

# Cherokee Nation

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## REQUEST FOR BIDS

### WELL DRILLINGS – 14 COUNTIES OF CHEROKEE NATION



**Bid Due Date: October 30, 2024**

**CHEROKEE NATION**

P.O. Box 948  
Tahlequah, OK 74465  
(918) 453-5000

**CHEROKEE NATION  
BID REQUEST  
WELL DRILLINGS – 14 COUNTIES OF CHEROKEE NATION**

The Cherokee Nation is accepting bids from interested parties for individual well drillings in the fourteen (14) counties of Cherokee Nation per specifications and technical provisions. Counties include: Adair, Cherokee, McIntosh, Muskogee, Sequoyah, Wagoner, Craig, Delaware, Mayes, Nowata, Ottawa, Rogers, Tulsa and Washington. There is an estimate number of 36 homes of well drillings to be done for the counties listed. The Cherokee Nation reserves the right to award to more than one firm. The scope of work and specifications are included in this bid packet. PLEASE NOTE - INTERESTED BIDDERS ARE STRONGLY ENCOURAGED TO REVIEW THE SPECIFICATIONS AS SOME OF CHEROKEE NATION REQUIREMENTS HAVE CHANGED. The purchase order will be from date of award notification through the end of the fiscal year for Cherokee Nation, September 30, 2025, with the option to renew based upon satisfactory performance, funding availability, and mutual agreement of both parties through September 30, 2027.

Interested parties are to provide a bid to furnish all labor, quality control, materials, supplies and supervision to complete the entire project. Interested bidders must follow all directions outlined in this bid packet including the utilization of mandatory bid response sheet to be considered fully responsive.

The lowest most responsive, responsible bid will be the determining factor in awarding this bid taking Indian Preference into consideration. The successful bidder will be issued an agreement and a purchase order incorporating the bid response. The Cherokee Nation reserves the right to award to more than one firm. The Cherokee Nation will make this RFB and the successful bidder's bid submittal a part of any contract awarded under this RFB.

**Bids are due Wednesday, October 30, 2024 by 5:00 p.m.**

**MANDATORY SUBMITTAL INFORMATION:** Bid submittal requirements must be followed. Each bid must be submitted on the prescribed, required form with all areas completed. If forwarded by mail, the envelope containing the bid and all other required, completed documents must be received on or before due date listed. Bids may be mailed to Cherokee Nation Acquisition Management, Attn: Michelle Parsons, P.O. Box 948, Tahlequah, OK 74465. Bids may be faxed to the attention of Michelle Parsons at (918) 458-4493 or (918) 458-7695 or e-mailed to michelle-parsons@cherokee.org. It is the bidder's responsibility to ensure delivery of bids by Wednesday, October 30, 2024 by 5:00 p.m. Any bids received after the designated date and time will be ineligible for award.

**Interpretation of the Bid Documents:** All questions or requests for interpretation of the bid must be submitted in written format to Cherokee Nation Acquisition Management. Requests maybe e-mailed to michelle-parsons@cherokee.org. Requests may also be faxed to (918) 458-4493 or (918) 458-7695, Attention: Michelle Parsons.

**Bid Acceptance:** Bids will be accepted from Indian and Non-Indian bidders. Cherokee Nation reserves the right to reject any and all bids. Cherokee Nation reserves the right to determine if a bid meets stated requirements, and to award a purchase order for the bid that is in the best interest of the Cherokee Nation including but not limited to the total cost and capability of the bidder. Bidders are responsible for any and all costs associated with the preparation and submission of bids. To be considered, bids must be received by the specified date and time; any bid received after stipulated date and time will be returned unopened. No bidder may withdraw their bid within 30 days after proposal due date.

**TERO Certification:** Indian preference will be given only to bidders who provide proof of current certification from the Cherokee Nation Tribal Employments Office (TERO) located in Tahlequah, Oklahoma, telephone number (918) 456-0671. Proof of TERO certification must accompany and be included in bid submittal.

**TERO Requirements:** Cherokee Nation TERO Office requirements apply to award of agreement; including fee of ½ of 1% of contract award. Successful bidder must complete required TERO paperwork and pay all applicable fees in accordance with the current Legislative Act for this project. Please contact Cherokee Nation Tribal Employment Rights Office (T.E.R.O.) at (918) 453-5000 with any questions. The successful bidder must have fees and all paperwork submitted to TERO for agreement to be considered fully executed.

**Wage Rate Requirements:** All laborers and mechanics employed by contractors and subcontractors shall be paid wages at rates not less than those prevailing on projects of character similar in the locality as determined by the Secretary of Labor in accordance with the Davis-Bacon Act.

For this project Davis Bacon Wage Rate applies.

**Buy American – Recovery Act provisions:** The buy American provisions direct that all of the iron, steel, and manufactured goods used in the project are produced or manufactured in the United States for a project for the construction, alteration, maintenance or repair of a public building or public work. This Buy American provision is applicable only to iron, steel, and manufactured good brought to the construction site for incorporation into a public building or public work. Products that do not fit the definition of manufactured goods are not covered.

**Laws and Regulations:** The bidder's attention is directed to the fact that all applicable State Laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though written out in full.

**Conflict of Interest and Restrictions:** If any contractor, contractor's employee, subcontractor, or any individual working on the proposed contract may have a possible conflict of interest that may affect the objectivity, analysis, and/or performance of the contract, it shall be declared in writing and submitted to Cherokee Acquisition

Management (Attn: Michelle Parsons) no later than on or before Wednesday, October 30, 2024 by 5:00 p.m. The NATION will determine in writing if the conflict is significant and material and if so, may eliminate the contractor from submitting a bid.

**Verbal Instructions:** Interested parties shall not initiate or execute any negotiation, decision, or action arising from any verbal discussion with any Cherokee Nation employee. Only written communications from the designated Contact Person at Cherokee Nation may be considered a duly authorized expression on behalf of the NATION regarding this RFB. Additionally, only written communications from interested parties are recognized as duly authorized expressions on behalf of the vendor. The same instructions shall apply to any subsequent award and agreement communications.

**Qualifications of Bidder:** The NATION may make such investigations as deemed necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the NATION all such information and data for this purpose as the NATION may request. The NATION reserves the right to reject any bid if the evidence submitted by, or investigation of, successful bidder fails to satisfy the NATION such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be accepted.

**Subcontracts:** The successful bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract must also be acceptable to NATION. Any proposed subcontracts must be approved by the NATION, and the TERO office must be consulted prior to subcontractor being on site to ensure all appropriate forms, paperwork, and approvals are in place. Successful bidder will be required to complete the Request for Acceptance of Subcontractor at time of contract signing if subcontractor to be utilized. All sums due to any suppliers or subcontractors must be paid or will be paid within ten (10) days of receipt of any money received from the Cherokee Nation under any executed Agreement.

**Method of Award – Lowest Bid That Contains Lowest Most Responsive/Reasonable Offer From Qualified Bidder:** After consideration of price and other factors, the project will be awarded to the bidder whose bid is determined to be the lowest most responsive/reasonable offer taking Indian Preference into consideration and in the best interest of the Nation to accept. Award shall be made under unrestricted solicitations to the lowest, most responsive/reasonable bid from a qualified economic enterprise or organization within the maximum total budget price established for the specific project or activity being solicited in accordance with Cherokee Nation Acquisition Management Policy & Procedures. Indian/TERO Preference will be given only to bidders who provide proof of current TERO certification from the Cherokee Nation Tribal Employments Office (TERO) in accordance with current Cherokee Nation Policy. Proof of TERO certification must accompany and be included in bid submittal. The Cherokee Nation reserves the right to award to more than one firm. The Cherokee Nation will make this RFB and the successful bidder's bid submittal a part of any contract awarded under this RFB.

