical review assistance contract Veenstra & Kimm, Inc. had with the City of Liberty, Missouri for the construction of the \$78.3M Liberty Wastewater Treatment Facility. His duties involved construction services and quality assurance visits to the project site. The project involved the construction of a new wastewater treatment facility as well as two lift stations with 18 inch and 20 inch force mains.

The Lathrop, Missouri project currently being designed has Mr. McDonald as a member of the design team for the collection system improvements and wastewater treatment plant improvements. His responsibilities involve lift station design and detailing as well as design of 4,000 feet of new trunk line and 2,000 feet of a new force main located along the west side of Lathrop.

**ROGER WALTEMATH, P.E.**

B.S. CIVIL ENGINEERING, UNIVERSITY OF NEBRASKA
PROFESSIONAL ENGINEER: MO, KS, CO, AK, NE

Roger Waltemath has been involved in many areas of civil engineering. This experience includes the design of water and sewer systems, and steel and concrete bridges. Field experience includes condition inspection and supervision of construction for water mains, sewers, roadways and bridges.

While located in Denver, Colorado, Mr. Waltemath assisted in the management of several sewer and water districts including the Castlewood Sanitary Sewer and Water District, and Wheatridge Sanitary Sewer District. In addition, Mr. Waltemath has been involved in the design of water and sanitary sewers for private developers in the Denver metropolitan area including developments within the Denver Technological Center, Tamarac Water Line and Irrigation System, South Quebec Street and Cherry Street water line extensions.

Waltemath was involved with the technical review assistance contract Veenstra & Kimm, Inc. had with the City of Liberty, Missouri for the construction of the Liberty Wastewater Treatment Facility. His duties involved construction services and quality assurance visits to the site.

In the Lathrop, Missouri Wastewater Treatment Plant project currently under design, Waltemath has been working with all the staff involved in the various disciplines in providing direction and support on issues. He is well suited to serve in a role reviewing preliminary design and planning and helping to start the design process.

**PHIL SCHRICK, P.E.**

B.S. CIVIL ENGINEERING, UNIVERSITY OF MISSOURI
PROFESSIONAL ENGINEER: MISSOURI

Phil Schrick has been involved in the design and plan production for various civil engineering projects including sanitary sewer and sanitary sewer systems. Responsibilities included all aspects of design for state highways, local roadways and residential development projects.

Since joining the firm, Schrick has been involved in planning and development of the sanitary sewer phases for several residential developments in the Northland area including Liberty, Missouri and Kansas City, Missouri. Design aspects for these developments included lot layout, roadway design, sanitary sewer design, water main design and storm drainage.

Schrick has verified drainage areas, discharges and survey data and has compiled data and input for HEC 2 and HEC-RAS bridge and culvert routines and has determined flood profiles and floodways for the Rolla, Missouri, Poplar Bluff, Missouri and Riley County, Kansas Flood Insurance Restudies. He has been involved in field reconnaissance, field surveys of channel and valley sections and the measurement of existing bridges for computer modeling required for hydraulic analysis.

Mr. Schrick is currently performing the structural design for the Lathrop, Missouri Wastewater Treatment Plant which includes the site lift station, Headworks Building, UV disinfection structure and all other miscellaneous structures.

**H.R. VEENSTRA JR, P.E.**

B.S. CIVIL ENGINEERING, IOWA STATE UNIVERSITY
M.S. ENVIRONMENTAL ENGINEERING, IOWA STATE
PROFESSIONAL ENGINEER: MO, IA, IL, KS, NE, SD

Veenstra joined Veenstra & Kimm, Inc. in 1976 and has served as President of the firm since 1990. Over his career Veenstra has worked extensively with municipalities and utilities on issues of planning, design and construction of a wide array of infrastructure, both above and below ground surface. Veenstra is well known in central Iowa for his technical abilities as well as the ability to work with a wide range of governmental bodies.

Veenstra has been providing city engineering services for 41 years and currently serves as the city engineer in Van Meter, Dallas Center, Granger, Bondurant and Elkhart. Throughout his career Veenstra has maintained a balance of serving as project manager on major infrastructure projects along with city engineering assignments.

In addition to his traditional engineering services, Veenstra brings to the engineering team a full complement of support engineering services, including his work with land use planning, capital improvement planning, rate studies, project financing and project implementation. Veenstra is able to address the full range of services necessary to work with the community in its city engineering relationship including engineering issues, legal issues, planning issues and financing issues.

