

TECHNICAL PLANS AND SPECIFICATIONS

For

OXNARD UNION HIGH SCHOOL DISTRICT

RIO MESA HIGH SCHOOL WELL NO. 3

CONSTRUCTION PROJECT

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**TECHNICAL SPECIFICATIONS
WELL CONSTRUCTION PROJECT USING
DIRECT OR REVERSE CIRCULATION
FLUID ROTARY DRILLING PROCESS**

SECTION 1 – PROJECT SCOPE OF WORK

The intent of these Contract Documents and Specifications is to construct, develop, and test a public drinking water supply well that will be drilled by using either the conventional direct circulation or reverse circulation rotary drilling method as specified herein. The design production capacity of the well is 650 gallons per minute (gpm) with a minimum specific capacity of 30 gallons per minute per foot of drawdown (gpm/ft).

All work shall conform to these Specifications, American Water Works Association Standard A100, Department of Water Resources Bulletin 74-81, Water Well Standards: State of California and supplement Bulletin 74-90 California Well Standards, and Standard Specifications For Public Works Construction, 2018 Edition (“Greenbook”).

SECTION 2 – PROJECT LOCATION

The project location is shown on Plate 1 – Well Site Location Map. The project is located in the unincorporated area of Ventura County, California. The area immediately surrounding the new well location is an active high school with agricultural property to the southeast. Plate 1 shows the preliminary well location and the immediate area in the vicinity of the site. The site is on property owned by the Oxnard Union High School District (District) and is adjacent to the locations of Well Nos. 1 and 2.

SECTION 3 – PROJECT SCHEDULE

The Contractor shall conduct drilling operations around-the-clock (24 hours per day) from commencement of pilot hole drilling through placement of the final sanitary seal. At the preconstruction meeting, which will be conducted before mobilization or any onsite work, the District’s construction manager and the District’s onsite representative (Engineering Geologist) shall review the Contractor’s submitted description of the drilling method, fluid processing system and equipment, and drilling fluid additives that are proposed for use. The project duration is ninety (90) calendar days. The 90-day period shall begin 30 working days from the date the District gives the Contractor the written Notice to Proceed.

SECTION 4 – LOCAL HYDROGEOLOGY

The well project is located within Oxnard Forebay Groundwater Basin. The underlying geology is comprised predominately of loose to moderately-cemented coarse-grained sand, gravel, and cobble layers interbedded with layers of silt and stiff or sticky clay. The Contractor is advised of these potential widely variable and possibly problematic subsurface conditions and shall propose the use of drilling equipment and methods that will achieve rapid penetration rates and at all times maintain borehole stability. Borehole stability is the responsibility of the Contractor. Borehole stability shall be accomplished using materials and methods that will not cause formation damage that could potentially decrease the production of the well.

Groundwater conditions in the area have been affected by years of production and return flows from overlying land uses. Little data are available about the piezometric surface of groundwater contained in the shallowest semi-perched aquifer zone(s) in the vicinity of the project site. While the static water level in the target production zone is anticipated to be at an approximate depth of 140 feet or greater below ground surface (bgs), shallower perched, semi-perched, or confined aquifer zones are anticipated to contain groundwater with a piezometric surface above the regional groundwater level and near ground surface. Pressure differentials of this type can be problematic during fluid rotary drilling if drilling fluid conditions are not properly maintained and if the fluid level in the borehole is not maintained at or above ground surface. The Contractor is advised of these potential widely variable and possibly problematic subsurface conditions and shall propose the use of drilling equipment and methods that will achieve rapid penetration rates and maintain borehole stability at all times.

SECTION 5 – PROJECT OVERVIEW

The work for this well construction project includes the furnishing of all materials, labor, equipment, fuel, tools, transportation, disposal, and services for drilling, construction, development, testing, and sterilization of a production well as described in these specifications. The general work required for construction of the well includes:

1. Provide sound control along the south side of the well site next to the classrooms and set a conductor casing to stabilize the ground surface throughout construction;
2. Mobilize the drill rig and the requisite fluid processing equipment specified for drilling the well bore;
3. Drill a pilot borehole for the well to a depth of approximately 520 feet and collect lithologic cuttings of the formation materials at 10 foot intervals;
4. Conduct electric geophysical survey of the pilot bore using spontaneous potential (sp), and multiple resistivity sondes;

5. Ream to a depth of approximately 320 feet a minimum 24-inch-diameter borehole and to a depth of 490 feet a minimum 22-inch-diameter borehole and at the option of the District, caliper the reamed hole;
6. Install approximately 280 feet of 14-inch-diameter low carbon steel casing, and approximately 70 feet of 12-inch-diameter stainless steel blank casing, and approximately 140 feet of 12-inch-diameter stainless steel wire wrap screen;
7. Install a select gradation of gravel pack in the annular space of the well from the bottom of the well up to an approximate depth of 300 feet. Construct a cement sanitary seal from the top of the gravel pack seal to ground surface;
8. Conduct a well plumbness and alignment survey on the well;
9. Mechanically develop the well by swabbing and airlift pumping;
10. Hydraulically develop the well with the pump and surge method;
11. Conduct production testing of the well with a capacity ranging from 250 to 850 gpm and a constant discharge of 650 gpm;
12. Conduct a video survey of the completed well;
13. Cleanup and restore the well site.

All work shall be conducted in accordance with these specifications.

SECTION 6 – PROJECT TERMINATION

The District reserves the right to terminate the work on the well at any time. In such an event, the Contractor shall be paid for work completed at that time on the basis of the unit bid prices. The District reserves the right to select an alternate well site to replace an abandoned well. If the District chooses an alternate site, the Contractor shall be paid for the work done on the alternate well on the basis of the unit bid prices.

Should the District terminate the work on the well and abandon the well due to the fault of the Contractor, the Contractor shall not be paid for work completed on the abandoned well.

SECTION 7 – DISTRICT AND OTHER AGENCY NOTIFICATIONS

The Contractor shall notify the District and the appropriate local, state, and federal agencies in advance of the commencement and completion of each contract operation including; well seal inspection as required by the well construction permit, and well

discharge notification. The Contractor shall record the commencement and completion of each contract operation.

SECTION 8 – OTHER REQUIRED WORK

Other work to be done by the Contractor shall include signing and returning the Ventura County well permit obtained by the District along with all supporting documentation required by the District, maintaining a copy of the County Well Permit, collecting geologic samples as directed by the Engineering Geologist; keeping a time-drilling log; proper cleaning and restoration of the drilling site upon completion of work; and doing all things necessary for drilling and completion of the work called for under these Specifications. The time-drilling logs will be made available by the Contractor for review by the Engineering Geologist on a daily or work-shift basis.

The District has designated a location for reuse of groundwater produced during final well development and production testing (see Plate 7). The clear water discharge point is located approximately 600 to 1,000 feet from the new well site where the Contractor will be required to discharge through spray irrigation onto existing sports fields designated by the District. The Contractor shall also be responsible for installing piping, valves, and other equipment necessary to convey and spread groundwater through spray irrigation at the reuse location. The Contractor shall notify the District 24 hours prior to discharge.

The Contractor will be required to provide and install a backflow prevention device on the potable water system for its use of water during well drilling and construction activities. The Contractor shall also be responsible for installing piping, valves, and other equipment necessary to convey the construction water from the designated location to the points of use on the well site during all aspects of well construction.

It will be the Contractor's responsibility to impound all drill cuttings and fluids within the designated containment area (see Plate 1). It will be the Contractor's responsibility to contain and remove drilling fluids and cuttings from the project area during and/or upon completion of work. If the Contractor is unable to contain the volumes of drill cuttings and fluids within the designated temporary containment area, it will be the Contractor's responsibility to transport the materials to a permanent disposal site at the Contractor's expense. It is anticipated that the Contractor will need to use 2 or 3, 20,000 gallon tanks to contain drilling fluids that are displaced from the borehole during installation of the well materials during construction.

Well site preparation, portable restrooms, fencing, and security will be the responsibility of the Contractor. The Contractor shall be responsible for maintaining the integrity of the work area throughout the entire well construction process.

SECTION 9 – NUISANCE WATER

The Contractor shall implement Best Management Practices and/or Best Available Technologies to anticipate and control nuisance water. It is anticipated that nuisance water, such as rainfall, groundwater, or surface runoff may occur within the construction site and/or on adjacent project access roads during the period of construction under this contract. The Contractor, by submitting his bid, will be held to have investigated the risks arising from such waters, and to have made his bid in accordance therewith. The Contractor shall at all times protect the work from damage by such waters and shall take all due measures to prevent delays in progress of the work caused by such waters.

The Contractor is advised of the condition that shallow groundwater may rise near ground surface during the time of drilling and shall only propose to utilize drilling methods and well construction techniques that will maintain a stable borehole environment under these conditions. Borehole stability is the sole responsibility of the Contractor.

SECTION 10 – NOISE CONTROL

Noise related impacts caused by drilling and construction activities specified in this document shall be mitigated by multiple methods including the installation of a temporary sound barrier along one (1) side (the sound sensitive side) of the work area (see Plate 1). The purpose of the sound barrier is to shield nearby classrooms from noise impacts. The sound barrier shall be a minimum of 18 feet high and be constructed of insulating panels and/or blankets specifically designed for construction related noise impacts. The Contractor shall be responsible to take any other mitigation measures necessary to comply with County noise ordinance conditions (see Attachment B). These measures may include the use of additional temporary sound barrier(s) alongside(s) of the project site that do not specify sound control. These measures may also include sound attenuation by insulating specific pieces of equipment and/or the use of highly effective sound reducing exhaust mufflers. **Proposed sound barrier details shall be submitted with the Contactor's bid.**

SECTION 11 – SERVICES PROVIDED BY THE DISTRICT

The District will provide the final well design details to the Contractor within 4 business days of receiving the geophysical log of the pilot borehole. The design shall include well casing and screen intervals, screen slot size, centralizer locations and gravel pack size.

SECTION 12 – ACCESS FOR INSPECTION

The Contractor shall provide proper facilities for access and permit the inspection of any part of the project site by the District, its agents and other regulatory agency representatives.

SECTION 13 – SUBMITTALS

All records shall be available to District at all times on the job site, and copies of all records shall be submitted to the District and its Engineering Geologist within 14 days of project completion or as otherwise requested during project performance.

The records to be submitted by the Contractor shall include:

1. Sound control barrier details.
2. Work Site Safety Plan.
3. Videotape documentation of the work area, adjacent public area, and adjacent properties. (14 days prior to mobilization and 14 days upon completion of equipment demobilization).
4. Copies of the Well Permit(s).
5. Copies of the completed State of California Well Completion Reports (Driller's Log).
6. Type and Model Number of proposed pilot bore drift indicator tool.
7. All geophysical logs; 5 copies of each on paper, one electronic copy in Adobe Portable Document Format (PDF).
8. Caliper survey log of borehole reams; 5 copies of each on paper, one electronic copy in Adobe Portable Document Format (PDF).
9. Cement delivery tickets for the sanitary seal around the conductor and well casings.
10. Steel certifications for all blank casing and accessory tubing and the manufacturer's screen design submittal for all screen sections.
11. Sieve analyses and delivery tickets for the gravel pack.
12. The mechanical development (airlifting and swabbing) records, which will include total volumes and water quality field measurements of discharge fluids.
13. Pumping development sheets including Rossum sand measurement records.
14. Step drawdown and constant rate discharge test records showing static and pumping water levels, pumping rates, drawdown, and specific capacities.
15. Downhole video survey – 2 DVD copies.
16. Well plumbness and alignment survey measurements.

SECTION 14 – MOBILIZATION/DEMobilIZATION

(BID ITEM NO. 1)

Scope

Mobilization/Demobilization shall include the purchase of insurance, labor and material bond; performance bond; transportation of personnel, equipment, and operating supplies

to and from the sites; establishment of offices, buildings, portable sanitary facilities, temporary construction water and other necessary facilities at the site, sound control barriers and equipment, and other preparatory work at the site (clearing and grubbing) and all mobilization for work required by the Contractor.

The Contractor shall provide one complete direct circulation or reverse circulation mud rotary drilling unit; all tools, accessories, power, fuel, materials, supplies, lighting, water, and other equipment; and experienced personnel necessary to conduct efficient drilling operations in the manner specified. The drilling unit shall be in good condition and have a minimum (lifting) capacity of 100,000 pounds for the mast and subbase (for the well). The Contractor shall also provide a vertical line-shaft turbine pump capable of pumping a minimum of 1,000 gpm against 450 feet of total dynamic head (TDH) and designed to allow backspin and surging during hydraulic well development. The Contractor shall also provide all equipment and personnel to maintain and restore the site as required. The Contractor shall provide mud tank(s) to accommodate a volume that is greater than twice the volume of the total reamed borehole. Drilling fluid processing equipment is required for construction and shall at a minimum consist of a shale shaker, desanding and desilting cones, a mud shear apparatus, and agitating equipment for proper mixing and agitation of drilling fluid additives. The use of mud pits or settling tanks for mud conditioning will not be allowed.

Measurement and Payment

Payment for Bid Item No. 1 will be in two payments, $\frac{1}{2}$ upon mobilization and $\frac{1}{2}$ upon completion and acceptance of the project by the District. The lump sum price bid for this item shall not exceed 20 percent of the total amount of the Contractor's bid. If the cost for Mobilization/Demobilization exceeds 20 percent of the total bid cost, it shall be considered grounds for rejection of the entire bid as nonresponsive.

Payment will not be made under this item for the purchase of items or costs of materials having a residual value, the purchase costs of materials to be incorporated in the project, or the purchase costs of operating supplies.

Payment for Mobilization/Demobilization will constitute full compensation for all labor, fuel, permits, materials, equipment, sound control, and all other items necessary and incidental to completion of the work, removal and replacement of interfering fences, gates and other obstructions.

SECTION 15 – CONDUCTOR CASING **(BID ITEM NO. 2)**

Scope

This item shall consist of drilling and installing a 28-inch-diameter (minimum) conductor (surface) casing to a minimum depth of 50 feet bgs to stabilize the well site for well construction and allow work to progress without interruption.

Construction Materials

28-Inch-Diameter Conductor. The 28-inch-diameter (minimum) conductor (surface) casing shall be ASTM Designation A-53 Grade B or A-139 Grade B steel plate, having a minimum wall thickness of 3/8-inch and being a minimum of 50 feet in length. The conductor sanitary seal shall consist of a 10.5-sack sand slurry cement mixture or a 6-sack pea gravel concrete mix as permitted by the County and as approved by the Engineering Geologist.

