
SKYWAY WELL #14 CONSTRUCTION SPECIFICATIONS

Project No. C19WTSTSTH

BID SET

PREPARED FOR

FAIR OAKS WATER DISTRICT



PREPARED BY

KASL CONSULTING ENGINEERS, INC.

JANUARY 2020

FAIR OAKS WATER DISTRICT
10326 FAIR OAKS BLVD
FAIR OAKS, CA 95628

**PLANS AND SPECIFICATIONS FOR
SKYWAY WELL #14 CONSTRUCTION**

Project No. C19WTSTSTH

Certifications and Seals

These specifications and drawings contained herein have been prepared by or under the direction of the following California registered professionals:



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INVITATION TO BID
SKYWAY WELL #14 CONSTRUCTION

Sealed Bids for furnishing all plant, labor, equipment, materials and performing all work to construct one water supply well will be received and opened at the office of the **Fair Oaks Water District, 10326 Fair Oaks Boulevard, Fair Oaks, CA. 95628, Attn: Michael Nisenboym** (hereinafter called **District**), on February 26, 2020 at 2:00 p.m., local time.

The work includes drilling pilot hole up to 400 feet, geophysical logging, reaming the pilot borehole, geophysical logging, installing well casings and screens, placing filter pack and annular seal, developing the well and production testing of the well. The work will be monitored by the **DISTRICT's REPRESENTATIVE**, KASL Consulting Engineers, Inc.

A non-mandatory pre-bid site walk will be held on February 12, at 2:00 PM. Interested parties are encouraged to attend and shall first meet at the District's Office in Fair Oaks before proceeding to the Skyway Well site.

A set of Contract Documents may be viewed and purchased at <http://planroom.csdinc.com>. Under Public Jobs search "SKYWAY WELL #14 CONSTRUCTION". For additional information, contact the Planroom at Century Graphics of (CSDS) California Surveying and Drafting Supply (916) 344-0232. Only Complete sets of Contract Documents may be purchased. The Bidder's attention is directed to the Instruction to Bidders for complete instructions regarding submission of bid.

Board of Directors approval to award the bid will be March 8, 2020. Anticipating one month for completion of contractual documents, insurance, and other contractor submittals, the commencement of construction would likely be on or around April 13, 2020. The Work must be completed within 50 calendar days after the commencement date stated in the Notice to Proceed.

The **CONTRACTOR** shall have completed at least three projects within the last three years similar to the subject project and shall provide references to the **DISTRICT** upon request.

OWNER reserves its rights to waive any informality or deficiency in any Bid, to accept any Bid, to negotiate modifications of any Bid with any Bidder and accept any modified Bid, to reject any Bid, to reject all Bids, and to rebid the Project, all at the **OWNER's** sole discretion.

BID PROPOSAL

FROM: FAIR OAKS WATER DISTRICT

PROJECT NAME: SKYWAY WELL #14 CONSTRUCTION

PROJECT NO: C19WTSTSTH

1. Bids shall be completed on the attached Bid Schedule. All numbered bid items must be completed. Numbers shall be stated in figures and the form signed. Any corrections to entries made on bid forms shall be initialed by the person (s) signing the bid. Before submitting a bid, bidders shall carefully examine the project documents and inspect the site of the work, fully inform themselves as to all existing governmental agency conditions and limitations and shall include a total cost figure on the bid proposal form.
2. The undersigned, having familiarized himself/herself with the local conditions affecting the cost of the work, and with the Contract Documents, for the above named project, do hereby propose to perform everything required to be performed, and to provide and furnish all labor, materials (except water meters), tools, expendable equipment, and all utility and transportation services necessary to complete work in the above named project, all in accordance with the prepared drawings, bidding documents and specifications.
3. The undersigned agrees, if awarded the contract, to start work within 20 calendar days after issuance of Notice to Proceed, and to complete same, ready for substantial and unobstructed use by DISTRICT within 50 calendar days of issuance of Notice to Proceed.
4. In submitting this bid, it is understood that the right is reserved by the DISTRICT to reject any and all bids or any portion thereof. It is agreed that this bid may not be withdrawn for a period of forty-five (45) days from the opening thereof.
5. The undersigned firm/individual holds California State Construction License Number _____ and Worker's Compensation Policy Number _____ issued by _____
6. The undersigned acknowledges receipt of the contract documents for the project consisting of the Skyway Well #14 Construction Specifications dated January 2020, together with all attached documents. The undersigned acknowledges that addenda numbers ____ through _____ have been received and examined as part of the Contract Documents.
7. The undersigned understands that if awarded bid, invoices and payments shall be for actual quantities of material installed at unit cost for each bid item.

FIRM NAME: _____

ADDRESS: _____

CITY & STATE: _____

TELEPHONE NO.: _____

BY: _____ TITLE: _____
TYPE OR PRINT NAME OF PERSON SIGNING BID PROPOSAL

BY: _____ DATE: _____ 2005
SIGNATURE

BIDS ARE TO BE RETURNED NO LATER THAN FEBRUARY 20, 2020 AT FAIR OAKS WATER DISTRICT OFFICE. MARK THE PROJECT NAME ON THE BIDDING ENVELOPE SUBMIT BID TO MICHAEL NISENBOYM.

RETURN TO: FAIR OAKS WATER DISTRICT
10326 FAIR OAKS BOULEVARD
FAIR OAKS, CA 95628

BID PROPOSAL BREAKDOWN

Project No.: C19WTSTSTH

District: Fair Oaks Water District

Project Name: SKYWAY WELL #14 CONSTRUCTION

Owner Name: Fair Oaks Water District

THIS PROJECT BIDS ON: February 20, 2020 at 2:00 p.m.

NOTE: THE CONTRACTOR MAY SUBMIT A BID FOR EITHER OR BOTH OF THE FOLLOWING OPTIONS: 1) DIESEL OR GASOLINE OPERATED DRILL RIG OPTION: 2) ELECTRICALLY OPERATED DRILL RIG OPTION.

DIESEL OR GASOLINE OPERATED DRILL RIG OPTION

Item	Description	Unit	Qty.	Unit Price, \$	Total Price, \$
1	Mobilization and Demobilization	LS	1		
2	All-Weather Pad and Site Access	LS	1		
3	Noise Abatement (Sound Wall)	LF	300		
4	Furnish and Install 36-inch Conductor Casing (Including Sanitary Seal)	LF	75		
5	Drill 32-inch Borehole	LF	390		
6	Geophysical Logging	EA	1		
7	Caliper Survey	EA	1		
8	Borehole X-Y Geometry (Deviation) Survey	EA	1		
9	Furnish/Install 18-inch Stainless Steel Casing	LF	315		
10	Furnish/Install 18-inch Stainless Steel Wire Wrap Screen	LF	70		
11	Furnish/Install 3-inch Filter Feed Pipe	LF	250		
12	Furnish/Install 2-inch Stainless Steel Sounding Tube and termination Box	LF	290		
13	Furnish/Install Filter Pack (Gravel)	LF	145		
14	Furnish/Install Transition Sand	LF	5		

BID PROPOSAL BREAKDOWN (CONT'D)					
Item	Description	Unit	Qty.	Unit Price, \$	Total Price, \$
15	Furnish/Install Annular Seal	LF	240		
16	Well Development with Rig	Hour	40		
17	Install/ Remove Test Pump	LS	1		
18	Well Development with Test Pump	LS	1		
19	Step Drawdown Pump Test	HR	30		
20	Continuous Pump Test	HR	24		
21	Plumbness Test, Alignment Test, Video Log.	LS	1		
22	Disinfection	LS	1		
23	Mud/Cuttings Disposal	LS	1		

Subtotal Base Bid Proposal (Items 1- 23) _____

Contingency Bid Item (Diesel or Gasoline Operated Rig)

24	Standby Time	HR	EA		
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Alternative Bid Items (Diesel or Gasoline Operated Rig)

A-1	Furnish / Install Glass Bead Filter Pack (Replace Bid Item 13 if selected)	LF	145		
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BID PROPOSAL BREAKDOWN

ELECTRICALLY OPERATED DRILL RIG OPTION

Item	Description	Unit	Qty.	Unit Price, \$	Total Price, \$
1	Mobilization and Demobilization	LS	1		
2	All-Weather Pad and Site Access	LS	1		
3	Noise Abatement (Sound Wall)	LF	300		
4	Furnish and Install 36-inch Conductor Casing (Including Sanitary Seal)	LF	75		
5	Drill 32-inch Borehole	LF	390		
6	Geophysical Logging	EA	1		
7	Caliper Survey	EA	1		
8	Borehole X-Y Geometry (Deviation) Survey	EA	1		
9	Furnish/Install 18-inch Stainless Steel Casing	LF	315		
10	Furnish/Install 18-inch Stainless Steel Wire Wrap Screen	LF	70		
11	Furnish/Install 3-inch Filter Feed Pipe	LF	250		
12	Furnish/Install 2-inch Stainless Steel Sounding Tube and termination Box	LF	290		
13	Furnish/Install Filter Pack (Gravel)	LF	145		
14	Furnish/Install Transition Sand	LF	5		
15	Furnish/Install Annular Seal	LF	240		
16	Well Development with Rig	Hour	40		
17	Install/ Remove Test Pump	LS	1		
18	Well Development with Test Pump	LS	1		
19	Step Drawdown Pump Test	HR	30		

BID PROPOSAL BREAKDOWN (CONT'D)					
Item	Description	Unit	Qty.	Unit Price, \$	Total Price, \$
20	Continuous Pump Test	HR	24		
21	Plumbness Test, Alignment Test, Video Log.	LS	1		
22	Disinfection	LS	1		
23	Mud/Cuttings Disposal	LS	1		

Subtotal Base Bid Proposal (Items 1- 23) _____

Contingency Bid Item (Electrically Operated Rig)

24	Standby Time	HR	EA		
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Alternative Bid Items (Electrically Operated Rig)

A-1	Furnish / Install Glass Bead Filter Pack (Replace Bid Item 13 if selected)	LF	145		
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DESIGNATION OF SUBCONTRACTORS

The following are the names and locations of places of business of all subcontractors who will perform work or labor or render service to the bidder in or about the work, or improvement according to the specifications, in an amount in excess of one-half of one percent (0.5%) of the total bid.

PORTION OF WORK	SUBCONTRACTOR	PLACE OF BUSINESS

END OF SECTION

AGREEMENT

THIS AGREEMENT is dated as of the _____ day of _____ in the year 2020 by and between **FAIR OAKS WATER DISTRICT** (hereinafter called **DISTRICT**) and

_____ (hereinafter called **CONTRACTOR**), **DISTRICT** and **CONTRACTOR**, in consideration of the mutual covenants hereinafter set forth, agree as follows:

Article 1. WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

- Obtain all necessary permits
- Move on and off each site
- Install conductor casings
- Drill a 32-inch diameter borehole to 390 feet
- Construct 18-inch diameter production well.
- Develop the well
- Production test the well
- Complete geophysical logging
- Conduct Caliper Survey, X-Y Borehole Geometry Survey, Plumbness Test, Alignment Test

Article 2. CONTRACT TIME AND LIQUIDATED DAMAGES

2.1 The Work will be completed and ready for final payment within 50 calendar days from the commencement stated in the Notice to Proceed.

2.2 The Work will be considered completed upon completion of the aquifer testing.

The **DISTRICT** and the **CONTRACTOR** agree that as liquidated damages for delay (but not as a penalty), the **CONTRACTOR** shall pay the **DISTRICT** \$250 for each day that expires after the time specified above.

Article 3. CONTRACT PRICE

3.1 **DISTRICT** shall pay **CONTRACTOR** for completion of the Work in accordance with the Contract Documents in current funds as follows:

The unit price amounts as set forth in the Bid Schedule.

Article 4. PAYMENT PROCEDURES

CONTRACTOR shall submit applications for payment in accordance with the General Conditions. Applications for payment will be processed as provided in the General Conditions.

Article 5. CONTRACTOR'S REPRESENTATIONS

In order to induce **DISTRICT** to enter into this Agreement, **CONTRACTOR** makes the following representations:

5.1 **CONTRACTOR** has familiarized itself with the nature and extent of the Contract Documents, Contract Times, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or finishing of the Work.

5.2 **CONTRACTOR** familiarized itself with available lands, subsurface and physical conditions and associated responsibilities as described in the General Conditions.

5.3 **CONTRACTOR** has given **DISTRICT** written notice of all conflicts, errors or discrepancies that they have discovered in the Contract Documents and the written resolution thereof by **DISTRICT** is acceptable to **CONTRACTOR**.

Article 6. CONTRACT DOCUMENTS

The Contract Documents that comprise the entire agreement between **DISTRICT** and **CONTRACTOR** concerning the Work consist of the following:

6.1 This Agreement.

6.2 General Conditions.

6.3 Technical Specifications as listed in Table of Contents.

6.4 Four drawings as listed in Table of Contents.

6.5 Addenda numbers to , inclusive.

6.6 **CONTRACTOR**'s Bid.

6.7 Change Orders which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto:

There are no Contract Documents other than those listed above in this Article 6. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

Article 7. MISCELLANEOUS

7.1 Terms used in this Agreement that are defined in the General Conditions will have the meanings indicated in the General Conditions.

7.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

7.3 **DISTRICT** and **CONTRACTOR** each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

Article 8. OTHER PROVISIONS

8.1 Government Regulations

The following clauses, where applicable, are incorporated in this Agreement by reference:

Workers' Compensation: Contractor affirms that it is aware of the provisions of Section 3700 of the California Labor Code, which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and Contractor affirms that it will comply with such provisions before commencing the performance of the work under this Agreement and will make its contractors and subcontractors aware of this provision.

Americans with Disabilities Act: By signing this Agreement, Contractor assures that it complies with the Americans with Disabilities Act (ADA) of 1990, (42 U.S.C., 12101 *et seq.*), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA.

Nondiscrimination clause: During the performance of this Agreement, Contractor and its subcontractors shall not deny the Agreement's benefits to any person on the basis of religion, color, ethnic group identification, sex, age, physical handicap or mental disability, nor shall they discriminate unlawfully against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, mental disability, medical condition, marital status, age, or sex.

Contractor and its subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code, Section 12900 *et seq.*), the regulations promulgated there under (California Code of Regulations, Title 2, Section 7285.0 *et seq.*), the provisions of Article 9.5, Chapter 1, Part 1, Division 3, Title 2 of the Government Code (Government Code, Sections 11135-11139.5).

Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the Agreement.

- a. **Drug-Free Workplace Certification of Compliance:** By signing this Agreement, Contractor or its subcontractors hereby certify, under penalty of perjury under the laws of the State of California, compliance with the requirements of the Drug-Free Workplace Act of 1990 (Government Code 8350 *et seq.*), that they have received and read a copy of the District's Drug-Free Awareness Program, as required by Government Code Section 8355(b) and have or will provide a drug-free workplace by notifying employees and subcontractors that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees or subcontractors for violations, as required by Government Code Section 8355(a).

CONTRACTOR accepts this Agreement and will supply any information relating to Laws or Regulations relating to the above.

IN WITNESS WHEREOF, **DISTRICT** and **CONTRACTOR** have signed this Agreement in quadruplicate. Two counterparts each have been delivered to **DISTRICT**, and **CONTRACTOR**. All portions of the Contract Documents have been signed or identified by **DISTRICT** and **CONTRACTOR** on their behalf.

This Agreement will be effective on _____, 2020.

DISTRICT:

CONTRACTOR:

FAIR OAKS WATER DISTRICT

(signature)

(signature)

Print Tom Gray

Print _____

Title General Manager

Title _____

Witness: _____

Witness: _____

Address for giving notices

Address for giving notices

Michael Nisenboym, P.E.,
Operations Manager

Fair Oaks Water District

10326 Fair Oaks Boulevard

Fair Oaks, CA 95628

License No. _____

(If **CONTRACTOR** is a corporation, attach evidence of authority to sign.)

