

NORTH KERN WATER STORAGE DISTRICT  
Kern County, California

**NOTICE TO PLAN HOLDERS**

Attached is Addendum No: 1 to the Specification 22-1 for constructing two to five irrigation wells.

Sign and return this notice with your bid.

**North Kern Water Storage District  
33380 Cawelo Avenue  
Bakersfield, CA 93308**

Date: February 18, 2022

Firm Name \_\_\_\_\_

By \_\_\_\_\_

Title \_\_\_\_\_

Date \_\_\_\_\_

By signing the cover sheet, Contractor certifies that it has reviewed the contents of the subject addendum and that its bid has been prepared taking into consideration the changes made by said addenda.

**NORTH KERN WATER STORAGE DISTRICT**

Attached is Addendum No: 1 to the Specification 22-1 for constructing two to five irrigation wells.

Specifications No: 22-1 is hereby changed and/or clarified as follows:

1. Revision of the entire Item **c. Pilot Borehole** in Section E-3 Well Drilling and Construction

**c. Pilot Borehole**

**1. General**

- a) This item includes drilling a 17.5-inch diameter pilot borehole by the approved drilling method to a total depth as shown on the Plans or as directed by the District Representative.
- b) Related Work Specified Elsewhere

Drilling Fluid – Section E-3d c)

Submittals

- 1) Daily activity report.
  - 2) Samples of formation materials.
  - 3) Lithologic log.
  - 4) Drilling rate log.
- d) Measurement and Payment

Payment for pilot borehole drilling at each site will be based on measurement of vertical feet of pilot borehole drilled from below the bottom of the conductor casing to the bottom of the borehole (as verified by the downhole geophysical logs). Payment shall include all materials, labor, tools, and equipment required to drill each pilot borehole, collect formation samples, maintain circulation, and protect the pilot borehole from collapse.

**2. Materials**

- a) Drilling Fluid
  - 1) The Contractor shall maintain controlled drilling fluid characteristics during the entire drilling operation as specified in Section E-3d Drilling Fluids.

**3. Execution**

- a) Pilot Borehole Drilling
  - 1) Each nominal 17.5-inch diameter pilot borehole shall be drilled from the bottom of the conductor casing to a total depth as shown on the Plans or as directed by the

District Representative. The Contractor shall take all measures necessary to protect the borehole from caving or raveling.

- 2) Deviation surveys shall be conducted at 100-ft intervals as the drilling proceeds at each site using either Eastman, Totco, or Martin-Decker mechanical drift indicators, or as otherwise approved. Three-degree (3°) targets shall be used. A maximum deviation of 1/2° from vertical per 100 ft. will be allowed at any site. If this amount is exceeded at any site, the Contractor will be required to correct the deviation at that time. **If the deviation is not corrected, the borehole will be abandoned and will be re-drilled at the Contractor's expense.**

- 2a) Contractors should have all necessary means of performing deviation surveys prior to commencing borehole drilling.

- 3) The Contractor shall maintain a record showing any variation in the addition and amount of approved clays or chemical products or water required during drilling at each site. The depths at which such changes are required shall be shown in the daily reports.

b) Formation Sampling

- 1) The Contractor shall collect, preserve and label one (1) set of representative samples of drill cuttings at 10-foot intervals and at each major change in formation as drilling proceeds to the full depth of each pilot borehole. The method of collection shall be discussed with and approved by the District Representative at the Pre-construction Conference. **Samples collected off a shaker screen are not acceptable unless specifically approved by the District Representative.** Samples shall be placed in one-gallon size, heavy (freezer) weight, zip-lock type, plastic bags and shall be labeled to indicate the well name, date, time, and depth interval. Collected samples shall be stored in a manner to prevent breakage or loss.

- 3) Upon completion of each pilot borehole, downhole geophysical logs shall be run.

2. Revision of the entire Item e. **Downhole Geophysical Survey** in Section E-3 - Well Drilling and Construction

e. **Downhole Geophysical Surveys**

1. **General**

a) Description

This item includes completion of downhole geophysical logs to be conducted in each

pilot borehole by a logging firm retained by the Contractor and approved by the District Representative. Geophysical surveys to be completed in each pilot borehole shall include:

- 1) Gyroscopic borehole alignment survey
  - 2) Resistivity (including curves for spontaneous potential, point resistance, 16-inch normal resistivity, 64-inch normal resistivity, and focused guard resistivity or lateralog)
- b) Submittals
- 1) Within ten (10) days of Notice of Award, the Contractor shall submit to the District Representative the name and qualifications of the firm proposed for completing geophysical surveys.
  - 2) The Contractor shall provide four (4) field copies of the surveys to the District Representative for interpretation upon completion. The Contractor shall also provide the District Representative with an electronic copy in pdf format.
- c) Measurement and Payment
- 1) Payment for geophysical surveys will be based on the lump sum price bid (see Bidding Sheets). Payment shall include full compensation for fluid circulation, removal of drill string, operation of the drilling rig and other equipment, furnishing and operating geophysical surveying equipment as specified, field and final copies of the surveys, digital copies of the surveys, and providing whatever assistance may be required to complete the surveys.
  - 2) There will be no additional payment for rig time and idle time while waiting for the surveying firm to arrive or while the surveys are being conducted.
  - 3) Upon receipt of copies of geophysical surveys, the District Representative may require an evaluation period of up to 72 hours, excluding weekends and holidays, to interpret the data, prepare a final well design, and obtain county approval for the well seal, as applicable. No standby time will be paid during the evaluation period. The evaluation period begins after receipt of geophysical logs and Contractor's lithologic log of drill cuttings for each site. Standby time will be paid for each hour after the specified evaluation period for which the Contractor waits to receive instructions.

## **2. Materials**

Geophysical logging equipment shall have the capability of producing representative borehole resistivity logs (16-inch and 64-inch normal) and spontaneous potential.

## **3. Execution**

- a) Upon completion of each pilot borehole, downhole geophysical surveys shall be conducted. Before conducting geophysical surveys, the Contractor shall cease drilling and circulate

fluid for not less than one (1) hour.

- b) The geophysical surveys shall be conducted in the presence of the District Representative. The surveys shall become the property of the District Representative at the time the surveys are completed.
- c) The logging speed for all surveys shall be 40 feet per minute, unless otherwise approved by the District Representative.
- d) If a survey probe fails to descend to the completed depth of any borehole, the Contractor shall at the Contractor's own expense, re-condition that borehole to permit the probe to descend to the maximum depth drilled or other depth approved by the District Representative. No additional payment will be made for time required to clean or condition the borehole for logging.
- e) The Contractor shall provide whatever assistance may be necessary to complete the geophysical surveys.
- f) The Contractor shall ensure the stability of each pilot borehole during the analysis period following completion of the geophysical surveys.
- g) Within the 72-hr evaluation period, the District Representative will submit a schedule for the final well design. Schedules submitted will be based upon an evaluation of formation samples, results of sieve analyses and the downhole geophysical surveys.
- h) If available information indicates well completion is not warranted at a particular site, the District reserves the right to terminate further work at that site under the contract. In this event, the borehole will be destroyed in accordance with Section E-7b of these Technical Specifications.

3. Revision of entire item **g. Well Casing and Accessory Tubing** in Section E-3 – Well Drilling and Construction

**g. Well Casing and Accessory Tubing**

**1. General**

a) Description

- 1) This item includes the supply and installation of blank and perforated well casing, end cap, cover plate, gravel feed tube, sounding tube (if installed), and air vent tube required by the final well design at each site. For bidding purposes, tentative schedules of completion (quantities) for the Wells are indicated on the Bid Sheets.
- 2) A final schedule of well casing and tubing will be prepared by the District Representative for each site and submitted to the Contractor upon completion of analyses of the lithologic log, sieve analyses of drill cuttings, and downhole

geophysical surveys.