Construction Methods

The Contractor shall drill a borehole with a minimum diameter that is 4 inches greater than the outside diameter of the conductor casing. The Contractor shall drill a minimum 32-inch-diameter borehole and furnish and install a 28-inch-diameter (minimum) conductor casing to a depth of 50 feet bgs. The drilling method for the conductor casing is optional; however, the casing shall be sufficiently plumb and straight to allow completion of the well as specified in the following sections of this contract and not interfere with the installation of any of the well materials.

The conductor sanitary seal shall be considered as a portion of the well's entire sanitary seal. Placement shall be conducted in accordance with County permit requirements and be pumped in place using the positive displacement method with a pneumatic grout pump and construction tremie pipe set 2 feet off the bottom of the sealing zone.

Measurement and Payment

Payment for conductor hole drilling, casing installation, and cement grout seal will be made on a lump sum basis at the unit price bid for Bid Item No. 2. Such payment will be considered full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to complete the conductor casing installation.

SECTION 16 – PILOT BORE DRILLING **(BID ITEM NO. 3)**

Scope

This item shall consist of drilling a pilot bore from the base of the conductor casing to a depth of 520 feet as shown on Plate 2 - Preliminary Well Design Drawing, or to the final depth determined by the Engineering Geologist. The Contractor shall use the approved drilling method and fluid parameters specified herein.

Construction Materials

The Contractor shall provide a description of all bit types, bit sizes, drilling fluid system and drilling fluid additives to be used concurrently with the submittal of its bid package. This submittal must include information regarding the types of fluid to be used, intended drilling fluid weights, viscosities, sand and solids contents, water loss control, and the name of the supplier. Failure to provide this information may render the bid to be considered unresponsive. The name and qualifications of the Mud Engineer that the Contractor intends to use must also be submitted with the bid.

In order to comply with the drilling fluid properties specified herein, it is the responsibility of the Contractor to have all equipment and drilling fluid additives onsite at all times during drilling and reaming procedures.

The Contractor shall possess and utilize the calibrated equipment necessary to measure the drilling fluid properties, including: weight, viscosity, sand content, and water loss/filter cake thickness. Drilling shall not commence until the Contractor demonstrates to the Engineering Geologist that the devices used for testing of drilling fluid properties are operable and calibrated.

The drilling fluid shall possess such characteristics as are required to adequately maintain the integrity of the borehole wall, prevent caving as drilling progresses, and to permit recovery of representative samples of cuttings. The drilling fluid shall possess such characteristics that it can be readily removed from the hole during the placement of the gravel pack and during development of the well.

Only fresh water with high grade commercial chemical products in common usage for water well drilling shall be used in drilling fluid make up. The drilling fluid shall be a commercial quality high grade bentonite clay system with a polymer supplement such as; Quick Gel, Hydrogel, Aquagel, Drispac, or an equal approved by the Engineering Geologist, to control water loss and maintain the mud properties specified. Drilling fluid with a mixture of unprocessed clay (bentonite), Super Ga Quich or other biodegradable material will not be permitted. The Engineering Geologist's approval of all drilling fluids prior to any drilling operations is required. The use of a non-bentonite clay drilling fluid such as Poly-Bore will not be permitted for this project.

All drilling fluids shall be mixed fresh onsite. The reuse or recycling of old drilling fluids will not be allowed. The Contractor shall make every effort to ensure that mud conditions will create a wall cake that can be removed from the production zones during the development of the well and prevent swelling of clay layers during construction. The drilling fluid to be utilized should possess properties necessary to inhibit this possibility. To maximize well performance, it is crucial that proper drilling fluid maintenance restrict water loss (mud invasion) from the borehole into the aquifer zones and minimize formation damage.

Proper control of the drilling fluid during both the pilot hole and reaming operations must be maintained to the specified parameters. The fluid system shall be sufficient to maintain the fluid properties listed below at all times. If the specified drilling fluid properties are exceeded, the Engineering Geologist may suspend further drilling operations until adjustments are made to allow for the system and fluids to meet specifications. Borehole stability at all times, including periods when drilling is suspended due to failure to meet drilling fluid specifications, is the sole responsibility of the Contractor. If proper control of the drilling fluid is not maintained to the satisfaction of the District and the Engineering Geologist, the Contractor may be required, at the Contractor's expense, to retain or employ an experienced, qualified Mud Engineer on the job during all operations to supervise and maintain drilling fluid properties that comply with the conditions specified.

Drilling mud processing equipment is required for this construction project and shall at a minimum consist of a 3,000 gallon mud tank (or larger) with fluid circulation nozzles/jets to maintain fluid movement and prevent settlement of solids, a shale shaker, desanding and desilting cones, and a mud shear apparatus for proper mixing of drilling fluid additives. Mud pits or settling tanks for mud treatment will not be allowed. The mud system shall be capable of handling a minimum of 500 gpm and designed to remove all but the finest of drill cuttings (suspended clays) from the drilling fluid. The fluid processing system shall be installed in the circulation system between the point of discharge from the borehole and the point of recirculation into the well bore. This equipment must keep the sand concentration in the drilling fluid below one percent at all times. All fluid additives shall be hydrated and properly mixed in compliance with manufacturers recommended hydration time prior to entry into the drill hole. The drilling rig must at all times be provided with the following fully operational and calibrated drilling fluid measuring devices:

- (a) Drilling fluid weight scale;
- (b) Drilling fluid viscosity funnel (Marsh Funnel);
- (c) Drilling fluid sand content cone and screen;
- (d) Drilling fluid mud press for water loss and filter cake.

The Contractor shall measure and record the properties of the fluid entering the borehole every two (2) hours during all drilling activities. The drilling fluid shall have the following properties in accordance with API Code RP-13B (or recent modification) "Recommended Standard Procedure for Testing Drilling Fluids:"

- **Weight**, a maximum of 72 pounds per cubic foot (9.6 pounds per gallon).
- **Viscosity**, using a Marsh Funnel a maximum of 50 seconds and a minimum of 32 seconds.
- **Sand Content**, of mud entering the borehole, a maximum of 1.0 percent by volume during all aspects of drilling.
- **Water loss**, a maximum of 15 cubic centimeters (cc) at 30 minutes under 100 psi, with a wall cake thickness no greater than 1/16-inch during all aspects of drilling.

If drilling fluid properties exceed the specified parameters, the Engineering Geologist may request immediate suspension of drill hole advancement and the drilling fluid shall be reconditioned and brought into compliance with the specified properties. If reconditioning cannot be achieved, the drilling fluid shall be disposed and replaced with a new mixture that complies with the specified fluid parameters prior to commencement of drill hole advancement. A record shall be maintained showing any variation in the addition and amount of approved chemical products or water required during drilling. The depths at which such changes are required shall be shown in the daily reports. The driller shall record the depths of excess mud loss or loss of circulation in the well bore. At no time during the well drilling or construction process shall fluid loss prevention material (i.e., Hole Plug, Magma Fiber, N-Seal, etc.) be introduced into the borehole.

The Contractor must keep records that provide the following information:

- A log of drilling bit types and the depths at which bit changes are made.
- A depth tally of the drill string.
- A log of drilling fluid tests and additives used.
- A log of the cuttings, providing the depths and descriptions of the earth materials encountered. The Contractor shall collect cutting samples at 10-foot intervals during the pilot bore drilling. Samples shall be placed in quart sized zip-lock[®] plastic bags (or larger) and the sample depth interval clearly labeled with a permanent marker.

All measurements for depth shall be referenced to existing ground surface at the well site.

The Contractor shall be responsible for providing and installing a backflow device at the source of construction water for drilling and construction of the well from District water system at the location designated by the District. It will be the Contractor's responsibility to provide all piping, valves, storage tanks and all appurtenances necessary for transporting the water to the site from the designated supply source.

Construction Methods

A pilot bore having a diameter between 12 to 17 inches, shall be drilled for the well pilot hole at the selected site to the depth specified by the Engineering Geologist. The pilot hole shall be drilled from the base of the conductor casing to the final specified depth using the direct or reverse circulation mud rotary drilling process. The wall of the drill hole

shall be held in place at all times with a circulating fluid which shall be washed out during the gravel pack placement process and subsequent well development. The work shall be performed with equipment which is adequate to perform all phases of well construction. If, in the opinion of the Engineering Geologist, the Contractor's equipment is not capable of satisfactorily performing the work provided for in these specifications, the Contractor, at his own expense, shall substitute equipment satisfactory to the Engineering Geologist and the District. The Contractor shall take the appropriate measures necessary to protect the pilot bore from caving and not plug the aquifers that will yield groundwater to the completed well.

It will be the Contractor's responsibility to provide and maintain a temporary containment area for drill cuttings and provide temporary storage tanks (Baker/Adler Tanks) to contain drilling fluids. It will be the Contractor's responsibility to remove and properly dispose of all cuttings and fluids produced during the project. It will be the Contractor's responsibility to maintain the area designated for cuttings and fluid storage. All cuttings and drilling fluids produced during the project which cannot be contained in the designated areas must be transported from the drill site and properly disposed of at the Contractor's expense.

In order to ensure that drilling of the pilot bore for the well meets alignment specifications, the Contractor shall furnish and deploy a self-checking mechanical drift indicator to measure hole deflection. The fully operational and adequately designed tool shall be onsite prior to commencement of pilot hole drilling operations. The mechanical drift indicator shall be an Eastman Mechanical Drift Indicator available from the Eastman Oil Well Survey Company, or approved equal. A 3-degree unit shall be used with the indicator. Drift indications shall be taken at 100-foot intervals immediately after each 100-foot-increment of pilot bore is drilled. The first drift survey shall be conducted at a depth 100 feet bgs and the last drift survey shall be conducted at a depth of 500 feet bgs. The drift from vertical shall not be more than 0.25 of 1 degree. Excess deviation shall be corrected by the Contractor at his own expense prior to proceeding with hole advancement. The Contractor shall submit the Drift Indicator specifications to District with its bid.

At 10-foot intervals, or as directed by the Engineering Geologist, the Contractor shall take a large (one percent) representative sample of drill cuttings from the interval and shall label and preserve each sample in a re-sealable plastic bag (i.e., zip-lock®) 1 quart size or larger supplied by the Contractor. All containers shall be labeled to indicate the depth interval of the collected sample. The samples shall be properly stored by the Contractor in a manner as to prevent breakage or loss until inspected by the Engineering Geologist and final use for well construction design is complete.

The driller shall prepare a record of construction activities of each shift for the Engineering Geologist. In addition, a time drilling log of the hole shall be kept by the driller and will consist of recording the time (in minutes) required to drill each 10-foot interval of the hole. Upon completion of the pilot bore, geophysical logging of the hole shall be conducted for

the purpose of providing information for the final design of the well. Determination of the final depth of the pilot borehole shall be made after completion of the geophysical logging.

Measurement and Payment

Payment for pilot bore drilling will be made on a linear foot basis from the bottom of the conductor casing to the depth specified by the Engineering Geologist at the unit price bid for Bid Item No. 3. Such payment will be considered full compensation for furnishing all labor, materials, tools and equipment necessary and incidental to complete the pilot bore from the bottom of the conductor casing to the final depth of the pilot hole as specified by the Engineering Geologist.

SECTION 17 – GEOPHYSICAL LOGGING (BID ITEM NO. 4)

Scope

This item shall consist of performing professional geophysical logs, consisting of spontaneous potential (sp), 16-inch and 64-inch normal resistivity, and 6-foot lateral resistivity surveys.

Construction Methods

The Contractor shall furnish professional services for geophysical logs in the pilot hole. Logging shall be performed by a professional logging company and provide survey quality consistent with industry standards. Borehole geophysical logs, consisting of spontaneous potential (sp), 16-inch and 64-inch normal resistivity, and 6-foot lateral resistivity surveys, shall be made by the Contractor as directed by the Engineering Geologist. A guard or single point resistivity survey may be substituted for the 6-foot lateral resistivity survey. If reverse rotary drilling is being used for well drilling, the electric log shall be accompanied by a caliper survey of the borehole to allow interpretation of borehole diameter effects on the electrical resistivity signature of the geophysical survey. The caliper shall be considered as part of the geophysical electric log suite for reverse rotary drilling.

During drilling of the well, the driller shall maintain proper mud consistency to prevent caving of loose sand and gravel and swelling of clay zones to ensure the hole is open to the bottom for geophysical logging. If the logging probe fails to descend to the desired depth, the Contractor, at its own expense, shall condition the hole and permit the logging probe to descend to the bottom of the hole. Standby time will not be paid for additional cleaning and conditioning of the hole to enable logging operations to proceed. Standby time for the drill rig to allow geophysical survey completion shall be included in the cost of this work task.

Upon completion of downhole data collection, five (5) final quality copies of the electrical survey (and caliper survey for reverse rotary) shall be submitted to the Engineering

Geologist along with an electronic copy of the data (LAS File). The Contractor shall also provide the geophysical log in PDF format.

Measurement and Payment

Geophysical logging of the pilot bore shall be paid on a lump sum basis for the unit price bid for Bid Item No. 4. Payment shall be considered full compensation for all labor, tools, equipment and insurance for doing all the work necessary and incidental to completion of the task, including but not limited to drill rig standby time and caliper survey if using reverse rotary drilling. Payment shall be made at the unit price bid for additional logging requested by the Engineering Geologist.

SECTION 18 – REAMING PILOT BORE (BID ITEM NO. 5)

Scope

This item shall consist of reaming of the pilot bore as specified herein and as shown on Plate 2 from the bottom of the conductor casing to the final depth approved by the Engineering Geologist. The final borehole ream depth will be determined at the same time the final well design is provided. The Engineering Geologist will provide final well design details to the Contractor within 4 business days of receiving the geophysical log of the pilot borehole.

Construction Method

After successful completion of the geophysical logging, the pilot bore shall be reamed with a minimum 24-inch-diameter drill bit to a depth of 320 feet and shall be reamed with a minimum 22-inch-diameter drill bit to a depth of 490 feet or to a final depth determined by the Engineering Geologist. The final ream diameter shall be of requisite size for the use of equipment typically employed by the Contractor to construct a well of the specified size and depth and shall be the sole responsibility of the Contractor to ensure successful completion. Should the Contractor elect to ream a larger diameter hole, the conductor casing diameter shall be appropriately sized to allow the final ream diameter(s) and the cost of Bid Item No. 2 shall include this consideration. The maximum borehole ream diameter for the well screen section(s) of the well shall not be greater than 24 inches. The drilling fluid properties during the pilot bore ream shall be maintained in compliance with all conditions as specified in Section 16.