EXHIBIT "A"
GENERAL TERMS AND CONDITIONS

- a. **CONTRACT FORMATION:** Contractor's quotation or proposal is deemed a firm offer and the final signing of this contract by all parties constitutes invocation of all items within the contract and is legally binding.
- b. **SEVERABILITY:** The Contractor and the District agree that any provision of this contract that is found to be illegal or unenforceable, such term or provision shall be deemed stricken and the remainder of the contract shall remain in full force and effect. Either party having knowledge of such term or provision shall promptly inform the other of the presumed non-applicability of such provision.
- c. **TERMINATION:** Upon seven days written notice to Contractor, the District may, without cause and without prejudice terminate the Agreement.
- d. **AUTHORIZED PERSONNEL:** Contractor shall not accept direction or orders from any person other than the General Manager or the person(s) whose name(s) is listed as "other authorized representative(s)."
- e. **PERMITS:** Contractor will comply with local, state and federal regulations and statutes including Cal/OSHA requirements.
- f. **SCOPE OF WORK:** Any change in the scope of the services to be done, method of performance, nature of materials or price thereof, or to any other matter materially affecting the performance or nature of the services will not be paid for or accepted unless such change, addition or deletion be approved in advance, in writing by a supplemental agreement by the Fair Oaks Water District. Contractor's "authorized representative(s)" has (have) the authority to execute such written change for Contractor.

The Contractor shall furnish all labor, materials, equipment, tools, facilities and transportation necessary to construct the Skyway Well within the boundaries of the Fair Oaks Water District. Work must be performed and completed according to Professional Contractor Standards to the satisfaction of the District, and in the manner designated in, and in strict conformity with the Contract Documents.
- g. **RESPONSIBILITY FOR WORK:** Until the completion and final acceptance by the District of all the work under and implied by this Agreement, the work shall be under the Contractor's responsible care and charge. The Contractor shall rebuild, repair, restore and make good all injuries, damages, re-erectments, and repairs occasioned or rendered necessary by causes of any nature whatsoever.
- h. **EXTRA WORK:** The Contractor shall do no extra work except on the written authorization of the District. If the District does authorize extra work, the costs thereof will be added to the monthly invoice upon the completion of the extra work.
- i. **CONTRACT AMOUNT:** The District agrees to pay and the Contractor agrees to accept, in full payment for the above work, the sum computed in accordance with the actual amount of each item of work performed or material furnished and incorporated in the work, at the unit price which the Contractor bid for each such item in the Contractor's bid, said unit price to be determined as provided in the proposal.

j. **PROGRESS AND FINAL PAYMENTS:**

1. On a monthly basis, the Contractor shall present to the District a statement showing the amount of labor and materials incorporated in the work during the preceding month. The District personnel shall verify the statement. If accuracy of invoice is satisfactory, a payment will be made within 30 days in an amount equal to ninety percent (90%) of the value to date, based on the contract price, less any previous payments for all work performed and materials actually used by the Contractor during said period. The Contractor shall not be paid for any defective, unfinished, disputed, or improper work.
 2. The remaining ten percent (10%) of the value of the work completed under this contract, if unencumbered, shall be paid thirty-five (35) days after final completion and acceptance of work by the District. Acceptance by the Contractor of said final payment shall constitute a waiver of all claims against the District arising under the Contract Document.
 3. Pursuant to Part 5, Section 22300 of the Public Contract Code, the Contractor will be permitted to substitute securities for any money withheld by the District to ensure performance under this contract. At the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the District, or with a State or Federally chartered bank in California as the escrow agent, who shall pay such monies to the Contractor upon satisfactory completion of the Contract. At the direction of the District, the securities shall be returned to the Contractor.
 4. Alternately, the Contractor may request, and the District shall make payment of retentions earned directly to the escrow agent at the expense of the Contractor. At the expense of the Contractor, Contractor may direct the investment of the payments into the investments upon the same terms provided for in this section for securities deposited by the Contractor. Upon satisfactory completion of the contract, Contractor shall receive from the escrow agent all securities, interest, and payments received by the escrow agent from the District, pursuant to the terms of this section. The Contractor shall pay to each subcontractor, not later than twenty (20) days following receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each subcontractor, on the amount of retention withheld to insure the performance of the Contractor.
 5. Securities eligible for investment under this section shall include those listed in Section 16430 of the Government Code, or bank or savings and loan certificates of deposit.
 6. The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon.
 7. Any escrow agreement entered into pursuant to this provision shall be substantially in the form set forth in Section 22300 (e) of the California Public Contract Code.
- k. **RETENTION OF SUMS CHARGED AGAINST CONTRACTOR:** When, under the provisions of this contract, the District shall charge any sum of money against the Contractor, the District shall deduct and retain the amount of such charge from the amount of the next succeeding progress estimate, or from any other monies due or that may become due the Contractor from the District. If, on completion or termination of the Contract, sums due the Contractor are insufficient to pay the District's charges against the Contractor, the District shall have the right to recover the balance from the Contractor.

1. **NON WAIVER BY PAYMENT:** Payment to the Contractor or occupation of the project by the District shall not relieve the Contractor of liability for defective materials or quality of the work used in the completion of the project or for failure to construct the project according to specifications. Acceptance by the Contractor of any payment provided for in this contract shall be a representation by the Contractor to the District that all work performed before the payment became due has been completed by Contractor in accordance with the terms of the contract and according to the specifications.

- m. **WAGE RATES:** The Contractor acknowledges that the Contractor has examined the California State Prevailing Wage Determination made by the Director of the California Department of Industrial Relations and agrees to pay workers not less than the stipulated wage rates.

- n. **INDEMNIFICATION:** To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless and defend the District, its directors, officers, employees, or authorized volunteers, and each of them from and against:
 1. Any and all claims, demands, causes of action, damages, costs, expenses, losses or liabilities, in law or in equity, of every kind and nature whatsoever for, but not limited to, injury to or death of any person including the District and/or the Contractor, or any directors, officers, employees, or authorized volunteers of the District or the Contractor, and damages to or destruction of property of any person, including but not limited to, the District and/or the Contractor or their directors, officers, employees, or authorized volunteers, arising out of or in any manner directly or indirectly connected with the work to be performed under this agreement, however caused, regardless of any negligence of the District or its directors, officers, employees, or authorized volunteers, except the sole negligence or willful misconduct or gross negligence of the District or its directors, officers, employees, or authorized volunteers;
 2. Any and all actions, proceedings, damages, costs, expenses, penalties or liabilities, in law or equity, of every kind or nature whatsoever, arising out of, resulting from, or on account of the violation of any governmental law or regulation, compliance with which is the responsibility of Contractor;
 3. Any and all losses, expenses, damages (including damages to the work itself), attorneys' fees, and other costs, including all costs of defense, which any of them may incur with respect to the failure, neglect, or refusal of Contractor to faithfully perform the work and all of the Contractor's obligations under the contract. Such costs, expenses, and damages shall include all costs, including attorneys' fees, incurred by the indemnified parties in any lawsuit to which they are a party.
 4. The Contractor shall defend, at Contractor's own cost, expense and risk, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against the District or District's directors, officers, employees, or authorized volunteers.
 5. The Contractor shall pay and satisfy any judgment, award or decree that may be rendered against the District or its directors, officers, employees, or authorized volunteers, in any such suit, action or other legal proceeding.
 6. The Contractor shall reimburse the District or its directors, officers, employees, or authorized volunteers, for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided.

7. The Contractor agrees to carry insurance for this purpose as set out in the specifications. Contractor's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by the District, or its directors, officers, employees or authorized volunteers.
- o. **LAWS, REGULATIONS AND PERMITS:** The Contractor shall give all notices required by law and comply with all laws, ordinances, rules and regulations pertaining to the conduct of the work. The Contractor shall be liable for all violations of the law in connection with work furnished by the Contractor. If the Contractor observes that the drawings or specifications are at variance with any law or ordinance, rule or regulation, the Contractor shall promptly notify the District and the Engineer in writing and any necessary changes shall be made by written instruction or change order. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules or regulations and without giving notice to the District and the Engineer, the Contractor shall bear all costs arising there from.
- p. **SAFETY:** The Contractor shall execute and maintain the Contractor's work so as to avoid injury or damage to any person or property. The Contractor shall comply with the requirements of the specifications relating to safety measures applicable in particular operations or kinds of work.
1. In carrying out the contractual work, the Contractor shall at all times, exercise all necessary precautions for the safety of employees appropriate to the nature of the work and the conditions under which the work is to be performed, and be in compliance with all federal, state and local statutory and regulatory requirements including California Department of Industrial Relations (Cal/OSHA) regulations; and the U.S. Department of Transportation Omnibus Transportation Employee Testing Act (as applicable). Safety precautions as applicable shall include, but shall not be limited to, adequate life protection, and lifesaving equipment; adequate illumination for underground and night operations; instructions in accident prevention for all employees such as machinery guards, safe walkways, scaffolds, ladders, bridges, gang planks; confined space procedures; trenching and shoring; fall protection; and other safety devices, equipment and wearing apparel as are necessary or lawfully required to prevent accidents, injuries, or illnesses; and adequate facilities for the proper inspection and maintenance of all safety measures.
2. The Contractor shall be responsible for the safeguarding of all utilities. At least two working days before beginning work, the Contractor shall call the Underground Service Alert (USA) in order to determine the location of sub-structures. The Contractor shall immediately notify the District and the utility owner if the Contractor disturbs, disconnects, or damages any utility.
3. The names and telephone numbers of at least two medical doctors practicing in the vicinity and the telephone number of the local ambulance service shall be prominently displayed adjacent to telephones.
- q. **EVIDENCES OFINSURANCE:** Prior to execution of the contract, the Contractor shall file with the District a certificate of insurance {Acord Form 25-S or equivalent) signed by the insurer's representative. Such evidence shall include an original copy of the additional insured endorsement signed by the insurer's representative. Such evidence shall also include confirmation that coverage includes or has been modified to include Required Insurance Provisions 1-5.

The Contractor shall, upon demand of the District, deliver to the District such policy or policies of insurance and the receipts for payment of premiums thereon.

Contractor shall procure and maintain for the duration of the contract, and for 5 years thereafter, insurance against claims for injuries or death to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees, or subcontractors.

- r. **INSURANCE**: By his/her signature hereunder, Contractor certifies that he/she is aware of the provisions of Section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and that Contractor will comply with such provisions before commencing the performance of the services under this Agreement. Contractor and sub-contractors will keep workers' compensation insurance for their employees in effect during all work covered by this Agreement and shall file a certificate of insurance satisfactory to the Fair Oaks Water District evidencing professional liability coverage of not less than \$1,000,000 per claim and annual aggregate required by Labor Code Section 3700.

Contractor will file with the Fair Oaks Water District, before beginning construction, certificates of insurance satisfactory to the Fair Oaks Water District evidencing general liability coverage of not less than \$1,000,000 per occurrence (\$2,000,000 general and products-completed operations aggregate (if used)) for bodily injury, personal injury and property damage; auto liability of at least \$1,000,000 for bodily injury and property damage each accident limit; workers' compensation (statutory limits) and employer's liability (\$1,000,000) (if applicable); requiring 30 days (10 days for non-payment of premium) notice of cancellation to the Fair Oaks Water District. Any insurance, self- insurance or other coverage maintained by the Fair Oaks Water District, its directors, officers, employees, or authorized volunteers shall not contribute to it. The general liability coverage shall give the Fair Oaks Water District, its directors, officers, employees, or authorized volunteers insured status using ISO endorsement CG2010, CG2033, or equivalent. Coverage is to be placed with a carrier with an AM. Best rating of no less than A:VII, or equivalent, or as otherwise approved by the Member Water District. In the event that the Contractor employs other contractors (sub-contractors) as part of the work covered by this Agreement, it shall be the Contractor's responsibility to require and confirm that each sub-contractor meets the minimum insurance requirements specified above.

- s. **COMMERCIAL GENERAL LIABILITY AND AUTOMOBILE LIABILITY INSURANCE**: The Contractor shall provide and maintain the following commercial general liability and automobile liability insurance:

Coverage - Coverage for commercial general liability and automobile liability insurance shall be at least as broad as the following:

1. Insurance Services Office Commercial General Liability Coverage (Occurrence Form CG 0001)
2. Insurance Services Office Automobile Liability Coverage (Form CA 0001), covering Symbol (any auto)

Limits - The Contractor shall maintain limits no less than the following:

1. General Liability - One million dollars (\$1,000,000) per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit or products-completed operations aggregate limit is used, either the general aggregate limit shall apply separately to the project location (with the ISO CG 2503, or ISO CG 2504, or insurer's equivalent endorsement provided to the District) or the general aggregate limit and products-completed operations aggregate limit shall be twice the required occurrence limit.
2. Automobile Liability- One million dollars (\$1,000,000) for bodily injury and property damage for each accident.

- t. **REQUIRED INSURANCE PROVISIONS:** The general liability and automobile liability policies are to contain, or be endorsed to contain the following provisions:
1. The District, its directors, officers, employees, or authorized volunteers are to be given insured status (via ISO endorsement CG 20 10, CG 20 37, or insurer's equivalent for general liability coverage) as respects: liability arising out of activities performed by or on behalf of the Contractors; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor; or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the District, its directors, officers, employees, or authorized volunteers.
 2. For any claims related to this project, Contractor's insurance shall be primary insurance as respects to the District, its directors, officers, employees, or authorized volunteers. Any insurance, self-insurance, or other coverage maintained by the District, its directors, officers, employees, or authorized volunteers shall not contribute to it.
 3. Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the District, its directors, officers, employees, or authorized volunteers.
 4. Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.
 5. Each insurance policy required by this clause shall state or be endorsed to state that coverage shall not be canceled by either party, except after thirty (30) days (10 days for non-payment of premium) prior written notice by U.S. mail has been given to the District.
 6. Such liability insurance shall indemnify the Contractor and the sub-contractors against loss from liability imposed by law upon, or assumed under contract by, the Contractor or the sub-contractors for damages on account of such bodily injury (including death), property damage, personal injury and completed operations and products liability.
 7. The general liability policy shall cover bodily injury and property damage liability, owned and non-owned equipment, blanket contractual liability, completed operations liability, explosion, collapse, underground excavation and removal of lateral support.
 8. The automobile liability policy shall cover all owned, non-owned, and hired automobiles.
 9. Any deductible or self-insured retention must be declared to and approved by the District. At the option of the District, the insurer shall either reduce or eliminate such deductibles or self-insured retentions.
 10. All of the insurance shall be provided on policy forms and through companies satisfactory to the District. The insuring companies shall have a current A.M. Best rating of no less than A:VII or equivalent or as otherwise approved by the District.
 11. The Contractor and all subcontractors shall insure (or be a qualified self-insured) under the applicable laws relating to workers' compensation insurance, all of their employees working on or about the construction site, in accordance with the "Workers' Compensation and Insurance Act," Division IV of the Labor Code of the State of California and any Acts amendatory thereof. The Contractor shall provide employer's liability insurance in the amount of at least \$1,000,000 per accident for bodily injury and disease.

12. The Contractor shall provide and maintain builder's risk insurance (or installation floater) covering all risks of direct physical loss, damage or destruction to the work in the amount specified in the General Conditions, to insure against such losses until final acceptance of the work by the District. Such insurance shall include explosion, collapse, underground excavation and removal of lateral support. The District and the Engineer shall be a named insured on any such policy. The making of progress payments to the Contractor shall not be construed as creating an insurable interest by or for the District or be construed as relieving the Contractor or his/her subcontractors of responsibility for loss from any direct physical loss, damage or destruction occurring prior to final acceptance of the work by the District.
13. The insurer shall waive all rights of subrogation against the District, its directors, officers, employees, or authorized volunteers.
- u. **SUBCONTRACTORS:** In the event that the Contractor employs other contractors (sub-contractors) as part of the work covered by this agreement, it shall be the Contractor's responsibility to require and confirm that each subcontractor meets the minimum insurance requirements specified above.