- 3) Materials and material quantities specified in this section are summarized in the Bidding Sheets. The actual quantities installed will be specified in the final well design submitted by the District Representative after evaluation of the lithologic log, sieve analyses of drill cuttings, and downhole geophysical surveys from each successive well site.

b) Submittals

The Contractor shall submit certified test reports and other documentation necessary to demonstrate compliance with (1) the physical and chemical properties of the steel used in the manufacture of blank and perforated well casing, and all accessory tubing delivered on-site, and (2) diameter, wall thickness and slot dimensions (as applicable) of blank and perforated well casing, and accessory tubing specified in the final well design for each site.

c) Measurement and Payment

- 1) Payment for installation of blank well casing at each site will be based on measurement of the vertical feet of well casing installed, complete and in place, exclusive of perforated well casing (see Bidding Sheets).
- 2) Payment for installation of perforated well casing at each site will be based on measurement of the vertical feet of perforated well casing installed, complete and in place, exclusive of the blank well casing (see Bidding Sheets).
- 3) Payment for the permanent gravel feed tube at each site will be based on the vertical feet of tubing installed from the ground surface, complete and in place (see Bidding Sheets).
- 4) Payment for the blank and perforated well casing, air vent tube and permanent gravel feed tube at each site shall include supply and installation of welding collars, centralizers, cover plate, end cap, tubing caps and all equipment, materials and labor required for successful installation at the specified depths.

## 2. **Materials**

a) Blank Well Casing

- 1) All blank well casing shall have the same I.D., thickness, physical and chemical properties as the perforated well casing at each site.
- 2) All casing shall be fabricated in lengths of 10, 20 or 40 feet. Random lengths of casing are not permitted.
- 3) The ends of all casing joints shall be machined perpendicular to the casing axis to ensure the straightness of each assembled section. Joints shall be furnished with collars for

welding. Collars shall be of the same thickness and have the same physical and chemical properties as the corresponding casing section. The collars shall be rolled to fit the outside diameter of the casing and factory welded to one end. Three equally spaced 5/16-inch diameter alignment holes shall be provided in each collar to ensure proper matching of the ends upon assembly.

- 4) All welding shall be done with shielded arc electrodes compatible with the casing material and shall be performed by certified welders in accordance with American Welding Society Standards.
- 5) All casing materials shall be new. b)

#### Perforated Well Casing

- 1) The perforated well casing shall have the same I.D., thickness, physical and chemical properties as the blank well casing at each site.
2. a) "Mill Slot" - all perforated well casing shall consist of 18-inch 5/16-inch wall casing with vertical saw-cut, 1/8" x 2 1/2", (1 row per diameter inch) perforations.
2. b) "Shutter Screen" - all perforated well casing shall consist of 18-inch 5/16-inch well casing, Standard Flo Shutter Screen with 10 holes/circle, 60 holes per foot. Slot length of 2 5/8" and slot size of 1/8". Please note that Standard Flo casing should have a minimum of 10 holes/circle, evenly spaced around the circumference of the casing. "Shutter Screen" Perforated Well Casing to be included in Bid Detail Schedule for District review & consideration as optional pricing. Please note the standard casing for this project and bid should reflect Mill Slot Casing.
- 3) All perforated well casing shall be provided with welded collars attached.
- 4) The ends of all casing joints shall be machined perpendicular to the casing axis to ensure the straightness of each assembled section. Joints shall be furnished with collars for welding. Collars shall be of the same thickness and have the same physical and chemical properties as the corresponding perforated well casing section. The collars shall be rolled to fit the outside diameter of the perforated well casing and factory welded to one end. Three equally spaced 5/16-inch diameter alignment boreholes shall be provided in each collar to ensure proper matching of the ends upon assembly.
- 5) All perforated well casing shall be factory assembled in 10-feet, 20-feet or 40- feet lengths as specified by the District Representative.
- 6) The Contractor shall ensure the inside diameter of all perforated well casing is the same as the inside diameter of the blank well casing.
- 7) All welding shall be done with shielded arc electrodes compatible with the casing material and shall be performed by certified welders in accordance with American Welding Society Standards.

- 8) All perforated well casing materials shall be new. c)

Casing Centralizers and Bottom End Cap

- 1) Casing centralizers and bottom end cap shall be provided as shown on the Plans. All centralizers and bottom end cap shall be of the same physical and chemical properties as the well casing.

d) Gravel Feed Tube

- 1) One (1) 3-inch I.D. Schedule 40 gravel feed tube shall be provided at each well as shown on the Plans. The gravel feed tube shall be fabricated of mild steel in accordance with ASTM Standard A53 Grade B.
- 2) The final depth of the gravel feed tube at each site will be specified in the final well design provided by the District Representative. For bidding purposes, the depth of the gravel feed tube is 435 ft.

e) Casing Vent Tube

- 1) One (1) 3-inch I.D. Schedule 40 casing vent tube shall be provided at each well as shown on the Plans. The casing vent tube shall be fabricated of mild steel in accordance with ASTM Standard A53 Grade B.

f) Welding Electrodes

The following electrode shall be used for welding all grades of casing specified in the Bid Sheets and the Specifications herein:

E-7018 ( E-7024 may be used on casing with collars)

E-6011 may be used for the root pass on the casing, and for the centralizers and gravel fill tube.

The following electrode sizes shall apply: Wall

Thickness	Electrode Size Over
1/4-inch	3/16- to 1/4-inch

**3. Execution**

a) General

- 1) Installation of well casing shall commence upon completion of a District Representative-approved caliper survey of the reamed borehole and after all well construction materials delivered on site have been examined and approved by the District Representative for



compliance with the final well design at each site.

- 2) The final arrangement of the accessory tubing (sounding tube, gravel feed tube and air vent tube) and temporary tremie pipe around each well casing shall be approved by the District Representative prior to installation of well casing.

b) Joints

**All field joints shall be properly lap or butt-welded during installation with a minimum of two continuous passes per circumference.** All field welding shall be performed in accordance with American Welding Society Standards by a certified welder.

c) Centralizers

Three centralizing guides shall be welded to each well casing string 120 degrees apart at intervals of not more than 80 feet to centralize and hold the casing in the proper position until the gravel is in place. The first set of guides shall be placed 5 feet from the bottom of the casing. Guides shall be fabricated and placed as shown in the Plans. Only like metals shall be welded on the casing.

d) Gravel Feed Tube

A permanent gravel feed tube shall be installed in each reamed borehole prior to installation of the well casing. The bottom of the tube shall be placed below the planned top of the gravel pack as specified in the final well design. The top of the gravel feed tube shall extend above the ground surface as shown on the Plans.