**Debarment, Suspension, Proposed Debarment, and Other Responsibility Matters:**

The responding party certifies to the best of its knowledge and belief that the person, the firm, or any of its principals are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency or Indian tribe. The bidder will also certify they have not, within a three-year period preceding this Request for Proposal, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, Local or Tribal) contract or subcontract; violation of Federal or State antitrust statutes relating to the submission of offers; or commissions of embezzlement, theft, forgery, bribery, falsifications or destruction of records, making false statements, and are not presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in this provision. The responding party certifies they have not, within a three-year period preceding this Request for Proposal, had one or more contracts terminated for default by a Federal, State, Local or Tribal agency. The responding party shall provide immediate written notice to the Cherokee Nation if, at any time prior to contract award, the person learns its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

**General Information:** Cherokee Nation reserves the right to waive any informalities or to reject any and all bids. Award will be to the lowest most responsible responsive bidder and will be subject to availability of funds. Indian preference will be given to Contractors certified as an Indian-Owned firm by the Cherokee Nation Tribal Employment Rights Office (T.E.R.O.). Proof of certification must accompany all bids. No bidder may withdraw their bid within thirty (30) days after bid opening date. The Cherokee Nation reserves the right to award to more than one firm. The Cherokee Nation will make this RFB and the successful bidder's bid submittal a part of any contract awarded under this RFB.

A prospective contractor seeking to receive Indian Preference under this contract must be certified as an Indian-owned firm by the Cherokee Nation Tribal Employment Rights Office (TERO) and submit proof of that certification with their bid.

**Drug Free Workplace and Tobacco Free Workplace:** Any Contractor performing work for the Cherokee Nation agrees to publish a statement notifying all employees, subcontractors, and other workers that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against violators of such prohibition. The NATION will consider lack of enforcement or lax enforcement of the statement by Contractor a default of the contract. The Contractor further agrees to provide all persons engaged in performance of the contract with a copy of the statement. A copy of bidder's Drug Free Workplace statement shall be included with the proposal or else the successful bidder will be deemed to accept and agree to use the statement provided by NATION. The Contractor understands and recognizes that all Cherokee Nation buildings, whether leased or owned, and the grounds surrounding those facilities are considered by the Nation to be a tobacco free workplace. The Contractor will ensure all employees, subcontractors, and other workers will abide by this policy.

**Contractor's Insurance Requirements:** Before performing contractual services on the behalf of or for the Cherokee Nation, compliance with the following insurance requirements must be verified:

**\*\* Provide an original Certificate of insurance naming the Cherokee Nation as a certificate holder and additional insured with respect to general liability, automobile liability, and builders risk policies, as their interest may appear with respect to the operations defined in this bid packet. The certificate shall reflect that coverage has been placed with an AM Best Rated Carrier of at least A IX and will contain the following information for each required coverage:**

- 1) Type of insurance
- 2) Policy number
- 3) Effective date
- 4) Expiration date
- 5) Limits of Liability (this amount is usually stated in thousands)
- 6) Thirty day notice of cancellation, except ten-day cancellation clause will apply for nonpayment of premium.

**\*\* Required Coverages:**

- 1) **Worker's Compensation and Employer's Liability:**

Limits of Liability:

Bodily Injury by Accident: \$100,000 each accident

Bodily Injury by Disease: \$500,000 policy limit

Bodily Injury by Disease: \$100,000 each employee

Oklahoma Statute requires Worker's Compensation coverage for anyone with one (1) or more employees. Contractor's worker's compensation policy shall include a waiver of subrogation in favor of Cherokee Nation of Oklahoma.

- 2) **General Liability:**

Coverages:

Commercial (including products/completed operations) with specific reference made to coverage for lead abatement (as this is usually excluded under standard commercial general liability policies). In addition to the additional insured endorsement, the commercial general liability policy shall also include a waiver of subrogation in favor of Cherokee Nation of Oklahoma.

Limits of Liability:

Bodily Injury and Property Damage Combined: \$1,000,000  
(each occurrence)

- 3) **Automobile Coverage:**

Vehicles Covered:

All Autos

Hired Autos

Non-owned Autos

Limits of Liability:

Bodily Injury and Property Damage Combined: \$300,000

NOTE: The Contractor shall either: (1) require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage for the type and in the same amounts as specified above, or (2) insure the activities of this subcontractors in his own policy. Each subcontractor policy must also name Cherokee Nation as an additional insured with respect to general liability and auto liability.

**MANDATORY BID RESPONSE SHEET**  
**WELL DRILLINGS – 14 COUNTIES OF**  
**CHEROKEE NATION**

The General Contractor, as Bidder, agrees to perform all work as shown and called for in the scope of work and specifications for the Cherokee Nation, that is shown to be the Base Bid. The Work will be completed within the specified number of working days of acceptance of this bid, a fully executed contract, and receipt of a Notice to Proceed. The Bidder agrees to furnish all labor and materials for the Base Bid for the sum of:

**TOTAL BID**                      \$ \_\_\_\_\_

**INSERT TOTAL AMOUNT  
PER BID SHEET ATTACHED**

NOTE TO BIDDERS REGARDING INDIAN PREFERENCE: (Check One)

TERO Certified Contractor: \_\_\_\_\_ Yes    \_\_\_\_\_ No  
(Proof of certification must accompany all bids)

Major Cherokee Employer: \_\_\_\_\_ Yes    \_\_\_\_\_ No  
(Bidder must contact TERO at 918-453-5000 for this preference)

SUBMITTED:

\_\_\_\_\_ Company Name

\_\_\_\_\_ Company Address

\_\_\_\_\_ Company Address

\_\_\_\_\_ Authorized Signature

\_\_\_\_\_ Print Name & Title



**REQUEST FOR BID**

Cherokee Nation

Department of Transportation & Infrastructure / Office of Environmental Health & Engineering

115 North Street

Tahlequah, OK 74464

**Domestic Well Drilling for an estimated (36) homes within the Cherokee Nation**

ITEM	DESCRIPTION	ESTIMATED QUANTITIES	UNIT	UNIT PRICE	TOTAL
1	Drill Well* - Type A	1	FT		
2	Furnish & Install 6-inch Steel Casing, Type A	1	FT		
3	Grout Annular Space Around Casing - Type A	1	FT		
4	Furnish & Install Well Screen	1	FT		
5	Well Development	1	EA		
6	Test Pumping	1	EA		
7	Disinfection	1	EA		
8	Furnish & Install Temporary Cap	1	EA		
9	Plug Abandoned Hole	300	FT		
10	Mobilization / Demobilization (one per household)	1	EA		
				<b>Total:</b>	

**SECTION 01 33 00.0000  
SUBMITTAL PROCEDURES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes submittal procedures
- B. Related Requirements
  - 1. Section 01 78 00.0000 – Closeout Submittals

**PART 2 PRODUCTS (Not applicable)**

**PART 3 EXECUTION**

**3.01 SUBMITTAL PROCEDURES**

- A. The required submittals are listed in **PART 2 PRODUCTS** of each section.
- B. Provide one copy of each submittal to the Project Officer.
- C. Identify each cut sheet or shop drawing with the following information:
  - 1. Contract or Purchase Order number
  - 2. Supplier
  - 3. Specification Section number
- D. Submit the following information (if applicable):
  - 1. Manufacturer's cut sheets: Show compliance with references (e.g. applicable ASTM, AWWA standards)
  - 2. Laboratory results
  - 3. Any other information necessary to show compliance with the specifications
- E. Identify variations from the Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
- F. Identify and re-submit all changes made since previous submittal.
- G. Distribute copies of approved submittals to concerned parties, (i.e. suppliers, sub-contractors).
- H. Communicate in writing any inability to comply.

- I. Allow three weeks for submittal approval.
- J. Replace unapproved materials at the Contractor's expense.