**JORDAN KAPPOS, P.E.**

B.S. CIVIL ENGINEERING, UNIVERSITY OF IOWA
PROFESSIONAL ENGINEER: IOWA

Since joining Veenstra & Kimm, Inc. in 2007 Jordan Kappos has worked on the design of a number of sanitary sewer rehabilitation projects and sanitary sewer relief sewer projects. Kappos' work includes both sanitary sewer as well as storm sewer improvements. Jordan has experience in the areas of planning and design of gravity sewers, lift stations, force mains and collection system planning. Jordan also has extensive experience in the areas of planning and design of sewer main and manhole rehabilitation.

Kappos has served several Des Moines area communities including the City of Waukee, the City of West Des Moines and the Urbandale Sanitary Sewer District, providing services ranging from sewer rehabilitation, lift station replacement and design, water main design, water system distribution system planning and master planning.



JAY WYNN, P.E., PTOE

B.S. CIVIL ENGINEERING, UNIVERSITY OF KENTUCKY
 M.S. CIVIL ENGINEERING, UNIVERSITY OF KENTUCKY
 PROFESSIONAL ENGINEER: MO, AK, KS, OK, IL

Jay Wynn, PE, PTOE, Principal-in-Charge of CJW has over 30 years of experience in civil engineering and land transportation planning and design including: traffic impact studies; analytical studies of traffic control problems; corridor and land use origin – destination studies; technical design for municipal infrastructure; roadway design; traffic signal design; intersection improvements; stormwater and sanitary sewer design; lighting systems; signal timing & operation; signal system control and optimization; intersection capacity analysis; intersection geometrics; level of service studies; preparation of construction plans; specifications and bid documents; project management; contract administration and construction inspection.

Jay has experience with budget administration and is familiar with the process of procuring various forms of funding from federal, state, and municipal agencies.

Jay has worked closely with public and private entities of all sizes and was awarded the Melvin B. Meyer Transportation Professional of the Year Award in 2013 by the Missouri Valley Institute of Transportation Engineers. The most important aspect of Jay's experience is his ability to manage projects. Jay's extensive experience and project management skills ensure that Federal, State, Municipal, and private entities will have their projects completed on time, and with the greatest precision possible.



JAMES, VAUGHAN, PLS

PROFESSIONAL LAND SURVEYOR: MISSOURI

James Vaughan, PLS, Survey Manager is a Professional Land Surveyor for CJW Transportation with over 38 years of experience in land surveying and mapping. Jamie joined CJW in 2010 as Surveyor Manager and has completed a variety of land surveying projects while working with CJW. His expertise includes boundary surveying, design surveying, right-of-way establishment, construction staking, and property records research. James has experience conducting and managing surveys for gas and energy pipelines; road widening projects; regional sewer systems; sewer treatment plants; subdivision lot layout; and land planning, platting, and design.