Measurement and Payment

Payment for reaming the pilot hole for the well to the specified diameter shall be made on a linear foot basis from the bottom of the conductor to the base of the well casing assemblage (or as otherwise specified) for the unit price bid for Bid Item No. 5. Payment shall be considered full compensation for furnishing all labor, materials, tools, and

equipment necessary and incidental to completion of the work. The unit price bid for Bid Item No. 5 shall be considered inclusive of all costs to drill a larger diameter hole if elected by the Contractor.

SECTION 19 – CALIPER SURVEY (BID ITEM NO. 6)

Scope

This item shall consist of furnishing professional logging services for the caliper survey of the borehole diameter.

Construction Materials

The Contractor shall furnish professional logging services for a caliper log in the borehole. The caliper tool shall have the ability to measure borehole diameters up to 48 inches. The Contractor is advised that many of the available caliper tools rated for this diameter do not perform adequately. It will be the Contractor's responsibility to deliver a usable caliper log. A record copy of the caliper survey shall be delivered to the Engineering Geologist upon completion of the log. Upon completion of the caliper log, five (5) final quality copies of the caliper survey shall be provided to the Engineering Geologist along with an electronic copy of the data in LAS and PDF formats.

Measurement and Payment

Caliper surveying of the reamed borehole for the well shall be paid on a lump sum basis for the unit price bid for Bid Item No. 6. Payment shall be considered full compensation for all labor, tools, equipment, insurance, and conducting all work necessary and incidental to completion of the task including rig standby time.

SECTION 20 – WELL CASING AND SCREENS (BID ITEM NOS. 7 THROUGH 13)

Scope

This item shall consist of providing and installing well casing, screen, centralizers, and end cap, as specified herein and shown on Plate 2 for the well.

Construction Materials

1. 14-Inch Nominal Diameter Low Carbon Steel Casing: The 14-inch nominal diameter casing shall be low carbon steel manufactured in accordance with ASTM Standard A-139 Grade B or A-53 Grade B specifications and have a minimum wall thickness of 0.312-inch. The final wall thickness used shall be adequate to protect against

- collapse during construction and subsequent production of the well. The well casing sections will be fitted with collars for ease of installation and sound construction.
2. 14-Inch by 12-inch Diameter Low Carbon Steel Reducer: The 14-inch by 12-inch nominal diameter casing reducer shall be low carbon steel manufactured in accordance with ASTM Standard A-139 Grade B or A-53 Grade B specifications and have a minimum wall thickness of 0.312-inch. The final wall thickness used shall be adequate to protect against collapse during construction and subsequent production of the well. The well casing reducer shall be fitted with a collar for ease of installation and sound construction.
 3. 12-Inch Dissimilar Metal Connector: A dissimilar metal connector will be used to join the low carbon steel reducer and the stainless steel casing materials in order to compensate for the corrosion potential that can be caused by the connection of 2 different metal types. The design shall be as shown on Plate 3 - Dissimilar Metal Adaptor or as otherwise approved by the Engineering Geologist. The Contractor shall submit the connector's manufacturer's specifications to the District with its bid.
 4. 12-Inch Nominal Diameter Stainless Steel Casing: The 12-inch nominal diameter casing shall be Type 304L stainless steel manufactured in accordance with ASTM Standard A-312 or A-778 specifications and have a minimum wall thickness of 0.312 inches. The final wall thickness used shall be adequate to protect against collapse during construction and subsequent production of the well. The well casing sections will be fitted with collars for ease of installation and sound construction.
 5. 12-Inch Nominal Diameter Stainless Steel Screen: The 12-inch nominal diameter well screen shall be Type 304L, stainless steel continuous wire wrap screen of the type manufactured by Roscoe Moss Company, Johnson Screens, or approved equal, with a 0.060-inch slot between the surface wires. The wire wrap screen shall have a minimum height (altitude) of 0.217 inches and a minimum width of 0.130 inches. The screen shall have a minimum of 60 vertical rods and the rods shall have a minimum diameter of 0.204 inches that provides a minimum cross sectional area of 2.09 square inches. The well screen design shall provide a minimum collapse strength of 173 pounds per square inch (psi) and a minimum safe hanging weight of 22,000 pounds. Screen sections shall be manufactured complete with stainless steel weld rings having a minimum 0.25-inch wall thickness attached at each end and a stainless steel collar for lifting and connection of each joint. The bottom of the 0.060-inch slot screen section shall be fitted with a tapered or rounded end cap manufactured of the same material as the well screen. The Contractor shall submit the well screens manufacturer's specifications to the District with its bid.
 6. Centralizers: The well casing and screen centralizers shall be installed throughout the well assemblage at approximately 60-foot intervals and be made of the same material as the well casing and screen sections they are attached to. The final well centralizer schedule shall be provided with the final well design.

Construction Methods

At the completion of reaming the pilot bore; the Contractor shall install the well screen and casing at intervals determined by the Engineering Geologist. The proposed well design with the estimated well casing and screen lengths shown on Plate 2 is approximate only.

The final design of the well will be determined subsequent to the geophysical logging of the pilot borehole. The following description is of the proposed well design. The Contractor shall ream with a minimum 22-inch-diameter and maximum 24-inch-diameter bit in the well screen section to the depths determined by the Engineering Geologist. After reaming operations and hole fluid conditioning, the Contractor shall install the lengths and intervals of each casing type and well screen section as determined by the Engineering Geologist.

Prior to well casing and screen installation, a temporary open-end construction tremie pipe shall be installed in the borehole. The construction tremie shall consist of 2 7/8-inch upset tubing with beveled collars or approved equal. The construction tremie shall be set to within 20 feet of the final casing depth. (The depths shown on Plate 2 are preliminary only).

The 12-inch-diameter casing and screen assemblage shall be plumb and shall be centered in the hole. All field joints shall be properly lap-welded during installation with a minimum of two passes per circumference. The casing/screen inspection holes in the collars shall be filled by reinserting the inspection hole coupons and completely welded closed.

Three centralizers with 120° spacing, attached directly to the casing and screen joints by welding at approximately 60-foot intervals (or as specified in the final design) shall be provided in order to center and hold the casing in the proper position until the gravel pack envelope and cement sanitary seal are in place. The centralizers shall be of the same material used in each casing or screen interval. Centralizers shall be placed from the base of the well up to a depth of 100 feet bgs or as approved by the Engineering Geologist, and it is estimated that 6 sets of centralizers will be required.

The casing shall be suspended in tension from the surface by means of an appropriate hanger or clamp. Buoyancy or floatation of the casing shall not be allowed. The bottom of the casing shall be at a sufficient distance above the bottom of the reamed hole to ensure that the well casing assemblage is not supported from the bottom of the hole.

All field-welding shall be performed in accordance with American Welding Society Standards. All casing material shall be new. If any of the casings should collapse prior to well completion, they shall be withdrawn and replaced at the Contractor's expense.

If, for any reason, the casing assembly cannot be landed in the correct position or at a depth acceptable to the District and the Engineering Geologist, the Contractor shall

construct another well at a location specified by the Engineering Geologist and complete the replacement well in accordance with these Specifications at no additional cost to the District. The abandoned hole shall be sealed in accordance with the standards contained in the County well ordinance.

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 allowed, except as specifically provided herein.

The Contractor is advised that well casing collapse strength is typically calculated based on a standard factor of ellipticity (0.01). Should shipping and handling compromise the integrity of the casing shape, it is the Contractor's responsibility to inspect and replace pipe that will not provide the manufacturer's published collapse strengths. Submittal of a bid indicates the Contractor has reviewed the specified materials and concurs that the design is competent for successful well construction and operation.

Measurement and Payment

1. 14-Inch Nominal Diameter Low Carbon Steel Casing: The 14-inch-diameter low carbon steel 0.312-inch wall thickness casing for the upper portion of the well casing will be paid for on a per linear foot basis in place at the unit price bid for Bid Item No. 7. Payment shall be considered full compensation for furnishing all labor, materials, tools, fuel, and equipment necessary and incidental to completion of the work.
2. 14-Inch by 12-inch Diameter Low Carbon Steel Reducer: The 14-inch by 12-inch nominal diameter low carbon steel 0.312-inch wall thickness casing reducer will be paid for on a lump sum basis in place at the unit price bid for Bid Item No. 8. Payment shall be considered full compensation for furnishing all labor, materials, tools, fuel, and equipment necessary and incidental to completion of the work.
3. Dissimilar Metal Connector: The dissimilar metal connector for the 12-inch-diameter 0.312-inch wall thickness well casing will be paid for on a lump sum basis in place at the unit price bid for Bid Item No. 9. Payment shall be considered full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to completion of the work.
4. 12-Inch Nominal Diameter Stainless Steel Casing: The 12-inch-diameter Type 304L, stainless steel 0.312-inch wall thickness casing will be paid for on a per linear foot basis in place at the unit price bid for Bid Item No. 10. Payment shall be considered full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to completion of the work.
5. 12-Inch Nominal Diameter 0.060-Inch Slot Stainless Steel Screen: The 0.060-inch slotted 12-inch nominal diameter Type 304L, stainless steel wire wrap screen will be paid for on a per linear foot basis in place at the unit price bid for Bid Item No. 11.

Payment shall be considered full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to completion of the work.

6. 12-Inch Stainless Steel End Cap: Payment for furnishing and installing the end cap shall be made at the unit price for Bid Item No. 12. Payment shall be considered full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to completion of work.
7. Centralizers: Payment for furnishing and installing the low carbon steel and stainless steel centralizers shall be made at the unit price bid for Bid Item No. 13. Payment shall be considered full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to completion of the work to install each centralizer set.

SECTION 21 – GRAVEL PACK (BID ITEM NO. 14)

Scope

This item shall consist of providing and installing a select gradation of a continuous fine gravel/coarse-grained sand, with the gradation as specified by the Engineering Geologist, adjacent to the screen interval(s) in the annulus of the well. (as shown on Plate 2).

Well Construction Materials

All gravel/coarse-grained sands used for the filter envelope shall be hard, water-worn and washed clean of silt, fine sand, organic materials and foreign matter (crushed gravel will not be accepted). It shall be well rounded, spherical, graded, with a silica content equal to or greater than 99%. The gravel pack materials shall be of the type manufactured by Premier Silica, Cemex Lapis Lustre, SRI, or approved equal, and conform to the following gradations. The Engineering Geologist will determine the actual gravel pack size, gradations after the completion of the pilot hole.

The gravel pack material shall have an acid solubility of less than 1 percent in a 15 percent hydrochloric acid (HCL) solution and have a uniformity coefficient less than or equal to 2.5.

Percentages Passing Screen Numbers (6 X 12 Gradation)

<u>No. 4</u>	<u>No. 6</u>	<u>No. 8</u>	<u>No. 12</u>	<u>No. 16</u>
100%	80-96%	30-50%	2-8%	1-2%

A description and manufacturer's sieve analysis of gravel packing material proposed for use shall be provided with the Contractor's bid package. A sample of the materials to be delivered to the site must be submitted for approval to the Engineering Geologist prior to shipping to the site. The Engineering Geologist may elect to have a certified laboratory

perform a sieve analysis to verify conformance with the approved sample. Failure to meet gradation of the approved sample may be grounds for rejection. Transportation and storage of gravel shall be conducted using super sacks. Bulk delivery will not be allowed.

Well Construction Methods

Prior to placement of the gravel pack in the well, the drilling fluid shall be thinned with clean water in sufficient quantity to allow descent and settlement of gravel filter material. The Contractor shall also submit his written estimate of the volume of gravel to be placed. If a significant difference exists between the estimated and the final volume of gravel added, the discrepancy may be grounds for rejection of the well by the District.

Gravel, as specified, shall be installed in the annular space between the reamed hole and the well screen through an open-ended construction tremie pipe. The use of clean water and a gravel pump will be required. During placement of gravel in the annulus, displaced fluids pumped from the well casing shall be contained onsite.

The gravel pack shall be placed by pumping through a construction gravel-feed line extending to within 20 feet of the bottom of the well casing-borehole annulus. The construction tremie shall be gradually withdrawn as the gravel is placed. After the gravel is in place within the lower section, swabbing with tubing and a 8-inch-diameter packer assembly on a wireline or an appropriately sized 8-inch-diameter (or larger) bailer shall be conducted opposite the selected screen section(s) for a period of 1-hour or until the gravel is consolidated. As the gravel settles, more shall be added. The gravel shall be sounded and topped off at the designated final design depth in preparation for placement of the sanitary seal placement. The addition of chlorine during gravel pack operations is not required. If the Contractor elects to use chlorine it shall be a sodium hypochlorite solution. If the sand line cable on the drill rig is not sufficiently long or the wench is not rated for the work described, the Contractor shall mobilize a pump rig to accomplish the wireline swabbing work specified during gravel pack placement.

Measurement and Payment

Payment for furnishing and installing the gravel pack shall be made on a linear foot basis in place from the bottom of the well casing and screen assemblage to the bottom of the sanitary seal depth (as provided on the final well design) at the unit price bid for Bid Item No. 14. Payment shall be considered full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to completion of the work.

SECTION 22 – SANITARY SEAL (BID ITEM NO. 15)

Scope

This item shall consist of providing and installing a cement grout sanitary seal in the well annulus from a depth of 300 feet up to ground surface.

Well Construction Materials

All cement grout used for the seal around the well casing shall be a ten and one half (10.5)-sack sand-slurry cement grout mixture. Cement used for sealing mixtures shall meet the requirements ASTM C150 "Standard Specification for Portland Cement," Type III or Type IV. Materials used as additives for Portland cement mixtures in the field shall conform to ASTM C494 "Standard Specification for Chemical Admixtures for Concrete". The Contractor may not use alternate concrete mixtures even if allowed by the well construction permit. Prior to any drilling operations, the District and the Engineering Geologist will approve the concrete mixture. No additives are anticipated to be necessary for this project and shall not be used without a prior written request for approval by the District or Engineering Geologist.

Construction Methods

Cement grouting shall seal the annular space between the borehole (and conductor casing) and the well casing, from the top of the gravel pack up to ground surface. Placement of the well's final sanitary seal shall be conducted in accordance with County permit requirements and be pumped in place using the positive displacement method with a pneumatic grout pump and construction tremie pipe set 2 feet off the bottom of each sealing zone. The tremie pipe shall be gradually extracted as the seal material fills the annular space, however, the end of the pipe shall remain submerged in the cement seal material throughout the installation process. At the end of the pour, a pint size sample shall be collected and placed in a bucket of water to observe the cure-time of the cement grout mix poured.

