



City of Grand Island

Tuesday, December 23, 2003

Council Session

Item G20

#2003-395 - Approving Phase I - Roger's Pumping Improvements Project - Water System Engineering Services - CH2MHill

Background:

The Utilities Department periodically retains the services of a consultant to do a detailed engineering analysis of the water system, to review the system for deficiencies and to assist in planning for future growth requirements. The water system must meet operational standards to be suitable both for human consumption and for fire protection. These operational standards include analyzing chemical and microbiological components of the water, and hydraulic testing of the system for flow and pressure characteristics. The consultant also projects future system demands and recommends improvements for pumping and distribution components of the system, as well as groundwater sources. The last study was conducted in 2001 by CH2MHill, which resulted in a Master Plan for the water system. Based on this Master Plan, future deficiency of pumping capacity, due to continued demand growth and loss of in-town wells, was noted, as well as a general timetable for completing corrective action. Adding major pumping and storage facilities will require additional engineering support. Detailed proposals for engineering services have been solicited from CH2MHill because of their prior familiarity with the project. Master Plan projects previously authorized for detailed engineering support have been the corrosion control system, modifications to the Platte River Pumping Station, and repairs to the Kimball Reservoir. These construction projects have gone well.

Discussion:

Because of increasing groundwater contamination and more stringent regulations, the Master Plan recommends planning for abandonment of the wells located in the City. In fact, two of the seven wells that were in operation at the time the Master Report was drafted have since been abandoned because of contamination. To replace the loss in pumping capacity, the Master Plan recommends increasing capacity and storage at the Roger's Pumping Station, located at Old Potash Highway and North Road. CH2MHill has provided a proposal for engineering services related to the preparation of contract documents for purchase of pumps and motors, referred to as Phase I – Roger's Pumping Improvements Project, for an amount not to exceed \$82,961. Subsequent phases are anticipated to include expansion of the pumping station, and the addition of another reservoir. Design work is scheduled to be started in early 2004 to support the installation of the additional pumps by the spring of 2005.

Recommendation:

The addition of pumping capacity at Roger's Pumping Station will required outside engineering support. Department engineering staff has reviewed the proposal from CH2MHill and it is the recommendation of the Utilities Department that the additional

amount of \$82,961.00 quoted by CH2MHill for this project be authorized under the terms of our engineering services agreement.

Fiscal Effects:

Expenditure of not more than \$82,961.00 from Enterprise Fund 525. This project is included in the '03-'04 budget. There are sufficient funds available.

Alternatives:

Revise project schedule and solicit proposals from other engineering firms.

Staff Contact: Gary R. Mader; Dale Shotkoski

Proposed Scope of Services and Fee Estimate for Adding Additional Pumping Capacity at the Roger's Reservoir Site.

TO: City of Grand Island

FROM: CH2M HILL

DATE:

Project Understanding

The City of Grand Island's *Water Distribution Master Plan Report* (CH2M HILL) includes a capital improvement plan (CIP) recommendation for additional pumping capacity at the Roger's Pump Station and Reservoir site. Additional pumping capacity may be added either through modifications to the existing pump station or through the design and construction of a new pumping station. The *Water Distribution Master Plan Report* suggests that an additional firm capacity of 7,000 gallons per minute is required to meet existing and future demands.

The project will be delivered in three phase with each phase building upon previous work. Phase 1 will focus on the preparation of pre-purchase specifications for the pumps and motors. Phase 2 will focus on site planning of the Roger's site and Phase 3 will include preparation of construction drawings and specifications as well as services during bidding and construction. The following outlines the proposed scope of services for Phase 1 of this project. At completion of each phase, a detailed scope of services for the subsequent phase will be prepared and provided to the City.

Proposed Scope of Services

CH2M HILL, Incorporated (CONSULTANT) shall provide design services related to the preparation of contract documents for equipment pre-purchase of pumps and motors, hereafter referred to as Phase 1 - Roger's Pumping Improvements Project. The following details the tasks the CONSULTANT will complete as part of Phase 1 of this project.

Task 1: Project Management

CONSULTANT shall participate in a Project Kick-Off Meeting with CITY staff. CONSULTANT attendees shall include the Project Manager, lead Mechanical Engineer, and lead Electrical Engineer. The meeting shall be concurrent with a site visit, and shall focus on reviewing the detailed project Scope of Services and project objectives.

CONSULTANT shall provide routine project management services including, but not limited to, project instructions, budget and schedule tracking, project team coordination, progress updates for the CITY, quality control reviews and preparation of invoices.

Task 2: Predesign Services

CONSULTANT shall provide the following Pre-design Services:

Utility Potholing

Description

This task involves locating existing utilities at the Roger's site. CONSULTANT will direct subconsultant to perform potholing activities to locate known utilities at the Roger's site to include surface location, depth to and size of utility, and materials of construction. CONSULTANT will direct subconsultant to survey horizontal vertical location of valve boxes, manhole covers, utility pothole surface locations and other miscellaneous surface features that are indicators for subsurface facilities.