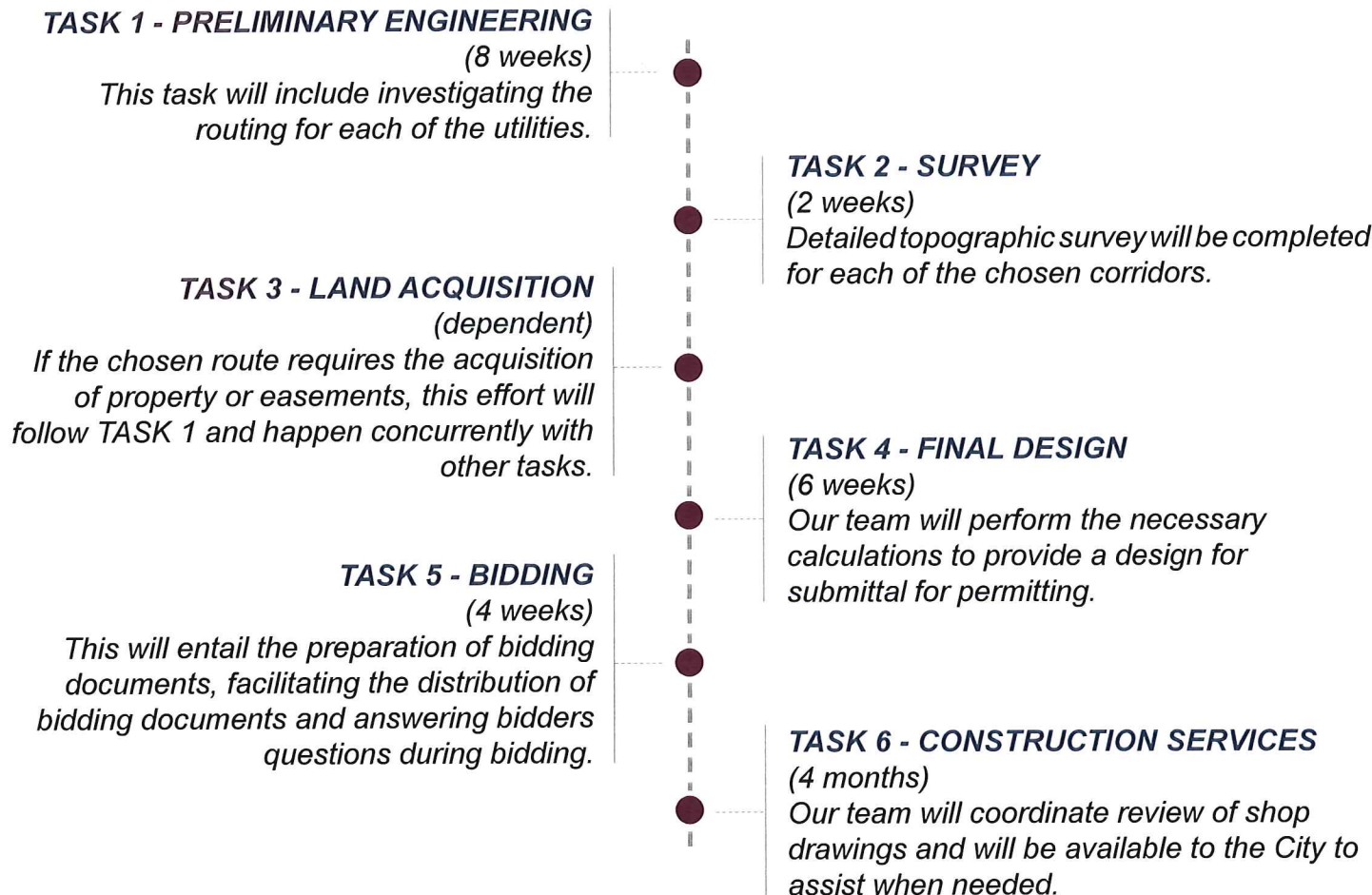
BRANDON R. PARRISH, P.E.

B.S. CIVIL ENGINEERING, UNIVERSITY OF MISSOURI
 M.S. CIVIL ENGINEERING, UNIVERSITY OF MISSOURI
 PROFESSIONAL ENGINEER: MO, KS, IA, OK, AK

Mr. Parrish, P.E. has over 15 years of experience in the Geotechnical Engineering and Construction Materials Testing Industry. Mr. Parrish, P.E. has worked at Palmerton & Parrish, Inc. as a Project Engineer and Project Manager on a full-time basis since 2006. Mr. Parrish assumed the role of Vice President and Geotechnical Engineering Manager in December 2012. Mr. Parrish's expertise includes supervision of Geotechnical Investigations; sinkhole studies; mine feature remediation; structural evaluations; drilled pier inspection; slope stability analysis including slope repair; shoring design, deep and shallow foundation design, and geotechnical laboratory testing.

PROJECT SCHEDULE

Upon successfully executing our contract, our team would anticipate the following schedule:



COMMITMENT TO SCHEDULE

With any project, there are elements that can impact schedules outside of the control of the owner and consultant such as weather, permitting, and land acquisition. We pride ourselves on our ability to set realistic expectations and devote the correct skill sets and adequate number of team members to deliver your project on time. All five projects discussed earlier in this proposal were completed within the agreed-upon design schedule, meeting each client's goal of timely completion.

COMMUNICATION PLAN

It goes without saying that the key to a successful project is transparency, clarity, and adequate frequency of the communication. We prefer to provide a weekly report of our progress toward your project goals. We provide a monthly summary of progress as well that may be included for communication to the public and/or the political body.

Additionally, we leverage and utilize our technology tools to improve our collaboration and communication. We routinely utilize Zoom© to meet face to face with our teams and our clients. This is a cost effective and convenient way to increase and improve communication.

