

ADDENDUM #3

Village of Cary, Illinois

ROTARY PARK DEEP WELL AND WATER TREATMENT PLANT

HR Green Project No.: 2302382

May 12th, 2025

This addendum forms a part of the bidding documents and contract documents and modifies the original bidding documents certified April 4, 2025.

Acknowledge receipt of this addendum in the space provided on the BID FORM and sign and include with your Bid. **Failure to do so may subject the Bidder to disqualification.**

BIDDING REQUIREMENTS, CONTRACT FORMS

- Bid Form or Proposal with Davis-Bacon Wage Act Requirements
 - Current Davis-Bacon Wage Rates (changes shown clouded)
 - Bid Schedule (changes shown clouded)
 - Major Items of Equipment (changes shown clouded)

SPECIFICATIONS


- Section 33 2113 (changes shown clouded)
- Section 44 4256.02 (changes shown clouded)
- Section 08 3323 Overhead Coiling Doors, Part 2.3A.1.
 - Replace “Basis of Design is “Heavy Duty Stormtite insulated springless service door”, EverServe Model 625S by Overhead Door Corporation, or approved equal” with “Basis of Design is “Rolling Steel Insulated Service Door – Model 625” by Overhead Door Corporation, or approved equal.””

PLANS

- Sheet C108
 - Add General Notes Below:
 - “GENERAL NOTES: 1. BORED AND DIRECT BURIED CONDUITS FOR UTILITY PRIMARY CONDUCTORS SHALL BE INSTALLED AT A MINIMUM DEPTH OF 30” BELOW FINISHED GRADE. DETAIL 9/E101 SHALL BE FOLLOWED FOR GENERAL METHODS OF INSTALLATION OF BURIED TRANSFORMER PRIMARY CONDUIT WITH OVERALL DEPTH OF 30” TO THE TOP OF CONDUIT FROM FINISHED GRADE.”
- Sheet E101
 - Add General Note 3. “3. CLASSIFICATION OF LIFT STATION WET WELL INTERIOR IS CLASS I, DIV. 1.”
- Sheets E102, E103, and E104:
 - Add space classifications for rooms as listed below:

- ROOM 001 – UNCLASSIFIED DAMP AREA
- ROOM 002 – UNCLASSIFIED DAMP AREA
- ROOM 003 – UNCLASSIFIED
- ROOM 004 – UNCLASSIFIED
- ROOM 005 – UNCLASSIFIED
- ROOM 006 – UNCLASSIFIED
- ROOM 007 – UNCLASSIFIED
- ROOM 008 – UNCLASSIFIED WET CORROSIVE AREA
- ROOM 009 – UNCLASSIFIED WET CORROSIVE AREA
- ROOM 010 – UNCLASSIFIED DAMP AREA
- Sheet E501:
 - Replace Key Note 1 with the following: “1. UTILITY TRANSFORMER PROVIDED BY UTILITY. SEE SPECIFICATION 26 2100 FOR ADDITIONAL INFORMATION.”
- Sheet E601:
 - Conduit and Raceway Schedule Circuit P000 – Modify Conduit from “ (2) 4” ” to “ 4” “. Modify Remark from “WIRING BY UTILITY. CONDUIT BY E.C.” to “WIRING BY UTILITY. CONDUIT BY E.C. PER UTILITY REQUIREMENTS.”

HR Green, Inc.

By 

Ravi Jayaraman, PE

This Addendum #3 **must** be attached and signed with your Proposal.

Received _____, 2025

Contractor _____

BID FORM OR PROPOSAL

Proposal of _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of Illinois doing business as _____^{*} to the Village of Cary (hereinafter called "OWNER").

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the construction of Rotary Park Deep Well and Water Treatment Plant project which generally consists of furnishing all labor, materials, and equipment necessary to drill and install a new 1,300 foot deep well (Well #14) and new water treatment building as shown in the contract documents. Project generally consists of the installation of a water treatment plant with ion exchange system, brine system, fluoride feed system, chlorine feed system, emergency chlorine gas scrubber, brine tank, and backwash surge tank, an emergency generator and lift station in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

BIDDER hereby agrees to commence WORK under this contract on or before a date to be specified in the NOTICE TO PROCEED and substantially complete the Project within 700 calendar days and final completion 730 calendar days. BIDDER further agrees to pay as liquidated damages, the sum of \$500 for each consecutive calendar day thereafter.

BIDDER certifies that all iron, steel, manufactured products, and construction materials used in the project for the construction, alteration, maintenance, or repair of a public water system are produced in the United States in compliance with the federal Build America, Buy America Act, Pub. L. No. 117-58 §§ 70901-52.

*** Insert "a corporation", "a partnership", or "an individual" as applicable.**

- (I) By submission of the bid, each bidder certifies, and in the case of a joint bid each party to the joint bid certifies, as to his or her own organization, that in connection with the bid:
- (i) The prices in the bid have been arrived at independently, without consultation, communication, or agreement with any other bidder or with any competitor, for the purpose of restricting competition, as to any matter relating to the prices;
 - (ii) Unless otherwise required by law, the prices quoted in the bid have not knowingly been directly or indirectly disclosed to any other bidder or to any competitor prior to opening; and
 - (iii) No attempt has been made or will be made by the bidder to induce any other person or firm to submit or withhold a bid for the purpose of restricting competition.
- (II) Each person signing the bid shall certify that:
- (i) He or she is the person in the bidder's organization responsible for the decision as to the prices being bid and that he or she has not participated, and will not participate, in any action contrary to (I)(i) through (I)(iii) above; or
 - (ii) He or she is not the person in the bidder's organization responsible for the decision as to the prices being bid, but that he or she has been authorized to act as agent certifying that the persons determining the prices have not participated, and will not participate, in any action contrary to (I)(i) through (I)(iii) above, and as their bidder's agent shall so certify. He or she shall also certify that he or she has not participated, and will not participate, in any action contrary to (I)(i) through (I)(iii) above.

BIDDER acknowledges receipt of the following ADDENDUM (Where applicable): _____

BIDDER certifies that wages paid in connection with the PROJECT shall be paid at prevailing rates not less than those prevailing under the Davis-Bacon Wage Act. Bidder further certifies that the provisions contained in the following clauses will be exercised in the performance of any contract resulting from this BID and are made a part of the CONTRACT DOCUMENTS thereto by their inclusion in the BID as follows:

(1) *Minimum wages.*

- (i) All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in §5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. Sub recipients may obtain wage determinations from the U.S. Department of Labor's web site, <http://beta.sam.gov/>
- (ii) (A) The sub-recipient, on behalf of USEPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The USEPA award official shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:
 - (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
 - (2) The classification is utilized in the area by the construction industry; and
 - (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the sub-recipient agree on the classification and wage

rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the sub-recipient to IEPA. IEPA shall forward the report to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise IEPA or will notify IEPA within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers, or mechanics to be employed in the classification or their representatives, and the sub-recipient do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), IEPA shall refer the questions, including the views of all interested parties and the recommendation of the sub-recipient, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise IEPA or will notify IEPA within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

- (iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
 - (iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis Bacon Act have been met. The Secretary of Labor may require the contractor to set aside, in a separate account, assets for the meeting of obligations under the plan or program.
- (2) *Withholding.* The sub-recipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the sub-recipient may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.
- (3) *Payrolls and basic records.*
- (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates

