

## ATTACHMENT A

### PHASE I SCOPE OF SERVICES

The scope of services to be performed for the City of Bonner Springs, Kansas Water Supply and Water Treatment Plant project include Preconstruction Phase 1 services are as follows:

#### A. General Services, Anticipated Meetings & Anticipated Workshops

1. Perform project management and administrative activities including invoicing, monitoring of the project budget and schedule, implementing internal policies and procedures, coordination of resources.
2. Conduct a Project Initiation Meeting with the City and Owner's Engineer to discuss the scope of services and the project execution plan (schedule), review available information and documentation and discuss the project organization and staffing plan.
3. Conduct Project Management Meetings with the City and Owner's Engineer. A total of three (3) Project Management Meetings are anticipated.
4. Conduct Technical Meetings with the City and the Owner's Engineer. A total of one (1) Technical Meetings related to the Alternative Design Concepts (Reference Item D).
5. Conduct Workshops to review the Basis of Design Memorandum and preliminary drawings and specifications with the City, Owner's Engineer and the Kansas Department of Health and Environment (KDHE). A total of two (2) Workshops are anticipated.

#### B. Site Survey

Provide, through a subcontract, a field topographical survey for the preparation of construction drawings and specifications. The site survey will include the site topography (contours), surface features, easements and utility locations. The survey limits will extend from the east side of the Public Works Building to the east side of the proposed lime residuals treatment facility and from the southern right-of-way of the railroad to the Kansas River. An approximate 100 ft. wide strip will also be surveyed from Well No. 1 to the proposed water treatment plant site and from the proposed lime residuals treatment facility to the Wastewater Treatment Plant. A survey will also be performed for the Lake of the Forrest Main. This survey will extend along K-32 from the west side of the Water Treatment Plant site going east to the entrance of the Lake of the Forrest Community and between the south edge of pavement to the south right-of-way for K-32.

#### C. Geotechnical Services

1. Provide geotechnical engineering services including exploratory work, laboratory and field testing and professional interpretations of exploratory and test data to provide design information for the Raw Water Supply and Water Treatment Plant facilities and the Lake of the Forrest Main.
2. The scope of services will include:
  - a. Locate the borings in the field with a hand-held GPS unit based on the final plan locations.
  - b. Obtain the required KDOT right-of-way permit.

- c. Notify Kansas One-call for the locating of public utilities.
- d. Drill the requested 10 borings to the planned depths. Soil sampling will be at 2.5 foot intervals with split-spoon and Shelby tube samplers in the upper 10 feet and at 5 foot intervals thereafter. Rock coring 10 feet is planned for one boring.
- e. Two borings will have temporary 1-inch diameter piezometers installed to obtain delayed water levels while the rig is at the site. The temporary piezometers will be removed on the last day of drilling.
- f. Borings on private property will be backfilled with cuttings. The borings within KDOT right of way will be backfilled with bentonite chips and auger spoils spread on the ground surface.
- g. The borings will be logged by a field geologist or engineer.
- h. Field resistivity testing is planned at two locations, each with two perpendicular lines. Pin spacings of 2.5, 5, 10, 15 and 25 feet are planned.
- i. Perform 12 cone penetration test (CPT) (two would be companion with borings) and 10 borings (the core boring, one at the lime treatment, the well field and all the transmission line)
- j. Perform 2 CTP's with seismic shear wave velocity.
- k. Laboratory testing to include (number in parenthesis):
  - i. Moisture content determination on cohesive samples (64)
  - ii. Dry unit weight and unconfined compressive strength (4)
  - iii. Unconsolidated-undrained triaxial tests (4)
  - iv. Sieve analyses for the well field borings (10)
  - v. Atterberg limits (6)
  - vi. Corrosivity suite consisting of pH, oxidation reduction potential, resistivity, sulfate, sulfide, chloride ions (4)
- l. Complete a geotechnical report outlining the findings of the geotechnical exploration.

#### D. Evaluation of Alternative Design Concepts

Perform evaluations of alternative design concepts. The evaluations will consist of developing a written description of each design concept, the development of conceptual drawings and the identification of the advantages and disadvantages of each alternative from a system performance, operations, and maintenance perspective. The Design-Build team will develop the estimated construction cost for each design concept. Conduct Technical Meetings (Item A.4) with the City and the Owner's Engineer to discuss the results of the evaluation and select the preferred approach.

