

**CONTRACT FOR TELEMETRY SYSTEM DESIGN SERVICES**

**CONTRACT NO. 2400-65-650-801.02**

THIS CONTRACT FOR ENGINEERING SERVICES, is made and entered into on Dec 26, 2013, by and between the County of Genesee, a Michigan County Corporation (hereinafter referred to as the "County") acting through its agent, the Genesee County Drain Commissioner, of G-4610 Beecher Road, Flint, Michigan 48532, as County Agency per Act 342, Michigan Public Acts of 1939, as amended, hereinafter called the "GCDC-WWS" and Dmytryka Jacobs Engineers, Inc., of 1101 Research Drive, Toledo, Ohio 43614, hereinafter called the "Engineer". GCDC-WWS intends to engage Engineer to provide general consulting and professional engineering services for design of a project involving Telemetry System Design (the "Project").

RECITALS:

WHEREAS, GCDC-WWS desires to engage the Engineer to review, evaluate, and design the Project;

WHEREAS, GCDC-WWS shall provide the Engineer with all available data for the Project, including the existing design reports and design Drawings that will aid the Engineer with the final design; and

WHEREAS, Engineer shall provide GCDC-WWS with the engineering services as outlined hereinafter, and a detailed scope of such services is set forth in Appendix A to this Contract.

## ENGINEER'S BASIC SERVICES

### **PHASE 1. PREPARATION OF DETAILED DESIGN, DRAWINGS AND SPECIFICATIONS:**

This phase of the Project shall follow the preliminary design, as prepared by Engineer, and shall include the development of detailed Drawings and Specifications suitable for obtaining regulatory permits and approvals in connection with the Project. The detailed design shall include the following services.

- A. Engineer shall serve as GCDC-WWS's professional representative in the design and construction of the Project and shall consult with and advise GCDC-WWS during the performance of Engineer's services.
- B. Engineer shall prepare engineering data where necessary for the application for regulatory permits required by local, state, and federal authorities and shall respond to and provide supporting documents to these authorities to address review comments and questions.
- C. Engineer shall prepare Contract Documents for review and approval by GCDC-WWS. Engineer shall also make any changes and revisions to the Contract Documents as requested by GCDC-WWS following completion of GCDC-WWS's QA/QC review.
- D. Engineer shall assist GCDC-WWS in securing proposals and bids from vendors and contractors and in analyzing the proposals and bids received.
- E. Engineer shall deliver Drawings and Specifications to GCDC-WWS as set forth in Appendix A to this Contract.

### ADDITIONAL SERVICES OF THE ENGINEER

Additional services required of the Engineer shall include the following, but only when authorized in writing by GCDC-WWS prior to Engineer performing the service.

- A. Revisions to approved Contract Documents for alternate proposals requested or approved by GCDC-WWS requiring Change Orders. Compensation for such revisions shall be based upon the rate schedule of personnel required to perform the Work. Minor revisions shall be made by the Engineer at no expense to GCDC-WWS. Revisions to correct design errors and omissions are not extra services and are non-compensable to Engineer.

## INSURANCE

The insurance policies and the limits of liability for such insurance policies required to be obtained and maintained by Engineer pursuant to the Contract are as follows:

1. Workers' Compensation	Statutory
2. Employer's Liability	\$1,000,000
3. General Liability	
General Aggregate:	\$1,000,000
Each Occurrence (Bodily Injury and Property Damage):	\$1,000,000
4. Excess Umbrella Liability	
Each Occurrence:	\$2,000,000
General Aggregate:	\$2,000,000
5. Automobile Liability Bodily Injury Combined Single Limit	\$1,000,000
6. Professional Liability (Each Occurrence)	\$1,000,000

The Genesee County Drain Commissioner's Office of Water and Waste Services Division shall be listed on all of the aforementioned policies of insurance as an additional insured, and Engineer shall promptly provide written documentation of the same to GCDC-WWS. All of the aforementioned insurance policies shall contain terms and conditions which are satisfactory to GCDC-WWS.

## PAYMENT TO THE ENGINEER

For and in consideration of the services to be furnished by the Engineer hereunder, GCDC-WWS shall pay the Engineer a fee of \$286,990.00. Payment of the fee shall be made by GCDC-WWS to the Engineer on a monthly basis in accordance with Appendix A and Appendix B attached hereto and incorporated by reference as though fully set forth herein.