- of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
- (ii) (A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the sub-recipient. Such documentation shall be available upon request of IEPA or USEPA. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Website, [<https://www.dol.gov/whd/forms/index.htm>]. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker and shall provide them upon request to the sub-recipient, for transmission to the IEPA, USEPA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sub-recipient.
- (B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
- (1) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;
 - (2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;
 - (3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

- (C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.
- (D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.
- (iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of IEPA, USEPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) *Apprentices and trainees*

- (i) *Apprentices.* Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid no less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be

permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) *Trainees.* Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by form certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) *Equal employment opportunity.* The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

- (5) *Compliance with Copeland Act requirements.* The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.
- (6) *Subcontracts.* The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the USEPA may by appropriate instruction require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.
- (7) *Contract termination: debarment.* A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.
- (8) *Compliance with Davis Bacon and Related Act requirements.* All rulings and interpretations of the Davis Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.
- (9) *Disputes concerning labor standards.* Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be

resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

- (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis Bacon Act or 29 CFR 5.12(a)(1).
- (ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis Bacon Act or 29 CFR 5.12(a)(1).
- (iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001

Contract Provision for Contracts in Excess of \$100,000 - clauses (1) through (4) shall be inserted in full in any contract in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act.

Contract Work Hours and Safety Standards Act

- (1) *Overtime requirements.* No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (2) *Violation; liability for unpaid wages; liquidated damages.* In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanics, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$25 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.
- (3) *Withholding for unpaid wages and liquidated damages.* The sub-recipient, shall upon its own action or upon written request of the USEPA award official or an authorized representative of the Department of Labor, withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

- (4) *Subcontracts*. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

The following shall be inserted into any contract subject only to the Contract Work Hours and Safety Standards Act.

The contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the USEPA and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

Current Davis-Bacon Wage Rates Can Be Found at the Link Below (search for McHenry County):

<https://sam.gov/wage-determination/IL20250008/5>
<https://sam.gov/wage-determination/IL20250020/1>

HR Green, Inc.
Project No. 2302382

Rotary Park Deep Well and Water Treatment Plant
Village of Cary, Illinois

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the lump sum:

The Owner will select the bid from the lowest responsive bidder based on the lump sum price for the Complete Project.

BID SCHEDULE

NOTE: Construction items and materials included in the Project are exempt from State of Illinois and Local Sales and Use Taxes. Contractor is responsible for obtaining the exemption on items included, as provided by law or for applying for reimbursement for such taxes paid. Contractor shall pay all other taxes required to be paid by Contractor in accordance with the laws and regulations of the place of the Project that are applicable during the performance of the Work. Contractor shall NOT include Sales and Use Tax in Contractor's bid. For more information on this exemption, please check the State of Illinois' website.

No.	Item	Unit	Total
	Complete Project	LS	
Unit Price Adjustments for Well Drilling (Section 33 2113)			
1.	Surface Borehole and Casing	LF	
2.	Lower Borehole and Casing	LF	
3.	Open Hole Drilling	LF	
4.	Cement Grout	Sack	

LUMP SUM PRICE\$ _____

Bidder is currently certified as an MBE or WBE under EPA's DBE Program? Yes ___ No ___

Respectfully submitted:

Signature

Address

Title

Date

Telephone #

E-mail Address

(SEAL - if BID is by a corporation)

Attest _____

MAJOR ITEMS OF EQUIPMENT

It is hereby expressly agreed that the Contractor shall furnish and install in full compliance with the Plans and Contract Documents, the major items of equipment, as manufactured or supplied by the following listed manufacturers/suppliers or Engineer approved equivalent:

It shall be the responsibility of the bidder to verify BABA compliance. Waivers from the requirements are available under certain circumstances with EPA review and approval.

No.	Description	Manufacturer or Supplier	Proposed Substitute Manufacturer/ Supplier	Adder/Deduct Price for Substitution
1.	Ion Exchange and Brine Dilution Systems	Tonka		
2.	Emergency Chlorine Scrubber	PureAir Filtration		
3.	Gas Chlorination System	Superior Water Solutions		
4.	Scales	Force Flow		
5.	Fluoride Metering Pump	LMI		
6.	Flowmeters	Badger Meter		
7.	Lift Station Grinder Pumps	Weil		

Proposed substitutes will only be considered after award of the Contract.

**SECTION 33 2113
WELLS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water well daily reports.
- B. Water well drill cuttings, well log, and well record.
- C. Pumping Records.
- D. Production samples.
- E. Testing and reporting results.
- F. Well drilling and casing installation and grouting.
- G. Water well development.
- H. Pumping tests.
- I. Sterilization of the water well.

1.02 UNIT PRICES - MEASUREMENT AND PAYMENT

- A. General Requirements
 - 1. Work listed in this specification shall be paid for as part of the "Complete Project" lump sum item listed in the "Bid Schedule." Unit Price Adjustments for final installed quantities that vary by +/- 5% from the plans and specifications will be subject to adjustment as described in "Bid Form or Proposal" and "Bid Schedule":
 - a. Surface Borehole and Casing
 - 1) Basis of Measurement: By Linear Foot
 - 2) Basis of Payment: Includes drilling, collecting and submitting samples, driller's log, furnishing, installing, and testing
 - b. Lower Borehole and Casing
 - 1) Basis of Measurement: By Linear Foot
 - 2) Basis of Payment: Includes drilling, collecting and submitting samples, driller's log, furnishing, installing, and testing
 - c. Open Hole Drilling
 - 1) Basis of Measurement: By Linear Foot
 - 2) Basis of Payment: Includes drilling, collecting and submitting samples, driller's log, and testing
 - d. Cement Grout
 - 1) Basis of Measurement: By the Sack
 - 2) Basis of Payment: Includes furnishing and placing

1.03 REFERENCES

- A. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2000.
- B. ASTM C 150 - Standard Specification for Portland Cement.
- C. AWWA A100 - Standard for Water Wells; American Water Works Association; 1997 (ANSI/AWWA A100).
- D. AWWA C206: Standard for Field Welding of Steel Water Pipe.
- E. AWS D10.9, Section 305 (except paragraph C): Qualifications of Welding Procedures and Welders for Piping and Tubing.
- F. API Specification 5L. Specification for Line Pipe.
- G. API Specification 5CT. Specification for Casing and Tubing.
- H. Illinois Administrative Code