After well construction, Contractor shall demonstrate, to the satisfaction of the Engineer, that the gravel tube is free of blockage and takes water freely prior to well development with the development pump. During well development, the gravel tube must be kept free of obstructions and while pumping water must flow freely down the gravel tube and not back up and overflow. If at any point the gravel tube is found to be obstructed, the Contractor shall clear all blockage prior to continuing well development, to the Engineer's satisfaction and at the Contractor's expense.

e) Construction Tremie Pipe

A temporary flush-threaded tremie pipe shall be installed in the reamed borehole prior to installation of well casing. The tremie pipe shall be used to install gravel pack, annular seal and sanitary seal materials in the annulus between the well casing and borehole. The tremie pipe shall be completely removed after placement of the upper annular seal.

f) Air Vent Tube

An air vent tube shall be welded to a cut port in each well casing as shown on the Plans.

g) Blank and Perforated Well Casing

- 1) Prior to casing installation at each site, the Contractor shall inspect for and remove any tags, labels or other deleterious material attached to the interior or exterior of the blank and perforated well casing.
- 2) Each assembled well casing string shall be suspended in tension from the surface by means of an appropriate hanger or clamp. Steel bars (clamp anchors) pre-welded to the casing to hold the casing clamp in place during casing installation, shall be removed prior to lowering a new casing section into the borehole. The use of float plugs to land and set any casing will not be permitted. All casing strings shall be plumb and centered in the borehole. The bottom of the casing shall not rest on the bottom of the borehole.
- 3) If for any reason the entire casing cannot be landed in the correct position at any site, or at a depth acceptable to the District Representative, the Contractor shall rectify the situation by either (1) removing the casing, re-reaming the borehole and re-installing the casing, or (2) constructing another well in accordance with the specifications, plans and final well design at a location immediately adjacent to the original well. All such remedial work shall be at no additional cost to the District. The borehole of the abandoned well shall be properly destroyed at the Contractor's expense in accordance with Section E-7b.
- 4) If any of the casings should collapse or be damaged prior to well completion, they shall be withdrawn and replaced at the Contractor's expense.
- 5) All work required to be repeated, and all additional materials, labor and equipment required, shall be furnished at the expense of the Contractor and no claim for additional compensation shall be made or be allowed therefore, except as specifically provided herein.
- 6) Alignment holes in all collars at casing joints shall be welded completely closed to prevent the entry of water from outside the casing.
- 7) The top of the well casing string shall extend at least 24 inches above the ground surface.
- 8) The bottom of each permanent gravel feed tube shall be placed approximately 5 feet below the top of the gravel pack at each site. The top of each gravel feed tube shall extend at least 12 inches above ground surface.
- 9) Following casing installation, the tops of all well casings shall be covered with a welded steel plate at all times when personnel are not on the site.

4. Revision of entire item **i. Annular Grout Seal** in Section E-3 – Well Drilling & Construction

**i. Annular Grout Seal**

**1. General**

a) Description

- 1) This item includes installation at each site of a grout seal in the upper portion of the annulus between the blank well casing and borehole wall or blank well casing and conductor casing from the top of the gravel pack to the ground surface.
- 2) For bidding purposes, a tentative seal depth of 300 feet below ground surface is to be used. The final depth of the seal will be specified in the final well design submitted by the District Representative after evaluation of the lithologic log and sieve analyses of drill cuttings, and geophysical surveys. Minimum seal depth shall be in conformance with Section 14.08.260 of the Kern County Water Well Ordinance.

b) Submittals

- 1) Daily activity logs.
- 2) Cement weight tickets.
- 3) Record of depth of placement and volume of grout placed in the annulus. c)

Measurement and Payment

Payment for the sanitary seal at each site will be based on measurement of the vertical feet of seal installed (see Bidding Sheets). No standby time shall accrue or be paid for a 24-hour idle period following seal placement required to allow the grout seal to set.

2. **Materials**

- a) The material used for the grout seal shall consist of standard brand Portland cement conforming to ASTM C150, Type II.
- b) The grout shall be a 10.3-sack sand-cement mix. There shall be not more than two parts by weight of sand to one part by weight of cement. The water-cement ratio shall be about 7 gallons per sack of cement (94 pounds). All on-site water additions shall be metered. Up to 5 percent bentonite gel may be added.
- c) Clean fine-grained sand shall be used to separate the gravel pack from the annular seal.

3. **Execution**

- a) The grout seal at each site shall be installed in the annulus **in a sufficient number of pours to preclude collapse of the well casing**. Prior to installing the seal, a 5-foot thick layer of clean washed and graded, fine grained sand, 5' bentonite seal (or other approved sand or seal approved or specified by the District Representative) shall be pumped into place at the top of the gravel pack using a tremie pipe

- b) The grout for the seal shall be pumped into the annulus between the blank well casing and borehole wall using a tremie pipe. The pipe shall extend from the ground surface to the bottom of the zone to be grouted. Grout shall be placed from bottom to top in a continuous operation unless determined by the Contractor that a staged placement is required to prevent casing collapse. The grout pipe shall be raised slowly as grouting proceeds. **The Contractor shall provide grout (tremie) pipe sections in incremental lengths sufficient to ensure the discharge end of the pipe remains continuously submerged in the grout at all depths during placement.**
- c) Installation of the tremie pipe required for grouting and placement of the seal shall not commence until the District Representative is on-site.
- d) The Contractor shall be responsible for determining the collapse potential of each well casing during grouting and shall take whatever precautions are necessary to prevent casing collapse. In the event a casing collapses prior to completion of seal installation, the Contractor shall take whatever steps are necessary to reopen that casing and place the seal as required by the final well design. Any such remedial action shall be conducted at the Contractor's expense.
- e) The Contractor shall keep a record of the actual depth and volume of grout installed at each site. The volume shall not be less than the calculated volume of the annular space between the conductor casing or reamed borehole and the pump house casing.
- f) The Contractor shall supply to the District Representative adequate evidence showing that the cement seal has been completed to the surface.
- g) The Contractor shall not operate any heavy equipment on-site during a 24-hour period immediately following placement of the seal

5. Revision of entire item **a. Initial Development by Airlifting and Swabbing** in Section E-4 – Well Development

**a. Initial Development by Airlifting and Swabbing**

**1. General**

**a) Description**

This item includes development of each new well by simultaneous airlifting and swabbing using a double swab tool. The Contractor shall swab and airlift the entire perforated section of the well starting from the top of the uppermost perforated section and working down. Multiple passes up and down the perforated section may be necessary to acceptably remove sediment from the well and clear the discharge.

**b) Submittals**

The Contractor shall maintain a **daily** record of development activities at each site. The record shall include: (1) depth interval and time developed, (2) measurements of

settlement of the gravel pack, (3) volume of gravel added through the gravel feed tube, (4) volume of sediment bailed from the bottom of the well, (5) static water level, (6) approximate well discharge during air-lifting, and total hours developed daily.

c) **Measurement and Payment**

- 1) Payment for well development will be made at the unit price bid per hour (see Bidding Sheets)
- 2) The time required for well development will be recorded by the hour with 15-minute intervals as the smallest unit of recorded time. The time recorded for payment shall commence when the equipment installed in the well is placed in operation and shall end when development is stopped at the direction of the District Representative. No additional payment will be made running equipment into or out of the well. The time required to run equipment into and out of the well shall be anticipated by the Contractor and included in the hourly rates bid for well development (see Bidding Sheets). Billable swab and airlift time is only accrued when the compressor is actively airlifting material out of the well. No additional payment will be made for running equipment into and out of the well, this includes single joint changes.
- 3) No payment will be made for delays resulting from: (a) equipment stuck in the borehole, (b) equipment breakdown, (c) arranging major drilling, pumping or testing apparatus, or (d) failure to conduct the operations in a diligent and workmanlike manner by which the desired results could ordinarily be expected.
- 4) No additional payment shall be made for gravel added to the annulus as the gravel pack settles.