Measurement and Payment

Payment for cement grout will be made on a linear foot basis in place at the unit price bid for Bid Item No. 15. Payment shall include full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to complete the installation in place.

SECTION 23 – WELL ALIGNMENT TESTING (BID ITEM NO. 16)

Scope

This item shall consist of testing to determine the plumbness and alignment of the well.

Construction Methods

Tests to determine the plumbness and alignment of the 12-inch-diameter casing shall be made by the Contractor after the well has been completed and before its acceptance.

The completed well shall be sufficiently plumb and straight so that there will be no interference with installation, alignment, operation, or future removal of the permanent well pump equipment.

A dummy, 40 feet long, will be lowered into the casing to test the plumbness and alignment of the well. The dummy shall consist of a rigid spindle of 4-inch-diameter extra heavy pipe with three rings (having an outside diameter 1/2-inch less than the smallest inside diameter of the 12-inch-diameter casing) rigidly fixed to the pipe so that they cannot move longitudinally along the pipe. The rings shall consist of suitable material, which will not harm the interior of the casing while being lowered or raised.

Should the dummy fail to move freely throughout the entire casing interval in which pump equipment will be installed, or should the well vary from the vertical in excess of 6 inches per 100 feet of depth. Insufficient plumbness or alignment may be grounds for rejection of the well. Records of deflection readings and all other pertinent information shall be kept and made part of the permanent well log and record. The depth of the alignment test will be provided by the Engineering Geologist based on the final well design and is anticipated to be approximately 300 feet bgs to the top of the dummy.

Measurement and Payment

Payment for testing to determine the plumbness and alignment of the well shall be made on a lump sum basis at the unit price bid for Bid Item No. 16. Payment shall be considered full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to completion of the work.

SECTION 24 – MECHANICAL WELL DEVELOPMENT (BID ITEM NOS. 17 AND 18)

Scope

This item shall consist of swabbing and airlift pumping with a dual swab assembly to remove drilling fluids and develop the gravel pack and aquifer to maximize the yield and efficiency of the well.

Drilling Fluid Purge

Within a 48-hour-period after well construction is complete (final sanitary seal is placed), the heavy drilling fluids in the well shall be purged to prepare the well for development. The drilling fluid purge process shall consist of installing an open-ended airlift pipe with a minimum 4-inch-diameter to the bottom of the well and conducting airlift pumping to remove heavy drilling fluids and solids (fill material) to prepare the well for development. During initial airlift pumping, 2,000 gallons of fresh water shall be added to the top of the well casing at a rate approximately equal to or less than the rate of airlift pumping.

The initial airlift operation shall be conducted until a minimum of 5,000 gallons of fluid have been removed off the bottom of the well. Prior to removal of the airlift piping, the pipe shall be slowly lowered to touch the bottom of the well and remove all sediment. Drilling fluids removed during this process shall be contained onsite for drying and subsequently deposited by the Contractor at the onsite location.

Subsequently, the airlift pipe shall be removed and mechanical well development shall commence. During airlift pipe removal, 6 gallons of 12.5% sodium hypochlorite shall be placed through the airlift pipe when the pipe is at the depth of 420 feet bgs. Fresh water shall be added to displace the volume inside the pipe that is below the fluid level in the well, and effectively spot the chlorine at that depth. The same procedure shall be conducted again when the airlift pipe is at a depth of 350 feet bgs (6-gallons of sodium hypochlorite and flush pipe with fresh water).

Well Mechanical Development Method

Swab and Bail

The mechanical development process shall begin by surging the well screen with a swab tool and bailing the solids from the well. A solid surge block or large diameter bailer (minimum of 8-inch-diameter) shall be used to swab the well screen interval(s) in the well by moving the assembly up through the well screen with a minimum line speed of 3 feet per second. Bailing shall be alternately conducted to remove fines washed in through the well screen during swab/surge development and remove residual drilling fluid loosened by the process. This procedure is anticipated to require active swabbing of each 20 foot section of well screen for a minimum 1-hour-period. Based on the proposed design (140 feet of well screen), a total of 7 hours of active mechanical well development is anticipated. Active development means the swab or bailer is actively being moved up and down inside the well at a minimum rate of 3 feet per second. It is anticipated this procedure will be conducted using a wireline to facilitate an efficient operation. Active swabbing using a cable tool rig with a rocker arm assembly and a swab plate is preferred. Upon completion of the active swabbing activities, the well shall be bailed back to bottom using a large diameter suction bailer to remove the fill in the bottom of the well. Alternatively, the Contractor may elect to conduct an open-ended airlift to remove the fill.

Swab and Airlift

At the completion of swab and bail activities, the well will be actively airlifted to evacuate debris loosened by the swab and bail development. Initially, airlifting will proceed from the top of the screen to the bottom and be actively conducted for a 20-minute-period per 20 foot section of well screen and is anticipated to require a total of approximately 140 minutes (approximately 2.3 hours) of active airlifting to remove the bulk of the residual drilling mud in the gravel pack and formation materials.

Subsequently, airlifting will proceed from the bottom of the screen to the top and is anticipated to require a total of approximately 1 hour of active airlifting per 20 foot section of screen; 7 hours total active airlifting for the proposed design with 140 feet of well screen. The Contractor shall utilize a dual rubber swab assembly with swab plates sized at 1/2 inch less than the inside diameter of the well screen, and with a maximum 1-foot spacing between the swab plates. The swab assembly design is shown on Plate 4 – Dual Swab Assembly Drawing – Side View, and Plate 5 – Dual Swab Assembly Drawing – Top View. All turbid fluids produced during mechanical well development shall be placed in tanks and contained onsite for subsequent disposal.

The airlift design shall be a minimum 1.25-inch-diameter air injection pipe inside a 5-inch-inside-diameter eductor pipe. The 1.25-inch-diameter airline shall initially be set to a depth of 260 feet on the down pass and shall be sufficient to produce a flow of approximately 140 gpm or greater. As the airlift assembly is lowered each 20 feet an additional airline shall be installed down to a depth of approximately 340 feet and shall be sufficient to produce a flow of approximately 180 gpm or greater. The airlift shall be conducted using an air compressor capable of generating a minimum of 120 psi and a minimum of 740 cubic feet per minute. Upon completion of development of the well screen, the well shall be bailed with a suction bailer or airlifted with an open-ended pipe to clean all sand and silt fill from the well to its total construction depth.

The Engineering Geologist must approve the use of any chemicals. Mud dispersing agents and other chemicals applicable to standard procedures for breakdown and removal of drilling fluids may be used where applicable and as required.

Active development means the dual swab assembly is actively being moved up and down the well while the airlift is actively pumping to waste. All fluids that do not comply with District discharge conditions shall be containerized onsite and hauled off by the Contractor for legal disposal. Discharge fluids that have a turbidity below 150 nephelometric turbidity units (NTUs) can be released to the point of discharge (see Plate 1). Prior to initial discharge, the Contractor shall provide field test results to District for its review and approval. The Contractor shall provide a readily accessible valued sample port for use by the Engineering Geologist during airlift operations.

Measurement and Payment

Payment for active well mechanical development will be made on an hourly basis in accordance with the hourly rate bid for Bid Item Nos. 17 and 18. Such payment shall be considered as full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to completion of this task.

SECTION 25 – DEVELOPMENT AND TEST PUMP INSTALLATION (BID ITEM NO. 19)

Scope

Following the initial mechanical development, the Contractor shall install a clean line shaft turbine test pump assembly to a depth of 280 feet (top of bowls) with a diesel or gasoline powered engine(s). The pump bowl assembly shall be capable of producing on the order of 1,000 gpm with up to 450 feet of total dynamic head. The engine shall be equipped with suitable throttling devices to control discharges between 200 and 1,000 gpm and have suitable horsepower (perhaps up to 200 hp) to achieve the specified flow rates and discharge heads that are anticipated. The test pump shall be designed appropriately to allow pump and surge development and not be equipped with a foot valve, which would prevent backspin and interfere with back-surfing operations. After pump test operations are complete, the pump and power plant assembly shall be removed. This item also includes installation and removal of approximately 1,000 feet of a 8-inch-diameter (minimum) discharge piping with Victaulic fittings, sounding tube, airline, flow meter, sample port, and appropriate air-vac and control valves to facilitate completion of hydraulic well development and testing.

Well Test Pump Installation Method

The Contractor shall furnish, install and remove the necessary measuring instruments, discharge pipeline, and pumping equipment capable of pumping to the required point of discharge a maximum of 1,000 gpm, with up to 450 feet of total dynamic head. The Contractor's equipment shall have satisfactory throttling devices, so that the discharge may be reduced to 200 gpm. Pumping unit shall be complete with an ample power source, controls, and appurtenances and shall be capable of being operated without interruption for a period of 72 hours.

For water level measurements, the Contractor shall install a ¼-inch-diameter airline and a 1.25-inch-diameter Schedule 40 PVC sounding tube during test pump installation to sound water levels in the well during development and testing. The airline shall be equipped with an air gauge that has an operational range no greater than 100 psi.

Piping, valves, meter, sampling port, sand tester port, and airline/sounding tube shall be properly installed to insure successful operation of each apparatus. The PVC sounding tube shall be made readily accessible for use by the Engineering Geologist with a minimum 3-foot vertical clearance directly over the tube. District shall utilize the PVC sounding tube throughout well development and testing for the installation of a pressure transducer. The contractor may install a second PVC sounding tube for its own use or sound water levels using the pressure gauge or through the annulus between the well casing and the pump column pipe.

Measurement and Payment

Payment for installation and removal of the development and test pump assembly will be made on a lump sum basis in accordance with the unit price bid for Bid Item No. 19. Such payment shall be considered as full compensation for furnishing all labor, materials, tools, fuel, and equipment necessary and incidental to completion of this task.

SECTION 26 – HYDRAULIC WELL DEVELOPMENT (BID ITEM NO. 20)

Scope

This item shall consist of intermittent pump and surge (rawhide) well development to maximize well efficiency and production.

Hydraulic Development Method

At the completion of mechanical development activities, intermittent pumping shall be used for well development, which shall be at an initial rate of 200 gpm and continued until the water is clear. The pump shall be stopped and the water in the column allowed to surge back through the bowls with free backspin and out into the well screen. The pump shall then be started and stopped several times; and then pumped at 200 gpm until the water is clear. The procedure shall be repeated in approximately 100 gpm increments up to a maximum of 1,000 gpm or as directed by the Engineering Geologist. Pump discharge shall be measured with a flow meter that provides instantaneous rate and totalizing meter readings.

Development records shall be maintained to document each surge cycle showing production rate, pumping level, drawdown, sand production, number of surges and all other pertinent information concerning well development. Development shall continue until the following conditions have been met.

1. The specific capacity (gpm/ft) shall have reached a constant value over a period of at least 6 continuous hours, or as directed by the Engineering Geologist.
2. Sand content is acceptable as described below.

The equipment for sand testing shall be the Rossum Centrifugal Sand Sampler (see Journal of the American Water Works Association, Volume 46, No. 2, February 1954). The Engineering Geologist upon notification by the Contractor, shall conduct the test after completion of hydraulic well development.

Sand content shall not exceed 10 parts per million (ppm) after the start of pumping, from a 30-minute off condition. Sand content shall average less than 2 ppm during a continuous 4-hour pumping period which will begin 30 minutes after the start of pumping from a 30-minute off condition. The sand content shall be determined by averaging the

results of 5 samples collected at the following time during the final pumping test: (1) 15 minutes after start of the test; (2) after 1/4th of the total planned test time has elapsed; (3) after 1/2 of the time has elapsed; (4) after 3/4th of the time has elapsed; and (5) near the end of the pumping test. The pumping rate during sand content testing shall be 1,000 gpm. At the option of the Engineering Geologist, the sand content testing may be conducted during the constant discharge test.

If the sand content exceeds 2 ppm, the Contractor may be requested to conduct the necessary redevelopment work and pumping of the well until the sand content is less than 2 ppm. It is anticipated that this phase of development will require 32 hours of active pumping and surging development activities for the well. For bid purposes, a total of 32 hours of active pump and surge development shall be assumed. Active pump and surge development means the pump assembly is actively being operated to discharge fluids from the well or back surge fluids into the well.

All turbid fluids produced during well development shall be contained onsite before being properly disposed by the Contractor. Fluid disposal is the responsibility of the Contractor. No turbid fluids produced during well development shall be allowed to enter any storm drains or watershed drainage areas (ditches). It is anticipated that the fluids produced during hydraulic well development can be used for irrigation of the approved turf areas on campus.

Measurement and Payment

Payment for hydraulic well development using the pumping and surging well development procedure will be made on an hourly basis per the rate bid for Bid Item No. 20. Such payment shall be considered as full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to completion of this task.

SECTION 27 – WELL PRODUCTION TESTING (BID ITEM NO. 21)

Scope

This item shall consist of testing the well to determine the final well performance, measure site-specific aquifer parameters, and provide data to assess the optimum rate and level of pumping during permanent operation.

Test Preparation

After the well has been completely developed in accordance with these specifications, the Contractor shall notify the Engineering Geologist of the well test schedule and make the necessary arrangements (fuel and manpower, etc.) for conducting the final production testing. Production testing shall consist of a variable rate step-drawdown test and a constant rate discharge test.

Step-Drawdown Test

Prior to starting the pump, water level measurements shall be made at least hourly, for a minimum of eight hours by the Engineering Geologist. The well shall be “step” tested at rates beginning at approximately 250 gpm and increased by increments of 250 gpm until a rate of 1,000 gpm is attained. The complete test is estimated to require four (4) 2-hour steps and 8 hours total pumping time, not including recovery time. The Contractor shall operate the pump and change the discharge as directed by the Engineering Geologist. Discharge of the pump shall be controlled by both gate valve and engine throttle. The discharge shall be controlled and maintained at approximately the desired discharge for each step with an accuracy of plus or minus 5 percent. The Engineering Geologist shall furnish and install a pressure transducer for the District’s use. Well recovery time after the step test will be a minimum of 12 hours.