Hydraulics Technical Memorandum

Description

This task involves the evaluation of distribution system hydraulics and transient (surge) pressures resulting from the pump station operation (starting, stopping and power failure). The evaluation results will document the anticipated range of pump station operating conditions and anticipated surge pressures, including recommendations for mitigation. CONSULTANT will provide recommendations for surge control to be included within the detailed design of pumping improvements at this site only. CONSULTANT will identify surge impacts outside of the pumping station site, but the design of mitigation measures within the distribution system is not included within this scope of services.

Deliverables

- Draft Technical Memorandum
- Final Technical Memorandum

Pumps and Mechanical Systems Technical Memorandum

Description

This task involves preparation of a technical memorandum that discusses issues related to pump requirements and pump station mechanical system concepts. The technical memorandum will address the following specific issues:

1. The pump station head requirements will be determined for the capacity range established in the hydraulic technical memorandum.
2. The following will be evaluated:
 - Type and number of pumps.
 - Approach to capacity control.
 - Constant speed vs. adjustable speed.
 - Pump and piping layout.

- Modifications to existing pump station –vs- new pump station.
- Provisions for access and maintenance.

3. Process mechanical design concepts, including:

- Piping materials.
- Manual valves.
- Air and vacuum valve type and location.
- Pump control valves.
- Corrosion protection.

Deliverables

- Draft technical memorandum.
- Final technical memorandum.

Chlorination Technical Memorandum

Description

This task involves examining historical data for chlorine dosage at the existing pumping facility and summarizing the findings in a TM. Chlorine feed rates and storage requirements will be calculated and presented in the TM based on the historical dosage data and expected flowrates. CONSULTANT will develop design criteria for the chlorine storage and feed system to meet the requirements of the expanded pumping capacity of the facility. The design criteria will assume continued use of 150-pound cylinders of chlorine gas. The TM will include a schematic of the proposed chlorine system and discussion of the expected operational approach (e.g., operating time between cylinder change-outs, and the number of cylinder change-outs required on a monthly basis under average and peak flow conditions)

Deliverables

- Draft technical memorandum.
- Final technical memorandum.

Electrical and Instrumentation and Controls Technical Memorandum

Description

This task involves defining the electrical and instrumentation and controls (I&C) needed for the project. Electrical predesign includes preliminary load calculations, service requirements, backup power requirements (if any), and overall electrical concepts and design criteria. I&C predesign includes overall control system philosophy and definition of desired data flow.

It is assumed that the City of Grand Island electric utility department will provide service to the pump station including any modifications, if required, to the primary electrical distribution system.

Deliverables

- Draft technical memorandum.

- Final technical memorandum.

Task 3: Equipment Procurement

This task involves the preparation of plans, specifications and cost estimates as follows:

Specifications will consist of Contract Documents and technical specifications. CONSULTANT will use CONSULTANT's master specifications as the basis for all specifications, including General Conditions, Supplemental Conditions, Division 1, and all applicable Division 2 through 16 technical sections. CONSULTANT will prepare contract documents, consisting of advertisement for bids, bid form, instructions to bidders, and standard special conditions using CITY standards.

CONSULTANT will prepare specifications and Contract Documents for CITY pre-purchase of major equipment (pumps and motors), including estimate of probable cost for the equipment pre-purchased.

CONSULTANT will submit to the CITY for review six (6) copies of preliminary equipment pre-purchase specifications and cost estimates. The CITY will have two (2) weeks from receipt of the preliminary specifications to provide comments. CONSULTANT will incorporate pertinent and relevant comments into succeeding submittal. CONSULTANT will provide twenty (20) copies of Bidding Documents to CITY for distribution to prospective bidders and suppliers.

CONSULTANT will submit pre-purchase specifications on the CITY's behalf to the Nebraska Health and Human Services (NHHS) for review, including payment of the review fee, which shall be a reimbursed by the CITY as a direct project cost.

Deliverables

- Preliminary equipment pre-purchase specifications (6 copies).
- Final Bidding Documents for equipment pre-purchase (20 copies).

Task 4: Services During Bidding and Equipment Fabrication

CONSULTANT will provide the following services during bidding for the pre-purchase of major equipment:

- Responding to bidders'/vendors' questions
- Preparing addenda as required
- Reviewing bids and preparing recommendation of award

It is assumed that the CITY will be responsible for all other bidding services, including advertising and distributing plans and addenda.

It is assumed that the successful vendor(s) of the pre-purchased equipment will contract directly with the CITY.

It is assumed that the CONSULTANT 's lead mechanical and lead electrical engineers will witness factory testing of the pumps, motors, and drives. A total of 4 man-days are assumed for factory witness testing.