PAST PROJECT BUDGETS

There are three main elements to the overall cost of a public works project:

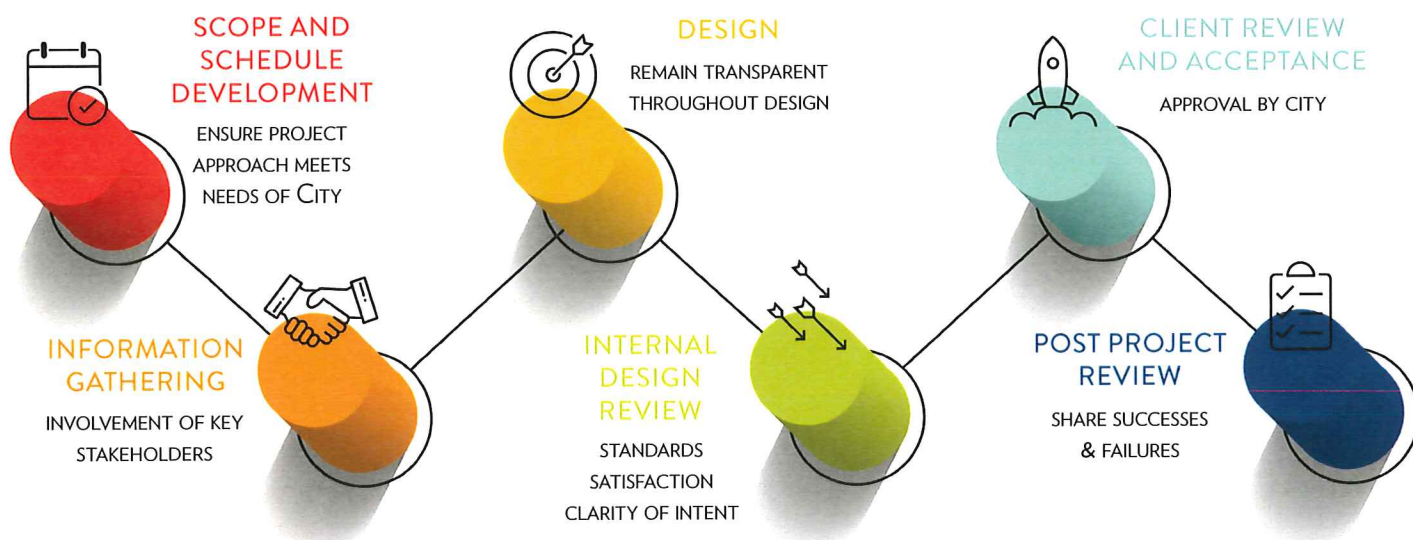
- 1) Construction Costs*
- 2) Land Acquisition Costs*
- 3) Professional Services Costs*

We leverage the breadth of experience of our staff over the Midwest to implement ideas and methods to bring the most cost effect solution to your project. This allows us to minimize construction costs for our clients. Land Acquisition costs are an element in our preliminary engineering evaluation and is a large component in our viability assessment. If it is advantageous for our client to route utilities to avoid land costs, this is discussed and identified at early stages. Finally, we are able to control our professional fees through a concerted and conscience effort to control our overhead costs. Our Midwest roots and connection with our clients have driven this successful philosophy. At Veenstra & Kimm, Inc, we utilize DELTEK Vision to monitor and control project budgets. This regular review prevents unnecessary surprises and waste that occur without adequate project control.

QUALITY CONTROL

Veenstra & Kimm, Inc. understands Quality Assurance and Quality Control (QA/QC) requires a combination of commitment by all members of the project team as well as a review structure to provide an independent and critical review of quality. V&K utilizes an internal QA/QC program on all projects especially those relating to water and wastewater facilities. Our QA/QC plan was developed to adapt the classical independent QA/QC concept within the context of our firm.

Veenstra & Kimm, Inc.'s QA/QC program is based on two major elements. The first element of our QA/QC plan is our approach to planning and design. Veenstra & Kimm, Inc.'s business model is based on our most experienced and qualified staff members being actively involved in all aspects of project planning, design and construction. Although our project team involves a combination of experienced and junior staff members, the most active members of the project team are the senior staff members with the greatest experience. This approach is the reverse of many firms in which junior staff members are primarily responsible for the day to day activities with oversight provided by senior personnel. Our project team can avoid many of the quality issues that arise when less experienced staff members are responsible for most of the engineering analysis and design.