**END OF SECTION**

**SECTION 33 21 13.1085  
DOMESTIC WELL GROUT**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes
- B. Related requirements:
  - 1. Section 01 33 00.0000 – Submittal Procedures.
  - 2. Section 33 21 13.1001 – Domestic Well Drilling.
  - 3. Section 33 21 13.1081 – Well Screens.
  - 4. Section 33 21 13.1084 – Well Gravel Pack

**1.02 MEASUREMENT AND PAYMENT**

- A. Concrete Grout
  - 1. Measurement: Vertical feet of grout installed.
  - 2. Payment: Shall be full compensation for:
    - a. Provision and installation of materials including:
      - 1) Concrete.
      - 2) Water.
      - 3) Aggregates.
      - 4) Tremie pipe and pump.
      - 5) Appurtenances.
    - b. Other work:
      - 1) Record drawings.
- B. Bentonite Grout
  - 1. Measurement: Vertical feet of grout installed.
  - 2. Payment: Shall be full compensation for:
    - a. Provision and installation of materials including:
      - 1) Bentonite grout

- 2) Water.
  - 3) Tremie pipe and pump.
  - 4) Appurtenances.
- b. Other work:
- 1) Record drawings.

### **1.03 REFERENCES**

#### **A. Reference Standards:**

1. Use current standard.
2. ASTM C33 – Standard Specification for Concrete Aggregates.
3. ASTM C150 – Standard Specification for Portland Cement.
4. Oklahoma Water Resources Board (OWRB), Title 785, Chapter 35, Subchapter 7, Paragraph d.

#### **B. American Society for Testing and Materials (ASTM)**

### **1.04 SUBMITTALS**

#### **A. Product Data:**

1. Conform to Section 01 33 00.0000 – Submittal Procedures.
2. Bentonite Grout.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

1. Concrete Grout:
2. Annular space of 1.5 inches minimum:
  - a. Cement that conforms to ASTM Standard C-150.
  - b. Water: 6 gallons per 94 lb. sack of cement.
  - c. Additives may not be used to increase the cements fluidity.
3. Annular space greater than 1.5 but less than 4 inches:

- a. Concrete Grout
    - 1) Ratio not more than one part sand to one part cement.
    - 2) Water: 6 gallons per 94 lb. sack of cement.
  - b. Annular space Greater than 4 inches:
    - 1) Ratio not more than one part sand to one part cement.
    - 2) Water: 6 gallons per 94 lb. sack of cement.
    - 3) Up to 50% by dry weight ½-inch or smaller gravel may be added.
4. Bentonite Grout
- a. High-solids bentonite grout and water mixture with 20 percent solids mixed and placed in accordance with the manufacturer's written instructions.
  - b. Swelling bentonite clay 10% minimum.
  - c. Conventional bentonite drilling clay and water mixtures are not allowed.

### **PART 3 EXECUTION**

#### **3.01 PREPERATION**

- A. Concrete Grout:
  - 1. Mix the water, cement, and aggregates (if allowed) to the proper consistency recommended by the cement manufacturer before placing in the well.
  - 2. Placing dry cement in the annular space and adding water is not allowed.
- B. Bentonite:
  - 1. Pre-hydrate to the manufacturer's recommended consistency.
    - a. Pre-hydration requires the bentonite be properly mixed with the recommended amount of water.
  - 2. Use potable water for mixing cement and bentonite grouts.

## 3.02 INSTALLATION

### 1.01 GROUTING

- A. Install a minimum of 10 continuous feet of grout.
  - 1. The top 5 feet of grout must be cement/concrete.
  - 2. The bottom 5 feet of grout may be cement/concrete or Bentonite clay with 20% minimum solids.
  
- B. Variances:
  - 1. If a sleeve is used at the surface for the sole purpose of attaching a pitless adapter:
    - a. Embed the sleeve within the surface seal.
    - b. Extend 8 feet (minimum) below ground level in the bore hole.
  - 2. If the surface casing does not extend 12 inches above the natural ground level and a pitless cap or sanitary seal is not installed:
    - a. Install 10 feet of grout between the surface casing and the production casing terminating within 4 feet of the ground surface.
  
- C. The cement/bentonite seal:
  - 1. Total minimum length after settling: 10 feet.
  - 2. Minimum starting depth: 10 feet.
  - 3. Maximum termination depth: 4 feet below the surface.
    - a. If needed for pitless adapters.
  - 4. The Project Officer may require additional grouting.
  
- D. Well Bore Hole:
  - 1. Surface Casing: Minimum diameter of at least 3 inches greater than the outside diameter of the surface casing (including coupling if they are located in the grout).
  - 2. Production Casing: Minimum diameter of at least 3 inches greater than the outside diameter of the surface casing (including coupling if they are located in the grout).
  
- E. Annular Space
  - 1. Fill with cement grout or cement/bentonite grout to a minimum depth of 10 feet.
    - a. Additional depth may be required to exclude pollution.

- F. Pitless Well Adapter or Pitless Unit:
  - 1. Start grouting below the junction of the pitless adaptor or pitless unit where it attaches to the well casing.
  - 2. Continue for a minimum depth of 10 feet.
- G. Pump grout under pressure from the bottom of the annular space to the surface.
- H. Place grout in a single uninterrupted operation.
- I. No work on the well will be allowed within 72 hours after completion of grouting.
- J. If quickset grout is used this period may be reduced to 24 hours if approved by the Project Inspector.

**END OF SECTION**



**SECTION 33 21 13.1085**  
**DOMESTIC WELL DISINFECTION**

**PART 1 GENERAL**

**1.01 SUMMARY**

A. Section includes:

1. The disinfection of domestic water wells.

B. Related requirements:

1. Section 01 78 00.0000 – Closeout Submittals.
2. Section 33 21 13.1001 – Domestic Well Drilling.
3. Section 33 21 13.1015 – Submersible Well Pumps.
4. Section 33 21 13.1081 – Well Screens.
5. Section 33 21 13.1084 – Well Gravel Pack.
6. Section 33 21 13.1085 – Domestic Well Grout.
7. Section 33 21 13.1085 – Domestic Well Development.
8. Section 33 21 13.1085 – Domestic Well Test Pumping.

**1.02 MEASUREMENT AND PAYMENT**

A. Disinfection:

1. Measurement: lump sum.
2. Payment: Shall be full compensation for:
  - a. Provision and installation of materials including:
    - 1) Equipment.
    - 2) Equipment set up and takedown.
    - 3) Disinfection agent.
    - 4) Potable water.
    - 5) Appurtenances.
  - b. Other work:

- 1) Testing.

### **1.03 REFERENCES**

#### **A. Reference Standards:**

1. Use current standard.
2. Oklahoma Water Resources Board: Title 785, Chapter 35, Subchapter 7.
3. AWWA A100-6: Section 4.9 Well Disinfection.
4. ANSI/AWWA C654-3 Disinfection of Wells.

### **1.04 CLOSEOUT SUBMITTALS**

- A. Conform to Section 01 78 00.0000 – Closeout Submittals.
- B. Provide test results to the Project Officer

## **PART 2 PRODUCTS (Not Used)**

## **PART 3 EXECUTION**

### **A. PREPARATION**

1. Prepare the liquid chlorine solution prior to injection into well.
  - a. Mix volume and strength such that a minimum concentration of 50 ppm of free residual chlorine is obtained in all parts of the well for a minimum of 24 hours after injection.