- I. (415 ILCS 30/) Illinois Water Well Construction Code
- J. Manual of Methods for Chemical Analysis of Water and Wastes, EPA--625/6-74-003.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating casing pipe, screen, grout, filter pack, and protective cover.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Project Records: Submit as specified below.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit documents under provisions of Section 01 7800.
- B. Water Well Daily Reports
 - 1. Each shift of operators shall keep an accurate record of work done during that shift, whether drilling, placing casing, testing, repairing equipment or performing work of an emergency nature. The Engineer will confer with the Contractor before start of construction as to a simple form of daily or shift report blanks. These report blanks shall at a minimum contain the following information:
 - a. The serial number of the report.
 - b. Date.
 - c. Depth of well at beginning and end of shift.
 - d. Size of hole being drilled.
 - e. Size, quantity and type of casing placed.
 - f. Type of material being drilled.
 - g. The static water level in the well, particularly any change in the same.
 - h. The serial number of the samples of drill cuttings preserved during the shift.
 - i. The notation of results of any tests conducted during the shift.
 - j. Special work done or extra work orders received.
 - k. Grouting operations.
 - l. Notation of any claim for extra compensation.
 - m. Accidents of construction nature.
 - n. Accidents of liability nature.
 - o. Total number of hours and men worked each calendar day.
 - 2. Two (2) copies of each report shall be made, one to be retained in the Contractor's field office, one mailed to the Engineer. Copies of each report shall be delivered or mailed as requested by the Engineer. The Contractor shall contact the Engineer daily with status reports. The contact shall be in-person or over the telephone.
- C. Drill Cuttings
 - 1. During the entire progress of drilling, the well bailings of typical drill cuttings from the well shall be discharged into a container not holding cuttings from other sections of the well before passing to the pit or waste channel previously described. The Contractor shall preserve samples of drill cuttings, with samples to be taken at intervals of five (5) feet of depth and more often whenever a change in formation is encountered. As each sample is taken, the sample container shall be clearly marked with the following:
 - 2. The Contractor shall provide a rack in the Contractor's tool house or construction office of sufficient size to hold these samples during the period of drilling, and they shall be kept neatly in serial order for convenient reference. In general, the size of each sample shall be sufficient to provide a representative sample for the Engineer, the Contractor, and the Illinois State Geological Survey
- D. Prior to submitting a request for payment for drilling work, the Contractor shall submit a complete set of the Drill Cuttings to the Illinois State Geological Survey.

1.06 DRILLER'S LOG

A. Driller's Well Log and Well Record

1. In addition to the foregoing record of the well required to be maintained under this contract, the Contractor shall keep a driller's log. This log shall contain, at a minimum, the following:
 - a. The reference point for all depth measurements.
 - b. Depth at which each change in formation occurs.
 - c. The identification of the stratigraphy and lithology encountered in the borehole.
 - d. Depth to the static water level (SWL) and observable changes in the SWL with well depth.
 - e. Total depth of the completed well.
 - f. Casing depth and diameter.
 - g. Depth and diameter of the surface liner.
 - h. Location limits of lost circulation zones.
 - i. Location limits of any liners placed.
2. The log shall be available to the Engineer for reference. Prior to submitting a request for payment for drilling work, the Contractor shall submit a copy of the Well Log to the Engineer and a copy to the Illinois State Geological Survey.

B. Air-Lift Pumping Records

1. Prior to starting air-lift pumping, Contractor shall record the static water level (and the means by which it was determined) and the pressure indicated by the depth or pressure gauge. Every 15 minutes during air-lift pumping, the Contractor shall record the following information:
 - a. Flow rate.
 - b. Air pressure.
 - c. Sand content.
2. No payment will be made for air-lift pumping unless the above measurements are duly made and recorded or unless a prior exception is granted by the Engineer.

C. Test Pumping Records

1. Contractor shall provide the following to the Engineer prior to test pumping:
 - a. Test pump capacity-head characteristics
 - b. Static water level
 - c. Depth of test pump setting
2. Contractor shall record the following information during the production test:
 - a. Flow rate (gpm) - Record at the start of the test (noting time and date), after every change in flow rate, and every 15 minutes thereafter.
 - b. Drawdown gauge pressure indication - Record at 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 40, 50, 60, 80, 100, 120 minutes and every hour thereafter, and as above after each change in flow rate.
 - c. Static Water Level (ft)
 - d. Pumping Level (ft)
3. The Contractor shall submit required pumping test results to the Engineer and to the Illinois State Geological Survey

D. Water Well Production Samples

1. After the production well has been production tested and disinfected, the Contractor shall collect and test water samples as indicated below and as required under Illinois Administrative Code / Illinois Water Well Construction Code / Illinois Environmental Protection Agency.
2. Field tests required at the time of collection:
 - a. pH
 - b. Temperature
 - c. Alkalinity
 - d. Carbon dioxide
 - e. Hydrogen sulfide

- f. Hardness
 - g. Conductivity
 - h. Run Time Prior to Sampling
 - 3. Test methods shall be as outlined in Manual of Methods for Chemical Analysis of Water and Wastes, EPA--625/6-74-003, Office for Technology Transfer, USEPA, Washington, D.C.
 - 4. Laboratory tests:
 - a. Specific Conductance, pH, Stability Index, Soluble and Total Iron, Silica, Filterable and Total Residue, Hardness, and Alkalinity
 - b. Cations (K, Na, Ca, Mg, Mn)
 - c. Anions (NO₃, F⁻, Cl⁻, SO₄, HCO₃, CO₃)
 - d. Trace Metals (Cu, Cr, Pb, Hg, As, Ba, Cd, Se, Ag, Zn)
 - e. Radioactivity (Gross Alpha, Gross Beta, Ra226, Ra228, Sr90, Uranium)
 - f. Bacteriological
 - g. Atrazine
 - h. Alachlor
 - i. Nitrogen as Ammonia, Nitrite, Nitrate
 - j. Total organic carbon
 - k. Organic chemicals
 - l. All parameters listed in 35 Ill. Adm. Code 620.410 shall be analyzed to determine their presence in the source water along with Aldrin, Chlorobenzene, DDT, Dieldrin, 1,2-Dichloropropane, Di(2-ethylhexyl) adipate, Diquat, Hexachlorobenzene, and Oxamyl (Vydate).
 - 1) See Illinois Environmental Protection Agency's Schedule C-1 Well Construction, Attachment 1, "New Well Groundwater Quality Sampling Parameters" for additional information.
 - 5. Laboratory tests shall be conducted by Pace Analytical Services, LLC or other laboratory approved by the Illinois Environmental Protection Agency (IEPA, and results of above testing shall be sent to the Engineer, Owner and the IEPA). The cost of sample collection and testing shall be paid by the Contractor and included in the price for the well.
- E. Bacteriological Tests
 - 1. Submit results to the Engineer and IEPA following sterilization of the production wells.

1.07 PROJECT/SITE CONDITIONS

- A. Contractor's Investigation at Site:
 - 1. Investigate the surface and subsurface conditions, including available records indicating the nature of the formations likely to be encountered.
 - 2. Visit the site of the proposed work to become familiar with the locations and local conditions.
- B. Contractor's Use of Site:
 - 1. Access to site shall be coordinated through the Owner and/or Engineer.
 - 2. Restore drilling site and access roads, if needed.
 - 3. Provide additional improvements as needed to allow equipment access to sites.
 - 4. Maintain and clear site in accordance with Section 01 7400 - Cleaning.

1.08 CONTRACTOR'S GUARANTEE

- A. Contractor is not required to guarantee the productivity or mineral quality of the well, but is required to guarantee that it shall furnish a sanitary quality of water insofar as the possibility of pollution from the formations by assuring an impervious seal with cement grout as hereinafter specified.
- B. The responsibility for the completed construction rests entirely with the Contractor, and final payment will be due the Contract only when the completed structure, after examination, is determined to be in agreement with the requirements herein.

