

## SCHEDULE 1

### HAP CREMEAN WATER PLANT SLUDGE PUMP STATION RENOVATIONS SCOPE OF BASIC SERVICES Contract No. 870, Project No. 690332

#### I. GENERAL SERVICES

The Engineer shall perform services as hereinafter stated which include customary civil, structural, mechanical and electrical engineering services and customary architectural services incidental thereto.

The basic services to be provided under this Agreement are engineering services necessary for and incident to the provision of sludge conveyance and pumping upgrades and electrical upgrades at the Hap Cremean Water Plant and the existing 17-mile long sludge force main to the McKinley Avenue Quarry; said upgrades hereinafter called the Project.

The design shall be coordinated with ongoing and proposed capital improvement projects. Temporary interfaces among Project facilities and other facilities shall be included and the design shall minimize any downtime of the existing water plant. The design shall include construction sequence requirements that allow the water plant to be upgraded with minimal downtime.

Engineering services shall be coordinated with the Division of Water's Supply Group and Hap Cremean Water Plant personnel.

The instrumentation and control system for the new facilities shall be designed in conformance with the existing and proposed future plant control systems.

Two design reports were prepared by others to study and evaluate upgrades for the Project as follows: 1) "Hap Cremean Water Plant Sludge Pumping Station Study – Final Report", Greeley & Hansen, December 1994, and 2) "Hap Cremean Water Plant Power System Study Report", W M Engineering, August 2003. The design will generally follow the scope and requirements included in these two referenced design reports except as otherwise outlined in the Project Facilities below.

#### I.A. PROJECT FACILITIES

The Project shall include the following facilities:

- I.A.1. Sludge conveyance and pumping upgrades including new Sludge Control Houses No. 3 and improvements to the Sludge Control Houses No. 1 and No. 2. Evaluate existing Sludge Control Houses No. 1 and No. 2 for improved maintenance, access, and safety features and provide improvements as appropriate. Relocate the 36-inch main drain to allow construction of new control house. Improve the plant drain system to reduce leakage at basins and channels drain valves and upgrade sluice gates as appropriate.
- I.A.2. New Sludge Pumping Station to pump sludge to either the plant lagoons or the McKinley Avenue Quarry. Confirm existing sludge flows and solids concentrations. Due to the unique pumping application of the existing pump station, sludge solids percentages and flows are anticipated to be similar to existing conditions; however, pumping requirements shall be evaluated and alternative pumping schemes shall be considered. Provide controlled dilution or other measures to maintain existing sludge flow and solids conditions, if appropriate. New pumps shall be designed to be more efficient and require less maintenance compared to the existing pumps. Detailed design of a New Sludge Pumping Station with sludge flows and solids significantly different from existing conditions, if required, shall be completed as additional services.
- I.A.3. Evaluate if the Kingshill Road Pumping Station is needed. Provide for the demolition of this pump station or provide detailed design of upgrades or replacement of this pump station, if appropriate.

- I.A.4. Provide field services at the existing Sludge Pump Station and three (3) sludge force main readily accessible air release manholes to generally inspect condition, manually discharge air at air releases, and demonstrate pressure and flow effects, if any, of entrapped air on pumping system. Following field services, evaluate and make recommendations for improvements to the sludge force main air releases. Provide typical details in Contract Documents for unit pricing of air release manhole upgrades. Detailed design of significant upgrades to the sludge force main, if required, shall be completed as additional services.
- I.A.5. Provide an effluent flowmeter at the McKinley Avenue Quarry to monitor sludge force main leakage. Connect flowmeter to the City's existing SCADA System. In addition, the Engineer shall evaluate and summarize the other alternatives that could be used for leak detection of the sludge force main. Minor improvements shall be included in the design.
- I.A.6. Provide a new outdoor Main Substation servicing both "A" Plant and "B" Plant. Provide a fence and screening around the substation to comply with the recommendations of the City's Vulnerability Assessment.
- I.A.7. Provide a new conditioned electrical room (enclose the existing main substation) for the new "A" Plant switchgear, "B" Plant switchgear and "A" Plant 5 kV high service starters. Reconnect all existing MCCs which are not being replaced (MCC CH, MCC P1, MCC P2, Filter Bldg. "A" MCC, Filter Bldg. "B" MCC) and the existing "B" Plant 5 kV high service starters to the new switchgear.
- I.A.8. Provide a new conditioned electrical room at the existing "B" Plant 5kV high service starters.
- I.A.9. Provide a new electrical room with MCCs at the existing Chemical Building. Modify existing office area to provide new replacement locker room as necessary to construct new electrical room.
- I.A.10. Provide a building addition for a new electrical room with new MCCs at the existing Chemical Storage Building and replace all instrumentation and controls at this building. Evaluate existing building for improved maintenance, access, and safety features and provide improvements as appropriate.
- I.A.11. Enclose existing MCCs at both Filter Buildings "A" and "B" and provide separate HVAC for each new room.
- I.A.12. Provide new main circuit breaker and panelboards at the existing Intake Structure. Provide new electrical ductbank with multiple conduits for existing and future use.
- I.A.13. For all new equipment, provide electrical and process control, instrumentation, and automation and connect to the existing plant SCADA System.
- I.A.14. Provide field survey to identify potential hazardous materials for removal and disposal by others.
- I.A.15. Provide specifications and requirements for OSHA signage and labeling applicable to electrical and other work.