### **B. WELL DISINFECTION**

1. After test pumping and construction is complete, thoroughly clean the well of all foreign material (i.e. cement, oil, grease, joint dope, scum, etc.)
2. Disinfect well with a liquid chlorine solution.
  - a. Prepare solution prior to injection into well.
  - b. Mix volume and strength such that a minimum concentration of 50 ppm of free residual chlorine is obtained in all parts of the well for a minimum of 12 hours after injection.
  - c. Flush casing above static water level with solution.
3. Testing:
  - a. If the bacteriological test result is positive:
    1. Prepare and apply to the entire depth of the well a total volume of the chlorine solution of at least 100 mg/l available chlorine.
    2. Apply a volume equal to at least four times the volume of water in the well.

3. Allow solution to remain in well for 24 hours.
4. Retest.

**C. BACTERIOLOGICAL ANALYSIS**

1. Take bacteriological samples immediately after disinfection and flushing of each well.
2. Submit bacteriological samples to State Department of Health or Office of Environmental Health approved lab.
  - a. Provide copy of results within 10 days of receipt of the report.
  - b. If a sample tests positive, notify Project Engineer immediately and repeat chlorination of the well until a sample tests negative.

**END OF SECTION**

**SECTION 33 21 13.1085**  
**DOMESTIC WELL DEVELOPMENT**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Development of domestic water wells.
- B. Related requirements:
  - 1. Section 33 21 13.1001 – Domestic Well Drilling.
  - 2. Section 33 21 13.1081 – Well Screens.
  - 3. Section 33 21 13.1084 – Well Gravel Pack.

**1.02 MEASUREMENT AND PAYMENT**

- A. Well Development:
  - 1. Measurement: each hour of well development
  - 2. Payment: Shall be full compensation for:
    - a. Development of a domestic water well including
      - 1) Equipment.
      - 2) Sampling

**1.03 REFERENCES**

- A. Reference Standards:
  - 1. Oklahoma Water Resources Board: Title 785, Chapter 35, Subchapter 7.
  - 2. AWWA A100-6: Section 4.8 Well Development.

**PART 2 PRODUCTS (not applicable)**

**PART 3 EXECUTION**

**3.01 DEVELOPMENT**

- 1. Techniques:
  - a. Develop the well using a method that extracts the maximum practical quantity of drilling mud, fine sand, silt or other fine material.
    - 1) Maximum allowable sands and fine material: 2 ppm (by weight).
    - 2) Maximum allowable turbidity of less than 10 NTU under all conditions.

- a) Failure to meet the turbidity requirement may cause the well to be abandoned by fault of the Contractor.
- 3) Development by continuous over pumping is not be allowed.
- b. Acceptable development methods include surge plungers, compressed air or high velocity jetting.
  - 1) Bailing or pumping is not acceptable.
  - 2) Compressed air must be delivered at a minimum rate of 75 cfm at a minimum pressure of 100 psi.
- c. Conduct development to prevent settlement of the stratum above the water bearing formation.
- 2. Special Techniques:
- 3. High velocity jetting with phosphates may be required.
  - a. Follow established procedures for this type of development.

**END OF SECTION**

**SECTION 33 21 13.1085**  
**DOMESTIC WELL TEST PUMPING**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Test pumping of domestic water wells.
- B. Related requirements:
  - 1. Section 01 78 00.0000 – Closeout Submittals.
  - 2. Section 33 21 13.1001 – Domestic Well Drilling

**1.02 MEASUREMENT AND PAYMENT**

- A. Test Pumping
  - 1. Measurement: hours of testing including drawdown and recovery readings and records. No separate payment will be made for mobilization/demobilization and equipment setup and take down.
  - 2. Payment: Shall be full compensation for:
    - a. Test pumping including:
      - 1) Test pump.
      - 2) Temporary drop pipe.
      - 3) Power.
      - 4) Temporary submersible cable.
      - 5) Flow measurement device.
      - 6) Mobilization and demobilization
      - 7) Record keeping
      - 8) Appurtenances.

**1.03 REFERENCES**

- A. Reference Standards:
  - 1. Use current standard.
  - 2. Oklahoma Water Resources Board: Title 785, Chapter 35, Subchapter 7.
  - 3. AWWA A100-6: Section 5.1 Performance testing.

## **PART 2 PRODUCTS**

### **2.01 CLOSEOUT SUBMITTALS**

- A. Conform to Section 01 78 00.0000 – Closeout Submittals.
- B. Provide copy of drawdown and recovery measurements.

## **PART 3 EXECUTION**

### **3.01 TESTING FOR YIELD AND DRAW DOWN**

- A. Contact Project Officer two working days prior to the start of test pumping.
- B. Do not begin test pumping until development is complete and accepted by the Project Inspector.
- C. Provide all necessary labor, equipment, materials and power required for test pumping.
  - 1. Supply measuring equipment to determine water levels and the rate of pump discharge to the nearest 0.1-foot and 1-gpm.
    - a. Equipment approved for water level measurements: electrical probes or an air line.
    - b. Equipment approved for flow measurements are a 50 gal barrel, weirs, and calibrated meters.
    - c. Provide all piping necessary to convey water away from test pump site.
- D. Test pump wells at 10 gpm unless otherwise directed.
- E. Do not use the actual pumps to be installed in the well for the test pump operation.
- F. Duration of draw down test:
  - 1. Two hours after the water level draw down stabilizes in the well.
  - 2. Not less than 3 hours
- G. Take draw down and pump discharge measurements every 5 minutes for the first half-hour.
- H. Take draw down and pump discharge measurements every 10 minutes for the remainder of the test.
- I. Record recovery measurements immediately upon completion of test pump for one-hour total, unless otherwise directed by the Project Engineer.
  - 1. Take recovery readings every minute for the first 10 minutes.
  - 2. Take recovery readings every 5 minutes for the remainder of the hour.
  - 3. If requested by the Project Officer, take water samples for field chemical analysis test after test pumping but before grouting.
- J. Remove all temporary-pumping facilities at the conclusion of test pumping.

K. Submit test pump results to the Project Inspector within 5 days of completion.

**3.02 CLOSEOUT ACTIVITIES**

A. Submit test pump results to the Project Inspector within 5 days of completion.

**END OF SECTION**



## **SECTION 33 21 13.1084**

### **WELL GRAVEL PACK**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section includes
- B. Related requirements:
  - 1. Section 01 33 00.0000 – Submittal Procedures.
  - 2. Section 33 21 13.1001 – Domestic Well Drilling.
  - 3. Section 33 21 13.1081 – Well Screens.
  - 4. Section 33 21 13.1085 – Domestic Well Grout.

##### **1.02 MEASUREMENT AND PAYMENT**

- A. Gravel Pack
  - 1. Measurement: Vertical feet of gravel pack installed
  - 2. Payment: Shall be full compensation for:
    - a. Provision and installation of materials including:
      - 1) Gravel pack material.
      - 2) Tremie pipe.
      - 3) Appurtenances.
    - b. Other work:
      - 1) Record drawings.

##### **1.03 REFERENCES**

- A. Reference Standards:
  - 1. Use current standard.
  - 2. Oklahoma Water Resources Board (OWRB) Title 785, Chapter 35

##### **1.04 SUBMITTALS**

- A. Product Data:

1. Conform to Section 01 33 00.0000 – Submittal Procedures.

1. The manufacturer's gravel pack gradation recommendation for each screen size.

#### **1.05 CLOSEOUT SUBMITTALS**

- A. Conform to Section 01 78 00.0000 – Closeout Submittals.

- B. Provide record drawing showing the depth and length of the gravel pack installed.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

2. Clean, well-rounded, 95% siliceous material, smooth and uniform, free of foreign material, properly sized, washed and disinfected immediately prior to or during placement.

3. Weight loss by the acid test than 20%.

4. Gradation specified by the manufacturer of the well screen based on the gradation of the submitted water bearing formation.

### **PART 3 EXECUTION**

#### **3.01 PREPERATION**

- A. Disinfect filter pack by adding 1 lb of 65 percent available chlorine as pelletized tablets or liquid water mixture to achieve 50 ppm free chlorine to 1 yd<sup>3</sup> of gravel pack during placement.