MISCELLANEOUS

This Contract shall be binding upon the permitted successors and assigns of the Parties, provided, however, that Engineer may not assign or transfer its interest in this Contract without the written consent of GCDC-WWS. GCDC-WWS may assign or transfer its interest in this Contract without the written consent of Engineer. This Contract shall be governed by the laws of the State of Michigan. This Contract and its Appendixes set forth the entire agreement and understanding between the Parties as to the subject matter hereof, and supersede all prior and contemporaneous representations, amendments, or understandings of every kind or nature between them. No waiver of any of the obligations, covenants, representations, or warranties contained herein shall be effective for any purpose unless the same shall be in writing and signed by both of the Parties hereto.

IN WITNESS WHEREOF, Genesee County through its Agency, the Drain Commissioner, as GCDC-WWS, and Engineer have signed this Contract on this 26<sup>th</sup> day of December 2013.

WITNESSETH:

By: [Signature]

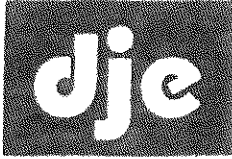
GENESEE COUNTY DRAIN COMMISSIONER

By: [Signature]  
Jeffrey Wright

DMYTRYKA JACOBS ENGINEERING, INC.

By: [Signature]

By: [Signature]



## DMYTRYKA JACOBS ENGINEERS, INC.

1101 Research Drive • Toledo, Ohio 43614

October 3, 2013

Mr. Matt Raysin, P.E.  
Genesee County Drain Commission  
G-4610 Beecher Road  
Flint, Michigan 48532

*Subject: Lake Huron Water Initiative -  
Telemetry System Design Proposal*

Dear Mr. Raysin:

Thank you for your continued interest in Dmytryka Jacobs Engineers, Inc. (DJE) and the opportunity to provide Genesee County engineering design services for the Lake Huron Water Initiative Telemetry System project. As DJE provided the telemetry design for the existing Genesee County SCADA telemetry system, we are very familiar with the work that is required to engineer the telemetry system design for this project. Based on our understanding of the project, we offer the scope of services and associated fees as described in the following Exhibits A and B.

Monthly invoices will be based on actual time used to complete the work billed at the rates identified on the attached Professional Fee Schedule. These rates will be based on a 2.8 multiplier of actual salaries. Average rates by classification have been used for the purpose of developing the Exhibit B fee schedule.

DJE can begin work upon receipt of your written authorization. We look forward to working with you and the County on this important project. If you have any questions regarding this proposal, please feel free to contact me.

Very truly yours,

A handwritten signature in black ink that reads "Mark E. Jacobs". The signature is fluid and cursive, with a large, stylized initial "M".

Mark E. Jacobs, P.E.  
Vice President

/cdd  
Attachment



## EXHIBIT A SCOPE OF PROFESSIONAL SERVICES

Following is the Scope of Professional Services proposed by Dmytryka Jacobs Engineers, Inc. (DJE) for the Genesee County Lake Huron Water Initiative -Telemetry System Design.

### Summary of Work:

The Genesee County Lake Huron Water Initiative project will require telemetering of SCADA information for monitoring and control capability along its approximately 60 miles of pipeline from Lake Huron to the new County Water Treatment Plant. The County administrative offices on Beecher road, an additional 30 miles to the west, will need the capability to monitor the status of facilities along the pipeline and provide some control. A communication link will need to be provided from the new WTP to the existing Henderson Pumping Station to support distribution of finished water. Additional links to communities such as Flint and Lapeer will also need to be accommodated to support distribution of raw water.

The telemetry system backbone will need to be installed and tested prior to any of the new facilities coming online. The Water Initiative project design completion is scheduled for the spring of 2014 and the system is to be operational by the end of 2015. This would necessitate the completion of the telemetry backbone by the summer of 2015. Assuming some need of verification of any computer modeling of signal paths with a physical on-site study this could be done at its earliest around May of 2014 when the trees get their leaves back. This would allow the summer/fall of 2014 to complete design, advertise, and award contract. Construction could begin on receipt of materials the first quarter of 2015 with completion and testing of the backbone that summer.