The following alternative design concepts are anticipated:

- Existing Well Modifications or Replacement

#### E. Basis of Design Memorandum

Prepare a detailed Basis of Design Memorandum and preliminary drawings as required to establish agreement on scope, operating parameters, and performance requirements.

The Basis of Design Memorandum will include the following items:

- General project scope and background
- Applicable codes, regulations and standards
- Geotechnical & survey information
- Drafting standards
- Process design criteria (raw water quality, treated water goals and design production rates)
- Establishment of the design criteria (written & tabular form) for the facilities including sitework, civil, building mechanical (HVAC & plumbing), mechanical process (chemical storage & feed, pumping units, valves & compressed air system), structural, architectural, electrical and instrumentation & controls.

#### F. Preliminary Drawings, Specification, and Budget Deliverables

2. Prepare preliminary drawings and specifications for the proposed construction work and for the materials and equipment required to develop the Guaranteed Maximum Price (GMP).
3. As the development of the drawings and specifications progresses, conduct document review meetings with the City and Owner's Engineer. A total of two (2) meetings are anticipated.
4. After receipt of comments during the review Workshops with the City and Owner's Engineer, revise the preliminary drawings and specifications to incorporate the required changes.
5. Address questions that arise regarding the Basis of Design Memorandum and preliminary drawings and specifications during the preparation of the GMP.
6. General Services: Prepare for and provide status reports detailing the progress of the work through all phases of the project. The status report shall be provided at minimum on a monthly basis. The status report will contain an update on each deliverable from the Design-Build team.
7. Coordination of Meetings: Coordination of all meetings will be routed through, organized, and managed by the DBR for the project. The DBR will prepare an appropriate agenda along with documentation of meeting minutes for review by the City of Bonner Springs.
8. Pre-Construction Deliverable Development: The DBR will work in conjunction with the Pre-Construction Manager for the project to ensure the deliverables are being completed within the agreed upon schedule. The deliverables of the Pre-Construction team shall be as follows:

- a. Design and Constructability Review
  - b. Costing Development
  - c. Bidding Documents Development
  - d. Critical Path Method (CPM) Schedule Development and Updating
  - e. Comment Log Management
  - f. Value Analysis Log Management
  - g. Risk Assessment and Analysis
  - h. Guaranteed Maximum Price (GMP) Development
9. Coordination with Funding Agencies: The Design-Builder will comply with funding agency guidelines for design and construction of the project. The DBR will be available for coordination meetings as needed to facilitate the funding agencies requirements for Design-Build delivery in the State of Kansas.
10. Coordination with KDHE: The Design Builder will comply with KDHE guidelines for design and construction of the project. The DBR will be available for coordination meetings as needed to facilitate KDHE requirements for Design-Build delivery in the State of Kansas.
11. Begin the necessary application process with the railroad to be able to obtain the necessary permits for construction.
12. Summarization of the Deliverables to the City at the Completion of the Phase 1 Scope.
- a. Site Survey as described in Item B. above with the following:
    - i. Include a Civil3d format (or equivalent)
    - ii. Include a .tin file (surface)
    - iii. Include survey control notes.
  - b. Geotechnical Report as described in Item C above with the following:
    - i. A boring location plan.
    - ii. Boring logs
    - iii. Discussion regarding the regional and local geology including seismic hazards.
    - iv. Up to two cross-sections across the site
    - v. Results of the field resistivity tests.
    - vi. Shallow foundation recommendations including frost depth, bearing capacities, and anticipated settlement.
    - vii. Ground improvement considerations, if required
    - viii. Site Class per IBC 2018

- ix. Excavation requirements including considerations for soft soils, dewatering and temporary slopes.
  - x. Fill placement criteria and an evaluation of the suitability of the site soils for reuse.
  - xi. Groundwater considerations
  - xii. Lateral earth pressures
  - xiii. Corrosion potential for ductile iron and steel pipe and the recommended type of cement
- c. Basis of Design Report
  - d. Preliminary drawing and specifications for development of the Guaranteed Maximum Price
  - e. Guaranteed Maximum Price Proposal
  - f. Phase 2 anticipated design build schedule and scope
  - g. Value Analysis and Comment Logs

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