1.09 FLEXIBILITY OF SPECIFICATIONS

- A. The probable construction requirements for the wells have been based on the Geological Forecast (contained herein.) The Geological Forecast is based upon the best information available to the Engineer, but the Engineer does not guarantee the accuracy of the forecast.
- B. Examination of drill cuttings consistently and systematically preserved, analysis of water produced, and the determination of static head and specific capacity, will determine final construction details. The Contractor shall at all times cooperate to the fullest extent with the Owner and Engineer in evaluating the geological conditions and in meeting the conditions encountered in order to accomplish the desired results.
- C. The Contractor's expertise in drilling wells of this type is considered to be of value in awarding the contract. The Contractor shall inform the Engineer when, in the Contractor's opinion, work undertaken is unlikely to be successful, or when another approach to the work is likely to provide greater value to the Owner per dollar spent. Contractor shall so inform the Engineer even when such approach contradicts the definite provisions of the construction documents or instructions of the Engineer or Owner.
- D. This specification is not intended to limit the Contractor's choice of means and methods, except as necessary to achieve design objectives. The Contractor shall confer with the Engineer before each new operation is undertaken to eliminate misunderstandings as far as possible and to achieve design objectives.
- E. The Contractor may, at the Contractor's option and own expense, provide hole or casing diameters greater than those specified, if in the Contractor's opinion these are necessary to obtain the diameter of the lower hole shown on the Construction Log.

1.10 EXTRA OR DELETED WORK

- A. The basic contract covers the complete construction of the wells and testing of the production wells as provided herein. It is understood that at the Owner's option additional development or construction work, not provided for in the bidding blank, may be required. Such additional work, if not provided for in the bid form, will be paid for as extra work in accordance with the provisions stated herein.
- B. It is understood that certain items of work designated herein are optional with the Owner and may be eliminated either prior to undertaking the work or during the construction as actual conditions indicate without invalidating the contract.
- C. The final contract sum shall be based upon the actual quantity of drilling done, casing placed, grout applied, development done and test pumping conducted, etc., at the unit prices bid.
- D. The Engineer shall have the authority to make minor or incidental changes in the work not involving extra costs and not inconsistent with the purpose of the work. Except in an emergency endangering life or property, any extra work or change in the contract documents, or requirements thereof, shall be by written order of the Engineer and Owner. The written order shall be explicit in its instructions, define the method of payment, stipulate the agreed extension of time, if any, and be dated and signed by the Engineer, the Owner, and the Contractor, with a copy to each party. Any extra work or change shall be executed under the conditions of the original contract. The contract sum shall be adjusted upward or downward according to the addition or deletion of work to the contract. Such adjustments shall be determined by one or more of the following methods in the following order of precedence:
 - 1. The unit prices previously agreed.
 - 2. An agreed lump sum or unit price cost.
 - 3. The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work, plus a percentage to be agreed upon in advance and not to exceed 15 percent.

1.11 CONSTRUCTION PLANT AND CREW REQUIREMENTS

- A. The Contractor shall have a Certified Water Well Contractor, certified under the laws of the State of Illinois, constantly in charge of the work at the well site. Provisions of Illinois Administrative Code, Well Contractor Certification, shall be considered as provisions of this specification. When a

Certified Water Well Contractor is not actually on the site, the crew on the site shall know his/her whereabouts and shall have a phone or radio by which he/she may be contacted.

1. The crew on the site shall have a mobile or stationary phone, and shall provide the number to the Owner and Engineer. If a mobile phone is used, the service area for the phone shall include the work site and the office of the Engineer in Illinois. Instructions, information and written orders given by the Engineer to the Contractor's superintendent on the site shall be considered as having been given to the Contractor and shall be accepted by the Contractor as official.
- B. The Contractor shall provide all equipment required to perform the construction and testing of the well as described herein. The Contractor shall submit with the bid a statement of the equipment available for the work, including type, condition, age and capacity.

1.12 PROTECTION OF QUALITY OF WATER

- A. The Contractor shall take all necessary precautions during the construction period to ensure that contaminants do not reach the subsurface environment through the casing or annular space, or by seepage. The Contractor shall use properly placed sanitary seals and pads and take all precautions necessary, or as may be required, to permanently prevent contaminants from entering the subsurface environment. No diesel fuel or similar hydrocarbon fluid shall be used in the well drilling operation or for freeing stuck tools.
- B. No motor oil or transmission fluid or any other type of fuel or lubricant shall be knowingly discharged on the ground at the site, or anywhere on the Owner's property adjacent to the site. In the event that the Contractor's equipment or workers discharge fuel or lubricant onto the ground, the Contractor shall clean up same at the Contractor's expense, and shall perform whatever is required by local, state, or Federal regulatory authorities or Courts to remediate the spill or pay penalties assessed, without expense to the Owner.
- C. During any break in construction or when the Contractor stops drilling operations and leaves the site, the well casing shall be sealed watertight, by a method approved by the Engineer.

1.13 PROTECTION OF PERSONS AND PROPERTY

- A. All operations of the Contractor in connection with the project shall be carried on in such a way that adjacent property, both public and private, shall be protected against damage and that persons, whether employed upon the work or not, shall be protected against injury. Points of hazard shall be adequately barricaded. Lights shall be maintained at night where necessary. Attention is called to the requirements of insurance and bond in this connection, and in any event the Contractor guarantees to hold the Owner and Engineer harmless from any and all claims arising through the Contractor's operations.
- B. The Contractor shall use particular care in preserving the soil foundation value for later construction of a pump foundation and well house by others. Should the Contractor's operations result in impairment of the foundation value of the soil to such an extent that ordinary footings for the pump foundations or building foundations will not be adequate, the Contractor shall place piling or otherwise adequately provide for the support of a structure, without additional compensation.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Casing
 1. Steel Casing: All casing shall be new steel pipe material. Manufacture of casing material shall conform to the latest ASTM or API Specifications. Markings on the casing shall indicate its place of origin and the standard to which it was manufactured. Results of all factory tests and records of the manufacture of the pipe shall be delivered with the casing and provided to the Engineer.
 2. Steel casing shall conform to ASTM A53 or API 5L or 5CT.
 3. All casing shall be supplied with beveled ends with 0.125-inch square root for welding.
 4. The casing thickness specified is the minimum thickness requirement. The Contractor shall supply casing of greater thickness at no additional cost to the Owner if the specified thickness

is not available at the time of bidding or construction. Availability of specified casing shall not be an issue of dispute or delay in bidding, awarding the contract or constructing the improvements in the specified time.

5. Each length of casing pipe shall be legibly marked in accordance with ASTM or API Marking Specification showing the manufacturer's name or trademark, size in inches, weight in pounds/ft, and the ASTM or API Specification and Grade Monogram. Unmarked pipe will be rejected and removed from the job site.
6. Casing size, lengths, and minimum thickness are as specified on plan sheet.

B. Grout

1. Cement Grout: Grout shall be neat cement grout - a mixture of Portland cement conforming to latest ASTM C150 Type II, containing not more than six (6) gallons of clean water per bag (one cubic foot or 94 pounds) of cement. Grout may also contain a maximum of 5% by weight bentonite.

C. Pitless Unit:

1. Shop fabricated from the point of connection with the well casing to the unit cap or cover.
2. Welded to casing design; shop assembled unit for field welding to casing; this connection is the only allowable field welding.
3. Water-tight construction throughout and of materials and weight at least equivalent and compatible to casing.
4. Field connection to 8-inch DI discharge pipe at elevation shown on drawings; 200 psi working pressure; pressure test at factory at rated working pressure.
5. Terminate a minimum of 2 feet above ground surface; eight foot length from cover to discharge pipe connection.
6. Include:
 - a. Access to disinfect well.
 - b. Casing vent; terminate in a downward position at or above the top of the unit in a minimum 1-1/2 inch opening covered with 24 mesh corrosion resistant screen.
 - c. Permanent water level measuring equipment, built of corrosion resistant materials firmly attached to drop pipe or pump column. Configuration which prevents entry of foreign materials.
 - d. Cover at upper terminal of well that will prevent entrance of contamination.
 - e. Sealed, contamination-proof entrance connection for electrical cable.
 - f. Inside diameter as large as well casing.
 - g. Access port: minimum 3/4" diameter, extending through pitless unit to allow insertion of tape into well with all cords and air tubes in place; threaded plug.
 - h. Hole for submersible level transmitter cable entrance. Fasten weatherproof box to side of pitless unit for cable pulling.
7. Maintain a minimum cover over discharge pipe as shown in the plans
8. Constructed to support weight of pump, motor, and drop pipe plus resist all thrust loads created by pump operation.
9. Approved Manufacturers
 - a. Baker Monitor Division.
 - b. Engineer approved equivalent.