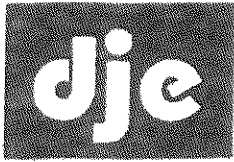
A bid for installation will allow local contractors to bid on the work. Specifications will follow EJCDC and CSI format. The Division of WWS will supply the specification front ends for use by DJE and will be modified as needed. DJE will provide separate sets of bidding documents, provide construction services, and provide operational phase services as described.

During the Construction and Operational Phases DJE will provide a resident project representative on an as needed basis during the critical construction periods of this project. Because a project such as this is more milestone or event driven, we do not anticipate this representative to be on-site full time. We believe the County should also participate in the inspection process to gain familiarity with the overall system. As such DJE will coordinate with the County to provide a comprehensive inspection effort. We have provided estimates of DJE on-site services as described later in this proposal.



Operational (Programming) Phase services will be limited to importing the information to be monitored from the various sites (Lake Pump Station, WTP, etc.) into the existing IFix and WIN911 applications at County Beecher Road offices. We assume other consultants or contracted integrators will develop the local PLC and HMI programming at the various facilities. DJE will develop standards for the HMI (graphics) screens and database structures for the contractor to adhere to. This will minimize the work required to import these screens into the Beecher Road IFix/WIN911 applications and help standardize the look and feel of the screens and alarm messaging. DJE will also provide standards for PLC to PLC communications and tag naming conventions across the backbone to insure consistency across the entire system.

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### Preliminary Design Phase:

During this Phase, DJE will develop the design memo to be used throughout the project. DJE Will:

1. Hold a workshop with the County and other consultants to discuss management and technical goals. County expectations of the telemetry system will be addressed. Various methods for telemetry, such as available frequencies, radio equipment, cellular equipment, fiber, and phone solutions will be discussed.
2. Contact providers of alternate methods for telemetry, such as cellular equipment, fiber, cable, and phone to determine availability and costing.
3. Determine the bandwidth requirements for the telemetry system.
4. Evaluate the data loading of the various available technologies and present typical data throughput (response) times.
5. Communicate with agencies having control of any existing assets which may be used as part of the overall telemetry backbone solution. This would include assets such as the City of Flint WTP water tower. DJE will direct any required Inter-modulation studies which will be provided by a third party specializing in this type of work. DJE has included an allowance in the amount of \$2,000.00 for payment to the contractor performing this work. Placement of radio equipment, panels, and availability of electrical services will be addressed.
6. Do preliminary frequency searches and follow up with enlisting an FCC licensing coordinator to provide direction on available frequencies. DJE has included an allowance in the amount of \$15,000.00 for payment to the contractor performing this work.
7. Contact contractors that will address possible structural/mechanical issues with existing asset modifications (i.e. the need to weld antenna mounting brackets on an existing water tower). DJE has included an allowance in the amount of \$6,000.00 for payment to the contractor performing this work.
8. Coordinate with other consultants on the Water Initiative Project to coordinate system architectures, equipment selections, and convey required locations of new towers so right of way permits and township approvals can be obtained.
9. Address FAA clearance of height requirements as they relate to nearby airports.
10. Meet with local inspectors to discuss project and possible code issues.
11. Evaluate the various available telemetry methods and associated construction costs.
12. Determine availability of electrical services at the outlying sites.
13. Develop a preliminary telemetry system architecture diagram, including recommended frequencies, power, and repeater locations.
14. Develop preliminary radio equipment, and miscellaneous system components recommendations. This will include antennas, coax feed lines, surge arrestors, power supplies, filters, UPS's, cabinets, communications doghouses, etc.
15. Verify the above system architecture with computer modeling of the required radio





paths.

16. Prepare a technical memorandum summarizing the findings of this phase.
17. Present finding to the County.

**Preliminary Design Memo/Permitting Phase Deliverables:**

1. Design memo and recommendations.
2. FCC license applications.

**Field Survey/Design Phase:**

During the Field Survey/Design Phase DJE will:

1. Based on the findings of the above technical memorandum, provide for physical on-site testing of the various radio paths where possible. DJE will make use of an outside contractor to climb any existing structures but as this is a new installation with almost no existing assets this effort will be minimal. DJE will self perform the study for the RTU level locations. We understand the County may provide use of a bucket truck and operator should the need arise. Fees associated with any outside contractor to assist in verification of these paths will be paid from an included allowance in the amount of \$10,000.00.
2. Evaluate all existing facilities to verify installation details and determine requirements of new locations.
3. Verify proposed conduit/wire routings.
4. Develop proposed design, system layouts, any I/O listings, hardware and software requirements, and estimated costs. Update project cost estimate.
5. Review required antenna heights with County and develop needed alternatives to problematic sites that must be sensitive to appearance.
6. Coordinate with local utility on sites requiring new power drops.
7. Obtain permission and coordinate access to sites not owned by the County.
8. Coordinate with tower vendors to assure any need for additional soil borings is included in their contract.
9. Discuss above findings with the County personnel.

**Installation/Panel Fabrication Drawings, Specifications, and Bidding Services Phase:**

During the Installation/Panel Fabrication Drawings, Specifications, and Bidding Services Phase DJE will:

1. Develop contract forms and general conditions of bidding documents where applicable for inclusion into the County's standard bid package. DJE will utilize front end documents supplied by the Division of WWS and will make modifications as required.
2. Develop technical specifications for all hardware, installation methods, testing, and training



requirements for the telemetry system. Specifications will follow Engineer Joint Council and CSI format.

3. Develop contract drawings. These will include demolition plans as they relate to removal of existing electrical equipment at existing facilities such as the City of Flint WTP, conduit/wire plans and associated schedules, panel fabrication drawings consisting of electrical/telemetry panel layouts with bills of materials, riser diagrams, installation details, network architectures, IP addressing schemes, and control wiring schematics as required. DJE will request specific utility information for locations of existing utilities. All electrical design will comply with NEC requirements. We understand the County will submit for any plan reviews. Specific electrical site plans will be developed by providing markups to civil site plans developed by others (with exception of the City of Flint WTP).
4. Discuss contract documents with the County personnel. DJE will provide the County three (3) review sets at the 30, 60 and 95 percent stages of completion.
5. Finalize technical documents for inclusion into the bidding documents. We understand the County will package these documents into their standard bid package and will distribute these to potential bidders.
6. Provide hardcopy record sets of drawings and Autocad files as required. We understand the County will print and distribute bid-sets.
7. Provide an Engineer's Estimate of Probable Construction Costs.
8. Attend a mandatory pre-bid conference.
9. Provide assistance to the County in the review and evaluation of qualified bids.

Installation/Panel Fabrication Drawings, Specifications, and Bidding Services Phase Deliverables:

1. 30%, 60%, and 95% design specifications and drawings review sets.
2. 100% design and specifications for inclusion in bid documents and record sets in formats as required by the county.
3. Opinion of probable construction costs.
4. Pre-bid conference minutes.
5. Addenda as required.
6. Bid evaluation and recommendation of the three lowest bidders.

#### Construction Services Phase:

During the Construction Phase DJE will:

1. Review and comment on all shop drawings submitted by the Contractor as needed.
2. Visit the sites during construction to inspect the installation, generate punch lists and make recommendation of substantial completion. DJE does not intend to provide a full time inspection presence during construction. DJE will coordinate our efforts with the County and inspect multiple sites during a single visit to verify completion of "milestone" events. We



estimated, and allotted for, 15 man days to inspect the contractor's work over approximately 10 sites.

3. Attend construction/coordination meetings. It is estimated a construction meeting will be required, on the average, once every three weeks over the construction period of approximately five months for a total of seven meetings.
4. Review Contractor pay requests and recommend appropriate action to the County if requested.
5. Witness commissioning of the telemetry system. This effort will verify both the construction methods and configuration of the hardware. It will also deal with performance issues regarding radio propagation, data throughput, etc.
6. Perform inspections for substantial and final completions and develop contractors list of deficiencies.
7. Review and comment on all operation and maintenance manuals and documentation submitted by the Contractor.
8. Provide as-built drawings for record.

#### Construction Services Phase Deliverables:

1. Copy of all shop drawing reviews.
2. Construction meeting minutes.
3. Review utility allowance usage.
4. Factory test report.
5. Commissioning effort reports.
6. Start-up effort report.
7. Contractor deficiency lists.
8. Change order review.
9. As-built drawings in format as required.