Fee Estimate

Task Description	Principal Technologists	Sr. Project Manager Sr. Technologist Sr. Consultant	Project Manager Engineer Specialist	Project Engineer	Associate Engineer	Staff Engineer 2	Staff Engineer 1	Tech 5	Tech 4	Tech 3	Clerical/Accounting	Hours	Labor	Expenses	Total
Rate	\$190	\$166	\$149	\$115	\$94	\$81	\$74	\$98	\$92	\$82	\$61				
Per Diem Code	3	4	5	6	7	8	9	11	12	13	19				
Task 1 - Project Management	-	-	16	20	-	-	-	-	-	-	24	60	\$6,148	\$386	\$6,534
Task 1 - Subtotal	-	-	16	20	-	-	-	-	-	-	24	60	\$6,148	\$386	\$6,534
Task 2 - Pre-design Services															
2.1 Utility Potholing	-	-	-	12	-	-	-	-	-	-	-	12	\$1,380	\$7,150	\$8,530
2.2 Hydraulics Technical Memorandum	40	-	8	40	-	-	-	-	-	-	4	92	\$13,636	\$592	\$14,228
2.3 Pumps and Mechanical Systems Technical Memorandum	-	-	40	-	-	-	-	-	12	-	6	58	\$7,430	\$373	\$7,803
2.4 Chlorination Technical Memorandum	-	-	-	20	-	-	-	-	-	-	2	22	\$2,422	\$142	\$2,564
2.5 Electrical and Instrumentation and Controls Technical Memorandum	12	-	-	-	-	32	-	-	-	-	4	48	\$5,116	\$309	\$5,425
Task 2 - Subtotal	52	-	48	72	-	32	-	-	12	-	16	232	\$29,984	\$8,566	\$38,550
Task 3 - Equipment Procurement															
3.1 Data Review	8	-	8	8	-	-	-	-	-	-	-	24	\$3,632	\$704	\$4,336
3.2 Equipment Pre-Purchase Specifications	12	-	32	12	-	-	-	-	-	-	20	76	\$9,648	\$1,039	\$10,687
3.3 Cost Estimates	-	-	4	4	-	-	-	-	-	-	-	8	\$1,056	\$51	\$1,107
3.4 QA/QC	12	-	-	4	-	-	-	-	-	-	-	16	\$2,740	\$103	\$2,843
3.5 NHHS Review														\$5,610	\$5,610
Task 3 - Subtotal	32	-	44	28	-	-	-	-	-	-	20	124	\$17,076	\$7,508	\$24,584
Task 4 - Services During Bidding and Equipment Procurement															
4.1 Responding to Bidders' Questions	2	-	12	-	8	-	-	-	-	-	2	24	\$3,042	\$154	\$3,196
4.2 Preparing Addenda	2	-	4	2	4	-	-	-	-	-	2	14	\$1,704	\$90	\$1,794
4.3 Reviewing Bid(s) and Preparing Recommendation of Award	-	-	2	2	-	-	-	-	-	-	2	6	\$650	\$39	\$689
4.4 Submittal Review	-	-	12	-	-	12	-	-	-	-	4	28	\$3,004	\$180	\$3,184
4.5 Factory Witness Testing	-	-	16	16	-	-	-	-	-	-	-	32	\$4,224	\$206	\$4,430
Task 4 - Subtotal	4	-	46	20	12	12	-	-	-	-	10	104	\$12,624	\$669	\$13,293
Total for Basic Services	\$88	\$0	\$154	\$140	\$12	\$44	\$0	\$0	\$12	\$0	\$70	\$520	\$65,832	\$17,129	\$82,961

RESOLUTION 2003-395

WHEREAS, on April 10, 2000, by Resolution 2000-110, the City of Grand Island authorized a contract with CH2M Hill of Englewood, Colorado for municipal water system engineering services for the Utilities Department; and

WHEREAS, such engineering services resulted in a Master Plan for the water system; and

WHEREAS, based on the Master Plan, future deficiency of pumping capacity due to continued demand growth and loss of in-town wells was noted, as well as a general timetable for completing corrective action; and

WHEREAS, due to the increasing groundwater contamination and more stringent regulations, the Master Plan recommends the planning for abandonment of the wells located in the City; and

WHEREAS, to replace the loss of pumping capacity, it is recommended that the capacity and storage at the Roger's Pumping Station located at Old Potash Highway and North Road be increased; and

WHEREAS, adding major pumping and storage facilities will require additional engineering support; and

WHEREAS, due to CH2M Hill's familiarity with the project, it is recommended that CH2M Hill continue providing engineering services for this project; and

WHEREAS, CH2M Hill has proposed to complete such engineering support necessary to add pumping capacity at Roger's Pumping Station for the amount of \$82,961 in accordance with the engineering services agreement; and

WHEREAS, it recommended that such proposal be approved.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND COUNCIL OF THE CITY OF GRAND ISLAND, NEBRASKA, that the proposal of CH2M Hill of Englewood, Colorado in the amount of \$82,961 for engineering support necessary to add pumping capacity at Roger's Pumping Station is hereby approved.

- - -

Adopted by the City Council of the City of Grand Island, Nebraska, December 23, 2003.

RaNae Edwards, City Clerk

Approved as to Form	☐ _____
December 18, 2003	☐ City Attorney