If, at any time during the performance of this Contract, Contractor fails to maintain any item of the required insurance in full force and effect, Contractor shall immediately discontinue all work under the Contract and District will withhold all Contract payments due or that become due until notice is received by District that such insurance has been restored in full force and effect and that the premiums therefore have been paid for a period satisfactory to the District.

- v. **GUARANTEE:** Excepting only items of routine maintenance, ordinary wear and tear and unusual abuse or neglect, Contractor guarantees all work executed by the Contractor and all supplies, materials and devices of whatsoever nature incorporated in, or attached to the work, or otherwise delivered to the District as a part of the work pursuant to the Contract, to be absolutely free of all defects in the quality of work and materials for a period of one year after final acceptance by the District of work performed. The Contractor shall repair or replace any or all such work or material, together with all or any other work or material which may be displaced or damaged in so doing, that may prove defective in the quality of work or material within said one year guarantee period without expense or charge of any nature whatsoever to the District.

In the event that the Contractor shall fail to comply with the conditions of the foregoing guarantee within ten (10) days' time after being notified of the defect in writing, the District shall have the right, but shall not be obligated to repair or obtain the repair of the defect, and the Contractor, "actor shall pay to the District on demand all costs and expense of such repair. Notwithstanding anything herein to the contrary, in the event that any defect in the quality of work or material covered by the foregoing guarantee results in a condition which constitutes an immediate hazard to the health or safety, or any property interest, or any person, District shall have the right to immediately repair, or cause to be repaired, such defect, and the Contractor shall pay to District on demand all costs and expense of such repair. The foregoing statement relating to hazards to health, safety or property shall be deemed to include either temporary or permanent repairs, which may be required as determined in the sole discretion and judgment of District.

- w. **DISTRICTS RIGHT TO TERMINATE RIGHT TO PROCEED:** If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified in Contract, or any extension thereof, or fails to complete said work within such time, the District General Manager

may, by written notice to the Contractor, terminate his right to proceed with the work or such part of the work as to which there has been delay. In such event, the District may take over the work and prosecute the same to completion, by contract or otherwise, and the Contractor shall be liable to the District for any excess cost occasioned the District thereby, until such reasonable time as may be required for the final completion of the work.

- x. **ATTORNEYS' FEES:** Should any litigation be commenced between the parties to this agreement concerning the project, any provisions of this contract, or the rights and obligations of either in relation thereto, the party prevailing in the litigation shall be entitled to a reasonable sum as and for the party's attorneys' fees in the litigation.
- y. **ASSIGNMENT BY CONTRACTOR:** This contract is for the personal services of the Contractor in construction of the project and the Contractor may not assign this contract, or delegate Contractor's duties under this contract to any other person or entity without the written consent of District.
- z. **NOTICE:** Any written notice permitted or required under this agreement may be given or served either in person or by regular or certified mail. Such notice shall be effective upon receipt thereof by the party to whom it is addressed, whether it is personally delivered or sent by certified mail. Any such written notice delivered by regular or certified mail shall, if not actually received earlier, be deemed to have been effectively delivered at the expiration of 48 hours after deposit in the United States Mail. Such notice shall be delivered or sent to the address of the party concerned as shown below. Either party may change such address by giving written notice to the other party as provided below:

CONTRACTOR:

(Signature)

(Print)

(Title)

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that _____
_____, having an office at _____
_____ as Principal, hereinafter called **CONTRACTOR**, and _____
_____ having an office at _____
_____, as Surety, hereinafter
called Surety, are held and firmly bound unto the _____
_____ having an office at _____, as Oblige
e, hereinafter called **DISTRICT**, for the use and benefit of claimants as herein below defined, in the amount of _____),
for the payment whereof **CONTRACTOR** and Surety bind themselves, their heirs, executors, administrations,
successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, **CONTRACTOR** has by written agreement dated _____, 2020, entered into a Contract with the **DISTRICT** for the construction of the project titled Skyway Well #14, in accordance with the Project Manual prepared by KASL Engineering Consultants, Inc. which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, the condition of this obligation is such that, if **CONTRACTOR** shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the **DISTRICT**.

Whenever **CONTRACTOR** shall be and declared by **DISTRICT** to be in default under the Contract, the Surety shall promptly remedy the default. If the **DISTRICT** terminates the Contract for such default, the following precautions shall govern the liability of the **CONTRACTOR** and the Surety hereunder.

In the event of such termination, the **CONTRACTOR** and the Surety shall remain fully liable to the **DISTRICT** for the **CONTRACTOR'S** failure to timely complete the Contract, any additional costs incurred by the **DISTRICT** in completing the Contract, and liquidated damages from the originally scheduled completion date to the date of the actual completion of the work by the **DISTRICT**.

In the event of such termination, the Surety Company may elect to take over and complete performance of the Contract by giving written notice to the **DISTRICT** of such determination within seven (7) days of the **DISTRICT'S** mailing of notice of termination to the Surety and actually commencing completion with fourteen (14) days of the **DISTRICT'S** notice to the Surety. The Surety shall fully complete the work by the originally

scheduled date of completion and the CONTRACTOR and the Surety shall remain liable to the DISTRICT for all damages sustained by the DISTRICT and for liquidated damages for delay.

Any suit under this bond must be instituted before the expiration of one (1) year from the date on which final payment under the Contract falls due or before the expiration of two (2) years from the Date of Substantial Completion of the Project, whichever is later.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the DISTRICT named herein or the heirs, executors, administrators or successors of the DISTRICT.

Signed and sealed this _____ day of _____, 2020.

WITNESS:

CONTRACTOR (SEAL)

By _____

(Witness)

(Title)

WITNESS:

(Name of Surety) (SEAL)

By _____
(Attach Power of Attorney)

(Witness)

(Title)

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 **SUMMARY**

Section Includes: Description of bid items, measurement, and payment.

1.02 **MEASUREMENT AND PAYMENT**

All measurements will be based on completed work performed in strict accordance with the specifications. Payment will be made for bid items only. Bid item amounts shall include items such as site preparation, drilling, well construction, well development, materials, equipment and labor and all other materials, equipment and labor necessary to complete the Work. All quantities for materials placed in the well are measured from the ground surface.

1.03 **BID ITEM DESCRIPTION**

Bid Item No. 1 – Mobilization and Demobilization

Description: This item includes, but is not necessarily limited to, all work associated with the permitting, mud tank construction, site preparation and restoration per Section 01110, SUMMARY OF WORK. This work also includes planning for and adhering to Storm Water and Non-Storm Water Best Management Practices (BMPs).

Measurement: Shall be lump sum (LS) for the completed work described above, and shall not exceed 10% of the Total Base Bid.

Payment: Based upon the LS amount, 50% after Notice to Proceed, 45% upon beginning construction and 5% retention upon demobilization and completion.

Bid Item No. 2 – All-Weather Pad and Site Access

Description: This item includes, but is not necessarily limited to, all work to install an all-weather pad, including site access to District property, complete, in place, and protective of surface water discharges.

Measurement: Shall be LS for the completed work described above.

Payment: Based upon the LS amount.

Bid Item No. 3 – Noise Abatement (Sound Wall)

Description: This item includes the installation of the sound wall between the drill rig and the residents on the northerly, easterly, and southerly sides of the site, at a minimum per sound requirement in Section 02671 WATER WELL.

Measurement: Shall be based on lineal footage (LF) measured by the District's Representative.

Payment: Based upon the unit price/LF of sound wall and certified by the District's Representative.

Bid Item No. 4 – Furnish/Install 36-inch Conductor Casing (Including Sanitary Seal)

Description: This item includes the conductor borehole drilling, casing, and sanitary seal for one well comprised of 36-inch nominal diameter x 0.375-inch wall steel with sand cement grout sanitary seal per Section 02671, WATER WELL.

Measurement: Shall be based on LF measured by the District's Representative from ground surface.

Payment: Based on the unit price/LF of conductor borehole completed and certified in conformance by the District's Representative.

Bid Item No. 5 – Drill 32-inch Borehole

Description: This item includes, but is not necessarily limited to, all work associated with the drilling of the borehole per Section 02671, WATER WELL.

Measurement: Shall be based on LF measured by the District's Representative from ground surface.

Payment: Based on the unit price/LF of borehole completed and certified in conformance by the District's Representative.

Bid Item No. 6 – Geophysical Logging

Description: This item includes but is not necessarily limited to all work associated with the geophysical logging of the completed borehole, per Section 02671, WATER WELL.

Measurement: Shall be based on completion of the downhole logging performed as directed by the District's Representative for the borehole.

Payment: Based upon per log (EA) amount.

Bid Item No. 7 - Caliper Survey

Description: This item includes but is not necessarily limited to all work associated with the caliper survey of the completed borehole, per Section 02671, WATER WELL.

Measurement: Shall be based on completion of the downhole logging performed as directed by the District's Representative for the borehole.

Payment: Based upon per survey (EA) amount.

Bid Item No. 8 – X-Y Borehole Geometry (Deviation) Survey

Description: This item includes, but is not limited to, all work associated with an X-Y borehole geometry survey of the pilot borehole per Section 02671, WATER WELL.

Measurement: Shall be based on completion of the X-Y geometry survey performed as directed by the District's Representative for the pilot borehole.

Payment: Based upon the LS amount for the completed work.

Bid Items No. 9 - Furnish/Install 18-inch Stainless Steel Casing

Description: This item includes, but is not necessarily limited to, all work and material associated with the installation of stainless steel well casing, per Section 02671, WATER WELL.

Measurement: Shall be based on LF measured by the District's Representative from ground surface.

Payment: Based on the unit price/LF of casing installed and certified in conformance by the District's Representative.

Bid Item No. 10 - Furnish/Install 18-inch Stainless Steel Wire Wrap Screen

Description: This item includes, but is not necessarily limited to, all work and material associated with the installation of 18-inch stainless steel wire wrap well screen per Section 02671, WATER WELL.

Measurement: Shall be based on LF measured by the District's Representative.

Payment: Based on the unit price/LF installed and certified in conformance by the District's Representative.

Bid Item No. 11 - Furnish/Install 3-inch Filter Feed Pipe

Description: This item includes, but is not necessarily limited to, all work and material associated with the installation of a gravel pipe per section 02671, WATER WELL.

Measurement: Shall be based on LF measured by the District's Representative from ground surface.

Payment: Based on the unit price/LF installed and certified in conformance by the District's Representative.

Bid Item No. 12 - Furnish/Install 2-inch Stainless Steel Sounding Tube and Termination Box

Description: This item includes, but is not necessarily limited to, all work and material associated with the installation of sounding tube and termination box per Section 02671, WATER WELL.

Measurement: Shall be based on LF measured by the District's Representative from ground surface.

Payment: Based on the unit price/LF installed and certified in conformance by the District's Representative.

Bid Item No. 13 – Furnish/Install Filter Pack (Gravel)

Description: This item includes, but is not necessarily limited to, all work and material associated with the installation of gravel filter pack per Section 02671, WATER WELL.

Measurement: Shall be based on LF measured by the District's Representative from ground surface.

Payment: Based on the unit price/LF installed and certified in conformance by the District's Representative.

Bid Item No. 14 – Furnish/Install Transition Sand

Description: This item includes, but is not necessarily limited to, all work and material associated with the installation of transition sand per Section 02671, WATER WELL.

Measurement: Shall be based on LF measured by the District's Representative.

Payment: Based on the unit price/LF installed and certified in conformance by the District's Representative.

Bid Item No. 15 – Furnish/Install Annular Seal

Description: This item includes, but is not necessarily limited to, all work and material associated with the installation of sand cement grout slurry per Section 02671, WATER WELL.

Measurement: Shall be based on LF measured by the District's Representative from bottom of the annular seal to the ground surface.

Payment: Based on the unit price/LF installed and certified in conformance by the District's Representative.

Bid Item No. 16 – Well Development with Rig

Description: This item includes, but is not necessarily limited to, all work and material associated with swabbing, jetting, and airlift pumping the well per Section 02671, WATER WELL.

Measurement: Shall be based on the hours (HR) of development completed.

Payment: Based on the unit price/HR at well development work certified by the District's Representative.

Bid Item No. 17 – Install/Remove Test Pump

Description: This item includes, but is not necessarily limited to, all work and material associated with the installation of an engine-driven, deep well turbine pump and appurtenant equipment per Section 02671, WATER WELL.

Measurement: Shall be LS for the completed work described above.

Payment: Based upon the LS amount.

Bid Item No. 18 – Well Development with Test Pump

Description: This item includes, but is not necessarily limited to, all work associated with the well development work with the pump as described in Section 02671, WATER WELL.

Measurement: Shall be based on hours of development completed.

Payment: Based on the unit price/HR of well development work and certified in compliance by the District's Representative.

Bid Item No. 19 – Step Drawdown Pump Test

Description: This item includes, but is not necessarily limited to, all work associated with step drawdown pump testing per Section 02671, WATER WELL.

Measurement: Shall be based on hours of step drawdown pump testing performed as directed by the District's Representative.

Payment: Based on the unit price/HR of step drawdown pump testing completed and certified by the District's Representative.

Bid Item No. 20 – Continuous Pump Test

Description: This item includes, but is not necessarily limited to, all work associated with continuous pump testing per Section 02671, WATER WELL.

Measurement: Shall be based on hours of continuous pump testing performed as directed by District's Representative.

Payment: Based on the unit price/HR of continuous pump testing completed certified by the District's Representative.

Bid Item No. 21 – Plumbness Test, Alignment Test, and Video Log

Description: This item includes, but is not limited to, all work associated with plumbness test, alignment test and a video survey of the completed well, per Section 02671, WATER WELL.

Measurement: Shall be based on completion of the downhole plumbness test, alignment test, and video log, performed as directed by the District's Representative for the completed well.

Payment: Based upon the LS amount for the completed work.

Bid Item No. 22 – Disinfection

Description: This item includes, but is not necessarily limited to, all work associated with the disinfection work per Section 02671, WATER WELL.

Measurement: Shall be LS for the completed work described above.

Payment: Based on the LS amount certified by the District's Representative.

Bid Item No. 23 - Mud/Cuttings Disposal

Description: This item includes, but is not necessarily limited to, all work associated with the disposal of drilling fluids per Section 02671, WATER WELL.

Measurement: Shall be LS for the completed work described above.

Payment: Based upon the LS amount certified by the District's Representative.

CONTINGENCY BID ITEM

Bid Item No. 24 – Standby Time

Description: This item includes the hourly cost incurred by the Contractor (and Contractor's drill equipment) to standby as approved and as directed by the District's Representative.

Measurement: Shall be based on the time, in hours (HR), required by the Contractor to standby as directed by the District's Representative.

Payment: Based on the unit price / HR of standby time as certified by the District's Representative.

ALTERNATIVE BID ITEMS

Alternative Bid Item A-1: Furnish / Install Glass Bead Filter Pack; (Replaces Bid Item 13 if selected by the District).

Description: This item includes, but is not necessarily limited to, all work and material associated with the installation of glass beads filter pack per Section 02671, WATER WELL.

Measurement: Shall be based on LF measured by the District's Representative from ground surface.

Payment: Based on the unit price/LF installed and certified in conformance by the District's Representative.