- B. Disinfect immediately prior to or during placement.

#### **3.02 INSTALLATION**

- A. Use the screen manufacturer's recommended filter pack material.

1. The manufacturer recommended filter pack material will be determined using the aquifer samples supplied by the well driller.

2. Filter pack material.

- a. Well rounded.

- b. 95% siliceous material.

- c. Smooth and uniform.

- d. Properly sized.
  - e. Washed and disinfected immediately before or during placement.
  - f. Minimum thickness of filter pack: 3 inches.
  - g. Maximum thickness of filter pack: 12 inches.
  - h. Extend 20 feet above the highest slot in the well screen.
3. Artificial filter packing will be placed in the well by either the Tremie or the reverse-circulation methods in a manner that will not allow hydraulic separation.
  4. Free dropping of the filter pack material into the drill hole from the ground surface will not be allowed.
  5. Install in one continuous operation throughout each screened interval.
  6. Artificial filter pack shall be placed from the bottom of the well to a point 20 feet above the upper most slots in the screen.
  7. The Project Officer may direct that the annular space from 20 feet above the upper most screen slot in the well to 10 ft below the surface be filled with gravel pack or cement or bentonite grout.

**END OF SECTION**

## SECTION 33 21 13.1081

### WELL SCREENS

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section includes well screens
- B. Related requirements:
  - 1. Section 01 33 00.0000 – Submittal Procedures.
  - 2. Section 33 21 13.1001 – Domestic Well Drilling.
  - 3. Section 33 21 13.1015 – Submersible Well Pumps.
  - 4. Section 33 21 13.1084 – Well Gravel Pack.
  - 5. Section 33 21 13.1085 – Domestic Well Grout.

##### 1.02 MEASUREMENT AND PAYMENT

- A. PVC Well Screen:
  - 1. Measurement: Vertical feet of PVC well screen installed.
  - 2. Payment: Shall be full compensation for:
    - a. Provision and installation of materials including:
      - 1) PVC well screen.
      - 2) End plate.
      - 3) Appurtenances.
    - b. Other work:
      - 1) Record drawings.
      - 2) Well log.
- B. Stainless Steel Well Screen:
  - 1. Measurement: Vertical feet of stainless steel well screen installed.
  - 2. Payment: Shall be full compensation for:
    - a. Provision and installation of materials including:

- 1) Stainless steel well screen.
- 2) End plate.
- 3) Appurtenances.
- b. Other work:
  - 1) Record drawings.
  - 2) Well log.
- C. Perforated Casing:
  1. No separate payment will be made for perforated casings. The cost will be included in the cost of the casing.
  2. Record drawings showing the depth and length of the perforated casing are required.

### 1.03 REFERENCES

#### A. Reference Standards:

1. Use current standard.
2. ASTM D 1784 – Standard Specification for Rigid PVC Compounds and Chlorinated PVC Compounds
3. ASTM F480 – Standard Specification for Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR), SCH 40 and SCH 80.
4. ASTM A276-04 Standard Specification for Stainless Steel Bars and Shapes.
5. NSF61 – Drinking Water System Components – Health Effects.
6. NSF14 – Plastic Piping System Components and Related materials.
7. American Water Works Association (AWWA) publication A-100 and appendices.
8. Oklahoma Department of Environmental Quality (DEQ).
9. Oklahoma Water Resources Board (OWRB).
10. Underwriters Laboratory (UL).
11. National Sanitation Foundation (NSF).

12. American Society for Testing and Materials (ASTM).

#### **1.04 SUBMITTALS**

##### **A. Product Data:**

1. Conform to Section 01 33 00.0000 – Submittal Procedures.
2. PVC well screen.
3. Stainless steel well screen

#### **1.05 CLOSEOUT SUBMITTALS**

- A. Conform to Section 01 78 00.0000 – Closeout Submittals.
- B. Provide record drawing showing the depth of screens, slot size, and total length of screen installed.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

##### **A. Storage and Handling Requirements.**

1. Comply with the manufacturer's instructions.
2. Store in manufacturer's packaging until the screen is placed.
3. Store off ground
4. Fully support screen to prevent bends in the material.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURED UNITS**

##### **A. Manufacturers.**

1. PVC Well Screen:
  - a. CertainTeed Corporation, P.O. Box 860, Valley Forge, PA 19482, tele: 866.284.7473, web: [www.certainteed.com](http://www.certainteed.com).
  - b. Johnson Screens, Inc., P.O. Box 64118, St. Paul, MN 55164, tele: 651.636.3900, web: [www.johnsonscreens.com](http://www.johnsonscreens.com).
2. Stainless Steel Well Screen:
  - a. Amistco Separation Products Inc., 23147 Highway 6, Alvin, Texas 77512, tele: 281.331.5956 Email: [amistco@amistco.com](mailto:amistco@amistco.com), web: [www.amistco.com](http://www.amistco.com).
  - b. Johnson Screens, Inc., P.O. Box 64118, St. Paul, MN 55164, tele: 651.636.3900, web: [www.johnsonscreens.com](http://www.johnsonscreens.com).

3. Substitution Limitations.

- a. Manufacturers meeting the requirements of this specification will be given equal consideration.

B. Materials

1. General Approved Products:

- a. All materials that will come in contact with potable water must be approved by the NSF, API, UL, or AWWA for use in public drinking water supplies.
- b. Made of material that that will not impart taste, odor, toxic substances or bacterial contamination to the water.
- c. Material resistant to damage by chemical action of ground water or cleaning operations.
- d. Openings based on sieve analysis of formation and filter pack (gravel pack) materials to permit maximum transmitting ability without clogging or jamming.
- e. Sufficient diameter and length to provide adequate specific capacity.
- f. Aperture entrance velocity less than or equal to 0.1 feet per second.
- g. Vertical velocity: less than 4 feet per second.

- 2. Provide riser, tail piece, and bottom plate or wash down bottom fitting of the same material as the screen.

C. PVC Screen:

- 1. SDR rating the same or larger p.s.i rating as the casing.
- 2. White PVC Type 1, Grade 1 material as described in ASTM F480 and ASTM D1784, Class 12454B.
- 3. Vee-Wire® screen with a continuous slot widening inwardly to minimize clogging.

D. Stainless Steel Screen:

- 1. Continuous slot design, with outer windings and internal longitudinal bars.
- 2. Type 304 stainless steel conforming to ASTM A276.

**PART 3 EXECUTION**

### 3.01 INSTALLATION

- A. Place to utilize the full depth of the water-bearing formation as approved by the Project Officer.
- B. Provide a centralizer on casing just above the screen so an even thickness of filter pack can be installed.
  - 1. For screens longer than 10 feet place a centralizer at the bottom of the screen.
- C. Fill the drill hole with approved material if the bottom is deeper than the screened area.
- D. Acceptable methods for installing PVC well screens:
  - 1. Open hole method.
    - a. Fit PVC well screen with an approved rubber type packer or by solvent welding a threaded adapter on to the PVC casing and threading the screen onto the adapter.
      - 1) Packer material approved by NSF.
    - b. Secure a wash down fitting, bottom or other suitable closure to the bottom of the screen.
- E. Acceptable methods for installing stainless steel well screens:
  - 1. Pull back method
    - a. Provide a 1 1/2-foot section of riser pipe and neoprene type packer.
    - b. Packer material approved by NSF.
  - 2. Open hole method
  - 3. Bail down method
  - 4. Wash down method
  - 5. Welding the screen to the casing.
    - a. Diameter equal to the casing.