**2. Equipment and Materials**

a) **Swab Tool**

A double swab tool capable of simultaneous airlifting and swabbing shall be employed for the initial development of the well. The swab tool shall be constructed with two rubber disks that are spaced 10 feet apart and mounted on a pipe that is perforated between the disks. The bottom of the perforated pipe shall be capped. The rubber swabs shall have an outer diameter of not less than 1/8-inch smaller than the inner diameter of the well casing.

b) **Air Compressor**

The Contractor shall provide an air compressor, airline and educator pipe that are capable of airlifting a minimum of 300 gpm during initial redevelopment by airlifting and swabbing. (Minimum air compressor size shall be 750 cfm @ 250 psi)

### 3. Execution

- a) Contractor shall not commence development until solids settlement, discharge and sound control (where applicable) facilities are installed at each site to the satisfaction of the District Representative.
- b) Mechanical development by simultaneous airlifting and swabbing shall commence within 24 hours after completion of the idle period following placement of the upper annular grout seal at each site. During all swab and airlifting, the Contractor shall airlift a minimum of 300 gpm. Development shall be completed in two stages as described below.
- c) Stage One - Initial Development with Single Swab
  - 1) Initial mechanical development shall be completed with an open-ended single swab attached to the end of the drill pipe.
  - 2) Swabbing shall be completed to remove sediment and heavy fluids from the well casing.
  - 3) The tool shall be moved up and down three to four times in a section of perforated well casing while airlifting. After working the tool to the bottom of the well, airlifting shall continue until all sediment is removed.
  - 4) **If drilling mud has been added during well construction, refer to Chemical Development (E-4. b.)**
- d) Stage Two - Development with a Double Swab
  - 1) Development with a double swab at each site shall commence immediately following completion of development with a single swab.
  - 2) Simultaneous airlifting and swabbing using the double-swab tool shall commence in the upper-most perforated interval and proceed to the lower-most perforated interval. Each perforated interval shall be swabbed and airlifted in 10-ft increments until the discharge water becomes substantially clear as determined by the District Representative.
  - 3) Development in each 10-ft increment of perforated well casing shall include raising and lowering the double swab tool three to four times or more in a shorter section of the perforated well casing as needed to produce sediment-filled discharge water while airlifting continues. Air-lift swabbing shall be followed by a period of airlifting without swabbing until the discharge water clears. This process shall be repeated until water produced from the 10-ft section of perforated well casing becomes substantially clear and no additional settlement of the gravel pack

is observed. Upon completion, the dual-swab tool shall be moved to the next 10-ft section of perforated well casing and the process repeated until all perforated intervals have been fully developed.

Swabbing and air lifting shall not exceed the bid amount without written authorization from the Engineer. Tool handling time, to include all trips and time spent adding or removing joints during swab and airlift shall not be classified as mechanical development (swab and airlift) hours, nor shall they be classified for payment.

4) Upon completion of mechanical development at each site, the well shall be accurately sounded in the presence of the District Representative to determine the level of accumulated sediment in the well. The sediment level shall be recorded on the Driller's daily activity log. All accumulated sediment shall be bailed from the well prior to installing the temporary test pump

6. Revision of entire item **c. Mobilization and Demobilization of Test Pump and Appurtenances** in Section E-4 – Well Development

**c. Mobilization and Demobilization of Test Pump and Appurtenances**

**1. General**

a) Description

This item includes mobilization and demobilization of equipment, materials and personnel for pumping development and well production tests at each site. For bidding purposes, the pump intake shall be installed to a depth of 600 ft. below ground surface. A final depth will be specified in the final well design submitted by the District Representative after evaluation of the lithologic log, sieve analyses of drill cuttings, and geophysical logs, as applicable. **Well development using the test pump shall commence within 10 days after completion of initial development by swabbing and airlifting.**

b) Submittals

- 1) Daily activity log.
- 2) Record of pump type, diameter, capacity range, intake depth, number of bowls.
- 3) Certification of the accuracy of the flow meter, completed within 6 months of delivering the meter to the site.

c) Measurement and Payment

No separate Payment shall be made for mobilization and demobilization. All costs

therefore shall be included in the unit price stated in the Bidding Schedule for the Chemical Development of which it is a part.

## 2. Materials

### a) Test Pump

- 1) Installation of equipment for development pumping and testing shall commence immediately upon completion of development by swabbing and airlifting at each site.
- 2) The Contractor shall furnish, install and upon completion of testing remove a deep well turbine pump powered by diesel or gasoline. The prime mover shall be a variable-speed type equipped with suitable throttling devices to control the well discharge. The prime mover shall meet all noise control requirements during development and test pumping.
- 3) The pump shall have a minimum pumping capacity of 4,000 gpm at 600' TDH and higher flow rates at heads less than 600'. (unless specified otherwise by District Representative)
  - a) Contractor shall provide the District or its representative a Pump Data Sheet (pump curve) for review and approval prior to installation of test pump.
- 4) The pump shall not be equipped with a foot valve.
- 5) The pump intake shall be set at a depth specified by the District Representative prior to installation of the test pump.
- 6) The pumping unit and engine shall be capable of continuous operation without interruption for a period of at least 72 hours.

### b) Discharge Piping and Appurtenances

The Contractor shall provide adequate discharge piping to convey well development water from each well to the designated heavy fluids settlement area and from the temporary water storage tanks to the point of discharge. The discharge piping shall include at least one water sampling port for the purpose of collecting groundwater quality samples.

### c) In-Line Flow Meter

The Contractor shall provide a flow control (butterfly) valve and dual-reading flow meter or other approved device to accurately control, maintain and measure the accurate rate of well discharge at each site. The flow meter shall provide instantaneous flow measurements in gallons per minute and shall be equipped with a totalizer that



provides measurements in gallons x 100. Prior to mobilization, the Contractor shall provide certification of the accuracy of the flow meter, completed within 6 months of delivering the meter to the site.

d) Centrifugal Sand Separating Meter

The Contractor shall provide a meter for measuring the sand content of the discharge water at each site. Sand production shall be measured using a centrifugal sand separating meter (Rossum Centrifugal Sand Sampler, or equivalent) as described in the Journal of American Water Works Association, Volume 46, No. 2, February 1954.

e) Turbidity Meter

The Contractor shall provide a turbidity meter capable of measuring turbidity in the discharge in the range of 0 to 1,000 Nephelometric Turbidity Units (NTUs).

f) Water Level Sounder

The Contractor shall furnish an electrical depth gauge capable of indicating changes in the well water level to the nearest one-tenth foot. The Contractor shall provide whatever assistance may be required by the District Representative for monitoring well water levels at each site.

### 3. Execution

- a) Prior to installing the test pump, the bottom of each well shall, in the presence of the District Representative, be bailed or pumped clean of any sediment.
- b) The Contractor shall install a deep well turbine test pump to a depth specified by the District Representative in the final well design for each site.
- c) The Contractor shall furnish, install and connect all aboveground discharge piping, complete with valves, inline flow meter, and a water sampling port.
- d) Upon completion of testing and after removal of the test pump, the Contractor shall, in the presence of the District Representative, remove any oil (e.g., pump lubricating oil) from the water surface at each site. An acceptable method of removal shall be to lower, via a cable, an oil absorbent “sock” or similar material designed to absorb spilled oil.
- e) After removal of the test pump and any lubricating oil from the well, the Contractor shall, in the presence of the District Representative, sound the depth of each well and record the depth to which sediment has accumulated as a result of test pumping. The well shall be then bailed or pumped clean of all sediment and debris

7. Addition of **Page 111A – Optional Pump Motor Requirements**. 500 HP pump motor requirements to be used for optional pricing.
8. Revision of Entire Item **c. Pump Discharge Heads** in Section F-5 – Pump Design and Testing

- c. **Pump Discharge Heads** – In conformance with details shown on the drawings, for all pumping units, the Contractor shall furnish and install cast iron or fabricated steel discharge heads for surface discharge; cast iron if utilized shall be in conformance with ASTM A48, Class 30. Steel shall be in conformance with ASTM A283, Grade C. Pump and discharge assembly should accommodate a 400 HP, standard efficiency vertical, hollow shaft motor with self-release coupling. If the option of a 500 HP motor is selected by the District, Pump and discharge assembly should accommodate a 500 HP motor. Each pump discharge head shall be provided with a right-angle flanged discharge elbow connected to branch piping and a flanged base. Approved manufacturer shall be: Peerless, Floway, Layne & Bowler or IDP.