## II. DETAILED DESIGN SERVICES

The Engineer shall:

- II.A.1. Conduct Project Initiation and Review Meetings: An initiation meeting shall be held with the Division of Water's Supply Group and Water Plant staff to review the Project schedule, responsibilities, communications, Project understanding, requirements and goals. Four (4) interim review meetings shall be held with the City at the 25, 50, 75 and 99 percent

completion stage. The purpose of these interim meetings will be to review the status and results of the engineering work completed to date and to identify and resolve any potential conflicts or problems. Additional meetings shall be held periodically with the City and regulatory agencies as necessary to supplement the scheduled review meetings. A final Project meeting shall be held with the City to present the Contract Documents and to review and discuss the final results of the detailed design work.

- II.A.2. Coordinate Design with Division of Water: All equipment, facilities and controls are to be developed in cooperation with Technical Support Section and Hap Cremean Water Plant personnel. Present and review documents with Technical Support Section and Hap Cremean Water Plant personnel.
- II.A.3. Prepare Detailed Design Drawings: Detailed design drawings shall be prepared for use in bidding and constructing the proposed improvements and facilities. Drawings shall be prepared using a 24" x 36" format and AutoCAD 2005, utilizing standard fonts, line types, symbols, shading, cross-hatching, etc.
- II.A.4. Prepare Project Manual: A Project manual shall be prepared to supplement the detailed design drawings. The Project manual shall include the notice to bidders, proposal forms, contract forms, proposal and contract bonds, general contract provisions, special contract provisions and affidavits required for Columbus Division of Water construction projects and technical specifications. The technical specifications shall be prepared using the Construction Specifications Institute standard format.
- II.A.5. Prepare Construction Cost Estimate: An estimate of probable cost and quantities for construction of the work shall be prepared for each of the four (4) interim reviews stated in paragraph II.A.1. above, and for the final Contract Documents.
- II.A.6. Assemble and Submit Contract Documents: The detailed design drawings and Project manual shall be submitted to the City and Ohio EPA (if applicable) for review and approval. It is anticipated that a maximum of ten (10) copies of Contract Documents will be required for review and approval purposes. Make payment of all fees required by agencies and other authorities as a cost reimbursable expense.
- II.A.7. Value Engineering: Qualified engineers not actively involved in the project development will be commissioned with performing a value engineering type review of the 25% complete documents. The City shall provide a facilitator for this independent review group, and identify specific project elements to be reviewed to identify potential design refinements that would result in cost savings to the City. The feasibility of these suggested design refinements would be evaluated by the design team, and implemented upon the City's directive.

### III. CONSTRUCTION ADMINISTRATION SERVICES

The Engineer shall:

- III.A. BIDDING
  - III.A.1. Bid Documents: Furnish Bid Documents for bidding and construction purposes as a Reimbursable Expense under this Agreement. Non-refunded Plan Holders' deposits shall be used to help offset the costs incurred by the Engineer in furnishing such documents.
  - III.A.2. Bidding Assistance: Assist City in obtaining bids for construction, materials, equipment and services. Prepare and distribute addenda to Plan Holders.