#### Operational Services Phase:

During the Operational (Programming) Phase DJE will:

1. Develop IFix HMI graphics and database standards for consultants/contractors for their use in programming the remote pump stations.
2. Develop WIN911 alarming standards for consultants/contractors for their use in programming the remote pump stations.
3. Develop PLC to PLC communication standards.
4. Import the various remote IFix applications developed into the Beecher Road IFix application. For the purpose of this proposal DJE has allowed up to 120 hours of on-site labor for this effort.
5. Commission the above modifications to the existing Beecher Road applications to verify proper operation. The intent of this effort is to verify the remote I/O signals back to the



Beecher Road computers. For the purpose of this proposal it is assumed the telemetry network will have sufficient bandwidth to support Ethernet connectivity from the Beecher Road network to the remote pump stations. This will minimize the commissioning of the above applications. DJE has allowed up to 160 hours of on-site labor for this effort. Should insufficient bandwidth be available to support IFix to IFix Ethernet connectivity the commissioning effort will require a sufficient increase in labor. At this time DJE estimates this additional scope requirement at a cost of \$24,000.00. We have called this out as an additional internal "allowance" item in the attached fee schedule. DJE will only bill against this line item on direction by the County.

6. Provide programming and startup of up to four intermediate Local Master Telemetry Units (LMTU's).
7. DJE will make every attempt to correct any problems with the IFix applications provided to us by the contractor. For persistent problems DJE will develop deficiency list in the provided applications.
8. Provide five sets of O&M manuals and CDs containing all files for software developed by DJE. The O&Ms will address the specific telemetry equipment, system architecture, and memory mapping for this project.
9. Provide operator and management training for the use of the new telemetry system. We see this effort requiring up to two man days on-site.
- 10 Provide additional reports to existing IFix application. DJE will produce four custom reports.

Operational Services Phase Deliverables:

1. Copy of IFix HMI standards.
2. Copy of WIN911 standards.
3. Copy of PLC to PLC communication standards.
4. Training outlines for review.
5. Training syllabus and manuals in quantities as required.
6. 5 sets of O&M manuals containing the above and CDs containing copies of all developed PLC and IFix software, memory map layouts, and system architectures..



EXHIBIT B

COMPENSATION

Following is the summary of fees proposed by Dmytryka Jacobs Engineers, Inc. for the services detailed in Exhibit A.

BASIC SERVICE	ESTIMATED FEE
<u>Phase IA</u>	
Preliminary Design Phase	\$ 37,200.00
Intermodulation Study Allowance **	\$ 2,000.00
Frequency Search/License Allowance **	\$ 15,000.00
Structural Evaluation Allowance **	\$ 6,000.00
Field Survey/Design Phase	\$ 27,192.00
Physical On-Site Study Allowance **	\$ 10,000.00
Installation/Panel Fab Drawings, Specifications and Bid Services Phase	\$ 35,720.00
Construction Services Phase	\$ 39,760.00
Operational Services (Programming) Phase	\$ 67,392.00
Additional Tagging and Commissioning Allowance **	\$ 26,000.00
Labor Subtotal (without allowances)	\$ 207,264.00
Expenses (10%)	\$ 20,726.00
SubTotal	\$ 227,990.00
Allowances	\$ 59,000.00
 TOTAL NOT - TO - EXCEED FEE	 \$ 286,990.00



Following is the Current Hourly Rate Schedule by job classification proposed for this project.

<u>JOB CLASSIFICATION</u>	<u>SALARY RATE</u>	<u>BILLING RATE</u>
Principal	\$45.00 - \$60.00	\$126.00 - \$168.00
Professional Engineer	\$35.00 - \$50.00	\$98.00 - \$140.00
Senior Engineer	\$30.00 - \$45.00	\$84.00 - \$126.00
Staff Engineer	\$22.00 - \$30.00	\$61.00 - \$84.00
Technician	\$20.00 - \$25.00	\$56.00 - \$70.00
CAD Operator	\$12.00 - \$25.00	\$33.00 - \$70.00
Intern	\$12.00 - \$18.00	\$33.00 - \$50.00
Word Processing	\$10.00 - \$15.00	\$28.00 - \$42.00
Chargeable Expenses		Actual Cost

Monthly invoices will be based on actual time used to complete the Basic Services billed at the employee's hourly rate multiplied by a factor of 2.8. Terms are Net 30 Days.

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