Discharge heads are to be provided complete with the following items included:

1. 2' long x 12" diameter suction nipple
2. 12" discharge flange w/2' long nipple, gasket bolts, 3" Waterman AV-150 air vent w/nipple.
3. One gallon (minimum) oil pot w/auto oiler, complete with fittings.

9. Revision of entire Item **a. General Motor Design** in Section F-7 – Motor Design and Testing

- a. **General Motor Design** – Except as otherwise specified herein, design and construction of motors shall be in conformance with NEMA Standard MG-1. Motors shall be vertical hollow-shaft squirrel cage induction type, similar to NEMA Design B, Standard Efficiency, (Per NEMA MG-1 parts 30 and 31) suitable for three (3)-phase, 60-cycle power operation at full load speed of approximately 1,800 rpm, with the locked rotor torque approximately 100 percent and the breakdown torque approximately 200 percent of full load torque. Motors shall have nameplate rating of 400 horsepower with a service factor of 1.15. For optional 500 hp motor, motor shall have nameplate rating of 500 horsepower with a service factor of 1.15. Rated voltage shall be 480 volts. Motors shall be capable of continuous operation at nameplate rated load without exceeding a motor winding temperature rise of 60°C by thermometer (70°C by resistance); this requirement shall be verified by the witness test specified under F-5(e). Motors shall operate continuously at nameplate rated load with a minimum efficiency of 92.5 percent, not including hydraulic thrust losses. Motors shall have a minimum power factor of 85 percent. Motors shall be enclosed in an outdoor weather protected NEMA Type 1 enclosure with internal corrosion proofing and with corrosion resistant screens to prevent the entrance of rodents. In accordance with applicable provisions of NEMA MG-1, each motor shall be balanced after assembly to an overall vibration amplitude of one (1) mil, maximum, when measured at the machine

bearing housing. Motors shall be equipped with a non-reversing ratchet. Motors shall be manufactured in the USA by U.S. Motors, General Electric or approved equal.

10. Revision of entire item **f. Electrical Motor Control Panel** in Section F-7 – Motor Design and Testing

**f. Electrical Motor Control Panel**

It is expected that the electrical motor control panel to be used will be a 650 Amp, 400 HP S811+ V65 Type 3R Soft Starter and Panel complete with fuses, manufactured by Eaton or an approved equivalent manufactured by Allen Bradley, Square D or Cutler Hammer.

If a 500 hp motor is selected by the District, it is expected that the electrical motor and control panel be equipped with appropriate 500 hp Soft Starter and panel complete with fuses, manufactured by Eaton or an approved equivalent manufactured by Allen Bradley, Square D or Cutler Hammer.

11. Revision of entire item **g. Electrical Meter Panel – for PG&E Service** in Section F-7 – Motor Design and Testing

**g. Electrical Meter Panel – for PG&E Service**

PG&E electrical service is anticipated to be 600 amp, 480 volt, 3 phase, 400 HP service. Contractor is to supply a precast concrete foundation accepted and approved by PG&E for installing their 400 HP (PG&E) ground-mounted transformer. All materials should be made up and ready to install in the field.

If a 500 hp motor is selected, the Contractor is to supply a concrete foundation accepted and approved by PG&E for installation of their (PG&E) ground-mounted transformer adequate for the 500 hp motor.

12. Replacement of **Attachment 1** - Well No. 88-03-009(Specifications 22-1 Well 2)

13. Replacement of **Attachment 1** - Well No. 99-00-096(Specifications 22-1 Well 4)

14. Replacement of **Attachment 1** - Well No. 99-00-114(Specifications 22-1 Well 5)

15. Replacement of **Attachment 2** - Typical Well Detail drawing (mill slot casing) and addition of supplemental typical well detail drawing (Shutter screen casing option).

16. Clarification to **Attachment 3 & 4** – Specifications selected (outlined in red) for the Motor Control Panel are for the 400 HP Motor, Contractor to provide optional pricing for 500 HP motor and appropriate panel configuration and components.

17. Replacement of **Attachment 5** – please note that the quantity for bid item No. 9 has been adjusted.

18. Replacement of **Attachment 6** – includes page added to specifications for optional pricing of a 500 hp motor.

## Optional Pump Motor Requirements

### 500 HP motor option

(1)	Required operating range of pump total head	650 ft maximum 400 ft minimum 550 ft design
(2)	Required range of pump capacities (Minimum)	@ design = 2,600gpm 2,400gpm to 3,200 gpm
(3)	Required minimum allowable bowl assembly efficiency for all values of bowl assembly head range (340' to 550')	75 percent
(4)	Required minimum allowable bowl assembly efficiency at design head and flowrate	82 percent
(5)	Required minimum allowable overall efficiency for any operating condition within the pump total head range	65 percent
(6)	Requirement rated nameplate horsepower of pump motors	500 hp
(7)	Required rated nameplate voltage of pump motors	480 volts – 3 phase
(8)	Required discharge column pipe-inner diameter	12 inches
(9)	Diameter of well casing	18 inches
(10)	Required nominal motor/pump speed	1760 rpm
(11)	Approximate bowl setting	600 feet
(12)	Minimum diameter of pump shaft and pump line shaft	2-3/16 inches
(13)	Nominal diameter of pump line shaft enclosing the tube (3" (RH 10thd) x 1-15/16" (10thd) tube, shaft w/5' bearing centers)	3.5 inches
(14)	Diameter and Weight of Column Pipe (12" x .330 x 20' – 3/4 taper)	12 inches, 0.330 min. wall thickness, 12.75 O.D., 43.77 lb/ft.

In addition to those requirements set forth above, the following performance requirements shall be satisfied:

- Friction losses to be used are defined on the included pump bid analysis form.
- Peak efficiency is not required for pumping units when operating with pump total heads greater than 550 feet; however, in no case at any value within the required operating range of pump total head, shall brake horsepower requirement of the pump exceed the nameplate horsepower rating of the pump motor.

## **Attachment 1 – Proposed Well Locations**



## GENERAL NOTES:

1. LOCATED  $\pm 800'$  SOUTH OF LERDO HWY ON THE WEST SIDE OF ZERKER RD, WEST OF 8-3 DITCH.
2. SOLIDS AND DRILLING FLUIDS DISPOSED OF IN PROXIMITY TO WELL.
3. DEVELOPMENT WATER TO BE DISPOSED OF AS DIRECTED BY DISTRICT.

E 1/4 COR.  
SECTION 16, 28/26

±100'



Know what's below  
Call before you dig.