III.A.3. Bid Substitutions: Consult with and advise City as to the acceptability of substitute materials and equipment proposed by Bidders when substitution prior to the award of contracts is allowed by the bidding documents.

III.A.4. Bid Evaluation and Award: Assist City in evaluating bids or proposals and in assembling and awarding construction contracts.

III.B. CONSTRUCTION PHASE (Future As- Authorized Services)

The following is the anticipated activities to be performed by the BBS team during the construction phase of the project. It should be noted actual scope of required services need to be refined when the exact scope of improvements is known; consequently the costs for these services will be authorized by a future modification to the engineering agreement.

III.B.1. Chair and Conduct Project Meetings: The pre-bid conference, pre-construction conference, progress meetings and other job conferences shall be chaired and conducted by the Engineer in company with the City. The schedule and agenda for such meetings and the minutes of the meeting, shall be prepared and distributed by the Engineer.

III.B.2. Perform Site Visits: Make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed work of Contractor(s) and to determine, in general, if such work is proceeding in accordance with the Contract Documents. Engineer shall visit site to observe condition of sludge force main and determine if additional improvements are recommended. Engineer shall not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of such work. Engineer shall not be responsible for the means, methods, techniques, sequences or procedures of construction selected by Contractor(s). Engineer's efforts will be directed toward providing a greater degree of confidence for City that the completed work of Contractor(s) will conform to the Contract Documents, but Engineer shall not be responsible for the failure of Contractor(s) to perform the work in accordance with the Contract Documents. During such visits and on the basis of on-site observations, Engineer shall endeavor to keep City informed of the progress of the work, shall endeavor to guard City against defects and deficiencies in such work and shall make recommendations for the disapproval or rejection of work failing to conform to the Contract Documents.

III.B.3. Submittal Review (Civil/Sanitary, Structural, HVAC, Equipment, Electrical, Mechanical and Instrumentation): Shop drawings, diagrams, illustrations, catalog data, schedules, samples and test results which the Contractor is required to submit shall be checked for general conformance with the design concept of the Project and compliance with the information given in the Contract Documents. Other data and certificates as required by the Contract Documents such as operation and maintenance instructions, schedules, guarantees, bonds and certificates of inspection shall also be reviewed. Such reviews or other actions by the Engineer shall not extend to the means, methods, techniques, sequences or procedures of construction or to safety precautions and programs incident thereto.

III.B.4. Issue Interpretation of Contract Documents: Assist in issuing instructions of City to Contractor(s); assist in issuing necessary interpretations and clarifications of the Contract Documents and in connection therewith assist in preparing change orders as required; have authority, as City's representative, to require special inspection or testing of the work; act as initial interpreter of the requirements of the Contract Documents and initial judge of the acceptability of the work thereunder and assist in making decisions on claims of City and Contractor(s) relating to the acceptability of the work or the interpretation of the requirements of the Contract Documents pertaining to the execution and progress of the work; but Engineer shall not be liable for the results of any such interpretations or decisions rendered by him in good faith.