PART 3 EXECUTION

3.01 WELL CONSTRUCTION

A. General:

1. Reference is made to the Construction Log and Geological Forecast contained herein. This sheet depicts the anticipated subsurface geological formations and details of the proposed production well construction. Depths shown on the Geological Forecast are relative to the ground surface at the project site. The depths were estimated using geologic logs located at or near the proposed well site, if available. Actual depths and elevations will vary. Well-specific details are indicated in the Schedule below and on the proposed construction log.

- a. The work shall include the installation of one (1) Cambrian-Ordovician aquifer production well to an approximate depth of 1300 feet. The well shall be constructed as shown in the proposed construction log.
 - b. The constructed well profile shall include a surface casing, a well casing, and a bottom borehole open.
 - c. Full-depth pressure grouting of all casing, including the surface casing, is required.
 - d. The surface casing shall extend 5 feet into competent bedrock (minimum) to protect the hole from cave-ins. The surface casing shall remain as permanent.
 - e. The upper well casing shall be of sufficient diameter and depth to accommodate the specified pump diameter and pump setting.
 - f. Completion of the well head shall be as specified with positive drainage away from the well and, if not immediately connected, a locking well cap.
 - g. Contact the Village for procedures and requirements to access water for drilling operations.
 - h. The Contractor shall work with the City and Engineer to identify an equipment and materials staging area.
 - i. The access road(s) and drilling and discharge areas shall be fully restored, including but not limited to the filling and compacting of any bailing pits and re-establishment of pre-drilling cover.
 - j. Work shall be performed in accordance with the standards, which are the Ten States Standards, current edition and the American Water Works Association (AWWA) Standards (A100), current edition. Where a situation arises that is not covered in these specifications, or to the extent of any conflict between Standards, the Ten States Standards shall apply. By this reference, the above Standards are adopted as part of this specification as if it were written herein.
- B. Bailing Pit:
1. The Contractor may excavate a bailing pit at the site but shall not channel solids off site; or shall not channel fluids off site unless it meets the requirements of clear water discharge under local, state, and federal requirements.
- C. Wastewater and Cuttings Discharge From Well Drilling and Testing Activities.
1. Solid drilling cuttings may be buried on site as long as it does not impact wetlands or drainage ways and provided the original surface conditions, including grade and cover are fully restored. Excess solid drilling cuttings, drilling fluids, air-lift pumping fluids, and development fluids shall be captured, containerized, and clarified or disposed of by the Contractor.
 2. Excess solid drilling cuttings, drilling fluids, air-lift pumping fluids, and development fluids shall be captured, containerized, and clarified or disposed of by the Contractor.
 3. Contractor shall furnish all labor, material, equipment, and storage necessary for routing, capture, containerization, and clarification or off-site disposal of all cuttings and wastewater.
 4. If off-site disposal is needed a disposal facility shall be identified, coordinated and paid by the Contractor. All off-site disposal shall be at no extra cost to the Owner.
- D. Water Well Construction:
1. Estimated depths for water well construction are shown on the proposed construction log. The forecast is based on conditions encountered at a well previously installed the Well No. 6 location. The existing ground elevation is based on a survey of the project location. Static water level is at about 535 feet below ground surface, as measured from the existing ground surface. The approximate drawdown is approximately 267 feet below the static water level.
 - a. Variations in the depth of the wells, well casings, etc. are expected. The Contractor shall examine the geologic logs and sieve analyses attached herein to get familiar with variability of the well field site.
 2. A pilot hole is not required.

3. Surface Liner: If necessary, the Contractor shall furnish and place a surface liner from the ground surface to the depth necessary to protect the hole from cave-ins. The surface liner shall be removed. The surface liner may be set by one of two methods:
 - a. Preferred method: Contractor shall drive casing to desired depth.
 - b. Alternate method: Drill to desired depth and set casing from surface to bottom of hole. No grout is required outside the surface liner.
4. Borehole: Contractor shall drill borehole as shown in the proposed construction log
5. Casing: Contractor shall furnish and place the required steel casing pipe with the required minimum wall thickness, as shown in plans (estimated total depth of about 1300 feet below ground surface).
6. Drilling and casings shall be installed at the diameters and estimated depths specified on the Plan Sheet.
 - a. Contractor shall grout the casing in place through its whole depth as specified herein. Grouting shall be completed within five (5) calendar days of completion of the borehole.
 - b. Before the Contractor proceeds with well work subsequent to grouting, grout shall be allowed to set for a minimum of 72 hours.

E. Drilling Fluid:

1. All water used for make-up of drilling fluid shall be potable water, obtained by Contractor. During all drilling operations, the Contractor shall use chlorinated water to reduce the possibility of contamination of the formation with iron bacteria. Chlorine shall be regularly added to the drilling fluid to maintain a chlorine residual at all times.
2. Contractor is responsible for locating, obtaining and hauling the water and for the coordination of these activities.

F. Plumbness and Alignment:

1. Dummy test: The drilling and casing placement for the production well shall be straight and plumb, and the Contractor shall be required to demonstrate that the well does not deviate from a straight and plumb line by lowering a 40-foot dummy through the cased depth of the well.
 - a. Contractor shall provide dummy. Dummy shall be constructed with three rings each 24 inches wide and no more than one-half (0.5) inch smaller in diameter than the inside diameter of the hole. The rings shall be truly cylindrical and shall be spaced at each end of the dummy and one ring in the center thereof. The spokes of the ring shall be at right angles to the vertical axis of the dummy.
 - b. The dummy shall be lowered into the well and shall be moved freely without binding to the full depth of the hole tested. Should the dummy fail to move freely throughout the entire length, the alignment of the well shall be corrected by the Contractor, at no expense to the Owner. Should the Contractor fail to correct the alignment, a new well shall be constructed by the Contractor, at a point to be designated by the Owner, with no additional expense to the Owner.
 - c. Well plumbness shall not vary from the vertical in excess of two-thirds (2/3) the smallest inside diameter of that part of the well being tested per 100 feet depth.

G. Lost Circulation:

1. Lost circulation shall be defined as loss of fluid down hole at an average rate of 100 gpm for 60 minutes (6,000 gallons of total fluid volume), or the loss of 6,000 gallons fluid volume at more than 100 gpm rate of fluid loss. Lost circulation may also occur during grouting of the well casing.
2. If lost circulation occurs, notify Engineer and proceed to insert a mix of bentonite and synthetic material into drill hole to restore circulation. If lost circulation problem continues, insert lost circulation material, such as Magmafiber or N Seal, into drill hole to attempt to seal off lost circulation zone from d
3. No increase in contract time or amount will be considered for performance or circulation restoration work outlined herein.