SCALE 1 INCH = 50.0 FT

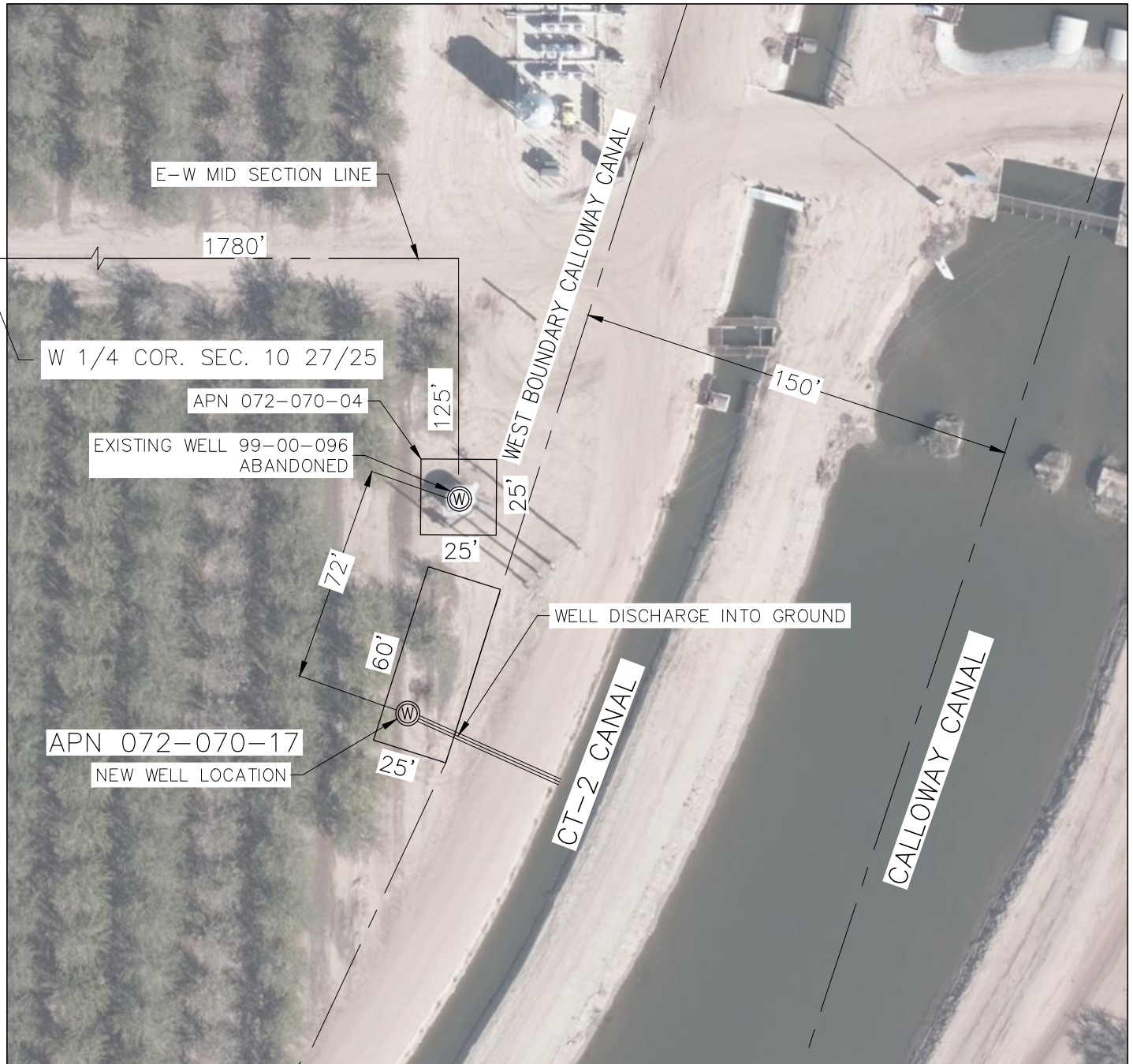


NORTH KERN  
WATER STORAGE DISTRICT  
33380 CAMELO AVENUE  
BAKERSFIELD, CA. 93308  
(661) 393-2696

NORTH KERN WATER STORAGE DISTRICT  
2021 WELL REPLACEMENT

WELL NO. 88-003-009  
NE 1/4 SECTION 16, 28/26

REVISIONS				DESIGN BY:	SHEET  1  OF 1
NO.	DATE	DESCRIPTION	BY:	DRAWN BY:	
				CHECKED BY:	
				DATE:	
				JOB NUMBER:	
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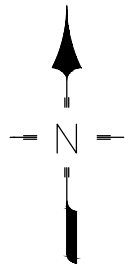


## GENERAL NOTES:

1. LOCATED  $\pm 0.54$  MILES SOUTH OF HWY-46 ON WEST SIDE OF CALLOWAY CANAL.
2. SOLIDS AND DRILLING FLUIDS DISPOSED OF IN PROXIMITY TO WELL.
3. DEVELOPMENT WATER TO BE DISPOSED OF AS DIRECTED BY DISTRICT.



Know what's below  
Call before you dig.