****END OF SECTION****

SECTION 01110

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

- A. Scope of Work: This contract work includes the drilling, construction, and development of a production water well at the Skyway Well site in Fair Oaks, California.
- B. The work to be performed under this Contract shall consist of furnishing all tools, equipment, materials, supplies, and manufactured articles, and for furnishing all transportation and services, including fuel, power, water and essential communications, and for the performance of all labor, work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. Quality Assurance and referenced standards are detailed in each specification. The Contractor certifies that the Contractor is experienced and qualified to anticipate and meet the requirements of this Project.
- C. The work shall be complete and include all labor, materials, and services not expressly shown or called for in the Contract Documents which may be necessary for the complete and proper construction. Work in good faith shall be completed and performed, furnished, and installed by the Contractor as specified or shown, at no increase in cost to the District.
- D. Work sequence and items per Contract Documents: The work required for the construction of one water well will include, but not be limited to, the following items:
 - 1. Mobilize to, provide temporary facilities for, and demobilize from the well site.
 - 2. Drill a minimum 48-inch diameter borehole and install a 36-inch conductor casing to 75 feet and place sanitary sealing material as required in annulus.
 - 3. Drill a 32-inch diameter borehole the full depth of the well in two passes. Collect the drill cuttings at 10-foot intervals and when changes in sediment type are detected in the pilot hole.
 - 4. Perform a caliper survey of the final borehole.
 - 5. Perform X-Y borehole geometry (deviation) survey.
 - 6. Furnish and install 18-inch stainless steel casing as directed by the District's Representative.
 - 7. Furnish and install 18-inch stainless steel wire-wrapped well screens.

8. Furnish and install sounding tube and filter feed pipe to the depth specified in plans.
 9. Furnish and install filter pack in the annular space to depths as described in the specifications and drawings.
 10. Install annular seal, including separate transition sand section between the sand cement grout seal and filter pack.
 11. Furnish and install well development equipment.
 12. Develop the well using swabbing, jetting, and air-lift pumping.
 13. Furnish and install an electric driven, deep-well turbine test pump with 3,000 gpm capability.
 14. Develop well with test pump.
 15. Complete step drawdown pump testing and continuous pump testing.
 16. Perform tests for plumbness/alignment and video logs.
 17. Disinfect the completed well.
 18. Return site to pre-drilling conditions. Mud tanks emptied of drilling fluid and the fluid disposed according to local regulations and the tanks removed from the site. The site area must be cleaned up including repairing any onsite pavement damage and any pavement damage on Cedarvillage Drive or Skyway Drive.
- E. Site Location: Site consists of approximately (slightly less than) one (1) acre located at the southwest corner of the intersection of Cedarvillage Drive and Skyway Drive, in Fair Oaks, California.

1.02 PRECONSTRUCTION MEETING

The Contractor shall submit the following at or before the preconstruction meeting.

- A. Construction schedule consistent with the contract time of completion and anticipated sequence of work.
- B. Proposition 50 labor compliance methodology.
- C. Methods of access to the construction site.
- D. Noise abatement procedure; estimated decibel measurements to surrounding residences.

- E. District's Representative's approved drilling fluid program.
- F. Methods for disposal of mud from drilling and water from development.
- G. Methods of sample collection.
- H. Temporary facilities to be established.
- I. Drilling permits.
- J. Anticipated filter pack gradation documentation and sample of proposed product.
- K. Physical and chemical properties of products, casing, screens, and sealing material.
- L. A work schedule and hours of operation.
- M. Plan for storm water and non-storm water Best Management Practices (BMPs) for erosion and run-off control.

1.03 PERMITS

- A. The Contractor shall obtain all permits in accordance to the laws and regulations governing the work. Refer to the District's NPDES permit and waivers for discharge of development and testing water.

1.04 DRILLING FLUID, WATER DISPOSAL, AND DRAINAGE

- A. The effluent produced by the drilling, developing, and testing shall be discharged only as directed by the District's Representative and shall not be discharged into local drainage inlets or streets.
- B. Applicable County and State guidelines related to permitting the discharge of drilling muds and development water must be followed by the Contractor.

1.05 SITE ACCESS AND FENCING

The new well site is located on District property which includes an existing pump station and storage facility. The facilities are enclosed within an existing perimeter fence with a locked gate at the entrance on Skyway Drive. All work activities shall be confined within the fenced site. Because the site is located in a residential neighborhood, Contractor shall take additional precautions when traveling to and from the site.

1.06 SITE RESTORATION

Contractor shall restore site to original condition. Restoration activities shall include, but not necessarily be limited to, the following:

- A. The mud tanks used to circulate drill mud onsite shall be removed. Subsequent to removal, the site will be cleaned to the satisfaction of the District.
- B. Cuttings shall be removed from the site.
- C. Restore areas disturbed by drilling activities to pre-work conditions.
- D. Repair any damage to onsite pavements, curbs, landscaping and drainage facilities.
- E. Remove rubbish, unused materials, and other unlike materials belonging to Contractor or used under Contractor's direction during construction.

1.07 HEALTH AND SAFETY GUIDELINES

The Contractor shall comply with Safety and Health Regulation for Construction, promulgated by the Secretary of Labor under Section 107 of the Contract Work Hours and Safety Standard Acts as set forth in Title 29, Code of Federal Regulations (CFR). The Contractor shall also comply with the provisions of the Federal and State of California Occupational Safety and Health Act (OSHA).

****END OF SECTION****

SECTION 02671

WATER WELL

PART 1 - GENERAL

1.01 SCOPE

This Section includes construction of a water supply well, as shown on the plans and in accordance with these Specifications. Work shall conform to AWWA Standards for Water Wells, A100 (latest edition). In case of conflict between the requirements of this Section and those of the AWWA Standards, the requirements of this Section shall prevail.

District's Representative, as used in this Section, shall refer to either the District's Hydrogeologist or the District's Engineer, as appropriate.

The District's Representative will select screen locations, slot size and filter pack gradation to be used in the production well based upon the interpretation of the test well data provided by the District. These selections will not relieve the Contractor of guarantees of these Specifications. The Contractor will be given a seven (7) day period beginning after the District's Representative's selections to review the test boring logs and the District's Representative's selections. If the Contractor believes that this design impairs the Contractor's ability to achieve the required guarantees, the Contractor shall notify the District's Representative in writing within two (2) days. Notification shall include the Contractor's recommendations for a production well construction meeting these Specifications and the required guarantees, and shall include an estimate of well yield, type and grading of filter pack material, settings and size of the screen openings. The District's Representative reserves the right to accept or modify the production well design based upon review of the Contractor's recommendations.

General work required for the production well includes drilling and installation of casing and well screens, filter packing, sealing, developing, testing, disinfecting, and capping the well. The work shall include the construction of an all-weather drilling pad which will allow the drilling work to proceed during any type of weather conditions and, as referenced, must be protective of potential discharges to surface water. Cost for the drilling pad shall be bid as a separate line item and shall not be included in mobilization costs. The well shall have design capacities as specified in Paragraph 3.01, Production Well Construction.

1.02 PERSONNEL AND EQUIPMENT

The production well shall be constructed using the reverse circulation drilling method. Drilling equipment shall be in good condition and of sufficient equipment capacity to perform the work required by these Specifications. All drilling equipment, including mast and draw works, air compressors, drilling fluid pumps, drill pipe, etc., must be of the size, capacity, and condition to drill and set casing to the required depth. The Contractor shall

furnish documentation regarding capacity of various components of the drilling equipment. Rigs shall be equipped with a weight indicator. Drill rigs shall have the ability to lift and land anticipated casing loads without the use of float plugs or similar devices.

Contractor's equipment shall not exceed local standards and regulations for noise. To address noise concerns, the Project includes an option to drill, construct and develop the well using equipment powered by electric motors supplied by an on-site, intrinsically quiet, portable generator. This option does not require modification of any of the following Sections.

The Contractor shall employ competent workers for Project execution. The Contractor shall designate one person, who shall have full decision making authority, to be the Contractor's representative on the jobsite on a daily basis. This person shall serve as Drilling Superintendent and their phone number shall be given to the District's Representative for emergency notification.

1.03 PERFORMANCE OF WORK

Should a borehole be lost due to fault of the Contractor, that borehole shall be abandoned (per Paragraph 3.09 B, Abandonment of Hole) and another borehole constructed in the immediate area. New drilling sites shall be approved by the District's Representative prior to drill rig setup. Cost of extending substitute boreholes to the depth and status of the lost borehole will not be considered for payment.

1.04 PROTECTION OF WORK

The Contractor shall provide means of protecting the well bore and casing assemblies, when installed, from entrance of foreign objects.

1.05 PERMITS, CERTIFICATES, LAWS, AND ORDINANCES

The Contractor shall, as part of the Contractor's bid, procure all permits, certificates, and licenses required by law for execution of the work. Contractor shall comply with all State and local laws, ordinances, and rules and regulations relating to performance of work and shall file all reports as required by State and local agencies in connection with well drilling. A copy of all required reports or permits shall be submitted to the District's Representative.

1.06 DISPOSAL

The Contractor shall dispose all of cuttings, drilling fluid, and development water per Paragraph 3.10, Environmental Control. Trash and other unsuitable material resulting from the Contractor's operation shall be disposed of offsite at the Contractor's expense.

1.07 SUBMITTALS

The Contractor shall submit information to substantiate compliance with these Specifications. In addition the following specific information shall be required:

- A. Conductor casing, well casing, and well screen: materials, dimensions, details, appurtenances, and mill certificates.
- B. Filter Pack (supply descriptive literature, source, 3 lb sample, and sieve analysis of sample).
- C. Sealing material – composed of a transitional seal, bentonite and cement.
- D. Drilling fluid program (per Paragraph 2.02, Drilling Fluid Additives).
- E. Geophysical electric log format for reporting and results during well completion activities.
- F. Caliper log methodology and results during well completion activities.
- G. X-Y borehole geometry (deviation) survey, methodology and results.
- H. Test results for plumbness and alignment.
- I. Test pumping protocol.
- J. Procedures and equipment for well development.
- K. Water, cuttings, and drilling fluid disposal plan (per Paragraph 3.10, Environmental Control).
- L. Complete driller's log report.
- M. Noise control plan.
- N. Temporary facilities plan for all-weather pad and construction site access, storage, disposal, and security.
- O. Disinfection product and method of use for circulating water additive to be used during filter packing (per Paragraph 2.05, Filter Pack and Transition Sand).
- P. Storm water and non-storm water Best Management Practices (BMPs) plan.

PART 2 – PRODUCTS

2.01 GENERAL

Materials shall be furnished by an established, experienced manufacturer or supplier. Materials shall be new, of first-class ingredients, and guaranteed to perform required service. Use of rejected, substandard, or previously used materials will not be permitted.

All chemicals and products that will be added to or come in contact with drinking water shall be certified to meet NSF International (NSF) Standard 60 for direct additives or NSF Standard 61 for indirect additives

2.02 DRILLING FLUID PROGRAM

Drilling fluid shall comply with the drilling fluid program designed by a qualified drilling mud engineer for use in reverse circulation drilling. The program shall be approved by the District's Representative prior to commencement of drilling. Any additives not specified in the drilling fluid program may not be used. The program shall include specifications for fluid viscosity (as measured with a Marsh funnel), weight, solids content and wall-cake thickness. These shall be recorded every 50 feet of depth drilled or every two hours, whichever is more frequent.

2.03 CASING MATERIALS

A. Conductor Casing

Conductor (surface) casing shall be 36-inch nominal diameter, with a minimum wall thickness of 3/8 inch, fabricated from steel plate with welded collars, or approved equal. Steel plate shall meet requirements of ASTM A53. Casing materials shall be new.

B. Well Casing

Stainless Steel Well Casing shall be fabricated from Type 316 stainless steel, 18-inch I.D. and 5/16-inch wall thickness. Casing shall be as fabricated by the spiral process utilizing double, submerged arc-welding that meets the requirements of ASTM A 778.

If field assembled by welding, ends of casing sections shall be furnished with collars. Collars shall have the same thickness, physical and chemical properties as the casings. Collars shall be 5 inches minimum in width, rolled to fit the casing outside diameter, and welded to the casing sections. Inside edges of the collars shall be ground or sufficiently scarfed to remove sharp edges, burrs and welds. Male ends of the casing sections shall be ground to remove excess welding bead within 4 inches of the ends to permit the casing section to enter collars without binding. Four alignment holes shall be provided in each collar to insure proper matching of the casing sections.

End piece of casing assembly shall be suspended by a steel plate having a minimum thickness of 5/16-inch or landing clamps with a design capacity in excess of the weight of the casing string.

All welders shall be prequalified under the American Welding Society (AWS) Standard Qualification Procedure for the type of work being performed.

Casings stored at the jobsite shall be elevated and not in contact with the ground surface.

C. Stainless Steel Wire-Wrapped Well Screen

Well screen shall be fabricated from Type 316 stainless steel. The screen shall be shaped wire, continuous-slot design in order to provide maximum inlet area. It shall be fabricated by circumferentially wrapping a triangularly shaped wire around a circular array of internal rods. The wire configuration must produce inlet slots with sharp outer edges, widening inwardly so as to minimize clogging. For maximum collapse strength, each juncture between the horizontal wire and the vertical rods will be fusion welded under the screen body. In order to provide adequate collapse strength to assure safe installation and in order to provide adequate column and tensile strength, the tensile strength and collapse pressure of the screen shall be a minimum of one and one-half (1.5) times necessary for the design depth of the well. The Contractor shall submit calculations for collapse strength, percentage of open area, and inside diameter for approval by the District's Representative.

Screens shall be nominal 18-5/16 inch outside diameter. For bidding purposes screen aperture shall be 0.075 inch. The final design will be based on borehole geology and selected filter pack material.

Ends of sections shall be furnished with collars. Collars shall have the same thickness, physical and chemical properties as the casings. Collars shall be 5 inches minimum in width, rolled to fit the casing outside diameter, and welded to the casing sections. Inside edges of the collars shall be ground or scarfed to remove sharp edges, burrs and welds. Male ends of the casing sections shall be ground to remove excess welding bead within 4 inches of the ends to permit the casing section to enter collars without binding. Alignment holes shall be provided in each collar to insure proper matching of the sections.

Screens stored at the jobsite shall be elevated and not in contact with the ground surface.

D. Casing Alignment

Casing section ends shall be machined flat and perpendicular to the casing axis. Longitudinal welds shall be ground flush. Inside collar and outside of the casing sections shall be de-burred and fitted prior to assembly. Joints shall be not greater than 0.06 inch out of round and section ends shall not vary more than 0.015 inch from perpendicular to the casing.

2.04 SEALING MATERIAL

A. Surface Sanitary Seal, Annular Seal, and Intermediate Cement Seals

Sealing material shall conform to American Petroleum Institute (API) Class A cement. Cement seal shall be composed of sand cement grout slurry. Slurry shall be composed of not more than 2 parts by weight of sand to 1 part cement to 7 gallons of clean water per sack of Type I or Type II Portland cement (10.3 sack mix). The Contractor may use quick-setting cement, retardants to setting, and other additives including hydrated lime (up to 10% of the volume of the cement) to make the mix more fluid. Bentonite, at a rate not to exceed 5% of the cement volume, may be used to make the mix more fluid and reduce shrinkage.

2.05 FILTER PACK AND TRANSITION SAND

A. Natural Gravel Filter Pack Material

Gravel or coarse-grained sand for packing shall be hard, water worn, and washed clean of silt, fine sand, dirt, and foreign matter. Gravel shall be well-rounded and graded. Crushed gravel will not be accepted. The filter pack material shall meet the requirements of the AWWA A100 (latest edition) and B100 (latest edition). The District's Representative may adjust gravel gradation after examination of borehole grain size data obtained in drilling the production well.

Filter pack materials are anticipated to meet the following requirements, but are subject to analyses of borehole geology and grain size analyses:

Uniformity Coefficient	1.35 - 2.00
Minimum 90% Retained Size	0.180-inch
Minimum 80% Retained Size	0.120-inch

Allowable Gradation

Sieve Size	% Passing
4	90-100
6	75-85
8	55-65
10	25-35
12	10-20
14	5-10
16	0-5

Samples of filter pack materials to be used and their sieve analyses shall be submitted to the District's Representative for approval prior to placement. The District's Representative may elect to have a certified testing laboratory perform sieve analysis to verify conformance with approved sample gradation. Failure to meet gradation shall be grounds for rejection. Filter pack shall be kept free of all foreign matter. Per AWWA standard A100, all gravel-pack materials require disinfection with a minimum 50-mg/L free-chlorine strength solution of potable water during installation. Gravel shall be as produced by Lone Star, Silica Resources, or other approved sources. The completed well shall meet the turbidity criteria shown within. The anticipated filter pack size is 4x16.