4. If lost circulation zone problem is not corrected, notify Engineer. Additional work to correct the problem will be that as mutually agreed upon by Owner, Contractor, and Engineer. Work may consist of placing cement grout, flow check material (sodium silicate) and calcium chloride. Perform additional work on direct hourly cost basis for rig, equipment, and crew, plus material used, without changes for field or office management supervision. Contract completion date shall be extended by number of days required for additional work to seal off lost circulation zone. Contractor shall furnish itemized summary of time, labor, equipment rental, and materials used to perform additional work. Contractor to include an itemized list of unit costs for the additional work and submit for approval by Engineer and Owner.

H. Casings:

1. Welded Casing Joints:

- a. Perform work in accordance with AWWA C206
 - b. Provide welding operator meeting qualifications of AWS D1.1
 - c. The Contractor shall certify that the qualifying tests are performed in accordance with the previously stated requirements.
 - d. All welds shall be full circumferential watertight welds.
2. Installation: The Contractor shall be responsible for furnishing and installing drive shoes, reinforcing bands, and lifting connection of proper design and adequate strength for safely lifting, handling, and properly installing all casings and liners.
3. Centralization of Casing: Centralizers shall be placed not more than 100 feet apart on the casing so that an even annular space is maintained around the casing. A careful check shall be made of concentric conditions prior to starting the grouting operations.
4. Cap: On completion of the well, the Contractor shall weld a cap to prevent any surface pollutants from entering the well.

I. Grouting

1. Mixing: Grout shall be mixed at the surface of the ground and continuously agitated in an adequate batch tank during the pumping operation. Said mixing and pumping facilities shall be adequate to complete the grouting operations over a period of time not to exceed two (2) hours. Grout shall completely fill the annular space between the hole and the casing.
2. Placement: Casing shall be centralized as noted herein. The annular opening (minimum 2 inches) between the well casing and upper borehole shall be cleared of debris prior to placing the grout. Grout shall be placed from the bottom of the casing upwards, by pumping, in one continuous operation.
3. Finish: The grout fill between the outside liner and inside casing shall be neatly troweled at the top of the liner.

J. Pitless Unit

1. Install in accordance with manufacturer's instructions, by qualified craftsmen.
2. Location, orientation, and quantities as indicated on drawings.
3. Include all required related items necessary for a complete installation and connection.

3.02 WATER WELL DEVELOPMENT

A. General:

1. The Contractor shall furnish equipment and labor for air-lift pumping to remove drilling fluid or mud, drill cuttings and fines, until water pumped from the well is clear and is free of sand or coarser material. Equipment shall be capable of air-lifting at 120%, or greater, of the design production capacity of the well.

B. The water and material generated during the development of the well shall be captured, containerized, and either clarified or disposed of off-site by the Contractor at no extra cost to the Owner. Discharge shall comply with the requirements of local, state, and federal requirements pertaining to discharge of wastewater generated by well related construction and services.

C. Measurement Devices Required:

1. During air-lift pumping, the Contractor shall provide and utilize the following equipment:
 - a. Flow measuring device.

- b. Drawdown gauge: A weighted airline provided with a valve, pump and air pressure gauge, or an electronic pressure transducer. Gauge shall be set to a recorded depth and provided with a means by which the operator may at any time check the pressure indicated (pressure shall be indicated in feet of water column.)
 - c. Rossum sand meter meeting AWWA A100 standards.
 - D. Notification of Engineer:
 - 1. Contractor shall notify Engineer 24 hours prior to starting air-lift pumping.
 - E. Measurement of Well Depth and Sand Content After Air-Lift Pumping:
 - 1. After completion of air-lift pumping Contractor shall measure the depth of the well to make certain that all loose material has been removed from the bottom of the well.
 - 2. Sand content at the end of development shall not exceed 2 ppm.

3.03 WATER WELL PUMPING TEST

- A. General:
 - 1. After completion each well construction, production tests are required. The Contractor shall notify the Engineer five (5) working days in advance of setting the well test pump.
 - 2. The Owner reserves the right to order more or fewer hours of testing than indicated on the bid blank, and also to determine at the time of the test the number of hours the production test will be conducted.
 - 3. The Contractor shall conduct a variable rate step-test followed by continuous test pumping to determine the capacity, drawdown and specific yield of the well.
- B. Pump:
 - 1. The test pump shall be utilized to pump 150% of the design well capacity at not less than 1,058 feet of total dynamic head. The design well capacity is 800 GPM. The pumping equipment shall provide any rate of flow from 50% to 150% of the maximum available from the well without unsubmergence of the pump as directed by the Engineer. In case a constant speed unit is used by the Contractor, the discharge line shall be equipped with a gate valve for throttling the flow. If a variable speed unit is used, it shall maintain a constant flow rate at any rate within the specified range. A check valve at the discharge head shall be used to eliminate any slugging affect following cessation of pumping.
 - 2. The Contractor shall provide, set, provide power for, and operate the test pump. The Contractor will not be required to operate the pump at such a rate as to cause the pump to become unsubmerged. The Contractor retains responsibility for setting the test pump at the base of the casing to fully test pump the well up to 1,200 GPM.
 - 3. The permanent pump shall not be used as the test pump.
- C. Pump Test Discharge:
 - 1. Contractor shall furnish all material and equipment necessary for disposal of wastewater during the well testing period.
 - 2. Non-clear water and material generated during the test pumping of the well shall be captured, containerized, and either clarified prior to discharge or disposed of off-site by Contractor, per local, state, and federal requirements, at no extra cost to the Owner.
 - 3. Clear water generated during the test pumping of the well shall be discharged in the direction that will not disturb existing land use or road access. The intended direction of discharge shall be presented by the Contractor to the Engineer prior to any wastewater discharge.
- D. Flow Metering During Pump Test:
 - 1. Contractor shall provide and install flow-metering device to be used during pump testing. Device used shall be satisfactory to the Engineer.
 - 2. Flow meters shall be accurate within + 2% of actual flow for normal range of the flow meter and 95% minimum accuracy at low flow range of flow meter.
 - 3. Contractor shall monitor and record flow rates at intervals specified for pumping test.
- E. Well Drawdown Monitoring:

1. Contractor shall provide and install a well drawdown monitoring gauge for the accurate measurement of drawdown during the production test.
2. Contractor shall provide, install, and monitor a well drawdown monitoring gauge in four existing Cambrian-Ordovician wells during the duration of the pumping and recovery test. This includes the Village of Cary's existing Well #6, Village of Lake in the Hills' Well #14, City of Crystal Lake's Well #8, and Material Service Co. (approx. Long/Lat: 42.182938, - 88.298251). Contractor shall verify well drawdown monitoring installation and locations with a Village representative and Engineer.

F. Pumping Test Plan:

1. The static water level shall be checked following development pumping for full recovery. The production test shall not start until the static water level remains constant for a two-hour period.
2. A 3-step variable-rate pumping test will be conducted at the following rates: Step 1 at be at 50%; step 2 at 100%; and step 3 at 150% of the design well capacity at not less than 1,058 feet of total dynamic head. The design well capacity is 800 GPM. Each step period shall be 1-hour in duration. Recovery between steps is not required.
3. A continuous 21-hour constant-rate test shall be completed without delay upon completion of the step-testing. The constant rate test shall be conducted at 100% design capacity.
4. Production test pumping shall last for 24 hours (minimum) unless the drawdown has remained stable for no less than 6 hours. Test pumping shall be at flow rates as determined by Engineer. Contractor shall maintain records as described previously.
5. Should any of the test pumping equipment fail and cause the stopping of the pump before the end of the pumping test, make necessary repairs and restart test from the beginning and repeat the schedule and procedure for that test at no additional cost to the Owner.