- III.B.5. Review Applications for Payment: Based on Engineer's on-site observations and on review of applications for payment and the accompanying data and schedules, assist the City in determining the amounts owing to Contractor(s) and recommend in writing payments to Contractor(s) in such amounts. Such recommendations of payment will constitute a representation to City, based on such observations and review, that the work has progressed to the point indicated, that, to the Engineer's knowledge, information and belief, the quality of such work is generally in accordance with the Contract Documents (subject to an evaluation of such work as a functioning Project upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, and to any qualifications stated in his recommendation), and that payment of the amount recommended is due Contractor(s). By recommending any payment, Engineer will not thereby be deemed to have represented that continuous or exhaustive examinations have been made by Engineer to check the quality or quantity of work, or to review the means, methods, sequences, techniques or procedures of construction or safety precautions or programs incident thereto or that Engineer has made an examination to ascertain how or for what purposes any Contractor has used the monies paid on account of the Contract Price, or that title to any of the work, materials or equipment has passed to City free and clear of any lien, claims, security interests or encumbrances, or that Contractor(s) have completed their work exactly in accordance with the Contract Documents.
- III.B.6. Conduct Substantial Completion Inspection: Assist in conducting an inspection to assist in determining if the Project is substantially complete and a final inspection to assist or determine if the work has been completed in accordance with the Contract Documents and if each Contractor has fulfilled all of his obligations thereunder so that Engineer may recommend, in writing, final payment to each Contractor and may give written notice to City and the Contractor(s) that the work is acceptable (subject to any conditions therein expressed), but any such recommendation and notice shall be subject to the limitations expressed in paragraph III.B.5.
- III.B.7. Prepare Record Drawings: The original Contract Drawings shall be revised based upon "as-built" information furnished by the Contractor which shall indicate the changes to the original Drawings. Field orders and change orders, which occur during the construction of the Project, shall be noted by the Engineer based in information furnished to the Engineer by others. After noting the construction changes and field conditions on the Drawings, one set of reproducible mylars and an AutoCAD most current version CD-Rom of the revised Drawings shall be provided to the City.
- III.B.8. Operation and Maintenance Manual: Prepare an O&M Manual for the sludge handling and electrical systems for use by plant operators and maintenance personnel. O&M Manual shall be in a format similar to existing plant manuals except as otherwise required by Division of Water's Supply Group and Hap Cremean Water Plant personnel.
- III.B.9. Engineer shall not be responsible for the acts or omissions of any Contractor, or subcontractor, or any of the Contractor(s)' or subcontractor(s)' agents or employees or any other persons (except Engineer's own employees and agents) at the site or otherwise performing any of the Contractor(s)' work; however, nothing contained in this paragraph shall be construed to release Engineer from liability for failure to properly perform duties undertaken by him.
- III.C. RESIDENT PROJECT REPRESENTATION
- III.C.1. A minimum of one full-time resident project representative shall be furnished to act as directed by Engineer in order to assist Engineer to observe the performance of the construction work. The Resident Project Representative shall conduct on-site observations of the construction work, assist in verifying performance of test procedures and equipment start-up, maintain job files, prepare daily inspection reports, maintain a set

of Contract Drawings with changes noted, review applications for payment with the Contractor and conduct a final inspection of the work in company with the City.

- III.C.2. Through more extensive on-site observations of the work in progress and field checks of materials and equipment by the Resident Project Representative, Engineer shall endeavor to provide further protection for City against defects and deficiencies in the work of Contractor(s); but the furnishing of such Resident Project Representation will not make Engineer responsible for construction means, methods, techniques, sequences or procedures or for safety precautions or programs, or for Contractor(s)' failure to perform their work in accordance with the Contract Documents.

#### IV. ADDITIONAL SERVICES

If authorized by City, Engineer shall furnish or obtain from others Additional Services of the following types which are not considered normal or customary Basic Services.

- IV.A. Preparation of applications and supporting documents for governmental grants, loans or advances in connection with the Project; preparation or review of environmental assessments and impact statements; review and evaluation of the effect on the design requirements of the Project of any such statements and documents prepared by others; and assistance in obtaining approvals of authorities having jurisdiction over the anticipated environmental impact of the Project.
- IV.B. Services resulting from significant changes in extent of the Project or its design including, but not limited to, changes in size, complexity, City's schedule, or character of construction or method of financing; and revising previously accepted studies, reports, design documents or Contract Documents when such revisions are due to causes beyond Engineer's control. Such additional services, as described in paragraph I.A., shall include: 1) Design of a New Sludge Pumping Station with sludge flows and solids significantly different from existing conditions, and 2) Design of significant upgrades to the sludge force main including any significant leak detection upgrades.
- IV.C. Providing renderings or models for City's use.
- IV.D. Preparing documents for alternative bids requested by City for Contractor(s)' work which is not executed or documents for out-of-sequence work.
- IV.E. Investigations involving detailed consideration of operations, maintenance and overhead expenses, except as provided in SECTION II.; the preparation of feasibility studies, cash flow and economic evaluations, rate schedules and appraisals; assistance in obtaining financing for the Project; evaluating processes available for licensing and assisting City in obtaining process licensing; detailed quantity surveys of material, equipment and labor; and audits or inventories required in connection with construction performed by City.
- IV.F. Approval review and other fees required by and payable to agencies and other authorities.