Constant Discharge Test

After water level recovery from the step test is complete, a constant rate test shall be conducted by pumping the well at the design rate of 650 gpm for a period of not less than 8 hours and until the pumping level remains constant for at least 4 hours, or until the Engineering Geologist terminates the test. A recovery period of not less than 24 hours shall follow the termination of the constant discharge test. At this time, the Engineering Geologist will collect residual drawdown data and the well will remain idle. All measurements during well recovery are to be made by the Engineering Geologist. The complete test is estimated to require approximately 8 hours of constant pumping, and a subsequent 24-hour well recovery period. The constant discharge test shall be initiated between Monday and Wednesday at 7:00 a.m. and terminated the same day. This will permit District’s staff to collect water quality samples toward the end of the test at a time that allows transportation and adhere to sample holding times for laboratory testing.

Aborted Test

Whenever continuous pumping at a uniform rate has been specified, failure of pump operation for a period of greater than one percent of the elapsed pumping time shall require suspension of the test until the water level in the pumped well has recovered to its original level. For the purposes of this section, recovery shall be considered “complete” after the well has been allowed to rest for a period of at least equal to the elapsed pumping time of the aborted test except that if any three successive water level measurements spaced at least 20 minutes apart show no further rise in the water level in the pumped well, the test may be resumed immediately. The Engineering Geologist shall be the sole judge as to whether this latter condition exists. The Contractor will not be paid for any retesting done if specified time or recovery requirements of the Engineering Geologist for the aborted test are not first met. These tests are invalid and will not be construed as a test or study.

Discharge Water

Discharged water shall be conveyed from the pump to a location approximately 1,000 feet from the well site or as otherwise designated by the District. It is imperative to ensure that no damage by flooding or erosion is caused to natural drainage or the adjacent properties. The Contractor shall provide all piping, valves, settling tanks, fencing, delineators, and discharge line necessary for conveyance and discharge of the test fluids through spray irrigation in the designated areas. It will be the Contractor's responsibility to make any necessary arrangements for the spray irrigation discharge of water. It will be the Contractor's responsibility to assist the District in obtaining representative water samples prior to the end of discharge during the 8-hour constant rate test.

Records

The Contractor shall keep accurate records of the pumping test and furnish copies of all records to the Engineering Geologist or his representative upon completion of the test. The records shall also be available to the Engineering Geologist or his representative for inspection at any time during the test. The records shall include physical data describing the construction features such as: the measuring point and its measured height above land surface; the methods used in measuring water levels, and pumping rates.

Measurement and Payment

Payment for the step-drawdown test and the constant discharge test will be made at the hourly rate bid for Bid Item No. 21. The estimated bid quantity for well production testing assumes 16 hours. Such payment will be considered as full compensation for furnishing all labor, materials, tools, fuel and equipment necessary and incidental to completion of these tasks. No payment will be made for observation of the well recovery periods.

SECTION 28 – DISINFECTION OF THE WELL (BID ITEM NO. 22)

Scope

This item shall consist of disinfecting the well against bacteria using sodium hypochlorite.

Disinfectant Materials

Sodium hypochlorite approved by state or local regulatory agencies shall be used as the disinfectant. The disinfectant shall be delivered to the site of the work in original closed containers bearing the original label indicating the percentage of available chlorine. The disinfectant shall be recently purchased liquid sodium hypochlorite solution. Storage of liquid compounds shall not be exposed to the atmosphere or to direct sunlight. Unless superseded by governmental regulation, the quantity of chlorine additives used for disinfection shall include:

Disinfectant Additives

16 gallons 12.5% sodium hypochlorite
10 gallons NuWell 410
5,000 gallons of potable water

Disinfection Preparation and Installation Method

The Contractor shall provide for disinfection immediately following completion of the well construction, cleaning, and testing procedures. The Contractor shall carry out adequate cleaning procedures immediately preceding disinfection where evidence indicates that normal well construction and development work have not adequately cleaned the well. The Contractor is responsible for removing or mitigating the effects of all materials introduced into the well during drilling.

The disinfectant solution shall be mixed above ground in a clean, suitable poly-tank prior to placement into the well. The disinfectant solution is designed to have approximately 300 parts per million (ppm) free chlorine and a pH below 7.0. The well disinfection solution shall be thoroughly mixed above ground in the tank and subsequently introduced into the wellhead. All accessible portions of the well above the water level shall be maintained in a damp condition with water containing the concentration of 300 ppm or greater disinfecting agent for a period of not less than 20 minutes. The disinfecting agent of 300 ppm shall be surged into the well screen with the pump for a period of ½-hour and then left in the well for a minimum of 12-hours. Following the minimum 12-hour contact time the well shall be pumped to purge the spent disinfecting agent from the well casing and surrounding gravel pack and formations. Approximately 20,000 gallons shall be pumped or until the produced groundwater test indicates no residual chlorine. Discharged water shall be de-chlorinated and held in a tank for subsequent disposal through spray irrigation.

Measurement and Payment

Payment for disinfection of the well will be made on a lump sum basis at the unit price bid for Bid Item No. 22. Such payment shall be considered full compensation for furnishing all labor, materials, tools and equipment and doing all the work to complete this task.

SECTION 29 – VIDEO SURVEY (BID ITEM NO. 23)

Scope

This item shall consist of performing a color video survey of the completed well and recording in DVD format.

Construction Methods

The Contractor shall furnish all services and equipment for video surveying the completed well. The downhole video survey shall be recorded in real color with camera equipment that has side scan capabilities. The Engineering Geologist shall witness the video survey.

Upon completion of downhole video survey, two (2) final quality copies of the video shall be provided to the Engineering Geologist in DVD format along with a copy of the video operator's report in hard copy and electronic PDF format.

Measurement and Payment

Payment for construction of the video log will be made on a lump sum basis at the unit price bid for Bid Item No. 23. Such payment shall be considered full compensation for furnishing all labor, materials, tools and equipment and doing all the work to complete this task.

SECTION 30 – WELLHEAD PREPARATION (BID ITEM NO. 24)

Scope

This item shall consist of extending the 12-inch-diameter well casing to a height of 2 feet above the ground surface and installing a wellhead flange. This item also consists of forming and pouring a steel reinforced concrete well pad. The well casing shall also have a 2-inch-diameter access pipe attached to the side of the well casing. Plate 6 –Wellhead Construction Drawing shows the well pump pad configuration. Work will be conducted and result in construction that complies with all applicable California Department of Drinking Water and County construction standards.

Construction Materials

The Contractor shall provide all labor, material and equipment necessary for modifying the well and preparing the wellhead for future permanent pump installation as shown on Plate 6. The concrete pad shall be constructed in accordance with the attached plans and the following items:

1. Concrete shall have a minimum design strength of 2500 PSI in 28 days and shall be Type V cement.
2. Reinforcement shall be A-615 Grade 40.
3. Minimum steel clearance shall be 3 inches unless otherwise specified and shall be measured from the nearest face of concrete
4. All bars shall be continuous and placed at 6-inch centers.
5. Design criteria shall be based upon the Uniform Building Code and ACI.

Wellhead Construction Method

The Contractor shall furnish all services and equipment necessary to perform the work to construct a well pad and complete wellhead construction. The well casing shall be extended to 24 inches above ground surface and equipped with a Class 125 steel flange. The steel flange shall be leveled and welded to the well casing to become the support for the permanent submersible well pump assembly. The top of the well shall be covered and secured with a ¼-inch thick steel plate or a blind flange bolted to the permanent flange.

The steel reinforced concrete well pad shall be 6 x 6 feet by 24 inches thick and have steel reinforcing rods placed at 3 inches below the top of the well pad. The concrete pad shall be constructed in accordance with State and County construction standards and fully support/protect the steel casing in a manner that prevents damage to the well casing. The top of the pad shall be elevated 12 inches above existing surface and sloped away from the steel casing to provide drainage. The access pipe shall be welded at an approximate 30 degree angle from vertical and be fitted with a coupling and threaded plug/end cap. The access tube shall be placed at a location as to not interfere with well discharge piping. The access tube shall be connected at a depth of 36 inches below the top of the well casing.

Measurement and Payment

Payment for wellhead preparation will be made on a lump sum basis at the unit price bid for Bid Item No. 24. Such payment shall be considered full compensation for furnishing all labor, materials, tools and equipment, and doing all the work to complete this task.

SECTION 31 – MUD AND CUTTINGS DISPOSAL AND SITE CLEAN-UP (BID ITEM NO. 25)

Scope

This item shall consist of maintaining the well site in a professional manner during drilling, construction, and testing and restoring the site grade to pre-drilling conditions after work is completed. Site maintenance shall prevent cuttings and drilling fluids from leaving the well construction work area throughout the well construction process. It will be the Contractor's responsibility to remove and properly dispose of all drill cuttings and fluids during and at the completion of the well construction project.

Clean-Up Method

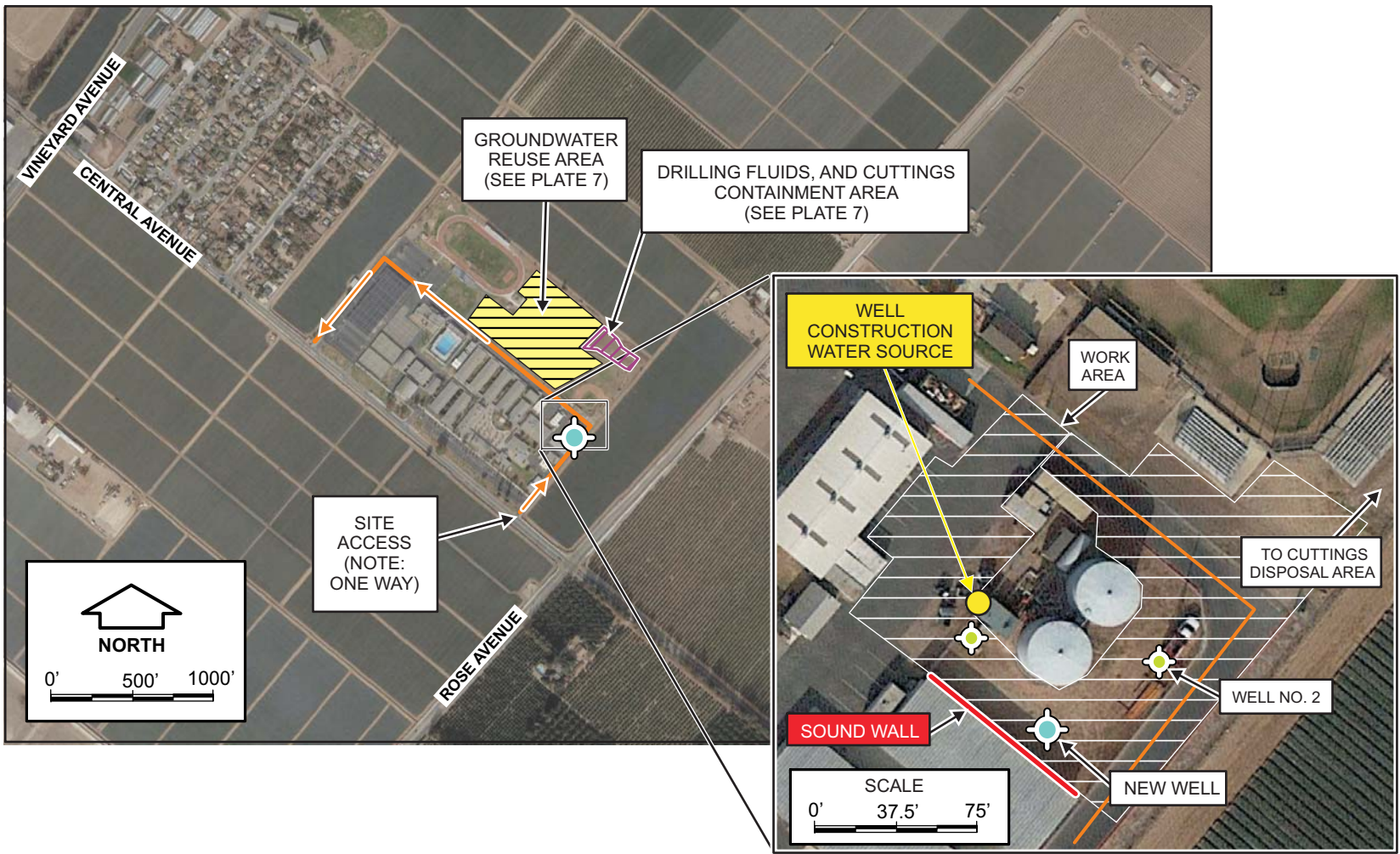
The Contractor shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the work, and at completion of the work, it shall remove all waste materials, rubbish and debris from and about the well site along with all tools, construction equipment, fuel tanks, machinery, and surplus materials. The

Contractor shall leave the site clean and ready for use by the District. The Contractor shall restore the grade in all temporary work areas to their original condition. Drill cuttings and mud are to be removed from the well site and disposed of by the Contractor at the designated location assigned by the District (see Plate 7). The Contractor is responsible for any damages to properties adjacent to the well caused by drilling, construction, or well testing activities associated with the work described herein.