G. Sand Content:

1. Sand content at the end of test pumping period shall not exceed 2 ppm as documented through the use of a Rossum sand sampler (or equivalent device; e.g., Imhoff cone sampler).

3.04 DISPOSAL OF WATER

- A. Dispose of water from drilling, bailing or test pumping in a manner that will cause no adverse conditions at the site or at any point downstream from the site.
- B. Erosion control system designed to handle the flows from pump testing must be in place, including but not limited to a sediment filter bag. Submit proposed erosion control system to Engineer for review.

3.05 STERILIZATION OF THE WATER WELL

- A. Disinfection shall be provided after completion of work and placement of permanent pumping equipment.
- B. Disinfection shall be completed in accordance with AWWA C654.
- C. The Contractor shall mix a 200 mg/L chlorine solution and thoroughly wash the interior of the well casing above the water level and the permanent pumping equipment.
- D. Upon completion of construction and installation of permanent pumping equipment, the Contractor shall supply sufficient amounts of a chemical disinfectant to obtain an initial concentration of 100 mg/L. This chemical shall be injected using a tremie pipe to the bottom of the well and withdrawn as disinfectant chemical is injected. Alternative means and sequencing of disinfection steps proposed by the Contractor shall be as approved by the Engineer.
- E. The Contractor shall withdraw a water sample from the well 24 hours after the addition of the chlorine. This sample shall be tested for chlorine by the Contractor at the Contractor's expense. The chlorine residual shall be not less than 10 mg/l after 24 hours. In the event the residual is less than 10 mg/l after 24 hours, the Contractor shall repeat the sterilization procedure to obtain a 10 mg/l concentration.

- F. Following sterilization, the Contractor shall pump the well to waste and periodically sample for a chlorine residual. Once the well is registering no chlorine residual, pump the well to waste for an additional 15 minutes and commence with bacteriological testing.
- G. Bacteriological testing: withdraw a water sample from the well and have it bacterially tested according to the procedure set forth in Illinois Administrative Code at a laboratory approved by the Illinois Environmental Protection Agency (IEPA). Testing shall be at Contractor's expense. Results of the test shall be furnished to the Engineer and to IEPA. Sterilization of the well will be considered complete upon receipt by the Engineer of a satisfactory bacterial analysis.
- H. Highly chlorinated well water with a chlorine residual exceeding 4 mg/L shall be dechlorinated in accordance with AWWA Standard C655 prior to discharge.

3.06 SCHEDULE

- A. Well Number 14
 - 1. Borehole Diameter: see plans
 - 2. Casing Diameter: see plans
 - 3. Existing Grade Elevation: 885+/- ft
 - 4. Proposed Grade Elevation: 886.5 ft
 - 5. Top of Well Casing Elevation (proposed grade + 2'): 888.55+/- ft
 - 6. Surface casing set depth: To competent carbonate rock unit (estimated on plans)
 - 7. Total Well Depth: 1,300 ft
 - 8. Design Pump Capacity: 800 gallons per minute

END OF SECTION 33 2113

**SECTION 44 4256.02
SUBMERSIBLE WELL PUMPS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submersible Well Pump and Motor.

1.02 REFERENCES

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop drawings showing arrangement, dimensions, and materials.
- C. Preliminary Submittal: Characteristic performance curves for pumps, showing total dynamic head, pump runout, shutoff head, efficiency, brake horsepower, and net positive suction head required plotted against capacity in gpm. Include full curve from shutoff head to maximum capacity for all impeller sizes. Indicate operating point and impeller diameter being furnished.
- D. Second submittal after Engineer returns preliminary submittal: Certified shop test curves. Include TDH, efficiency, BHP, shutoff head, pump runout, NPSHR plotted against flow in GPM. Indicate operating point and impeller diameter furnished.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Operation and maintenance manuals according to Section 01 7800.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Receive and unload shipments to site from suppliers of equipment under this contract.
- B. Unload equipment as soon as possible after arrival.
- C. Pay freight car and truck demurrage, detention, and any other costs which may be billed to Owner due to failure to unload cars or trucks within time required by freight companies.
- D. Provide physical protection for equipment placed in storage.
 - 1. Support stored equipment above ground and cover with canvas or other heavy-duty sheeting. Cover shall be securely fastened and shall be replaced if torn or otherwise damaged during storage period.
 - 2. Store motors in dry, warm place and in accordance with manufacturer's recommendations. Motors over 20 hp shall have shaft rotated 90 degrees each month. Provide Engineer with evidence that this requirement is met.
 - 3. Maintain desiccant between cover and motor frames on motors. Provide desiccant of type permitting visual determination of condition of desiccant. Replace desiccant when it becomes ineffective.
 - 4. Store the following items in weatherproof, heated (minimum 50 degrees F.) building complete with bins for storage of small pieces of equipment. Storage inside of existing treatment plant not available.
 - a. Electronic instruments and cabinets.
 - b. Electrical equipment with general purpose enclosures.
 - c. Insulation materials.
 - d. Rotating equipment.
 - e. Miscellaneous electronic equipment, gaskets, and small machined parts.
 - f. Instruments and controls.
- E. Inspect stored equipment weekly. Renew protective coatings as necessary to preserve fitness of equipment.
- F. Provide for safekeeping of materials or equipment received. Store and maintain materials and equipment after receipt until completed installation is accepted by Owner. Such storage and maintenance shall be in accordance with manufacturer's recommendations and requirements of

these Specifications. Provide materials, equipment, and labor required for such storage and maintenance.

- G. Contractor shall be accountable for any deterioration of materials or equipment occasioned by improper storage or maintenance, and shall recondition, repair, or replace any such materials or equipment without additional cost to Owner.

1.05 SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described in Section 01 4000 and to sign the Certification of Proper Inspection attached to Section 01 4000.
- B. Include necessary trip by the manufacturer's representative to provide two separate 8-hour work day(s) on-site (travel time not included) for startup and training of operations personnel. Training may be video taped by Owner.
- C. Additional trips required by the Contractor before or after final startup and training shall not be charged to the Owner.

1.06 START-UP, COMMISSIONING, AND TRAINING

- A. Factory test all pumps at manufacturer's plant. Perform tests in accordance with test code of Hydraulic Institute Standards. Pump test will not be witnessed by Owner or Engineer.
- B. Test curves shall cover full range of operation from shutoff to maximum capacity; plot capacity as abscissa; plot operating head, brake horsepower, efficiency and NPSHR as ordinates.
- C. Test Points:
 - 1. Shutoff.
 - 2. Pump runout.
 - 3. Design operating point.
 - 4. Two additional points, one on each side of the rated operating point.
- D. Test Tolerances:
 - 1. Operate pumps during tests within one of the following tolerances:
 - a. At rated head: +10%/-0% of the rated capacity.
 - b. At rated capacity: +5%/-0% of the rated head.
 - 2. No minus tolerance or margin with respect to capacity or total head at rated or specified condition.
- E. Provide shop space, tools, equipment, instruments, personnel, and facilities required for satisfactory completion of tests.
- F. Submit test curves and allow Engineer's review prior to pump shipments.
- G. Pump Tests:
 - 1. Pump manufacturer shall perform following inspections and tests on pumps prior to shipment.
 - a. Inspect for conformance to Contract Documents with respect to correct model number, motor rating, and electrical connections.
 - b. Test motor and seal housing chambers for moisture content or insulation defects.
 - c. Prior to submergence, allow pump to run dry to establish correct rotation and mechanical integrity.
 - d. Discharge piping attached to pump shall operate submerged under a minimum of 6 feet of water for a minimum of 30 minutes.
 - e. After operational test, motor and cable shall be tested again for moisture content or insulation defects.
 - 2. Pumps failing inspection or tests shall be repaired or replaced at no cost to Owner.