B. Bid Alternate: Glass Bead Filter Pack Material

As a bid alternate to the Gravel Filter Pack Material specified above, the Contractor shall submit a bid for glass bead filter pack material. If selected, the glass bead filter pack shall be beads manufactured of soda lime glass 0.079 to 0.118 inches in diameter with a roundness coefficient greater than 0.93, hardness equal to or greater than 6 on the Moh hardness scale, and a uniformity coefficient of 1.1 to 1.45. Final filter pack shall be determined on the basis of size and gradation of formation samples obtained from the pilot hole.

C. Transition Sand

A transition sand will be placed between the gravel pack and cement seals. The transition sand will consist of a 30 mesh sand. Transition sand shall be kept free of all foreign matter. Sand shall be as produced by Lone Star, Silica Resources, or other approved sources.

2.06 SOUNDING TUBE

Sounding tube shall be 2-inch type 316 stainless steel in uniform or random lengths, with threads and couplings. Sounding tube shall include a threaded cap. The sounding tube will be threaded to a termination box, fabricated of stainless steel, that is welded to the well casing and forms the entry to the well casing.

2.07 FILTER FEED PIPE

Pipe shall be 3-inch standard wall black steel, Schedule 40, ASTM A53 pipe. Pipe shall be joined by welding or with threads and couplings, in uniform or random lengths. Pipe to include a threaded cap and centralizers.

2.08 WATER FOR DRILLING

The fire hydrant on Skyway Drive adjacent to the well site's driveway may be used for water during construction. The District will furnish the Contractor with a hydrant meter. Contractor will be assessed charges for the water used for drilling in accordance with current District's rates.

PART 3 – EXECUTION

3.01 PRODUCTION WELL CONSTRUCTION

The location of well screen and the type of filter pack are preliminary guidelines to assist Contractor in preparing a bid. Final dimensions and specifications shall be determined by the District's Representative following evaluation of pilot hole drilling and geophysical logging.

The Contractor shall construct and develop a filter packed water production well with general dimensions and characteristics as follows:

Item	Value
Design capacity, gpm	Approx. 2000
Conductor casing borehole diameter, in.	48
Conductor casing diameter, in.	36
Conductor casing length w/sanitary seal, ft.	75
Minimum borehole diameter, in.	32
Borehole depth, ft.	390
Blank casing diameter, in.	18
Blank casing length (total), ft.	315
Screen diameter, in.	18
Screen length (total), ft.	70
Casing and screen length (total), ft.	385
Annular seal, ft.	240
Average sand content (not to exceed), ppm	5
Turbidity (not to exceed), silica scale	5
X-Y borehole geometry survey	per Paragraph 3.02D
Plumbness and alignment	per Paragraph 3.06

The production well shall be constructed in the following manner and sequence:

A. Drilling Conductor Bore and Installing Conductor Casing

The borehole for the conductor casing shall be advanced by using a bucket auger or approved method. The borehole shall have a diameter of 48-inches, to a depth shown on the plans. The borehole may be advanced using one or more drilling passes; however, if a reaming operation is employed, a pilot bit shall be provided ahead of the reaming bit to assure hole straightness.

The Project is located in a residential neighborhood. To mitigate noise impacts, the Contractor may submit, as an alternative bid item, the cost for drilling the conductor

borehole using electrically powered drill equipment. The electric motor drill equipment shall be powered by an intrinsically quiet standby power generator.

The conductor casing shall be securely welded in accordance with AWS Standards. All peep holes or alignment holes shall be filled by welding. The casing shall be centered in borehole with guides consisting of four welding straps centered on the casing.

The first set of guides shall be placed 10 feet above the bottom of the casing string. Second (and third, if required) set of guides will be placed at 40 foot intervals above the first set of guides.

Cement grout (sealing material) shall be injected between casing and borehole by means of a tremie pipe. Grout shall extend throughout the bore. Cement grout material shall be placed by a positive displacement method using pumping equipment.

Grout tremie pipe may be slowly raised as grout is placed, but the discharge end must be submerged in the grout until grouting is completed. Grout tremie pipe shall be maintained full until completion of the grouting. No work shall be performed in the well for a minimum of 24 hours after completion of the grouting.

B. Drilling Production Borehole

The borehole shall be constructed using the fluid reverse-rotary drilling method.

The borehole shall be drilled in two passes. The first pass (or pilot hole drilling) shall be at a minimum diameter of 14 inches. Reaming of the pilot hole to the design diameter of 32 inches shall not be initiated until all materials are on site and have been approved by the District's Representative.

Drill pipe may be of the dual tube type or single wall with an internal air line.

Drilling fluid composition shall not vary from the program defined and approved in accordance with Paragraph 2.02, Drilling Fluid Program.

The Contractor shall be responsible for maintaining the fluid level in the borehole sufficiently in order to maintain bore integrity. Maintaining an adequate supply of water from the available water source to the drilling sump is the Contractor's responsibility.

Similar to the requirements included in Section 3.01A, above, the Contractor may submit, as an alternative bid item, the cost for drilling the production borehole using electrically powered drill equipment. The electric motor drill equipment shall be powered by an intrinsically quiet standby power generator.

C. Geophysical Logging

Upon the pilot hole reaching the target depth, borehole geophysical surveys shall be performed. Logs shall include natural gamma radiation; spontaneous potential; point, short- and long-normal guarded resistivity; and lateral resistivity.

The geophysical logging company shall use digital logging equipment recording both in real time and on analog paper during the actual logging. The digital information is to be stored on a CD in Log ASCII Standard (LAS) format. The API standards will be followed for calibration of equipment and report format headings including, but not limited to, proof of last equipment calibration date and applicable temperatures or other pertinent equipment and borehole data. Prior to logging, the logging Contractor must evaluate conditions of the borehole prior to implementing the logging survey.

The Contractor is responsible for the integrity of the borehole to assure that the geophysical logging can be successfully accomplished. The Contractor shall maintain circulation in the borehole with tools on the bottom of the hole until the logging equipment is on location and prepared to conduct the survey. The logging service company shall obtain a sample of the circulating fluid for calibration of the logs prior to the securing of the mud circulating pump. Tools shall then be pulled by the Contractor and the logging services immediately commenced. If the logging probe fails to descend to the desired depth, the Contractor, at the Contractor's expense, shall rerun the drilling tools to recondition the hole.

The logging company shall be approved in advance by the District's Representative.

D. X-Y Borehole Geometry (Deviation) Survey

The borehole plumbness from the bottom of the conductor casing to the bottom of the pilot borehole shall be surveyed by the geophysics firm retained by the Contractor. The plumbness of the borehole shall conform to the AWWA A-100 Standard which is two thirds (2/3) of the smallest inside diameter of that part of the borehole being tested per 100-feet of depth. The X-Y borehole geometry survey does not replace the final well plumbness and alignment tests to be completed following the construction of the well. It is understood that the final plumbness and alignment tests of the well may produce different results than the X-Y geometry survey results of the borehole.

Upon completion of the pilot hole the X-Y borehole geometry survey shall be conducted. The plumbness survey can be run going in the hole with stops to be determined by the District's Representative and the X-Y borehole geometry survey logged out from the bottom.

The log will be run in the presence of the District's Representative.

The Contractor shall provide immediately upon completion, three (3) field copies of the log and copy on a CD to the District's Representative for interpretation upon completion of

logging. The logging speed for all logs shall be 40 feet per minute unless otherwise approved by the District's Representative.

The District's Representative will evaluate the X-Y borehole geometry survey. If at any point the borehole that will be used to accept casing or screen designated for use as the pump chamber, the plumbness exceeds two thirds (2/3) the borehole diameter per 100 feet, the borehole is considered unacceptable for completion.

If the borehole is determined to be out of plumb by the District's Representative, the Contractor shall take necessary steps to straighten the borehole to achieve acceptable borehole geometry.

At the completion of straightening the hole, a second X-Y borehole geometry survey shall be conducted and the borehole evaluated again by the District Representative.

Borehole straightening shall be completed at no additional cost to the District and shall terminate when the borehole has been deemed either acceptable or permanently unacceptable to the District's Representative.

If, in the judgement of the District's Representative, and based on the geometry survey, a borehole is deemed permanently unacceptable, the Contractor shall be required to drill a replacement boring at a new location on the site. The Contractor shall bear all additional costs for the proper abandonment of the permanently unacceptable borehole and the drilling and resurveying of the new borehole.

E. Caliper Survey

When reaming of the borehole has reached the prescribed depth, the Contractor shall conduct a caliper survey to confirm final diameter of the entire well. The caliper survey will be used to verify the quantity of gravel required for production well construction. The District's Representative shall witness the logging and shall be given at least 24 hours prior written notice by the Contractor.

If a minimum filter pack thickness of 6 inches cannot be achieved throughout the intake or screened portions of the well, the borehole will be considered unacceptable. The Contractor shall re-ream the hole and conduct a second caliper survey at the Contractor's own expense. If the borehole remains unacceptable, the Contractor shall abandon the hole and re-drill the well at a new location. Costs for abandonment and new well construction shall be borne by the Contractor.

During caliper survey, the fluid level in the borehole shall be maintained to a level sufficient to ensure stability of the borehole. Assuming acceptable tests are achieved in the required caliper survey, the Contractor will not be required to return to bottom with the drilling tools if casing installation immediately follows.

Upon completion of the caliper survey, the Contractor shall deliver to the District's Representative one field copy of the results, which shall be capable of reproduction. Additionally, three final copies shall be provided within 14 calendar days of completion of borehole log.

F. Standby Time

The Contractor must be prepared to construct the production well as shown on the plans. However, if the District's Representative determines that the well will be completed in a manner that will cause the Contractor and equipment to standby, a determination of standby time, as approved by the District's Representative, will be allowed for payment on an hourly basis. The bid proposal submitted for standby time shall be considered a contingency bid item.

G. Installation of the Casing

The Contractor shall insure that all cuttings have been removed from the well. Upon completion of drilling operations, the borehole shall be prepared for casing installation.

To allow for successful filter packing operations, a tremie pipe having a minimum inside diameter of 2-7/8 inches, shall be run into the borehole to the proposed casing installation depth. The pump to be used for filter packing shall circulate water from the sump with the same viscosity as that in the borehole. Circulation shall begin thirty minutes prior to casing installation and continue during the installation.

With the tremie pipe remaining in the borehole, casing installation shall proceed in accordance with final design.

During installation, all field joints shall be fillet-welded in accordance with American Welding Society Standards, with a minimum of two passes per circumference. Welding rods shall be suitable grade for material being welded. All peep holes or alignment holes shall be filled by welding.

Centralizers, three per set, placed at 120° intervals, shall be attached directly to the casing by welding at not more than 80 foot spacing. Centralizers shall center and hold the casing in proper position until gravel is in place. Centralizers shall be of the same material used for casing.

The sounding tube shall be installed concurrently with the casing and secured to the casing by welding stainless-steel metal straps with spacers at the depth specified on the plans. One-half inch spacers between the sounding tube and well casing shall be used. The top of the sounding tube shall be located adjacent to the conductor casing and extend at least two feet above the ground and shall be fitted with a standard threaded caps. Connection and entrance from the sounding tube to the production casing shall be as shown in the plans.

Casing shall be suspended from the surface by means of an appropriate hanger or clamp. Float plugs to land and set casing will not be permitted. Casing shall terminate above the

bottom of the reamed hole without any contact with the bottom of the hole. This requirement will be confirmed by observation of the weight indicator showing weight suspended from the drill rig.

If the casing cannot be landed in the correct position or at a depth acceptable to the District's Representative, the Contractor shall remove the casing from the well and re-ream the well. Contractor shall not attempt to drive or "spud" the casing and screen assembly. If problems arise which prevent the Contractor from completing the well, it will be considered rejected.

A permanent filter feed pipe shall be installed separately after the casing and sounding tube have been landed in place. The filter pipe shall be installed to a depth as shown in the plans. The top of the filter feed pipe shall be provided with a standard threaded end screw cap as shown on the plans. Centralizers shall be used to address the 2-inch separation requirement between casings and the borehole to the depth of annular seal placement.

H. Filter Pack

1. Natural Gravel Pack

After the well casing has been installed in place in the well, the natural filter pack gravel (if selected), with disinfectant, shall then be placed in the well using procedures to minimize segregation and bridging of the gravel, all as herein specified.

The annular space between the well casing and the side wall of the borehole shall be filled to the depth shown on the plans with clean, washed, selected graded filter pack, designed to give a sand-free water from the well as herein specified. The filter pack shall be pumped in place using a suitable positive displacement pump.

Prior to placing filter pack in the well, a granular hypochlorite or similar disinfectant with 70% available chlorine content shall be added at the rate of 1/2 lb per cubic yard of filter pack material. If a lesser strength hypochlorite or other chlorine product is used, quantity shall be adjusted accordingly. Disinfectant content may be adjusted by the District's Representative to suit field conditions and filter packing method used by the Contractor.

Tremie pipe shall be removed in 20 foot sections as the filter pack reaches the bottom of the pipe.

The filter pack shall be placed from the bottom to the top with suitable precautions to avoid the possibility of the pack bridging or clogging at any point. The filter packing of the well shall be properly coordinated with the surging and cleaning of the well. Filter packing and sealing shall continue uninterrupted until the filter pack material is brought to the level shown on the plans.

The screen sections shall be gently swabbed to facilitate the settlement of the filter pack material. After swabbing, filter shall be added to bring the level of the filter back to the location shown on the plans.

A cement grout seal shall be placed from the top of the filter pack to the surface as shown on the plans. The cement seal shall be composed of a slurry of sand cement grout, as described in Paragraph 2.04, Sealing Material.

Cement grout shall be injected through a tremie pipe in the annular space between the casing and the borehole, from the bottom to the top of the specified interval, by a positive displacement method using pumping equipment. A seal shall be placed between the cement grout seal and the filter pack as shown on the plans.

The quantities of filter material placed in the annulus of the well shall not be less than the computed volume of the annulus as determined by the District's Representative. A quantity less than the computed value will be judged as an indication of voids, and corrective measures shall be taken by the Contractor. Significant differences between the estimated and final volume of filter material installed will be grounds for the rejection of the well by the District's Representative.

2. Alternative Bid Item: Glass Bead Filter Pack

Furnishing and installing of glass bead filter pack material is an alternative to the natural gravel pack material specified above. After the well casing has been installed in place in the well, the glass bead filter pack with disinfectant shall then be placed in the well using procedures described above for installation of the natural gravel pack, and as recommended by the glass bead manufacturer.

3.02 WELL DEVELOPMENT

A. Initial and Final Well Development

1. Initial Well Development.

Upon installation of the filter pack, a non-phosphate drilling-fluid dispersant such as NuWell shall be installed in the well throughout the entire screened interval. The volume of dispersant shall be consistent with the manufacture's recommendations. Following installation, development will be suspended for a period of 24 hours. The cement annular seal above the filter pack may be installed at this time.

Initial development will proceed using a dual packer development tool. The tool shall comprise two packers separated by 10 feet of perforated pipe and attached to the bottom end of the reverse rotary drill pipe string. Swabbing shall start at the top of the shallowest well screen, working progressively downward to the bottom of the well then back to the top of the uppermost screen. The well shall be alternately swabbed and air-lift pumped via reverse circulation throughout the entire screened interval for a minimum of 30 minutes per linear foot of screen.

2. Final Well Development

Upon completion of initial development the line-shaft turbine test pump shall be installed and the well surged and pumped until the well is fully developed. Development shall consist of swabbing, jetting, and airlift pumping the well following gravel packing; bailing of materials introduced into the casing during development; installation of an engine driven deep well turbine test pump; and pumping and surging of the well until fully developed.