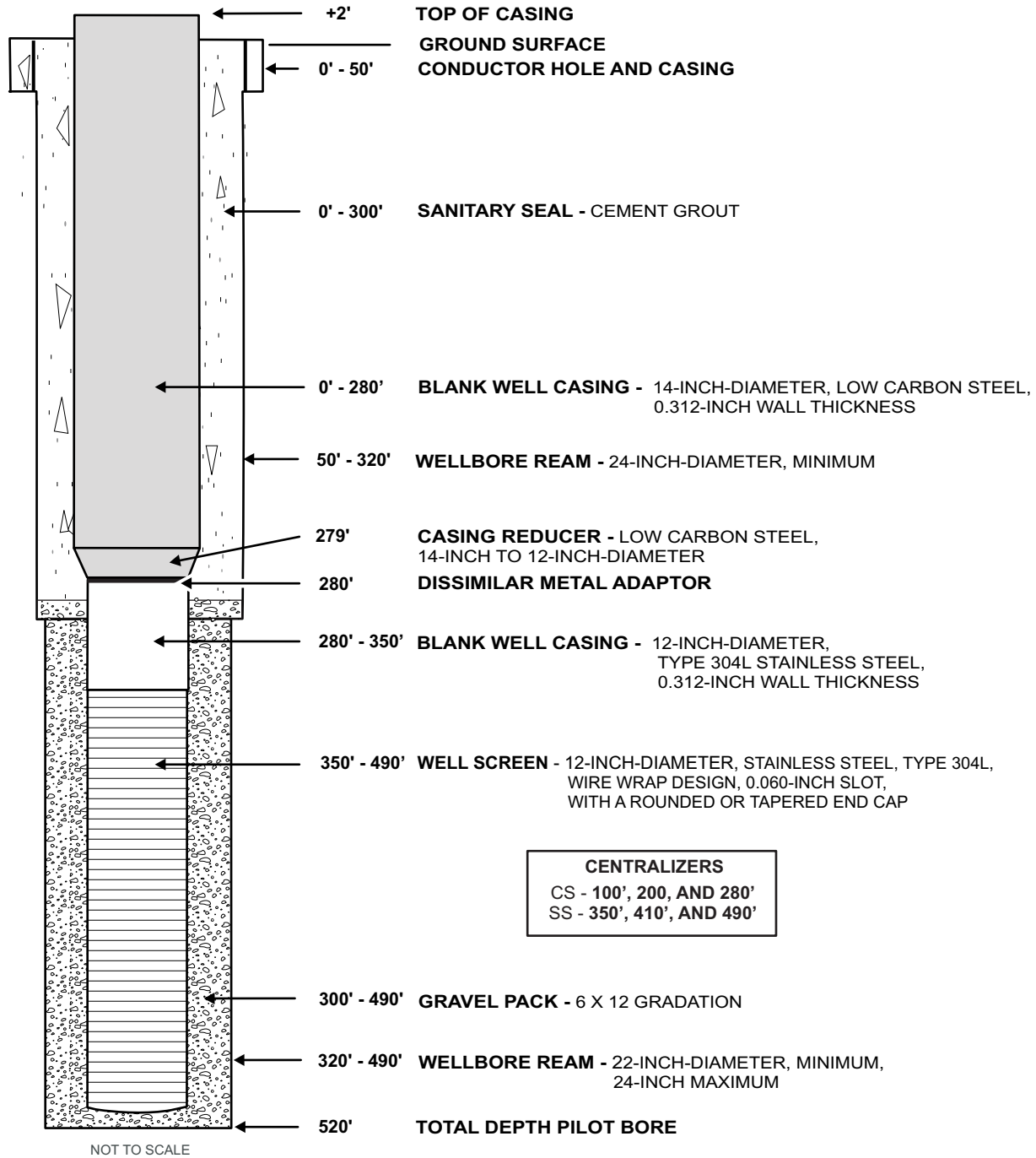
Measurement and Payment

Payment for well site clean-up and mud and cuttings disposal shall be made on a lump sum basis in accordance with the unit price bid for Bid Item No. 25 after final inspection and approval by the District. Final approval shall be made by the District of all work completed by the Contractor.

PLATES

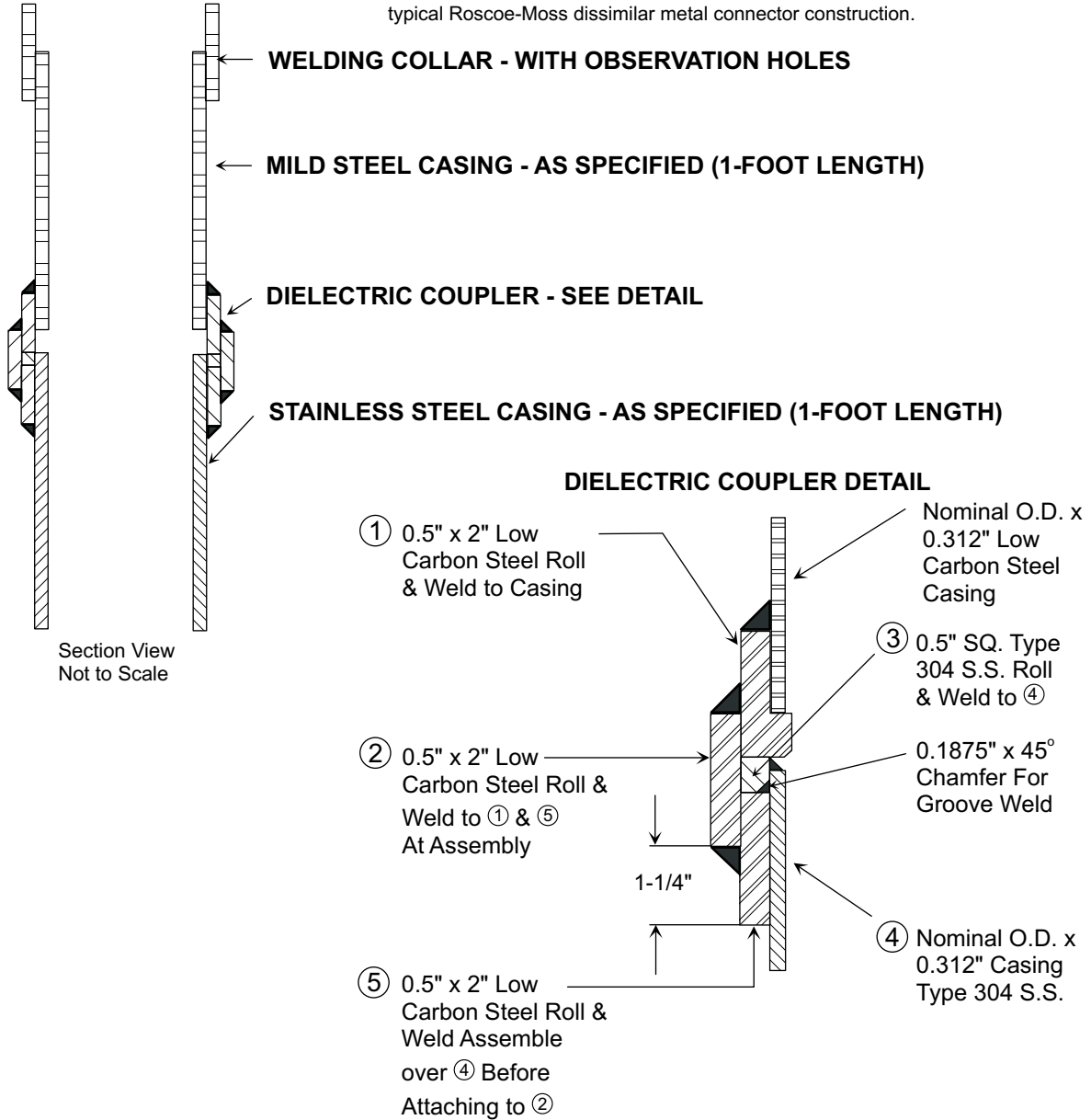


WELL SITE LOCATION MAP
Rio Mesa High School
Well No. 3 Construction Project
Oxnard Union High School District
Oxnard, California



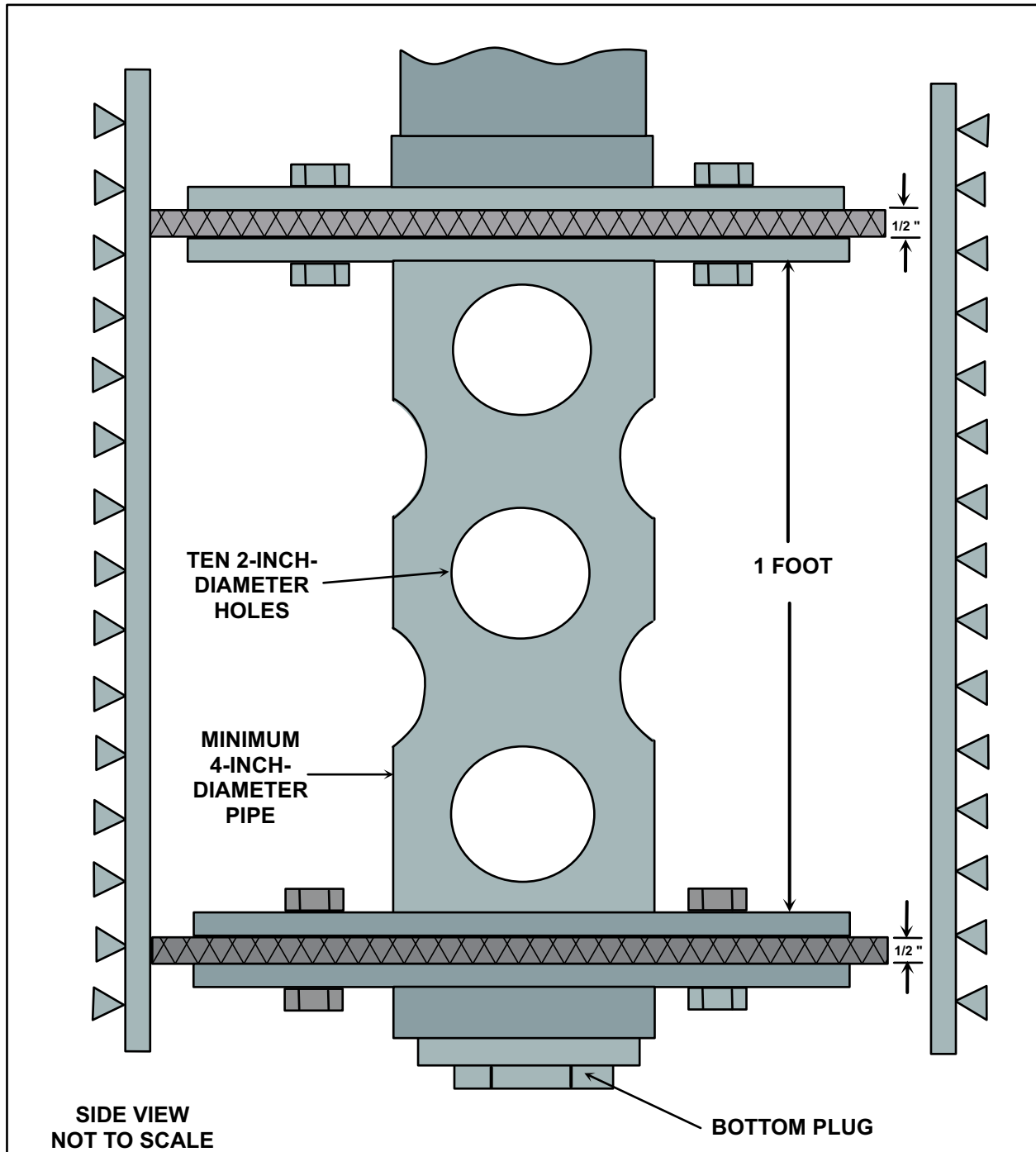
**PRELIMINARY WELL DESIGN DRAWING
 Rio Mesa High School
 Well No. 3 Construction Project
 Oxnard Union High School District
 Oxnard, California**

Generally the overall length of the Dielectric Coupler is 24-inches, and comprised of two 12-inch-long sections of each type of casing material as specified in the well design. The two sections are factory assembled, and welded under a low oxygen environment. Final design is in accordance with typical Roscoe-Moss dissimilar metal connector construction.



NOTE : NUMBER SEQUENCE OF COUPLING ASSEMBLY

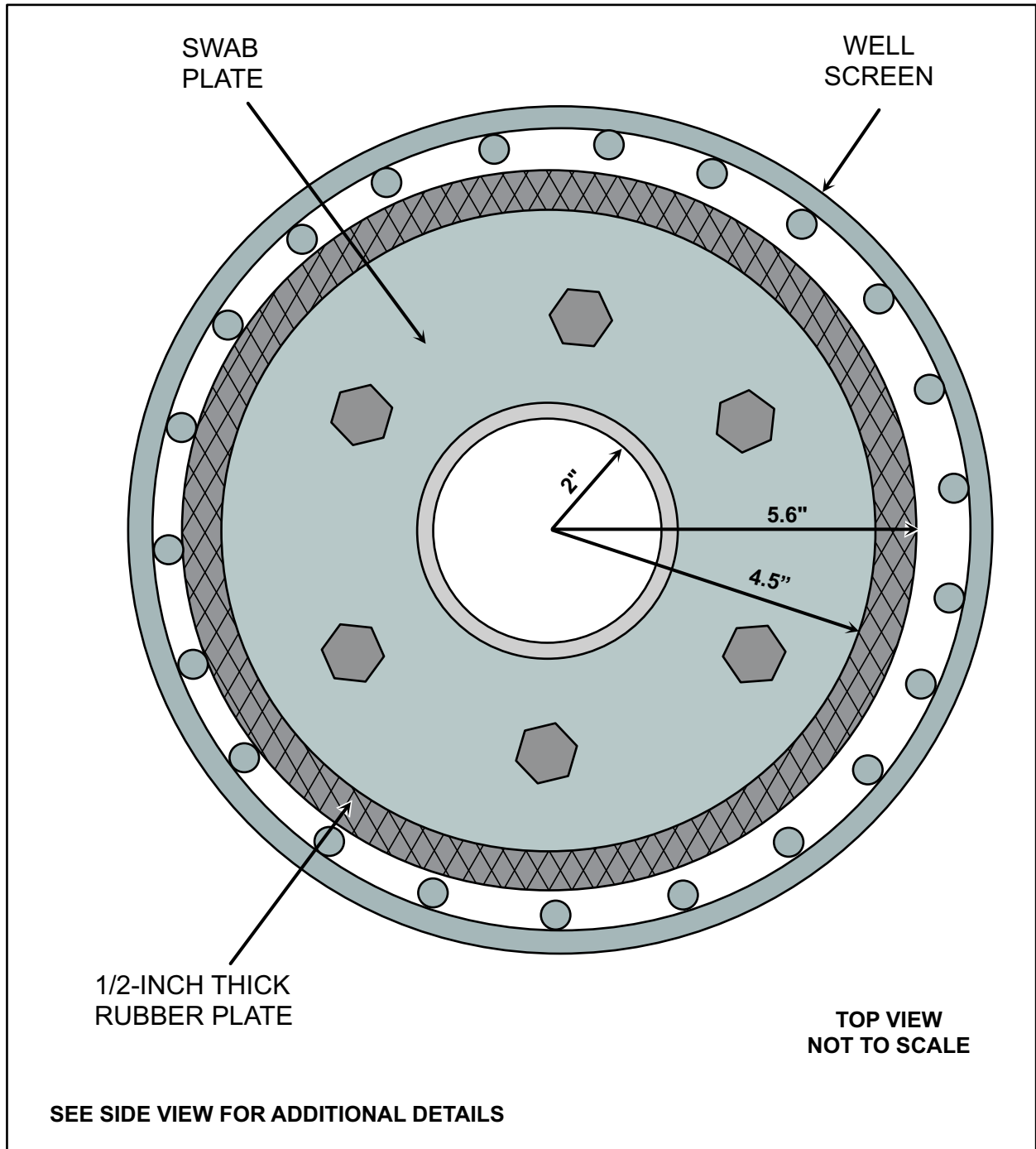
DISSIMILAR METAL ADAPTOR
Rio Mesa High School
Well No. 3 Construction Project
 Oxnard Union High School District
 Oxnard, California