- F. Bottom of well screen. Seal the bottom of the deepest well screen using one of the following methods
1. Attach a threaded or welded stainless steel endplate on screen.
  2. Self closing valve installed at the bottom of the screen with a 1-foot thick cement plug above the valve.
- G. Perforated Casing:
1. Perforated Casing
    - a. Well casing may be perforated by the manufacturer or the Contractor.
    - b. Accurately position perforations.
    - c. Cut uniformly sized perforations.
    - d. Cut with power or hand tools.
    - e. Provided clean even cuts free of burrs.
    - f. Base the width of the perforations on the aquifer formation and gravel pack.
      - (1) Do not exceed 0.125 inch.
    - g. The location of the perforations approved by the Project Engineer.
    - h. Construct perforated casing in accordance with the plan detail drawing.

**END OF SECTION**

**33 21 13.1082**  
**SLOTTED CASING**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes
- B. Related requirements:
  - 1. Section 01 33 00.0000 – Submittal Procedures.
  - 2. Section 01 77 00.0000 - Closeout Procedures.
  - 3. Section 01 78 00.0000 – Closeout Submittals.
  - 4. Section 33 21 13.002 – Well Abandonment.
  - 5. Section 33 21 13.1015 – Submersible Well Pumps.
  - 6. Section 33 21 13.1081 – Well Screens.
  - 7. Section 33 21 13.1084 – Well Gravel Pack.
  - 8. Section 33 21 13.1085 – Domestic Well Grout.
  - 9. Section 33 21 13.1085 – Domestic Well Development.
  - 10. Section 33 21 13.1085 – Domestic Well Test Pumping.
  - 11. Section 33 21 13.1085 – Domestic Well Disinfection.

**1.02 MEASUREMENT AND PAYMENT**

- A. Mobilization
  - 1. Measurement: Linear Foot
  - 2. Payment: Shall be full compensation for:
    - 1) On-site modifications to casing pipe.

**1.03 REFERENCES**

- A. Reference Standards:
  - 1. Use current standard.
  - 2. Oklahoma Water Resources Board: Title 785, Chapter 35, Subchapter 7.
  - 3. AWWA A100-6

**1.04 SUBMITTALS**

- A. Conform to Section 01 33 00.0000 – Submittal Procedures.

B. Qualification Statements.

1. Type of drilling equipment.
2. Well drilling rig operator experience and license number

**1.05 CLOSEOUT SUBMITTALS**

A. Conform to Section 01 78 00.0000 – Closeout Submittals.

1. Well Log

**1.06 QUALITY ASSURANCE**

A. Regulatory

1. Conflicts With State Well Codes

- a. The materials and construction methods specified herein are minimum requirements. Where the appropriate state well codes require more stringent materials or execution methods, they shall apply.

2. Notify the Project Inspector of any planned deviation from these specifications before proceeding so any price changes or quantity adjustments may be made.

B. Qualifications

1. Licensure:

- a. Well drillers performing work within Oklahoma shall be licensed by the state of Oklahoma.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

B. Steel Casing

1. Conform to standard accepted well drilling practice for water wells.

**END OF SECTION**

**SECTION 33 21 13.1015**  
**SUBMERSIBLE PUMPS**

**PART 1 GENERAL**

**A. SUMMARY**

1. Section includes:
  - a. Installation of submersible pumps in individual water wells.
2. Related Requirements:
  - a. Section 01 33 00.0000 – Submittal Procedures.
  - b. Section 01 78 00.0000 – Closeout Submittals.
  - c. Section 01 78 36.0000 – Warranties.
  - d. Section 26 05 13.0001 - Medium Voltage Cables For Individual Water Systems.
  - e. Section 22 11 13.7418 - PVC Pipe and Fittings for Well Drop Pipes.
  - f. Section 33 11 13.2501 - Polyethylene Pipe and Fittings for Well Drop Pipes.

**B. PRICE AND PAYMENT**

1. Well Pump:
  - a. Measurement: each approved pump installed.
  - b. Payment: Shall be full compensation for:
    - 1) Provision and installation of materials including:
      - a) Submersible pump.
    - 2) Other work:
      - a) Disinfection.
      - b) Warranty.
      - c) Record drawings.

**C. SUBMITTALS**

1. Product DATA:
  - a. Submersible Pump data.

- 0) The Project Inspector will approve the pump size, voltage, and depth settings before installation.

2. Closeout Submittals:

- a. Conform to Section 01 78 00.0000 – Closeout Submittals.
- b. Provide a complete record of installation and maintenance instructions for each pump install.
- c. Provide the manufacturer’s warranty.
- d. Provide a completed “Pump Data Report”.

**D. DELIVERY, STORAGE, AND HANDLING**

1. Follow manufacturer’s recommendations.

**PART 2 PRODUCTS**

**A. MANUFACTURED UNITS**

1. Manufacturers

- a. Submersible Pumps:

- 1) Franklin Electric, Corporate Headquarters, 400 E Spring St., Bluffton, IN 46714, Phone 260.824.2900, web site [www.franklin-electric.com](http://www.franklin-electric.com).
- 2) Meyers, Water Systems, SSE, Residential Centrifugal - 293 Wright St. Delavan, WI 53115 • Phone 888.987.8677, web site [www.femyers.com/products](http://www.femyers.com/products).
- 3) Redjacket, Residential & Commercial Water, Red Jacket Water and Wastewater Products, phone 866. 325.4210, web site [Www.redjacketwaterproducts.com](http://Www.redjacketwaterproducts.com).
1. Goulds Pumps, 2881 E. Bayard St., Seneca Falls, NY 13148, phone 315.568.7133, web site [www.goulds.com](http://www.goulds.com).

2. Substitution Limitations.

- a. All manufacturers meeting these specifications will be given equal consideration.

3. Performance.

- a. Provide a minimum of gpm with a discharge pressure of 50 psi at the total dynamic head of the system.
- b. The Engineer will select the appropriate size pump for each well prior to installation based on the depth of the pumping level, the well capacity, and the pump curves submitted by the Contractor.
- c. Provide most efficient pump to produce the required pumping capacity within the range of the total pumping head.

4. Materials:

- d. Pump motor:
  - 1) Heavy-duty.
  - 2) 4-wire.
  - 3) 230 volt.
  - 4) Single-phase.
  - 5) 60 cycle.
  - 6) Capacitor start and run.
  - 7) 4-inch diameter maximum.
  - 8) Stainless steel case.
  - 9) Stainless steel splined or hexagonal motor shaft.
  - 10) Built in check valve or installed on the pump discharge.
- e. Pump impellers:
  - 1) Stainless steel or high quality thermoplastic.
  - 2) Provide pump controls and 48-inch motor lead assembly.
  - 3) Pumps with brass or bronze components containing lead which may produce water lead levels anywhere within the well that exceed the maximum contaminant level for lead are not allowed.

### **PART 3 EXECUTION**

#### **A. INSTALLATION**

- 1. The Project Inspector will approve the pump size, voltage, and depth settings before installation.

#### **B. DISINFECTION**

- 1. Disinfect the well, pump, and pressure system with a chlorine solution.
- 2. Prepare the chlorine solution before injection into the well.
- 3. Maintain a minimum concentration of 50 ppm of free residual chlorine in all parts of the well water system for at least 24 hours.
- 4. Dumping of granular HTH into the top of the well will not be allowed.

#### **C. RECORD KEEPING**

1. Maintain a notebook during the project showing the locations of all facilities installed under this contract.
  - a. Record shall include, but not be limited to the following:
  - b. The homeowner name and location.
  - c. The location of the water service line and electrical cable.
  - d. The material, length and size of water service line and UF cable.
  - e. The pump data report.