The Contractor shall continue development of the well until the discharged water is clear of sand, silt, and mud and the following conditions have been met:

1. The final total quantity of filter material placed in the annulus shall be at least as great as the calculated volume of the annulus.
2. There shall be no further settlement of the filter envelope.
3. Sand production shall not be more than the value specified in Paragraph 3.11, Well Performance Guarantees.
4. Turbidity shall be less than the value specified in Paragraph 3.11, Well Performance Guarantees.
5. Specific capacity shall have reached the value specified in Paragraph 3.11, Well Performance Guarantees, and there shall be no significant increase in specific capacity during at least twelve continuous hours of pumping and surging.

B. Swabbing and Reverse Circulation Pumping for Wire Wrap Screen

The Contractor shall provide sufficient drill pipe and a dual-packer swab assembly designed for intake sections of the production well. Equipment shall be assembled to allow simultaneous pumping (by airlift methods) and swabbing. Pumping and swabbing, shall be accomplished between packers of the double rubber assembly previously used.

The swabbing and air-lift pumping tool shall be designed with packers spaced 10 feet apart and the intervening pipe perforated to permit passage of fluid and formation fines.

Jetting, swabbing, and pumping operations shall be alternately conducted over sections no longer than one length of drill pipe until that section of screen is fully developed. Jetting shall be performed uniformly for a minimum of 1-1/2 minutes per foot of screen being jetted, followed by airlift pumping for a minimum of 2 minutes per foot of screen. During pumping, the drill pipe shall be slowly moved, up and down, to achieve uniform pumping across the screen section.

Swabbing and airlift pumping shall begin at the screen top and progress downward until there is no return of sand, silt, or mud to the surface visible to the naked eye. This

procedure shall then be repeated from bottom of the lowest screen assembly to top of the uppermost screen.

C. Pumping and Surging

Upon completion of swabbing and airlift pumping operations, Contractor shall install a water-lubricated line-shaft turbine pump. The pump shall be equipped with an electric motor powered by an intrinsically quiet standby generator and the motor speed controlled by a variable speed drive. Foot valves installed on the pump or drivers with non-reverse ratchets installed will not be allowed. The electrical generator shall be equipped with a muffler that limits noise to levels allowed under local regulations. Contractor shall furnish and install necessary discharge piping to transport pumped water to an approved discharge location.

Contractor shall furnish necessary valves, flow meters, sand testing equipment, and other equipment required to accurately measure flow rate, water levels, sand production, and time of pumping. Installation of flow meters shall be as recommended by the manufacturer for this installation and shall provide reliable test information. In addition to any orifice or flow meter, the discharge assembly shall be equipped with a 3/4-inch female coupling for installation of a velocity probe by the District's Representative.

Water level measurements shall be made with an electric sounder or other equipment approved by the District's Representative.

Turbine pump used for development and testing shall be capable of producing 3,000 gpm from a pumping water level of approximately 175 feet below ground surface. The pump shall be installed with the intake placed at a depth of 185 feet below land surface. The electric motor and variable-speed controller shall have a minimum continuous horsepower rating required for continuous pumping at the maximum desired flow rate and pumping level.

Development pumping shall commence at a low flowrate. The well shall be frequently surged for development purposes. Flow rates shall be increased until the well achieves a minimum of 125% of the design flow rate or as directed by the District's Representative.

Development pumping shall continue for a minimum of eight hours and until the conditions in Paragraph 3.11, Well Performance Guarantees, have been met.

D. Records

Development records shall contain readings at half-hour maximum intervals showing production rate pumping level, drawdown, sand production, and all other pertinent information concerning well development.

E. Bailing

Contractor shall bail the well as needed to prevent accumulation of material above the lowest portion of the screen at all times and completely free of material prior to pumping and surging and after completion of test pumping.

3.03 COMPLETED WELL TEST PUMPING

The completed production well shall be tested to determine efficiency and aquifer characteristics. Testing shall consist of step-drawdown and constant-discharge tests.

Step test. The step test shall comprise four steps of one (1) hour duration each. The pumping rates for the steps are proposed at 1,000 gpm, 1,500 gpm, 2,000 gpm, and 2,500 gpm respectively. The District's Representative reserves the right to change the pumping rates for the test based on the results of well development. At the conclusion of the step test, water levels in the well will be permitted to recover overnight.

Constant-discharge test. The anticipated pumping rate for the 24-hour constant-discharge test is 2,000 gpm. Based on data obtained during well development and well pumping tests, but the District's Representative may change the rate on the basis of the results of the step-drawdown test. Upon completion of pumping, water levels in the well shall be permitted to recover for a period of 24 hours before test equipment can be removed from the well.

During each test, pump discharge rate shall be measured with an accurate ultrasonic flow meter with digital output or pipe weir and orifice, as approved by the District's Representative. Pump discharge shall be maintained during the test within $5\% \pm$ of the pumping rate through a combination of engine or motor speed and a valve. Prior to start of the first test, the pump shall be adjusted to each of the prescribed pumping rates to determine appropriate engine speeds (rpm) and discharge valve positions to facilitate pump adjustment. The pump should then be turned off and static, or non-pumping, level determined. Static water level shall be considered attained when three successive water level measurements, spaced ten minutes apart, show no appreciable rise in water level. A transducer and data logger, provided by the District's Representative, must be used to record the pumping water levels.

During pumping tests, depth to water level shall be measured and recorded at the following intervals (with start of test at $t=0$ minutes):

- a. Each minute, from $t=1$ min. to $t=12$ min.
- b. Each 2 minutes, from $t=12$ min. to $t=20$ min.
- c. Each 5 minutes, from $t=20$ min. to $t=50$ min.
- d. Each 10 minutes, from $t=50$ min. to $t=100$ min.
- e. At $t=120$ min., $t=150$ min., $t=180$ min., $t=240$ min., and $t=300$ min.
- f. Each 100 minutes after $t=300$ min.

During recovery tests, depth to water level shall be measured and recorded at the following intervals (with pumped being turned off at $t'=0$ minutes):

- a. Each minute, from $t'=1$ min. to $t'=12$ min.
- b. Each 2 minutes, from $t'=12$ min. to $t'=20$ min.
- c. Each 5 minutes, from $t'=20$ min. to $t'=50$ min.
- d. Each 10 minutes, from $t'=50$ min. to $t'=120$ min.

In case of pump failure for a period greater than 1% of elapsed pumping time from $t=0$ minutes, test shall be suspended until static water level has been attained. Should test be aborted as a result of a deficiency on the part of Contractor's equipment or personnel, time waiting for water level recovery and for rerunning pump test to the point where it was aborted shall be at no cost to the District.

Prior to completion of the pumping tests, the Contractor shall allow the District's Representative to obtain a water sample. The sample will be used for water quality testing as described in Paragraph 3.04 B, Water Analyses. The Contractor shall provide the District's Representative 24-hour notice to prepare for obtaining the water sample.

After test pumping has been completed, water level measurements shall be submitted to the District's Representative. Test pump shall not be removed from the well until the District's Representative has evaluated the data and authorized removal of the pump.

The Contractor shall maintain records of the pumping tests and furnish copies of all records to the District's Representative. Records shall also be available for inspection at any time during the test. Records shall also include physical data describing construction features such as well depth and diameter; complete screen description, length, and setting; a description of the measuring point and its measured height above land surface and/or mean sea level; and methods used in measuring water levels and pumping rates.

3.04 SAMPLING AND RECORDS

A. Logs and Samples

The Contractor shall furnish daily records or logs which will give depth, thickness, and nature of the strata penetrated, water level, and other information that may be requested by the State of California. Driller's report form shall be in the format required by the State of California.

The Contractor shall store samples of all strata penetrated in containers with the depth of strata and thickness noted on the containers as previously described. Samples shall be stored for a minimum of 20 days after submittal of the driller's report to the District's Representative for review. Following the minimum 20-day storage period and after acceptance of the well, at the written direction of the District's Representative, the samples shall either be delivered to the District's Representative or disposed of by the Contractor.

B. Water Analyses

The Contractor shall take precautionary measures at all times to prevent contamination of the well. Upon 24 hour advance notification from the Contractor, the District's Representative will collect the water samples and transport to a State of California certified laboratory to test the samples for the Title 22 Laboratory Analyses as required by the California Department of Public Health.

The District will be responsible for ordering and paying for the water quality tests. The Contractor will be responsible for pumping the water to the surface.

3.06 TESTS FOR PLUMBNESS AND ALIGNMENT

The completed well shall be tested for plumbness and alignment using a digital gyroscopic deviation survey. The logging firm shall provide station depth, inclination, azimuth, true vertical depth, departures and plane of closure calculations per methods approved by the American Petroleum Institute (API). Drift or deviation of the casing at each interval shall be calculated and plotted for each of the planes. Maximum allowable deviation (drift) per 100 foot section of the well shall not exceed two thirds of the smallest inside diameter of that part of the well being tested. The well shall be tested to a depth of 380 feet.

Should the well vary from the vertical in excess of that amount, the District's Representative shall have the option of having the Contractor correct the plumbness of the well or negotiating an adjustment of payment to the Contractor. Records of deflection readings and all other pertinent information shall be kept as part of the permanent well log and record.

The Contractor shall guarantee that the well, when completed, shall be sufficiently aligned and plumb for the free installation and operation of a pump. A well which fails to meet requirements for alignment or plumbness as specified herein will, at the District's Representative's option, be rejected or considered as having lesser value than a well meeting requirements for plumbness and alignment. In the latter case, the effective diameter of the well will be calculated in accordance with Section C.6 of AWWA A100 (latest edition) to determine its usefulness and an appropriate reduction of payment will be negotiated.

Cost of alignment and plumbness tests shall be included in the Contractor's bid. These tests are not considered part of developing and testing time.

3.07 VIDEO LOG

After final cleanup of the well, and before welding a plate on the top of the casing, the Contractor shall conduct a television inspection of the entire casing and screen assembly. The record of survey shall be recorded on DVD or other format approved by District's

Representative. The survey shall be delivered to the District's Representative for review and storage.

A footage counter accurate to within two feet \pm in 1,000 feet shall be used to indicate on the monitor and video tape distance traveled. Also displayed on the monitor shall be date of inspection and a continuous forward and reverse readout of camera distance from the top of casing.

During inspection, the monitoring technician shall, in addition to audio and video record of conditions, log in writing the location of any defective joints, indication of leaks, cracks, collapsed sections, deposits, and other conditions or data pertinent to the physical condition of the well. Conditions and defects shall be located by footage counter and video clock reference.

3.08 DISINFECTION OF COMPLETED WELL

Well disinfection shall be in accordance with AWWA A100 (latest edition). In the event of conflict between this Section and the AWWA Standards, the requirements of this Section shall prevail.

The Contractor shall disinfect the well as soon as development procedures have been completed. The Contractor shall clean the jobsite immediately preceding disinfection where evidence indicates that construction and development work have not adequately cleaned the well. All oil, grease, soil, and other materials, which could harbor and protect bacteria from disinfectants, shall be removed from the well. Unless prior approval is obtained from District's Representative for employing chemicals or other cleaning method, cleaning shall be by pumping and swabbing. Where test pumping equipment is to be utilized, such equipment shall be installed prior to or during disinfection and shall be thoroughly hosed, scrubbed, or otherwise cleaned of foreign material prior to installation. The Contractor is responsible for removing or mitigating the effects of all materials introduced into the well during the control of the site.

The chlorine solution used for disinfecting well shall be of such volume, strength, and application that a concentration of at least 100 ppm of chlorine is obtained in all parts of the well water; however, not less than 15 lbs. of 70% HTH, or its equivalent, shall be used. The chlorine solution shall be added while the test pump is still in place and the well surged to help distribute the chlorine solution into the well and surrounding strata. The chlorine solution shall remain in the well for at least four (4) hours.

3.09 COMPLETION AND CLEANUP

A. Capping Well

Except when drilling is in progress, the well shall be kept covered or capped in such a manner as to prevent either tampering with the well or entrance of foreign matter.

Upon completion of all work in connection with development and test pumping, the well shall be capped with a ½-inch steel plate welded full circumference over the well casing. Temporary capping shall be provided whenever the well casing is otherwise exposed prior to completion of the work. Capping shall meet requirements of the State of California, Department of Industrial Safety, and the Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor, and as directed by the District's Representative.

B. Abandonment of Hole

If the Contractor abandons a hole because of loss of tools or other causes which are the Contractor's responsibility, and that prevents completion of a well as specified, the hole shall be completely filled with clay or clay and concrete and the casing removed to a depth of at least 8 feet below ground surface. Abandoned well shall be treated in accordance with California Well Standards (Bulletin 74-90) and local ordinances. Sealing of the hole shall comply with all regulations or requirements of agencies with jurisdiction in this matter.

C. Cleanup

Following completion of work, the Contractor shall remove from jobsite all excess materials, tools, and equipment, and shall legally dispose of all debris resulting from the work.

3.10 ENVIRONMENTAL CONTROL

A. Drilling Fluid Containment

Drilling fluids shall be completely contained in watertight portable basins. Cuttings shall be removed regularly to assure that the fluid volume is sufficient for settling cuttings out of solution.

The drilling fluid shall become the property of the Contractor, and shall be legally disposed of offsite at the Contractor's expense. The Contractor is responsible for obtaining all necessary easements, rights, and permits pertaining to such disposal.

The drilling fluid tank(s) shall have a volume of at least three times greater than the final well bore volume. The fluid tank(s) shall be located within the area outlined and labeled "Limits of Construction" on the plans.

B. Disposal of Development Water

The Contractor shall submit a water disposal plan for the District Representative's approval seven (7) calendar days prior to initiation of development pumping. Water, including mud, sand, and debris pumped from the well during development and testing, shall be disposed of in such a manner as not to damage or interfere with work or property of others.

Prior to discharge into drainage facilities, a temporary settling basin shall be provided that eliminates discharge of mud and/or sediment. Settling basins shall consist of a portable tank. Basins shall have a minimum 60-minute detention time at the design flowrate.

Provisions for energy dissipation of the pumped water shall be employed prior to entering the basins to assure quiescent settling conditions in the basins. Baffles or multiple cells in portable sumps may accomplish this function. Removal of settling basins and sediment shall be accomplished after well development by the Contractor.

The Contractor shall conform to all waste discharge requirements imposed on the District by the California Regional Water Quality Control Board and other governing agencies. All actions necessary to conform to these requirements shall be performed by the Contractor as part of this contract.

C. Cuttings and Drilling Fluid Disposal

All fluids and cuttings shall be removed from the site and legally disposed of at the Contractor's expense.

D. Spillage during Hauling

Spillage resulting from hauling operations along or across any public traveled way (pedestrian or vehicular) shall be removed immediately at the Contractor's expense.

E. Sound Control Requirements

The Contractor shall comply with all local sound control and noise level rules, regulations, and ordinances which apply to any work performed pursuant to the Contract.

Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the Project without said muffler.

The Contractor shall submit a plan for abatement of excessive noise at the well site during drilling operations. Noise level shall be sixty-five decibel maximum at the property line of the nearest homes.

To meet the noise level requirements, a sound wall shall be erected.

F. Storm Water and Non-Storm Water Best Management Practices

In order to protect surface water quality, the Contractor shall implement BMPs as shown on Sheet G4.0 of the Project Plans. Standard erosion and sediment control BMPs are detailed and shall be incorporated into the work to reduce storm water and non-storm water impacts to surface water quality.

3.11 WELL PERFORMANCE GUARANTEES

A. Specific Capacity Guarantee

From analysis of the step and constant flow pumping tests of the well, the District's Representative will determine the 24-hour step and constant flow specific capacity of the well in gallons per minute per foot of drawdown and the transmissivity of the aquifer(s). The methods used by the District's Representative for determining the specific capacity and the transmissivity shall be methods normally used by professional groundwater hydrogeologists; but the specific methods, details of tests, and calculations shall be at the District Representative's option. The specific capacity will be determined for design capacity noted in Paragraph 3.01, Production Well Construction. If the District's Representative determines that the 24-hour specific capacity of the well at the selected pumping rate is not equal to or greater than 0.0004 times the transmissivity in gallons per day per foot, the Contractor shall resume development operations to improve the well specific capacity until it reaches or exceeds 0.0004 times the transmissivity. Well losses calculated from the step tests will be used to establish the well efficiency and verify the transmissivity assessment and need for redevelopment. The well efficiency should be greater than 75%.