The second element of our QA/QC plan involves an internal review of the planning and design documents at the conceptual, preliminary, and final completion milestones of the project. The QA/QC review is undertaken by senior staff members with experience in the type of work they are reviewing. The reviewers are staff members not actively involved in the project team. The QA/QC review is intended to provide an independent, objective, and accurate review.

The QA/QC review at the conceptual milestone is intended to ensure the concepts are sound and cost-effective. At the preliminary milestone the review is a secondary evaluation of the concept and the initial review of the detailed design. The final completion milestone QA/QC review focuses on specific details being recommended in the study or design that will assure the accuracy of the project studies, plans and specifications.

In implementing these factors within our QA/QC program, Veenstra & Kimm, Inc can seamlessly integrate our work in a manner that provides the appropriate quality assurance as well as the maintenance of project schedules and budgets while also reducing the risks for change orders during construction.

PROJECT APPROACH

The V&K Team will work with the City of Branson to determine for each project the primary design approach to achieve the City's objective for that project. The work includes determination of the alignment, connection points, and design philosophy as it relates to existing sewer and water mains in those areas where the presence of an existing sewer or water main affects the design approach.

Once the design approach has been established, the next element of the project is to develop a field reconnaissance based preliminary alignment for the sewer or water main. This field-based assessment takes into consideration available construction corridors, construction challenges, access issues, surface replacement requirements and other factors that will affect the design. It is during the reconnaissance the V&K Team will identify areas where directional drilling of the mains may be considered. With the decrease in the unit price for directional drilling that construction procedure is becoming increasingly popular in developed corridors. In some instances, the cost of open cut construction plus the cost for surface replacement for streets, driveways and sidewalks results in open cut construction and directional drilling being very similar in total cost. Non-economic factors such as disruption, can factor into the assessment of the construction technique.

The V&K Team places focus on the construction staging and an access plan. Construction of projects will result in a certain degree of disruption and inconvenience to adjoining residents and property owners. That disruption and inconvenience can be best managed by ensuring the construction plans include a staging or sequencing plan that manages the contractor's activities in a way that does not unnecessarily impact the affected property owners and residents. The construction staging plan can be as simple as establishing time lines for restoration of driveways, establishing maximum times for street closures, and requiring the contractor to complete restoration as work on the project progresses.

Another area of focus is on constructability. Especially in developed areas, the engineer must ensure the design is constructible. The engineer needs to evaluate how the contractor will physically construct the project to ensure the project can be constructed. Adequate space must be provided for the contractor's equipment, excavations must be large enough to undertake the work, and the sequencing of construction must be appropriate.

The V&K Team recognizes right-of-way and easement acquisition can be a time-consuming process, often exceeding the design period in its duration. To minimize the impact of easement acquisition the V&K Team works as diligently as possible to identify if there will be easement needs as early as possible in the design process. Once the easement needs have been identified, the V&K Team can prepare the necessary easement documents, including descriptions and plats. This allows the City to move forward with easement acquisition before the completion of the design. Typically, the V&K Team will be able to complete all the easement identification and document development before the submittal of the final review plans.

VALUE ENGINEERING

One of the objectives of the V&K Team's goal is to optimize the cost of the project through Value Engineering. The intent of Value Engineering is to allow the City the opportunity to evaluate the financial impact of differing construction techniques. One example of our commitment to value engineering is mentioned in our project approach through the possible use of directional drilling. As stated in our project approach, V&K will perform periodic assessments of the project during the design phase. These assessments include but are not limited to analysis of possible cost savings methods or procedures.

In some instances, optimization does not coincide with the minimum cost for construction. When non-monetary factors, such as disruption, are taken into consideration, optimization may mean the use of a construction technique that is slightly costlier but provides the best "value" to the City and affected parties.

Another aspect that is important in Value Engineering is constructability. Especially in developed areas, the engineer must ensure the design is constructible. The engineer needs to evaluate how the contractor will efficiently construct the project to ensure the project can be constructed with conditions that provide maximum cost effectiveness but also adaptable for future needs and expansion. Adequate space must be provided for the contractor's equipment, excavations must be large enough to undertake the work, and the sequencing of construction must be appropriate. Providing constructability in the initial construction phase also assures the same parameters are effective when providing future repairs and upgrades, and thus reduce long term operating and maintenance costs.