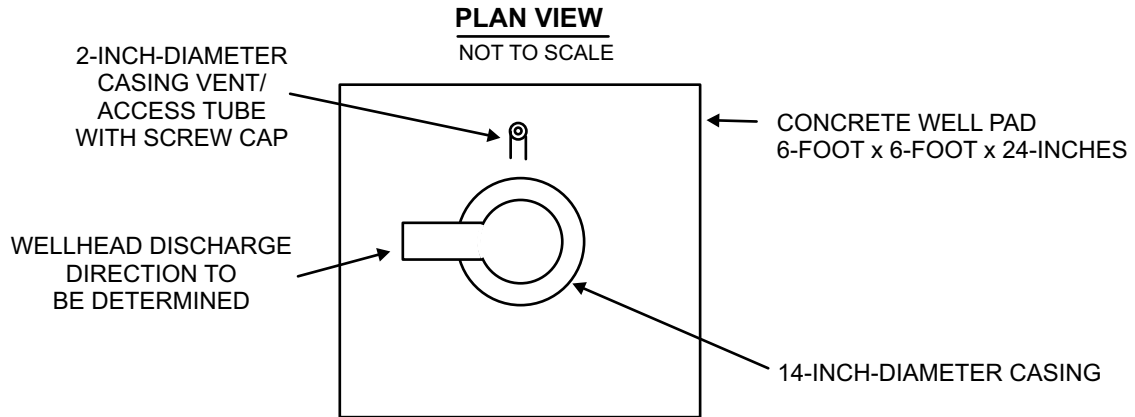
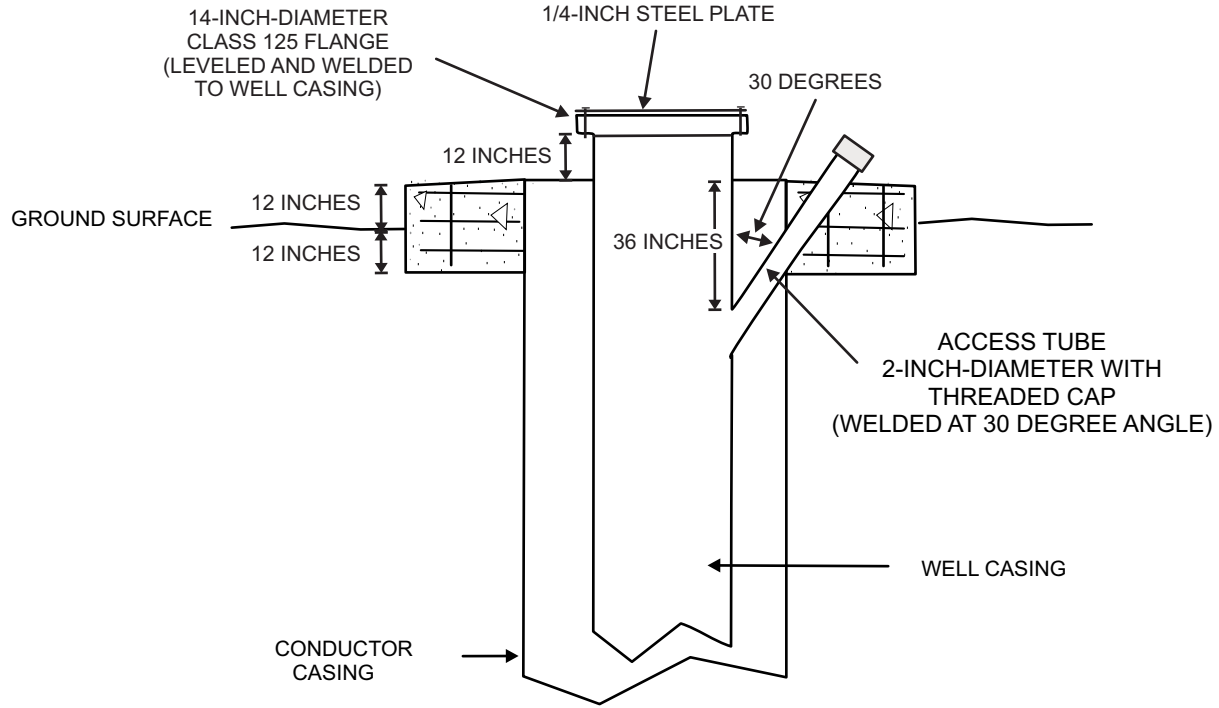
SEE TOP VIEW FOR PLATE DIAMETERS

DUAL SWAB ASSEMBLY DRAWING - SIDE VIEW

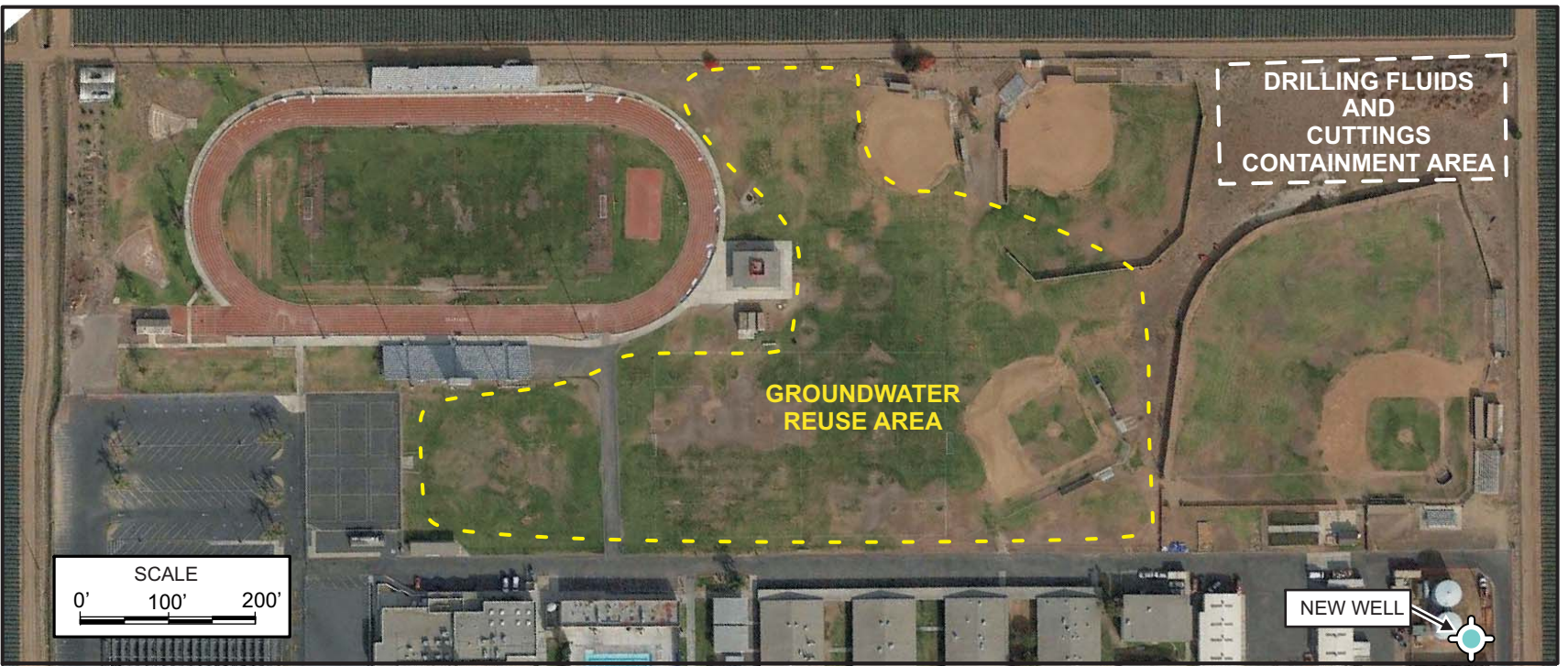
Rio Mesa High School
Well No. 3 Construction Project
Oxnard Union High School District
Oxnard, California



DUAL SWAB ASSEMBLY DRAWING - TOP VIEW
Rio Mesa High School
Well No. 3 Construction Project
Oxnard Union High School District
Oxnard, California




WELLHEAD CONSTRUCTION DRAWING
Rio Mesa High School
Well No. 3 Construction Project
Oxnard Union High School District
Oxnard, California



WATER REUSE AND CUTTINGS/FLUID CONTAINMENT AREA MAP
Rio Mesa High School
Well No. 3 Construction Project
Oxnard Union High School District
Oxnard, California

ATTACHMENT A
STATE WELL NO. 2N/22W-13N02
ELECTRIC LOG



(805) 647-3281

2747 Sherwin Ave., #1, Ventura, CA 93003

COMPANY: MIDMAX DRILLING AND PUMP		WELL: MUNICIPAL WELL #1	
FIELD: OXNARD		COUNTY: VENTURA STATE: CALIF.	
LOCATION: INTERSECTION OF ROSE RD. AND CENTRAL AVE.			
Sec 2 NORTH wp 22 WEST Rge 13 N			
Permanant Datum: GL	Elev: _____	Elev: K B _____	DF _____
Log Measured From: GL	Ft Above Perm Datum _____	GL _____	GL _____
Drilling Measured From: GL			
Date: 6/18/83			
Run No: ONE			
Depth—Driller: 123'			
Depth—Logger: 1218'			
Bitm Log Inter: 1218'			
Top Log Inter: _____			
Casing—Driller: _____			
Casing—Logger: _____			
Bit Size: 12 1/4"			
Type Fluid in Hole: BENTONITE			
Dens 1 Visc: 70			
pH 1 Fluid Loss: _____			
Source of Sample: SHAKER			
R @ Meas Temp: _____			
R @ Meas Temp: _____			
R @ Meas Temp: _____			
Source R @ Meas Temp: _____			
R @ BHT: _____			
R @ BHT: _____			
R @ BHT: _____			
R @ Meas Temp: 1500 @ 77'			

Change in Mud Type or Additional Samples	Type Log	Depth	Horizontal Scale
Sample No: 6-18/83	Soil	1218'	5 mV/div.
Depth—Driller: 123'	16" NORMAL	1218'	5 ohm-M/div.
Type Fluid in Hole: BENTONITE	64" NORMAL	1218'	5 ohm-M/div.
Dens Visc: 70	6" LATERAL	1218'	10 ohm-M/div.

EQUIPMENT DATA				
Run No	Tool Type and No.	Pad Type	Tool Position	Other
ONE	ELM-31277		FREE	

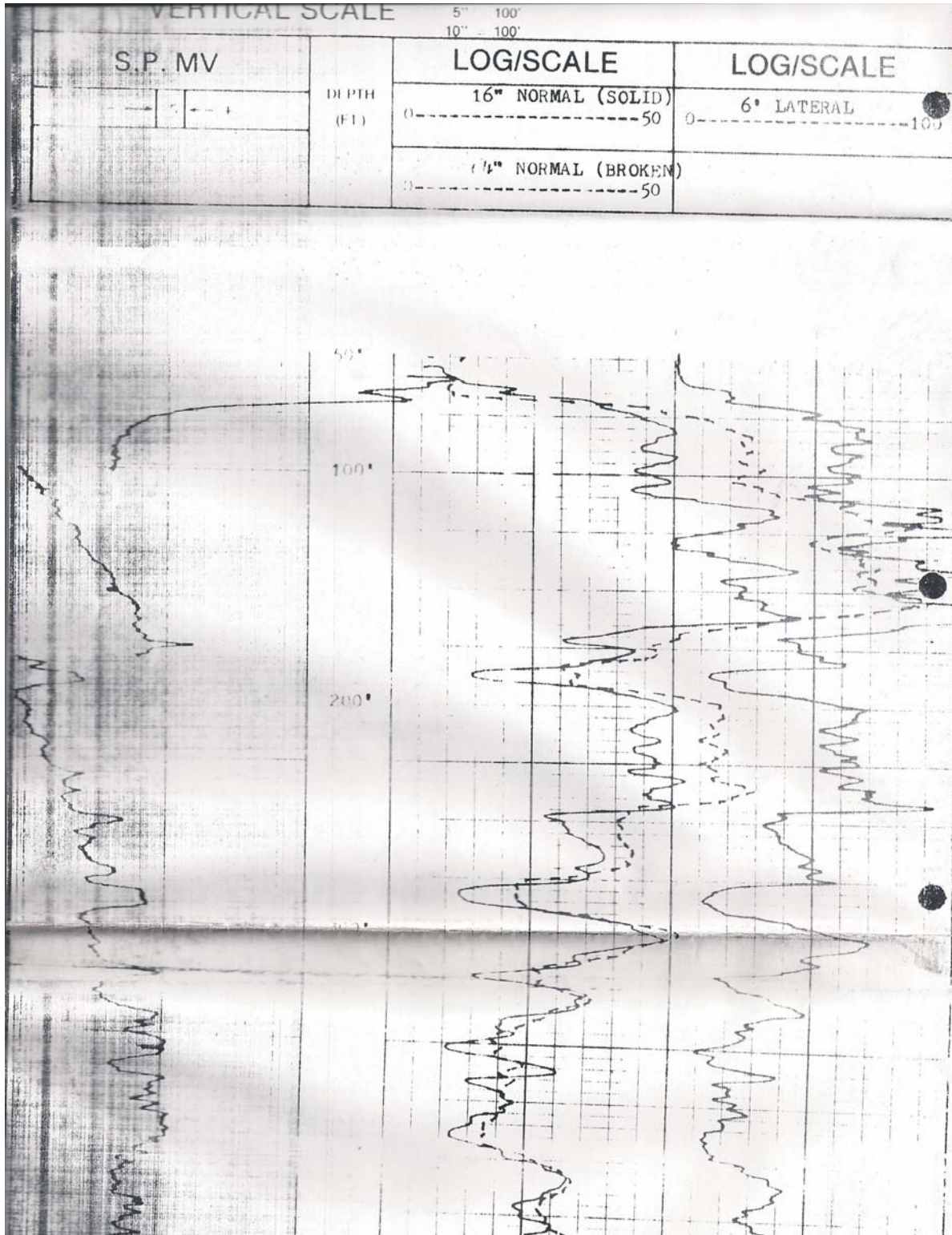
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees.