SCALE 1 INCH = 50.0 FT



NORTH KERN  
WATER STORAGE DISTRICT  
33380 CAWALO AVENUE  
BAKERSFIELD, CA. 93308  
(661) 393-2696

NORTH KERN WATER STORAGE DISTRICT  
2021 WELL REPLACEMENT

WELL NO. 99-00-096  
SW 1/4 SECTION 10, 27/25

REVISIONS				DESIGN BY:
NO.	DATE	DESCRIPTION	BY:	DRAWN BY:
				CHECKED BY:
				DATE:
				JOB NUMBER:
				Exhibit.dwg

SHEET  
1  
OF 1



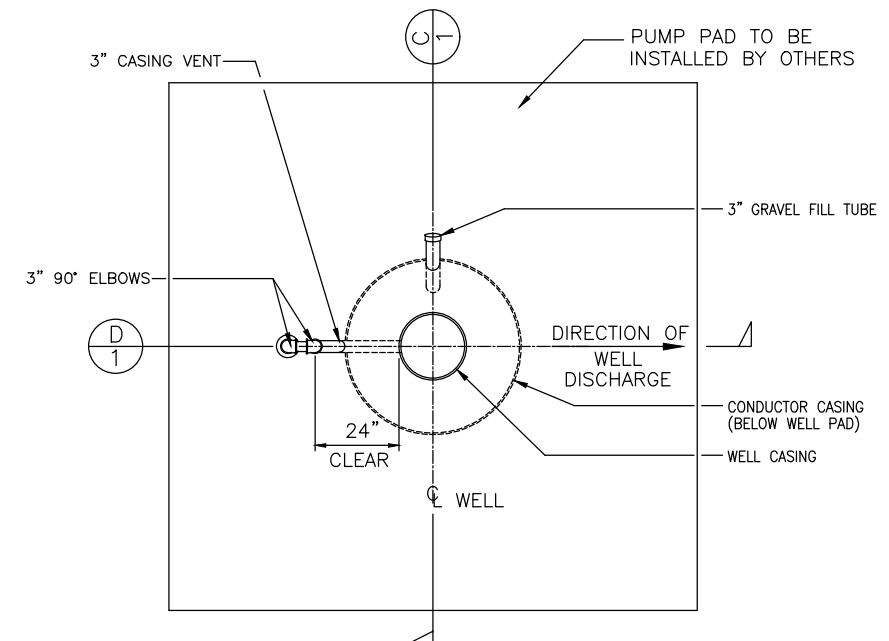
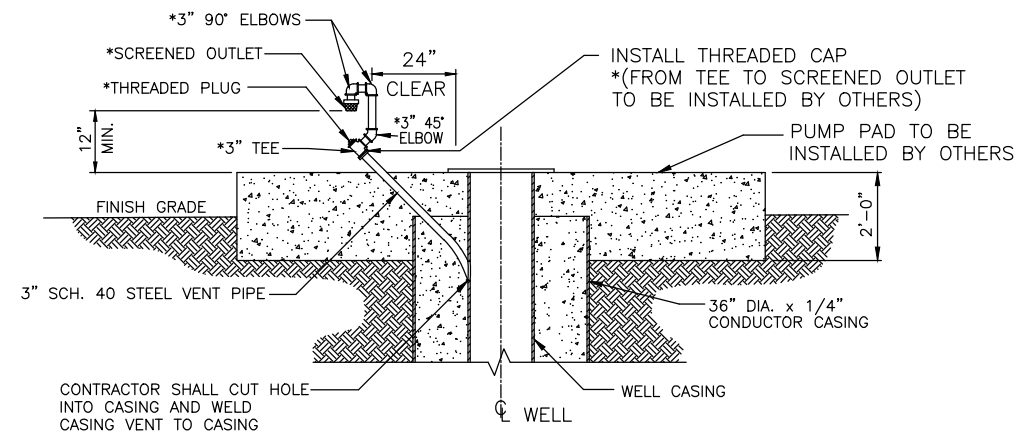
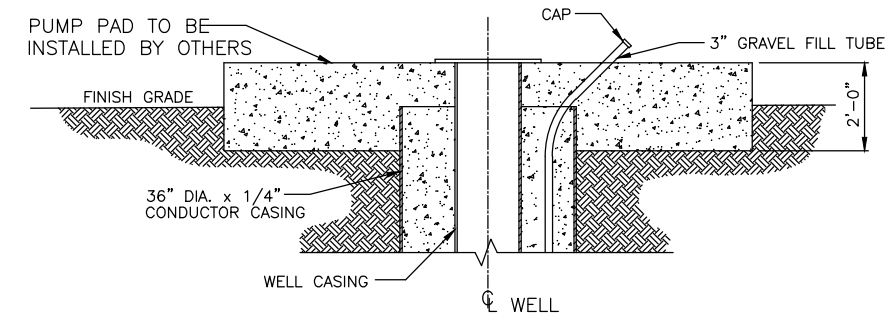
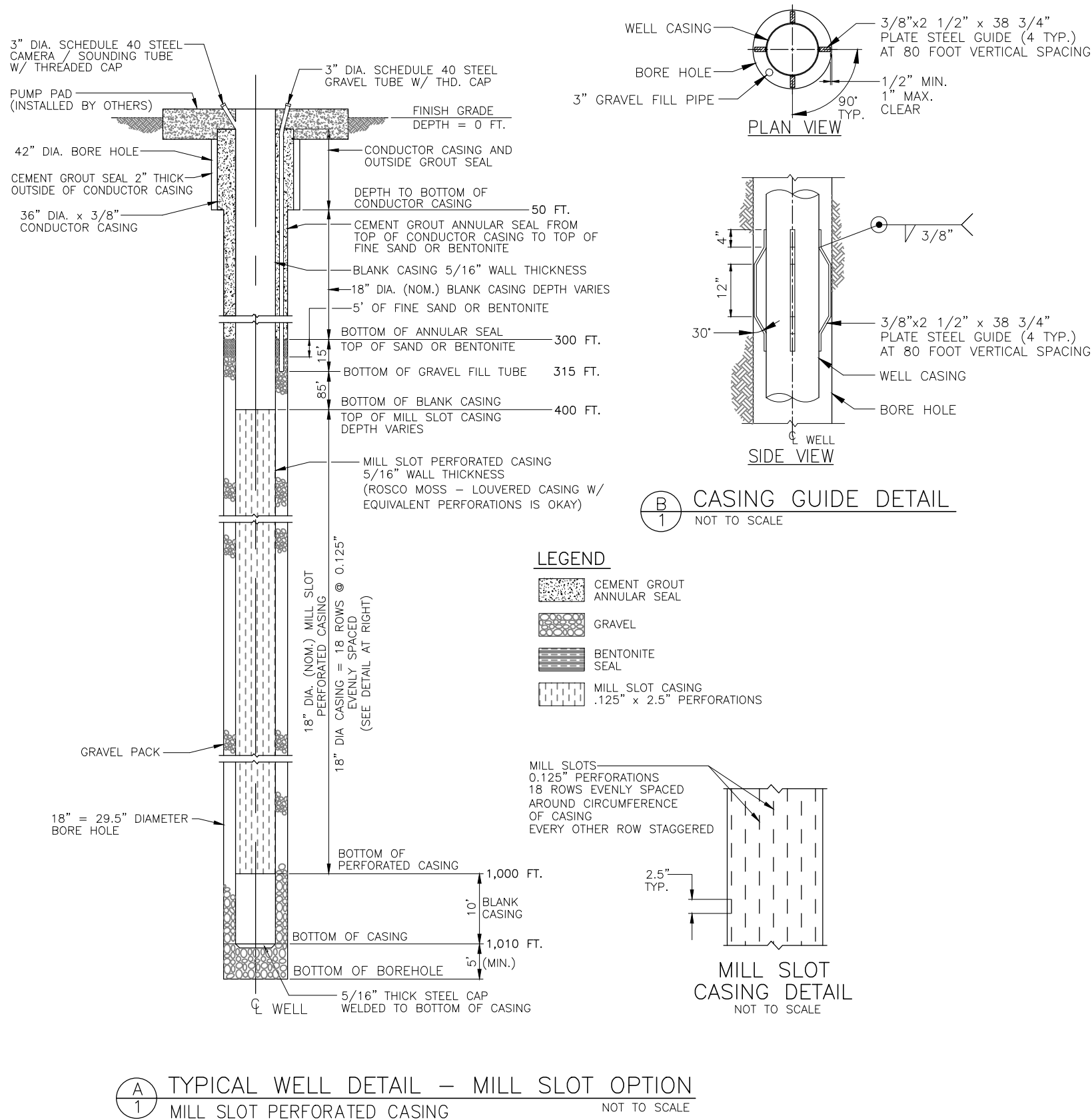
E 1/4 COR. SEC. 34, 26/25

REVISIONS				DESIGN BY:	SHEET  1  OF 1
NO.	DATE	DESCRIPTION	BY:	DRAWN BY:	
				CHECKED BY:	
				DATE:	
				JOB NUMBER:	

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coltsides

## **Attachment 2 – Typical Well Detail Drawing**



CONTRACTOR SHALL COORDINATE WITH THE DISTRICT REPRESENTATIVE FOR THE ORIENTATION OF THE CASING VENT AND GRAVEL FILL PIPE

**B 1 TYPICAL WELL LAYOUT**

**TOP VIEW**

**SCALE: 1"=2'**



BY:

REVISIONS

NO. DATE DESCRIPTION

NORTH KERN WATER STORAGE DISTRICT  
2-5 WELL REPLACEMENT PROJECT

TYPICAL WELL DETAIL - MILL SLOT CASING

CALL BEFORE YOU DIG  
CALL UNDERGROUND SERVICE ALERT (USA)  
**1-800-227-2600**  
AT LEAST 2 WORKING DAYS BEFORE YOU DIG

**NOTE:**  
ALL EXISTING UNDERGROUND AND ABOVE GROUND FACILITIES SHALL BE PROTECTED IN PLACE.



**Attachment 5 – Bid Detail Schedule for Primary Well Construction**

Bid Detail Schedule For Primary Well Construction					
Bidder Information					
Bidding Company Name:					
Bidding Company Address:					
Bidding Company Phone:					
Bidding Company Email:					
Bidding Company Contact Person Information:					
Date of Bid:					
Fixed Cost Detailed Bid (For Each Well)					
Line Item	Quantity	Unit of Measure	Item Description	Unit Price	Extended Price
			<b>Permits &amp; Bonds</b>		
1	1	Ea	County Drilling Permit and Paperwork		
2	1	Ea	Other Permit Related		
3	1	Ea	Bond Charges		
			<b>Drilling</b>		
4	1	Ea	Mobilize/Demobilize Equipment and Personnel/Water Supply		
5	1	Ea	Daily Log Entry & Core Sample Collection, Archiving		
6	1100	Ft	Drilling Per Foot (Adjustment to bid to be made based upon actual drilling depth during construction based upon the per foot price)		
7	1	Ea	E-log (includes rig time)		
8	1	Ea	Deviation Survey (includes rig time)		
9	950	Ft	Reaming Per Foot (Adjustment to bid to be made based upon actual drilling depth during construction based upon the per foot price)		
10	1	Ea	Other (Describe)		
			<b>Casing &amp; Other</b>		
11	50	Ft	Furnish & Install 36" Conductor Casing (any additional, if required and authorized to be at unit price)		
12	400	Ft	Furnish & Install 18" Blank Casing (any additional, if required, to be at unit price)		
13	600	Ft	Furnish & Install 18" Perforated(Mill Slot) Casing (any additional, if required, to be at unit price)		
14	700	Ft	Furnish & Install Gravel & Sand (between gravel and seal)		
15	300	Ft	Furnish & Install Annular Seal (any additional, if required, to be at unit price)		
16	315	Ft	Furnish & Install Gravel Tube		
17	1	Ea	Furnish & Install Air Vent/Sounding Tube Stickup		
18	1	Ea	Furnish & Install Casing Guides and Rounded Closed Shoe for Bottom of Casing String		
19	1	Ea	Well Alignment (Gyro) Survey		
20	48	Hr	Swab & Airlift		
21	600	Ft	Chemical Development with Swab and Airlift (PFD - Required if drilling mud additives used) Not required if only fresh water with no mud additives is used in drilling pilot hole and reaming process.		
22	1	Ea	Freight Charges		