All additional pumping tests required to check the well performance shall be at the Contractor's own expense, with no cost to the District. Failure of the Contractor to construct the well as specified so it will meet these guarantees shall be grounds for rejection of the well.

A well which fails to meet requirements for specific capacity as specified herein will, at the District Representative's option, be rejected or considered as having lesser value than a well meeting requirements for specific capacity. In the latter case, the specific capacity of the well will be used to determine its safe design yield; and an appropriate reduction of payment will be negotiated.

B. Sand Content Guarantee

Rossum Centrifugal Sand Sampler (see Journal of the American Water Works Association, Volume 46, No. 2, February, 1954) shall be used for sand testing. Test shall be witnessed by the District's Representative upon notification by the Contractor, after completion of well development by pumping.

Sand content testing shall be conducted during a short constant rate discharge at the well design capacity. Sand content shall be determined by averaging results of samples collected at 12, 13, 14, and 15 minutes after start of the pumping test. Average sand production shall be 5 parts per million or less. Pumping rate during sand content testing shall be at the design rate of the well or at a lower rate selected by the District's Representative.

If the average sand content exceeds 5 parts per million, the Contractor shall do necessary redevelopment work and repumping of the well until sand content is less than 5 parts per million. It is the Contractor's responsibility to meet this sand content requirement at the conclusion of development pumping. If the Contractor fails to meet these requirements after 48 hours of development pumping, the Contractor shall continue to redevelop the well until the desired sand content is achieved.

A well which fails to meet requirements for sand content as specified herein will, at the District's Representative's option, be rejected or considered as having lesser value than a well meeting requirements for sand content. In the latter case, the production rate at which the well meets the sand content requirement will be determined by test pumping; and an appropriate reduction of payment will be negotiated.

All additional pumping tests required to check the well performance shall be at the Contractor's own expense, with no cost to the District.

C. Turbidity Guarantee

Turbidity shall be less than five of the silica scale described in "Standard Methods for Examination of Water and Wastewater" (latest edition).

If the turbidity exceeds the specified value, the Contractor shall undertake necessary redevelopment work and repumping of the well until turbidity is less than specified value. It is the Contractor's responsibility to meet this turbidity requirement at the conclusion of development pumping. If the Contractor fails to meet these requirements after 24 hours of development pumping, the Contractor shall continue to redevelop the well until the desired turbidity level is achieved.

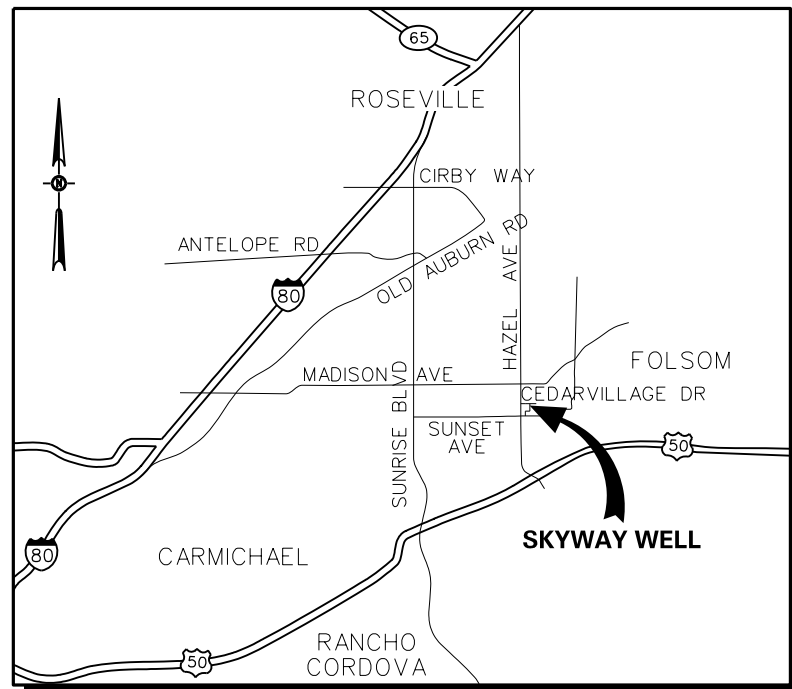
A well which, following redevelopment, fails to meet requirements for turbidity as specified herein will, at the District Representative's option, be rejected or considered as having lesser value than a well meeting requirements for turbidity. In the latter case, the production rate at which the well meets the turbidity requirements will be determined by test pumping; and an appropriate reduction of payment will be negotiated.

All additional pumping tests required to check the well performance shall be at the Contractor's own expense, with no cost to the District.

****END OF SECTION****

**FAIR OAKS WATER DISTRICT
FAIR OAKS, CALIFORNIA**

SKYWAY WELL
PROJECT: C19WTSTSTH
SACRAMENTO COUNTY, CALIFORNIA
PLANS FOR PRODUCTION WELL
DRILLING, DEVELOPMENT AND TESTING



GENERAL NOTES

1. THE CONTRACTOR SHALL NOTIFY THE FAIR OAKS WATER (DISTRICT) IMMEDIATELY REGARDING ANY DISCREPANCIES OR AMBIGUITIES WHICH MAY EXIST IN THE PLANS OR SPECIFICATION. THE DISTRICTS INTERPRETATION OR CORRECTION THEREOF SHALL BE CONCLUSIVE.
2. WHERE THE PLANS OR SPECIFICATIONS DESCRIBE PORTIONS OF THE WORK IN GENERAL TERMS BUT NOT IN COMPLETE DETAIL, IT IS UNDERSTOOD THAT ONLY THE BEST GENERAL PRACTICE IS TO PREVAIL AND THAT ONLY MATERIALS AND WORKMANSHIP OF THE FIRST QUALITY ARE TO BE USED.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND LICENSES AND PAYING ALL ASSOCIATED PROJECT FEES REQUIRED FOR THE CONSTRUCTION AND COMPLETION OF THE PROJECT.
4. THE CONTRACTOR SHALL EXERCISE DUE CAUTION AND SHALL CAREFULLY PRESERVE BENCH MARKS, SURVEY REFERENCE POINTS, AND SHALL BEAR ALL EXPENSES FOR REPLACEMENT.
5. PRIOR TO COMMENCING WORK, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD LOCATE ALL AFFECTED UNDERGROUND UTILITIES MAIN AND SERVICE LINES. THE CONTRACTOR SHALL NOTIFY THE MEMBERS OF THE UNDERGROUND SERVICE ALERT (U.S.A.) 48 HOURS IN ADVANCE OF PERFORMING EXCAVATION WORK BY CALLING THE TOLL-FREE NUMBER (800) 227-2600.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING IMPROVEMENTS FROM DAMAGE. THE COST OF REPLACING EXISTING IMPROVEMENTS SHALL BE INCLUDED IN THE CONTRACT BID PRICES.
7. CONTRACTOR AGREES THAT IT SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE DISTRICT AND DESIGN ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT.
8. APPROPRIATE DUST CONTROL SHALL BE PROVIDED, AT THE CONTRACTOR'S EXPENSE, TO MINIMIZE ANY DUST NUISANCE.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING BEST MANAGEMENT PRACTICES (BMPs) WITH REGARD TO STORM WATER AND NON-STORM WATER MANAGEMENT.
10. ROUTE TO SITE SHALL BE FROM HAZEL AVENUE, CEDARVILLAGE DRIVE EAST, SOUTH ON SKYWAY DRIVE

SHEET INDEX

SHEET	TITLE
G1.0	TITLE SHEET
G2.0	SITE PLAN
G3.0	PRODUCTION WELL SECTION & DETAILS
G4.0	BEST MANAGEMENT PRACTICE DETAILS

FAIR OAKS WATER DISTRICT



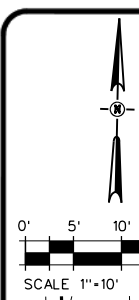
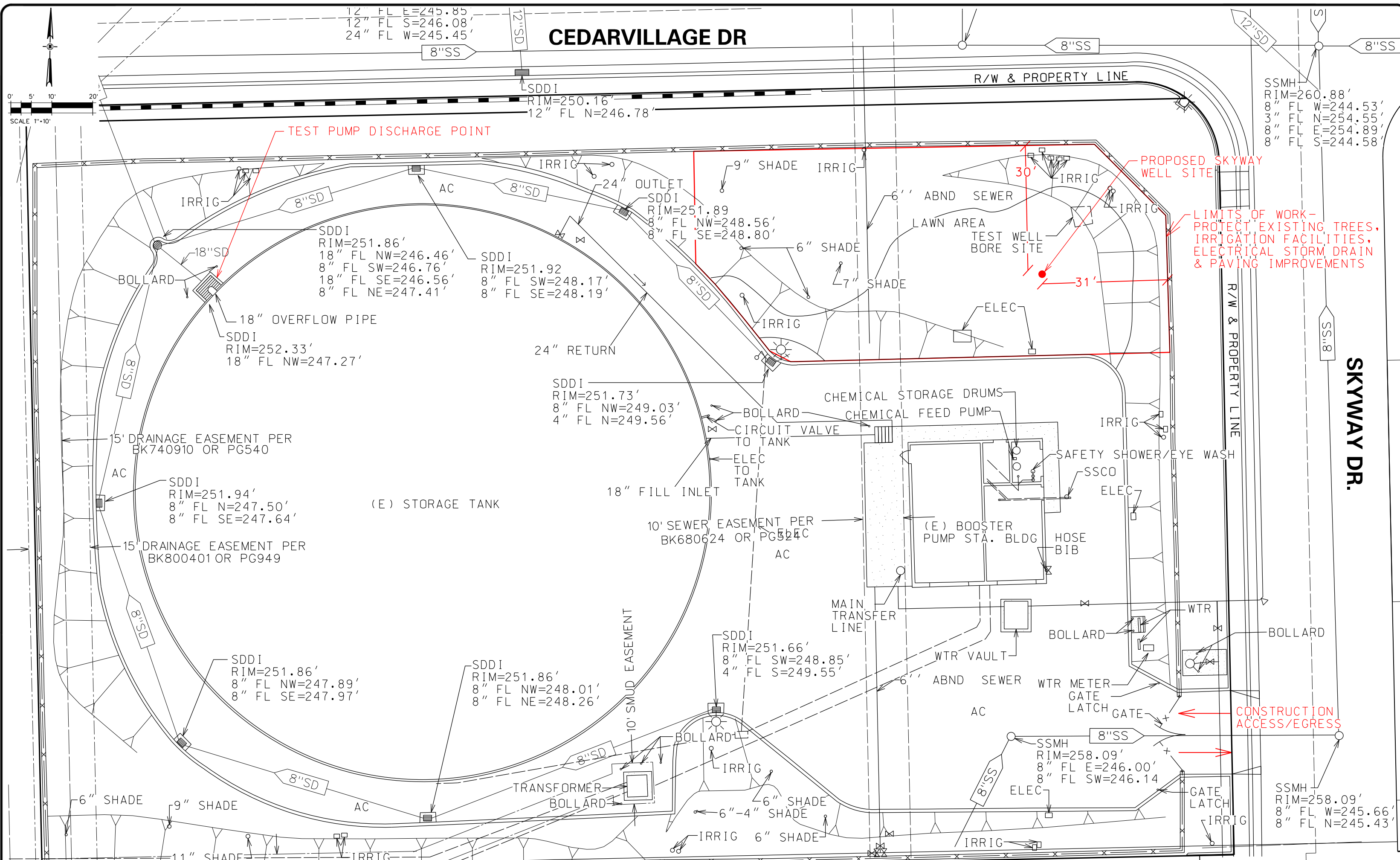
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REV.	DATE	DESCRIPTION	APP.

FAIR OAKS WATER DISTRICT
10326 FAIR OAKS BLVD, FAIR OAKS, CA 95628, (916) 967-5723

SKYWAY WELL DRILLING, DEVELOPMENT AND TESTING
TITLE SHEET

DATE:	DATE Jan 2020	<p>FAIR OAKS WATER DISTRICT</p>	SHEET	G1.0
SCALE:	N/A		OF	1 SHEETS
HORIZ:	N/A		PROJECT NUMBER	C19WTSTSTH
VERT:	N/A			
VER.:				



CEDARVILLE DR

SKYWAY DR.

LIMITS OF WORK -
 PROTECT EXISTING TREES,
 IRRIGATION FACILITIES,
 ELECTRICAL STORM DRAIN
 & PAVING IMPROVEMENTS

CONSTRUCTION
 ACCESS/EGRESS

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 DATE: 1/22/2020

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REVIEWED BY:	DATE:	DRAWN BY:			
REVIEWED BY:	DATE:	CHECKED BY:			
		DATE: 1/22/2020	REV.	DATE	DESCRIPTION
					APP.

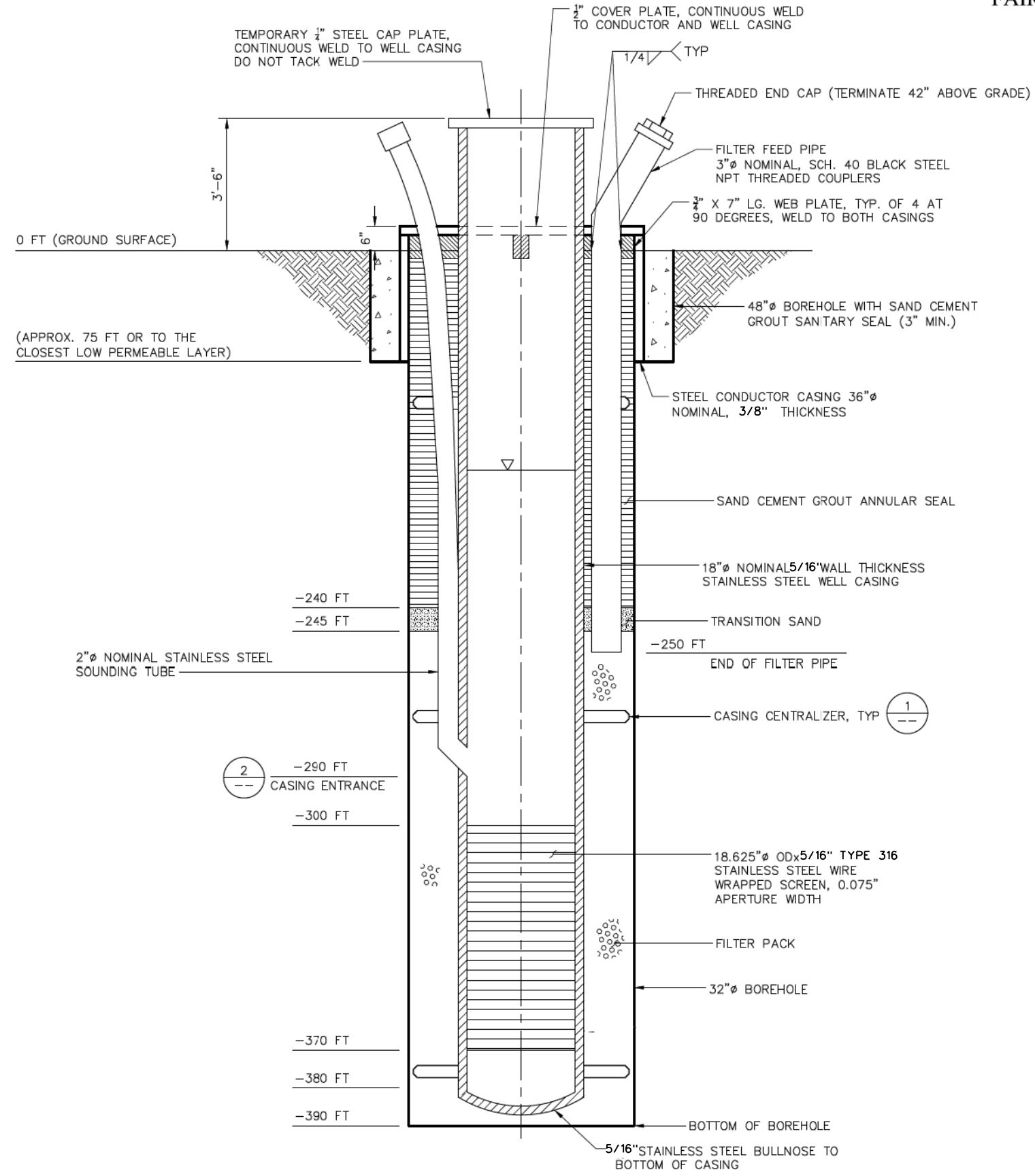
FAIR OAKS WATER DISTRICT
 10326 FAIR OAKS BLVD, FAIR OAKS, CA 95628, (916) 967-5723
 SKYWAY WELL DRILLING, DEVELOPMENT AND TESTING
SITE PLAN