**END OF SECTION**

**33 21 13.1001**

**DOMESTIC WELL DRILLING**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes
- B. Related requirements:
  - 1. Section 01 33 00.0000 – Submittal Procedures.
  - 2. Section 01 77 00.0000 - Closeout Procedures.
  - 3. Section 01 78 00.0000 – Closeout Submittals.
  - 4. Section 33 21 13.002 – Well Abandonment.
  - 5. Section 33 21 13.1015 – Submersible Well Pumps.
  - 6. Section 33 21 13.1081 – Well Screens.
  - 7. Section 33 21 13.1084 – Well Gravel Pack.
  - 8. Section 33 21 13.1085 – Domestic Well Grout.
  - 9. Section 33 21 13.1085 – Domestic Well Development.
  - 10. Section 33 21 13.1085 – Domestic Well Test Pumping.
  - 11. Section 33 21 13.1085 – Domestic Well Disinfection.

**1.02 MEASUREMENT AND PAYMENT**

- A. Mobilization and demobilization
  - 1. Measurement: Lump sum for mobilization and demobilization
  - 2. Payment: Shall be full compensation for:
    - a. Moving equipment and materials on site to commence drilling and removing equipment and excess materials from site at conclusion of successful drilling operations.
- B. Drilling for surface casing.
  - 1. Measurement: vertical feet of bore hole drilled for surfacing casing and annual space required for grouting.
  - 2. Payment: Shall be full compensation for:
    - a. All drilling operations and materials required to drill a bore hole of the diameter indicated on the bid schedule.



- 1) Materials include potable water, drilling mud or other drilling fluids.
  - b. Other work:
    - 1) Drilling log.
    - 2) Formation sampling.
- C. Drilling for permanent casing.
- 1. Measurement: vertical feet of bore hole drilled for permanent well casing and annual space required for grouting, formation stabilizer, and gravel pack.
  - 2. Payment: Shall be full compensation for:
    - a. All drilling operations and materials required to drill a bore hole of the diameter indicated on the bid schedule.
      - 1) Materials include potable water, drilling mud or other drilling fluids.
    - b. Other work:
      - 1) Drilling log.
      - 2) Formation sampling.

### **1.03 REFERENCES**

- A. Reference Standards:
  - 1. Use current standard.
  - 2. Oklahoma Water Resources Board: Title 785, Chapter 35, Subchapter 7.
  - 3. AWWA A100-6

### **1.04 SUBMITTALS**

- A. Conform to Section 01 33 00.0000 – Submittal Procedures.
- B. Qualification Statements.
  - 1. Type of drilling equipment.
  - 2. Well drilling rig operator experience and license number

### **1.05 CLOSEOUT SUBMITTALS**

- A. Conform to Section 01 78 00.0000 – Closeout Submittals.
  - 1. Well Log

### **1.06 QUALITY ASSURANCE**

- A. Regulatory
  - 1. Conflicts With State Well Codes

- a. The materials and construction methods specified herein are minimum requirements. Where the appropriate state well codes require more stringent materials or execution methods, they shall apply.

2. Notify the Project Officer of any planned deviation from these specifications before proceeding so any price changes or quantity adjustments may be made.

**B. Qualifications**

1. Licensure:

- a. Well drillers performing work within Oklahoma shall be licensed by the state of Oklahoma.

**B. DRILLING EQUIPMENT**

1. The drilling may be accomplished by:
  - a. Air rotary drilling machine.
  - b. Combination air-mud rotary machine.
2. Cable-tool or solely mud-rotary drilling machines are not allowed.
3. In good repair.
4. Capable of drilling to a depth of 500 feet.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

**C. Drilling Fluid (Air-Mud Rotary Method)**

1. Conform to standard accepted well drilling practice for water wells.

**PART 3 EXECUTION**

**3.01 PREPERATION**

**A. Minimum Location Standards:**

1. Locate wells a minimum distance from possible pollution sources:
  - a. Possible pollution sources:
    - 1) Existing or proposed septic tanks.
    - 2) Sewer lines.
    - 3) Absorption fields or beds.
    - 4) Seepage pits.
    - 5) Building foundations.
    - 6) Waste pits.

- 7) Lagoons.
- 8) Oil or gas wells/
- 9) Landfills

2. Minimum Distances:

- a. 50 feet from a closed or tight sanitary sewer line.
- b. 25 feet from aerobic (above ground) sprinkler spray.
- c. 50 feet from aerobic sprinkler head.
- d. 300 feet from the outside perimeter of an existing or proposed waste lagoon from an animal feed lot.
- e. 100 feet from all other pollution sources if up gradient from the pollution source.
- f. 75 feet from all other pollution sources if level with the pollution source.
- g. 100 feet from all other pollution sources if the if down gradient from the pollution source.
- h. If the well is within 50 to 75 feet and located down gradient from the pollution source a twenty foot surface casing is required.
- i. If a structure, object or other situation is encountered and the driller is unsure if it may be a source of pollution:
  - 1) Contact Cherokee Nation staff.
  - 2) Obtain approval for the well location.

B. Surface Preparation.

C. Demolition.

**3.02 INSTALLATION**

A. Locate all existing underground utilities.

B. Permanently prevent contaminated water or water with undesirable physical or chemical characteristics from entering the well.

- 1. This includes water contaminants entering the well through the opening made by the Contractor during drilling operations or entering the stratum from which the well draws its water supply.
- 2. Take all necessary and practical precautions to prevent contaminating or polluting substances from entering the well either through the opening or by seepage through the ground surface.

C. All water used during well drilling and developing shall contain at least 50-ppm chlorine.

- D. All drill pipes, bits, and any other drilling equipment used down-hole shall be washed with water containing at least 100-ppm chlorine before drilling operations begin.
- E. Drill and case wells of the type and size specified in the bid schedule.
- F. Locate wells as shown on the plans or staked by the Project Inspector.
- G. Drill wells to the depth specified, unless otherwise approved by the Project Inspector.
  - 1. If satisfactory yield is obtained at a lesser depth, terminate drilling and develop at that depth.

## **1.02 SAMPLING OF FORMATIONS**

### **A. General**

- 1. Do not wash samples.
- 2. Keep samples in cloth bags.
- 3. Tag each bag with the well location, depth of sample, type of sample, and date collected.
- 4. Provide Project Inspector with samples as the drilling progresses.
- 5. If directed by the Project Inspector, collect and lay out samples of each stratum encountered during drilling for inspection and verification of the well log.
- 6. Sampling is required when a well screen installation is anticipated.
- 7. Take a representative sample of the aquifer of sufficient volume to be analyzed.
- 8. The manufacturer of the well screen to mechanically analysis the sample to determine the required slot size of the well screen.
- 9. The driller may analysis the sample with the approval of the Project Officer.

## **1.03 DRILLING**

- 1. Drill the annular opening at least 3 inches wider than the outside diameter of the casing to accommodate the sanitary grout seal and/or formation stabilizer.
- 2. Depth of annular space:

- a. From the ground surface a depth of 10 feet, unless additional depth is necessary due to the character of the formation or type of aquifer(s).

- 1) Project Inspector to approve, in advance, any additional depth.

- 3. Drill any uncased portions of the well as large as can be reasonably drilled through the steel casing but no less than the diameter needed to install a 4-inch submersible pump.

**B. Test Wells**

- 1. Drill 4-inch to 5-inch diameter hole. If sufficient yield is found, ream the test well to the required diameter including annular space.

**3.03 FIELD QUALITY CONTROL**

**A. WELL LOG**

**B. Keep daily log of each hole drilled.**

- 1. Include all items required by the State.

**C. File an official construction report; using state approved form, with the designated state agency within 30 days from when well is completed.**

- 1. Submit a copy to the Project Engineer.

**D. Non-Conforming Work.**

**1. Unaccepted drilled wells.**

- a. Drilled wells will not be accepted due to insufficient capacity, unsatisfactory chemical or bacteriological quality, poor alignment, and loss of tools or any other cause.

- b. Obtain Project Engineer's approval prior to abandoning wells.