			<b>Test Pumping</b>		
23	1	Ea	Mobilize Pump Rig and Personnel		
24	1	EA	Install & Remove Develop/Test Pump		
25	60	Hr	Develop & Test Well		
26	200	Ft	Discharge Piping		
27	2	Ea	Mud Dispersant Treatment during pump development process (Mud-Nox)		
28	1	Ea	Deviation Survey (includes rig time)		
29	1	Ea	Video Log		
30	1	Ea	Weld Steel Plate At Top Casing After Completion If Required		
31	1	Ea	Other (Describe)		
			<b>Site Cleanup</b>		
32	1	Ea	General Cleanup, Restore Fencing, Roadways, and All Other Public & Private "Facilities"		
33	1	Ea	Other (Describe)		
				<b>Total</b>	

Variable Cost Items, Optional Bid Items & "If Required" Item Prices (For Each Well)					
Line Item	Quantity	Unit of Measure	Item Description	Unit Price	Extended Price
34	1	Ea	Disposal of Cuttings and Drilling mud residue, restore cuttings and drilling mud holding site.		
35	1	Hr	High Speed Bailing of well for well development (as directed by District Representative)		
36	1	Hr	Rock Bit Charge Per Hour If Required (Actual hours to be added to bid during drilling phase at the per hour price)		
37	1	Hr.	Standby rate per hour if authorized		
38	1	Ea	Other (Describe)		
39	600	Ft	Furnish & Install 18" Perforated(Shutter Screen) Casing (any additional, if required, to be at unit price)		

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Notes: \_\_\_\_\_

\_\_\_\_\_

**Attachment 6 – Bid Detail, Equipping & Bid Analysis Form**



Bidder Information					
Bidding Company Name:					
Bidding Company Address:					
Bidding Company Phone:					
Bidding Company Email:					
Bidding Company Contact Person Information:					
Date of Bid:					
Detailed Bid (For Each Well)					
Line Item	Quantity	Unit of Measure	Item Description	Each Price	Extended Price
			<b>Permits &amp; Bonds</b>		
1	1	Ea	Permits		
2	1	Ea	Bond Charges		
			<b>Column, Tube &amp; Shaft</b>		
3	1	Ea	Mobilize/Demobilize Pump Rig and Personnel		
4	600	LF	Furnish & Install Column, Tube & Shaft (Line Shaft : 3" x 1-15/16")		
5	1	Ea	Other (Describe)		
			<b>Bowls &amp; Pump Head</b>		
6	1	Ea	Furnish & Install Bowls		
7	1	Ea	Furnish & Install Pump Head		
8	1	Ea	Other (Describe)		
			<b>Discharge Head</b>		
9	1	Ea	Furnish & Install Complete Discharge Head Assembly		
10	1	Ea	Other (Describe)		
			<b>Motor</b>		
11	1	Ea	Furnish & Install 400 HP Electric Motor		
12	1	Ea	Other (Describe)		
			<b>Electrical</b>		
13	1	Ea	Furnish & Install 400 HP Soft Start Control Panel		
14	1	Ea	Furnish & Install Meter Panel		
15	1	Ea	Furnish and Install Underground and Above ground Electrical(conduits, wiring, etc.)		
16	1	Ea	Furnish & Install Transformer Pad		
17	1	Ea	Other (Describe)		
				<b>Total</b>	

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Notes: \_\_\_\_\_

## Pump Bid Analysis Form

[illegible]

## 500 HP Motor Option

Bidder Information					
Bidding Company Name:					
Bidding Company Address:					
Bidding Company Phone:					
Bidding Company Email:					
Bidding Company Contact Person Information:					
Date of Bid:					
Detailed Bid (For Each Well)					
Line Item	Quantity	Unit of Measure	Item Description	Each Price	Extended Price
			<b>Permits &amp; Bonds</b>		
1	1	Ea	Permits		
2	1	Ea	Bond Charges		
			<b>Column, Tube &amp; Shaft</b>		
3	1	Ea	Mobilize/Demobilize Pump Rig and Personnel		
4	600	LF	Furnish & Install Column, Tube & Shaft (Line Shaft : 3-1/2" x 2-3/16")		
5	1	Ea	Other (Describe)		
			<b>Bowls &amp; Pump Head</b>		
6	1	Ea	Furnish & Install Bowls		
7	1	Ea	Furnish & Install Pump Head		
8	1	Ea	Other (Describe)		
			<b>Discharge Head</b>		
9	1	Ea	Furnish & Install Complete Discharge Head Assembly		
10	1	Ea	Other (Describe)		
			<b>Motor</b>		
11	1	Ea	Furnish & Install 500 HP Electric Motor		
12	1	Ea	Other (Describe)		
			<b>Electrical</b>		
13	1	Ea	Furnish & Install 500 HP Soft Start Control Panel		
14	1	Ea	Furnish & Install Meter Panel		
15	1	Ea	Furnish and Install Underground and Above ground Electrical(conduits, wiring, etc.)		
16	1	Ea	Furnish & Install Transformer Pad		
17	1	Ea	Other (Describe)		
				<b>Total</b>	

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Notes: \_\_\_\_\_

## Pump Bid Analysis Form

[illegible]

## Bidder Summary & Certification Form

Bidders must complete all sections and answer all questions in order to be considered

## Bidder Company Information

Company Name:

Address:

Street Address

Apartment/Unit #
------------------

CityStateZIP Code

Phone:

( )

Email:

## Key Company

Contact Information:

## Summary Bid Information

## Company structure

- ☐ Corporation                      ☐ Sole Proprietor
- ☐ Partnership                      ☐ Other \_\_\_\_\_

### Minority or Woman-Owned Business

- ☐ Yes ☐ No

## Licensed Well Driller, Contractor(Pump Installer) in California

- ☐ Yes
- ☐ No
- ☐ License Number

## Experienced with reverse rotary drilling

- ☐ Yes
- ☐ No
- Number completed \_\_\_\_\_

## Experienced with well pump construction

- ☐ Yes
- ☐ No
- Number completed \_\_\_\_\_

**Experienced with well pump construction**

☐ Yes

☐ No

☐ Number  
completed\_\_\_\_\_

**Agree to NKWSD Terms and Conditions, meet all specifications**

☐ Yes

☐ No

☐ Agree but with exceptions

☐ Exceptions attached

**Proposed Start Date**

☐ \_\_\_\_\_

☐ Detailed project plan  
attached

**Proposed Completion Date**

☐ \_\_\_\_\_

☐ Number of concurrent drill  
rigs to be used\_\_\_\_\_

**Bid Price, each well drilling & Equiping**

☐ \_\_\_\_\_

☐ Cost detail form completed

**Bidder Certification**

**Bidder certifies that the information above and all other information included with this bid is accurate and complete.**

\_\_\_\_\_  
**Signature**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Printed Name**

\_\_\_\_\_  
**Company Name & Signer Title**