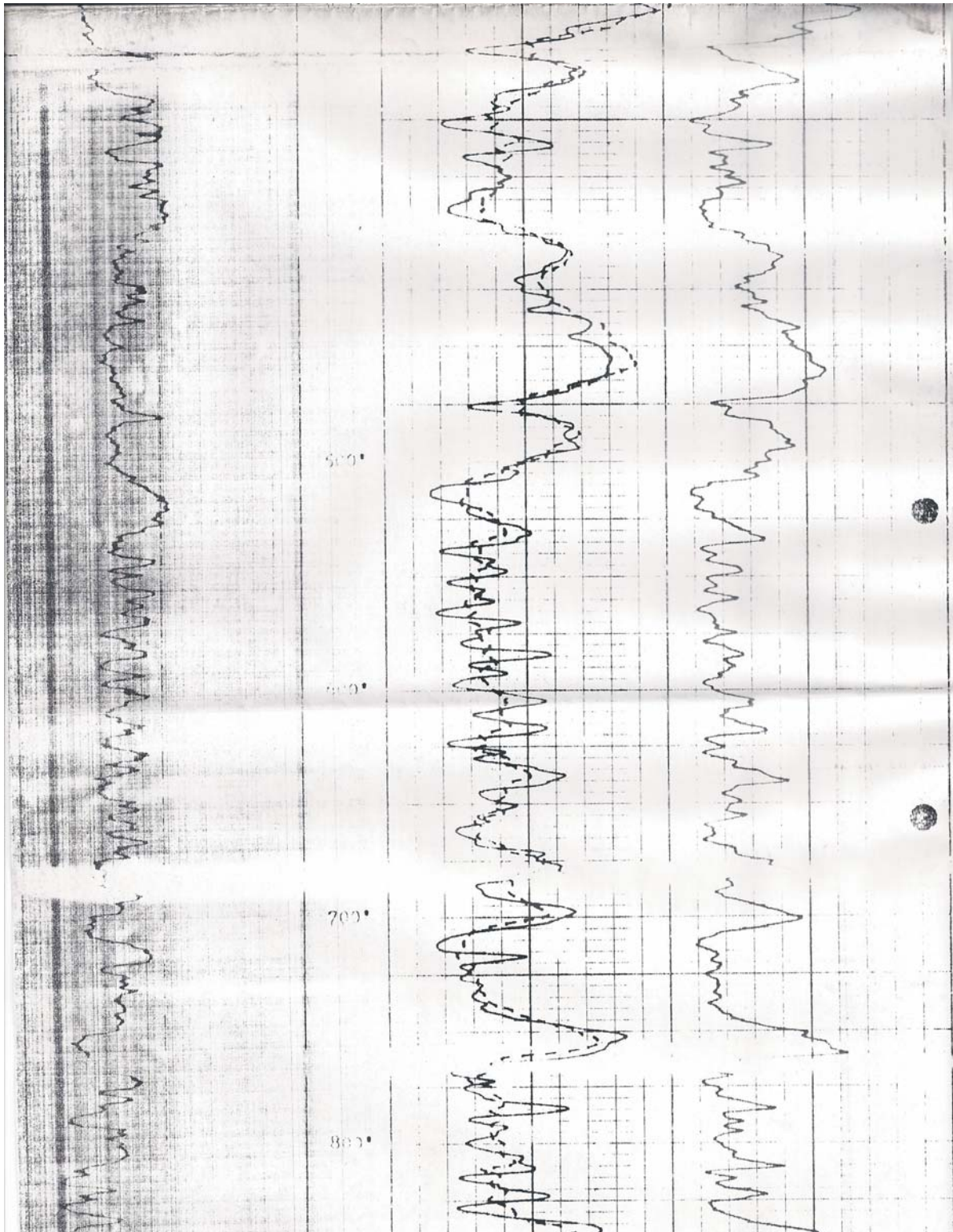
VERTICAL SCALE

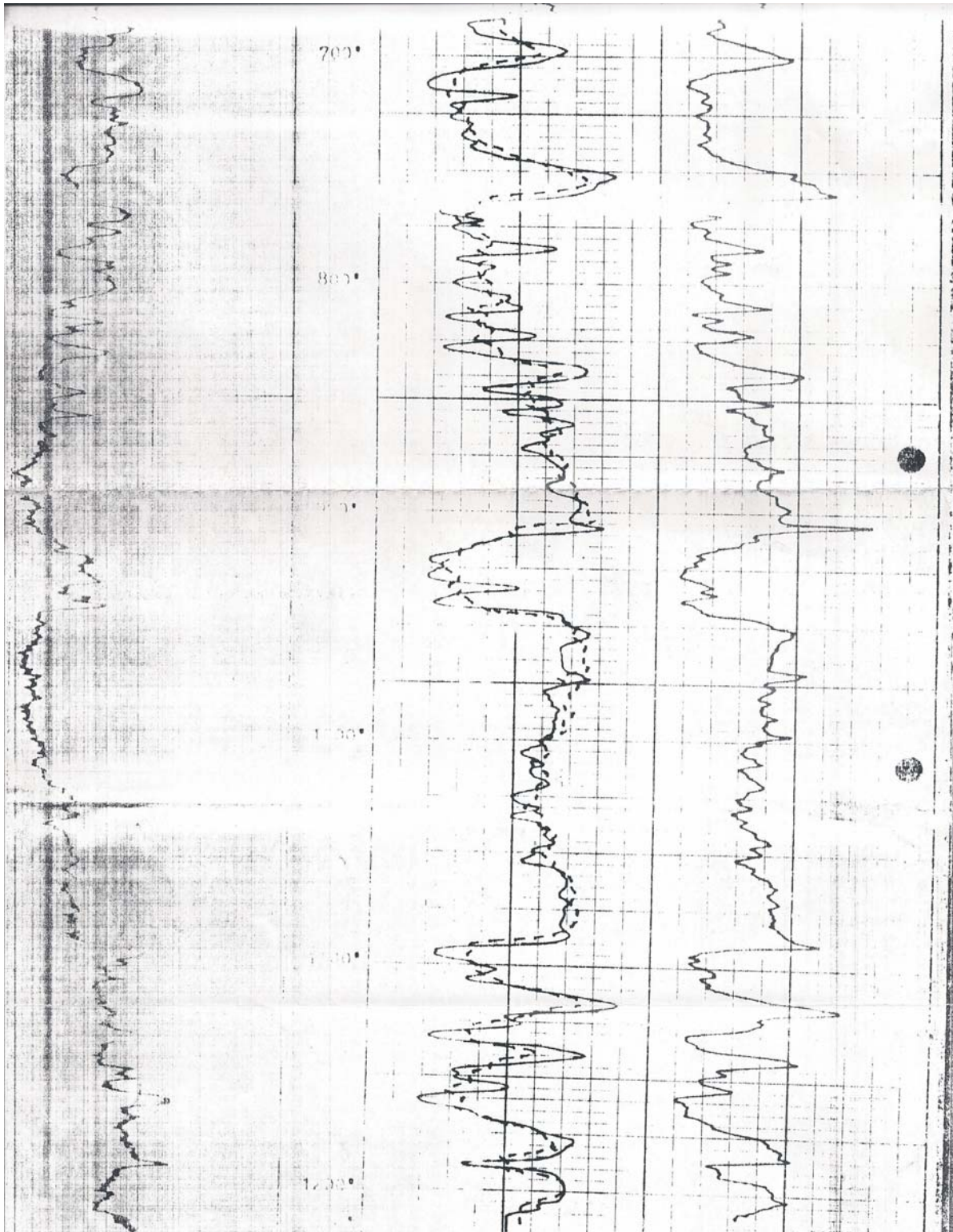
x 2" = 100'

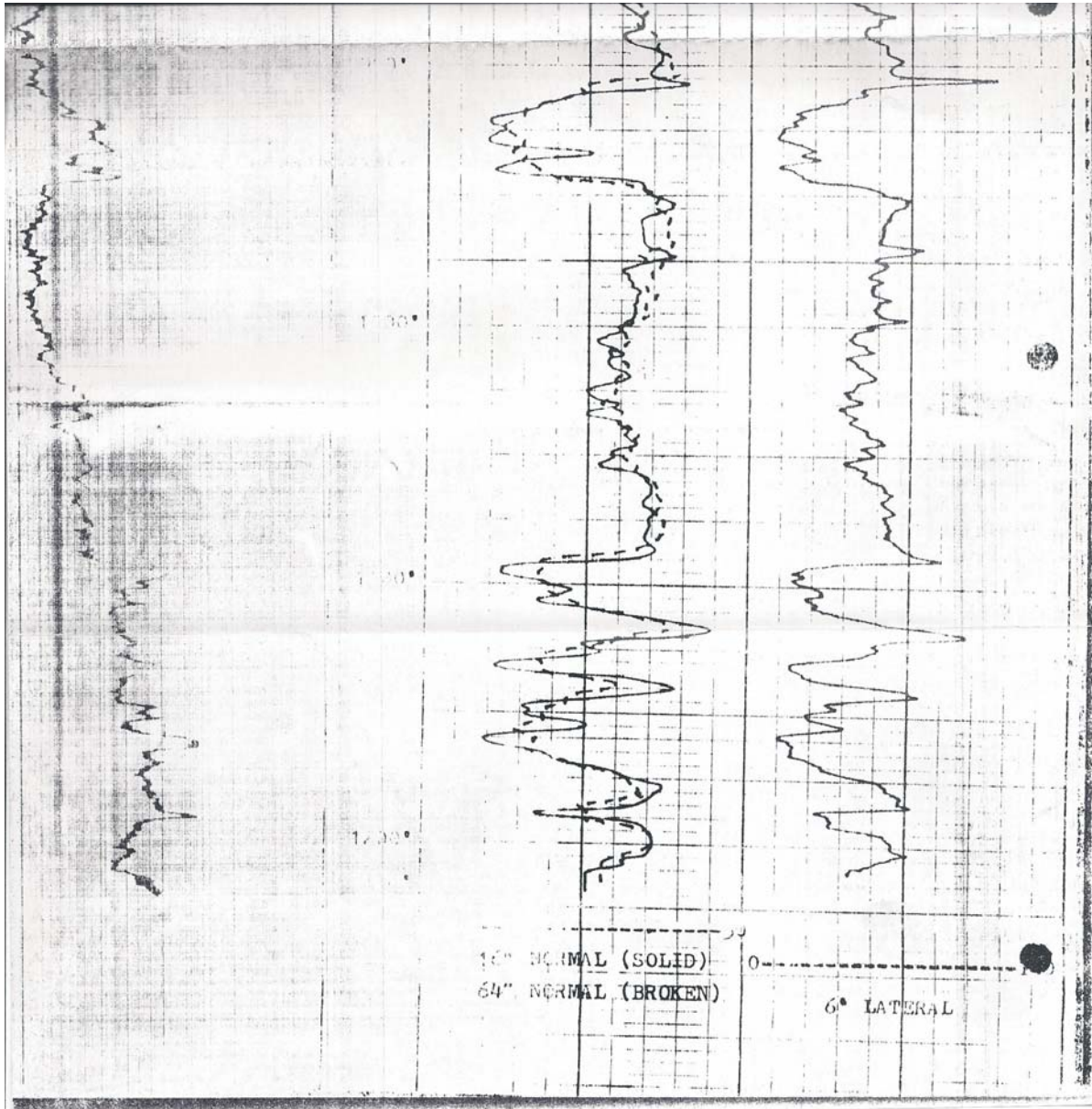
5" = 100'

10" = 100'









**ATTACHMENT B
VENTURA COUNTY NOISE ORDINANCE**

ORDINANCE NO. 4124

AN ORDINANCE OF THE BOARD OF SUPERVISORS
OF THE COUNTY OF VENTURA REGARDING LOUD
AND RAUCOUS NIGHTTIME NOISE IN RESIDENTIAL ZONES

The Board of Supervisors of the County of Ventura ordains as follows:

Section 1. Article 11 is hereby added to Chapter 2, Division 6 of the Ventura County Ordinance Code as follows:

ARTICLE 11

LOUD OR RAUCOUS NIGHTTIME NOISE IN RESIDENTIAL ZONES

Sec. 6299-1 - Loud or Raucous Noise Prohibition

No person shall create within any residential zone of the County of Ventura any loud or raucous noise which is audible to the human ear during the hours of 9 p.m. to 7 a.m. of the following day, at a distance of 50 feet from the property line of the noise source or 50 feet from any such noise source if the noise source is in a public right-of-way.

Sec. 6299-2 - Definitions

For purposes of this Article, the following definitions shall apply:

- a. "Person" means any individual, association, firm, organization, partnership, corporation or other entity, but does not include any government entity or public utility.
- b. "Residential Zone" means any areas within the unincorporated portion of Ventura County that are zoned:
 1. Single-Family Residential (R-1)
 2. Two-Family Residential (R-2)

3. Residential Planned Development (R-P-D)
4. Single Family Estate (R-O)
5. Rural Exclusive (R-E)
6. Coastal Single-Family Residential (C-R-1)
7. Coastal Two-Family Residential (C-R-2)
8. Coastal Residential Planned Development (C-R-P-D), or
9. Coastal Rural Exclusive (C-R-E),

as provided in Chapter 1 and Chapter 1.1 of Division 8 of this Code.

- c. "Loud or raucous noise" means sounds from: 1) the use or operation of any radio, musical instrument, phonograph, television receiver, video cassette recorder, or any machine or device for the production, reproduction or amplification of the human voice or any other sound or 2) the use or operation of any lawn mower, backpack blower, blower, lawn edger, riding tractor or other mechanical or electrical device or hand tool.

Sec. 6299-3 - Penalty

It is unlawful for any person in the unincorporated areas of Ventura County to do any of the acts prohibited by this Article. Any person who violates any of the provisions of this Article shall be guilty of a misdemeanor/infraction and, upon conviction thereof, shall be punished in accordance with Section 13-2 of the Ventura County Ordinance Code.

Sec. 6299-4 - Severability

If any provision or clause of the Article or the application thereof to any person or circumstance is held to be unconstitutional or otherwise invalid by a final judgment of

any court of competent jurisdiction, such invalidity shall not effect any other provisions, clauses or application, and to this end, the provisions and clauses of this Article are declared to be severable.

PASSED AND ADOPTED this 10th day of December, 1996, by the following vote:

AYES: SUPERVISORS Lacey, Kildee, Mi Kels,
Flynn and Schillo.

NOES: None.

ABSENT: None.

Frank Schillo
CHAIR, BOARD OF SUPERVISORS

ATTEST:

RICHARD D. DEAN, County Clerk,
County of Ventura, State of
California, and ex officio Clerk of
the Board of Supervisors thereof.

By Roberta Rodriguez
Deputy Clerk