- 2. Well abandonment shall be in accordance with Section 33 21 13.002 – Well Abandonment.

**3.04 CLOSEOUT ACTIVITIES**

**A. Submit well log to the Project Officer and OWRB.**

**END OF SECTION**

**SECTION 01 78 36.0000  
WARRANTIES**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Preparation and submittal.
  - 2. Time and schedule of submittals.
- B. Related Requirements:
  - 1. Section 01 78 00.0000 - Closeout Submittals.

**PART 2 PRODUCTS (Not Applicable)**

**PART 3 EXECUTION**

**3.01 PREPARATION OF SUBMITTALS**

- A. Obtain warranties executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten business days after completion of the applicable item or work.
- B. Unless otherwise approved, Warranty date is the Date of Substantial Completion.
- C. Verify that documents contain full information required.
- D. Specifically identify the warranty expiration date for each submittal. Retain warranties for the time specified for that submittal.
- E. Submit under provisions of Section 01 78 00 - Closeout Submittals.

**3.02 TIME OF SUBMITTAL**

- A. For equipment or component parts of equipment put into service during construction submit documents within ten business days after installation and approval by the Project Engineer.
- B. Submit other documents within ten business days after Date of Substantial Completion and prior to final Application for Payment.

- C. For items of work when acceptance is delayed beyond Date of Substantial Completion, submit within ten business days after acceptance, listing the date of acceptance as the beginning of the warranty period.

**END OF SECTION**

**SECTION 01 78 23.0000  
OPERATION AND MAINTENANCE DATA**

**PART 1 GENERAL**

**1.01 SUMMARY**

A. Section includes:

1. Form of Submittals
2. Preparation and submittal
3. Time and schedule of submittals

B. RELATED Requirements

1. Section 01 78 00.0000 – Closeout Submittals

**PART 2 PRODUCTS**

**2.01 OPERATION AND MAINTENANCE MANUAL**

A. Provide:

1. System treatment requirements
2. Description of the operation and control of the water treatment plant
3. Control of unit process.
4. Laboratory testing.
5. Common operating problems.
6. Start-up testing and procedures.
7. Standard operating procedures.
8. Alternative and emergency operations.
9. Emergency shutdown operations and emergency response.
10. Records control and retention.
11. Safety.
12. Public water supply system maintenance records.
13. Stormroom and inventory system.



14. Utilities.

**PART 3 EXECUTION**

**3.01 PREPARATION OF SUBMITTALS**

- A. Submit all operation and maintenance information as included in the packaging from the manufacturer regarding the materials installed.
- B. Additional project specific operation and maintenance requirements are listed in individual sections.
- C. Verify that documents contain full information.
- D. Submit under provisions of Section 01 78 00 – Closeout Submittals.

**3.02 TIME OF SUBMITTALS**

- A. Submit within ten business days after Date of Substantial Completion and prior to final Application for Payment.

**END OF SECTION**

**SECTION 01 78 00.0000  
CLOSEOUT SUBMITTALS**

**PART 1 GENERAL**

**1.01 SUMMARY**

A. Section includes:

1. The requirements for closeout submittals including:
  - a. Record drawings (as-builts)
  - b. Warranty information
  - c. General operation and maintenance information (if applicable)

B. Related Requirements:

1. Section 01 33 00.0000 – Submittal Procedures.
2. Section 01 43 00.0000 - Quality Assurance.
3. Section 01 77 00.0000 – Closeout Procedures.
4. Section 01 78 23.0000 – Operation and Maintenance Data.
5. Section 01 78 36.0000 – Warranties.

**1.02 DELIVERY**

A. Provide all closeout submittals meeting this specification and specific requirements of each section.

1. Closeout submittals must be received in required form.
2. Closeout submittals must be received before final payment can be made.

**1.03 DEFINITIONS**

A. Record Drawing's drawing showing:

1. The actual installation of facilities.
2. Changes from the plans with enough detail so that the facility can readily be located.

B. Ties: Measurements from permanent easily located objects to an installed object.

**PART 2 PRODUCTS (Not Applicable)**

## **PART 3 EXECUTION**

### **3.01 RECORD DOCUMENTATION**

- A. Provide record data in the following manner:
  - 1. Provide Test Pump Data Sheet.
  - 2. Provide OWRB Well Record Form.
  
- B. Provide installed bid schedule items quantities for individual facilities on 8½ X 11 sheets.
  - 1. Project Inspector may supply standard OEH forms for use by the Contractor.

### **3.02 WARRANTIES**

- A. Submit all applicable warranty information regarding the materials installed in conformance with Section 01 78 36.0000 – Warranties.
- B. Minimum warranty information is listed in Section 01 43 00 - Quality Assurance.

### **3.03 OPERATION AND MAINTENANCE INFORMATION**

- A. Submit all operation and maintenance information included in the manufacturer's packaging regarding the materials installed.
- B. Submit any additional Contract specific operation and maintenance requirements are listed in Section 01 78 23.0000 – Operation and Maintenance Data.

**END OF SECTION**

**SECTION 01 77 00.0000  
CLOSEOUT PROCEDURES**

**PART 1 GENERAL**

**1.01 SUMMARY**

A. Section includes information on closeout procedures and site cleanup.

**B. RELATED REQUIREMENTS**

1. Section 01 78 00.0000 – Closeout Submittals.

**1.02 ADMINISTRATIVE REQUIREMENTS**

A. Submit, to the Project Inspector, written certification that work is complete and ready for Final Inspection.

B. Provide warranties and record documents (e.g. as-built drawings) to Project Inspector within ten business days after date of first beneficial use or at the Final Inspection, whichever occurs first.

**C. Final Inspection:**

1. The Project Inspector will schedule the Final Inspection at a day and time convenient to all parties.

2. Conduct the Final Inspection in the presence of the Owner, the Project Inspector, Prime Contractor, and any other parties with an interest in the completed project.

3. Include all facilities installed under the Contract.

**1.03 SITE CONDITIONS**

A. Complete clean up before the Final Inspection.

B. Remove waste and erosion control devices, surplus materials, rubbish, and construction facilities from the site.

**C. Punch List:**

1. The Project Inspector will provide a letter (punch list) to the Contractor listing the deficiencies noted during the Final Inspection

2. Correct the deficiencies in conformance with the specifications and Contract Drawings.

3. Final payment will be withheld until all deficiencies are corrected.

**END OF SECTION**

**SECTION 01 43 00.0000  
QUALITY ASSURANCE**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Pre-requisites and procedures to assure the quality of construction.
- B. Related Requirements:
  - 1. Section 01 78 36.0000 – Warranties.

**1.02 QUALITY ASSURANCE**

- A. Perform work under the direction of personnel licensed in the state in which construction is located and where licensing of the trade is regulated by the state including, but not limited to:
  - 1. Plumbing.
  - 2. Well drilling.
  - 3. Septic system installation.
  - 4. HVAC.
  - 5. Rock blasting.
  - 6. Electrical work.
- B. Control Of Installation
  - 1. Perform work in accordance with the specifications.
  - 2. Comply fully with manufacturers' instructions.
- C. If manufacturers' instructions conflict with contract documents, request clarification from Project Officer before proceeding.
- D. Correct defective work to conform to the applicable specification.
- E. Manufacturer's Field Services:
  - 1. Provide reports of observations and documentation of workmanship to the Project Officer within 30 calendar days after manufacturers' field services are provided.

**1.03 DELIVERY, STORAGE, AND HANDLING**

- A. Inspect materials for acceptability when delivered to the site.
- B. Store and handle materials to prevent damage.

**1.04 WARRANTY**

- A. Provide a minimum one-year warranty for all materials and labor, covering defects in the materials or deficiencies resulting from contractor installation.
- B. Provide additional warranties as required by other sections.

**END OF SECTION**