1.07 QUALITY ASSURANCE

- A. Pump manufacturer shall be engaged primarily in design and fabrication of submersible pumps, including solids handling type pumps for wastewater service for at least the last 10 years.

1.08 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 SUBMERSIBLE PUMPS

- A. Manufacturers:
1. Goulds
 2. Plueger
 3. SIMFLOW
 4. Engineer approved equivalent.
- B. General
1. Furnish and install submersible well pump and motor at locations indicated on drawings. Units shall consist of submersible pump and motor, discharge pipe, check valve, pitless unit, power cable, cable fittings and accessories for a complete operable system.
 2. Service: See Submersible Pump Schedule at end of section.
 3. Conduit and wiring as required for complete working installation.
 4. Capable of operating at the conditions identified in the Submersible Pump Schedule, non-overloading over the entire pump curve, without the use of throttling devices.
 5. Provide brackets, bracing, and appurtenances needed to provide a complete assembly as recommended by the manufacturer.
 6. Disinfect all work.
 7. Clean units as necessary.
 8. Remove debris and waste materials resulting from installation.
 9. See Drawings and Submersible Pump Schedule for setting details and depth on each pump.
- C. Pump Design
1. Type: Vertical, multiple stage, water lubricated, centrifugal turbine submersible pump.
 2. Quantity: See Pump Schedule.
 3. Operating conditions: See Pump Schedule.
- D. Pump Bowl Assembly:
1. Capable of withstanding a hydrostatic pressure equal to twice the pressure at rated capacity or 1-1/4 times shutoff head, whichever is greater.
 2. Rubber or bronze sand collar on suction base bearing.
 3. Bronze, stainless steel, or epoxy-coated cast iron with stainless steel fasteners and bolts.
- E. Bowl Shaft:
1. Turned and ground 410 or 416 stainless steel.
 2. Adequate diameter to transmit the pump horsepower with liberal safety factor and rigidly support impellers between bearings.
 3. Size conforms to ASA-B17C, "Code of Design of Transmission Shafting."
- F. Impeller:
1. Bronze or stainless steel, semi-open or enclosed type, machined, statically and dynamically balanced.
 2. Securely fasten to the impeller shaft with stainless steel keys, taper bushings or locknuts, and bronze wear rings.
- G. Columnar Check Valve and Discharge Column Pipe:
1. Schedule 40 Type 304 stainless steel American Standard threaded and coupled pipe with tapered thread and couplings; furnish in sections with lengths as required for setting configuration as shown on the plans and scheduled below.
 2. Contractor shall assure proper alignment of column pipe when assembled

3. Couplings with strength equal to or greater than pipe. Drop pipe couplings shall be Scotchkote epoxy-coated heavy wall steel, or Engineer approved product that is NSF 61 certified.
4. Include in-line columnar valve(s) in pump discharge assembly with size to match column pipe. Provide Flowmatic Model 80 DIX or Engineer approved equivalent. A total of five (5) columnar check valves shall be provided: one (1) immediately above the submersible pump (within 20 feet) and additional valves spaced at approximately 200-foot intervals.

H. Suction Adapter:

1. One piece, bronze or stainless; serve as inlet, lower bearing housing, and motor adapter piece; stainless steel strainer.

I. Coupling Between Motor and Pump:

1. Stainless steel keyed or splined to the shaft.
2. Capable of transmitting maximum required torque with added safety factor.

J. Strainer:

1. Connect one stainless steel strainer to the pump.
2. Net inlet area equal to at least four times the suction pipe area.

K. Electric Motor Drives:

1. Type: Submersible motor, capable of continuous duty underwater operation.
2. Suitable for use with variable frequency drive.
3. Power: 460 VAC, 3 Phase, 60 Hz.
4. Thrust bearing of ample capacity to carry weight of rotating parts plus hydraulic thrust.
5. Service Factor: 1.15 minimum.
6. Design for normal starting torque and low starting current for across the line starting.
7. Non-overloading in excess of nameplate rating at design nor in excess of 110% at any condition from zero flow to maximum capacity of pump.
8. Mechanical seal to prevent foreign matter from entering the motor.
9. Ambient operating temperature: 40° C.
10. Total cast iron and/or stainless steel construction.
11. Approved motor manufacturers:
 - a. Hitachi.
 - b. Plueger.
 - c. SME
 - d. Engineer Approved Equivalent.

L. Water Level Gage:

1. Attach two parallel continuous lengths of 1/4 inch corrosion resistant tubing to drop pipe at 5 foot intervals with 1/8 inch wide plastic "Ti-raps". Electrical cable may be bonded with tubing. Terminate tubing at top of well screen and extend to bottom of pitless unit cap with no joints.
2. Provide connection for pressure gage which allows convenient installation and removal and which can be suitably capped to prevent contamination when gage is not in place; connect to one length of tubing; second tube is spare.
3. Furnish two 4-1/2 inch pressure gages calibrated in feet; range of 1 to 250 feet; $\pm 0.5\%$ accuracy; provide shutoff and snubber.
4. Provide a protective cover of 1/4" thick steel for airline and gage connection on outside of pitless unit; padlock, hasp or chain closure, maximum 1/4" gap between cover and pitless unit when secured with padlock.

M. Electrical:

1. Furnish adequately sized electrical cable, neoprene insulated and jacketed or PVC insulated and twisted, submersible pump cable to a depth of 900 feet below ground level, or approved equal, to connect to power feed; provide extra ten (10) foot length of electrical cable over what is needed to provide slack.

2. Inside well, support pump cable from discharge column at approximately 5 feet intervals, with stainless steel clamps shrouded with rubber hose; do not exert undue pressure on pump cable.
3. Make necessary connections at motor; do not splice pump cable between motor and pitless unit.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions and Section 46 0500, as indicated on drawings, by qualified craftsmen.
- B. Location, orientation, and quantities as indicated on drawings.
- C. Include all required related items necessary for a complete installation.
- D. Coordinate for compatibility of manufacturer's shop coating and final finish.
- E. Support and anchor as indicated on drawings.
- F. Start up in presence of manufacturer's service representative.
- G. Test power draw and motor vibration during initial operation with manufacturer's service representative.
- H. Pressure test.

3.02 FIELD TESTS

- A. Provide preliminary pump operation after installation for a period not less than 48 hours operating time to assure proper functioning and to detect any malfunctions.

3.03 SUBMERSIBLE PUMP SCHEDULE

- A. Well Pump.
 1. Quantity: 1.
 2. Design Point: 800 GPM @ 1,058' TDH.
 3. Nominal speed (rpm): 1800.
 4. Minimum Pump Efficiency (%): 80.
 5. Discharge Size (in): 8.
 6. Pitless Unit Side Discharge (in): 8.
 7. Motor Efficiency (%): 85.
 8. Motor Horsepower (hp): 300.
 9. Pump Setting Depth: 900' below ground surface
 10. Casing Size (in): See plans

END OF SECTION 44 4256.02