DATE: DATE **Jan 2020**
 SCALE: AS SHOWN
 HORIZ: N/A
 VERT: N/A
 VER:

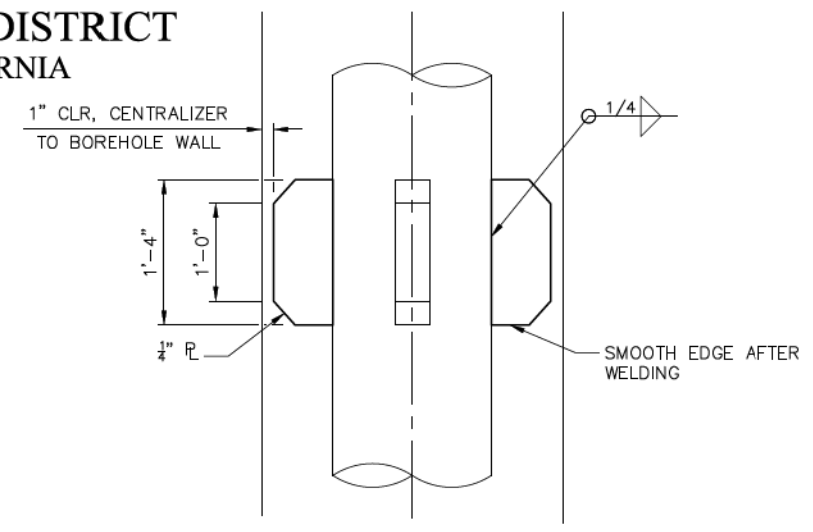


SHEET **G2.0**
 OF 2 SHEETS **4**
 PROJECT NUMBER
C19WTSTSTH

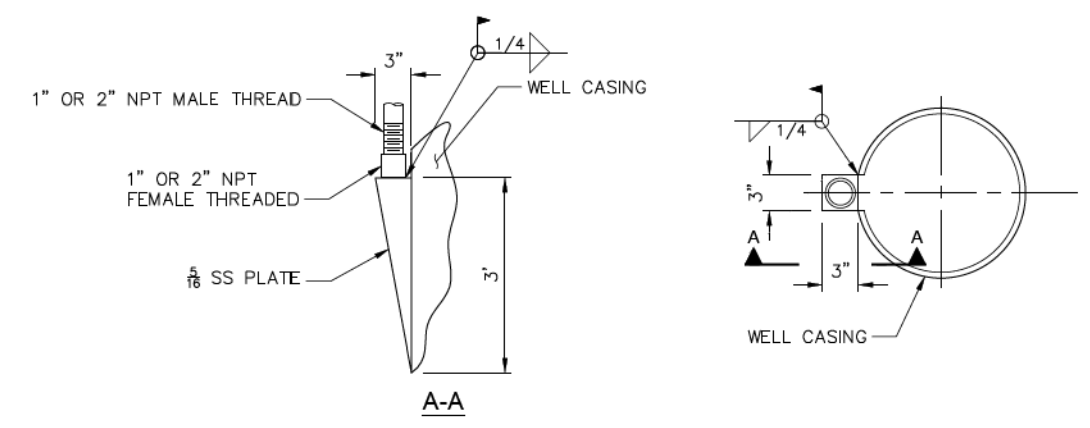
FAIR OAKS WATER DISTRICT FAIR OAKS, CALIFORNIA



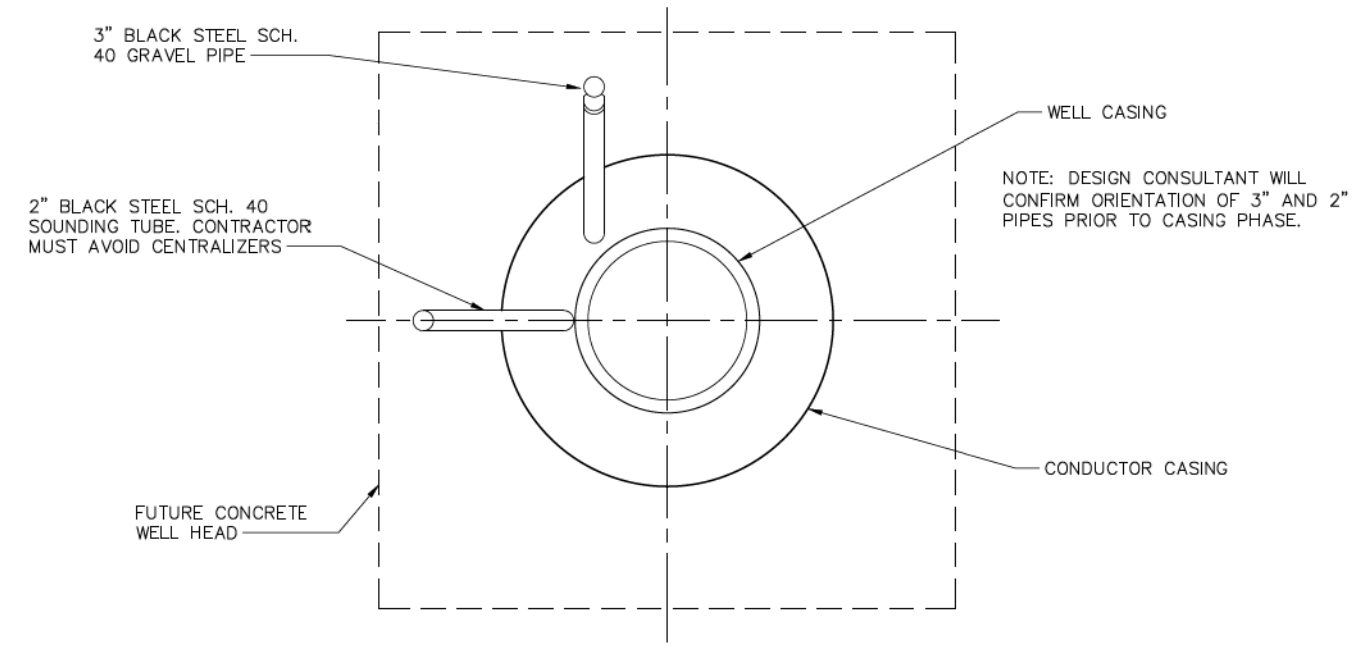
SKYWAY WELL SECTION
NOT TO SCALE



NOTE: INSTALL 3 CENTRALIZERS PER SET AT 120'
CASING CENTRALIZER DETAIL 1
NOT TO SCALE



CASING ENTRANCE DETAIL 2
NOT TO SCALE



WELL HEAD PLAN 3
NOT TO SCALE

- NOTES:**
1. THE LOCATION OF WELL SCREEN AND THE TYPE OF FILLER PACK ARE PRELIMINARY GUIDELINES. FINAL DIMENSIONS AND SPECIFICATIONS SHALL BE DETERMINED BY THE DISTRICT'S REPRESENTATIVE FOLLOWING EVALUATION OF TEST HOLE AND SAMPLING WELL RESULTS.
 2. DEVELOPMENT AND TESTING WATER SHALL BE DISPOSED OF AT THE TEST PUMP DISCHARGE POINT SHOWN ON SHEET G2.0. THE CONTRACTOR SHALL SUBMIT A PROPOSAL TO THE DISTRICT DESCRIBING THE METHOD OF REMOVING EXCESS SILTS FROM THE WATER PRIOR TO DISPOSAL.
 3. THE CONTRACTOR SHALL DECHLORINATE THE DISPOSAL WATER.
 4. IF THE CONTRACTOR DETERMINES THAT AN ALL-WEATHER, COMPACTED AGGREGATE BASE DRILLING PAD IS NECESSARY TO CONTINUE DRILLING OPERATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS AND CONSTRUCTION OF THE DRILLING PAD.

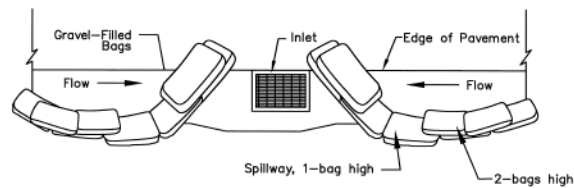
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REVIEWED BY:	DATE:	DATE: 1/22/2020			REV.	APP.

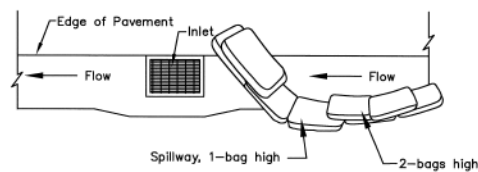
FAIR OAKS WATER DISTRICT
10326 FAIR OAKS BLVD, FAIR OAKS, CA 95628, (916) 967-5723
SKYWAY WELL DRILLING, DEVELOPMENT AND TESTING
PRODUCTION WELL SECTION & DETAILS

DATE: <u>DATE Jan 2020</u>		SHEET G3.0	
SCALE: <u>N/A</u>		OF 3 SHEETS 4	
HORIZ: <u>N/A</u>	FAIR OAKS WATER DISTRICT	PROJECT NUMBER C19WTSTSTH	
VERT: <u>N/A</u>			
VER: <u>N/A</u>			





TYPICAL PROTECTION FOR INLET ON SUMP

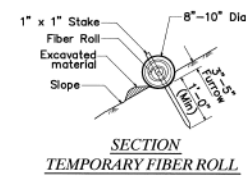


TYPICAL PROTECTION FOR INLET ON GRADE

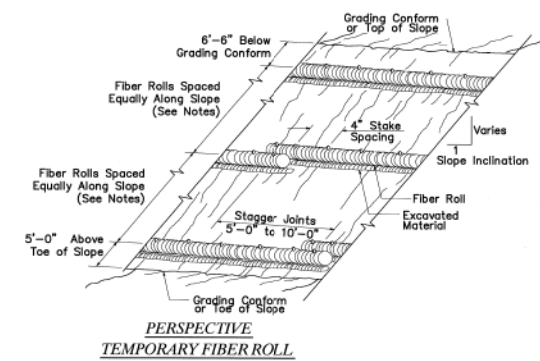
- NOTES:
1. Intended for short-term use.
 2. Use to inhibit non-storm water flow.
 3. Allow for proper maintenance and cleanup.
 4. Bags must be removed after adjacent operation is completed.
 5. Not applicable without filter fabric in areas with high silts and clays.

STORM DRAIN INLET PROTECTION
CURB INLET INSTALLATION

- NOTES:
1. Prepare the slope before the wattling procedure is started.
 2. Dig small trenches across the slope on contour, to place rolls. The trench should be deep enough to accommodate half the thickness of the roll, when the soil is loose and uncompacted, the trench should be deep enough to bury the roll $\frac{2}{3}$ of its thickness because the ground will settle.
 3. Install rolls perpendicular to water movement.
 4. Start at the bottom of the slope and work up.
 5. Construct trench at contour intervals of 12 feet apart.
 6. Use straight bar to drive holes through the wattle and into the soil.
 7. Make sure no gaps exist between the soil and the straw wattle.
 8. Drive the stake through the prepared hole into the soil. Leave only 1 or 2 inches of stake exposed above roll install stakes every 4 feet apart through the wattle. Additional stakes may be driven on the downslope side of the trenches on highly erosive or very steep slopes.
 9. Runoff must not be allowed to run under or around roll.

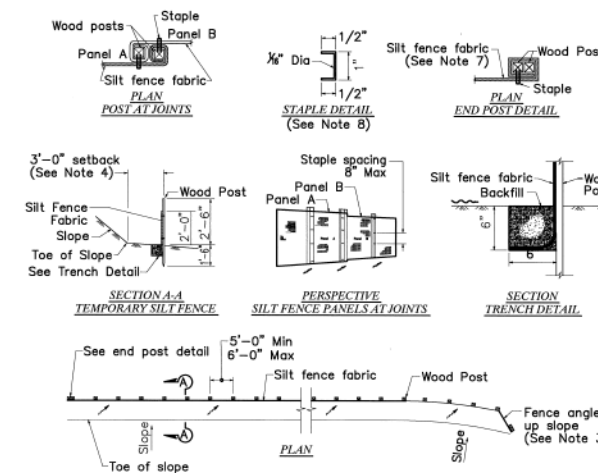


SECTION
TEMPORARY FIBER ROLL



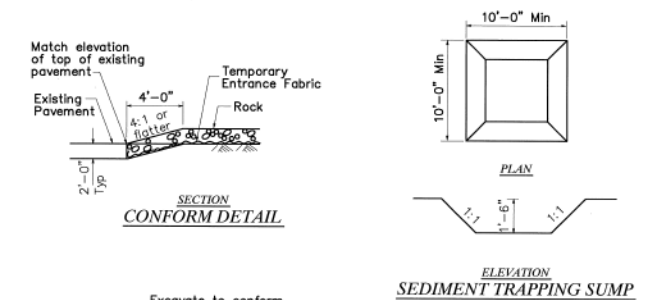
PERSPECTIVE
TEMPORARY FIBER ROLL

TEMPORARY FIBER ROLL

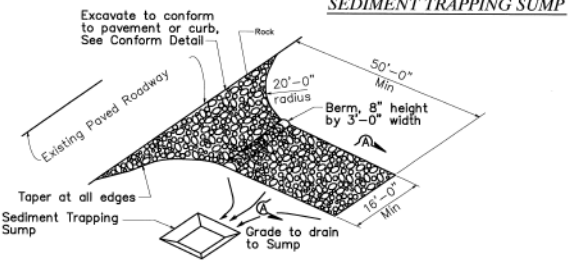


- NOTES:
1. Install Temporary Silt Fence by first digging trench, driving posts, placing and securing fabric. Then backfill and tamp.
 2. Reach length not to exceed 500 feet.
 3. The down stream end of the Temporary Silt Fence shall have the last 8' angled up slope.
 4. Setback dimensions may vary to fit field conditions.
 5. Posts to overlap and fence fabric to fold around each post one full turn. Secure fabric with 4 staples for each post.
 6. Posts shall be driven tightly together to prevent potential flow-through of sediment at the joint. The tops of the posts shall be secured to each other with wire.
 7. For each end post, fence fabric shall be folded around two posts one full turn and secured with 4 staples.
 8. Minimum of 4 staples shall be installed per post. Dimensions shown are typical.
 9. Maintenance openings shall be constructed in a manner to ensure that sediment is retained by the temporary silt fence.
 10. Joint sections shall not be placed at sump locations.

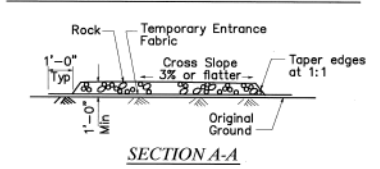
TEMPORARY SILT FENCE



ELEVATION
SEDIMENT TRAPPING SUMP

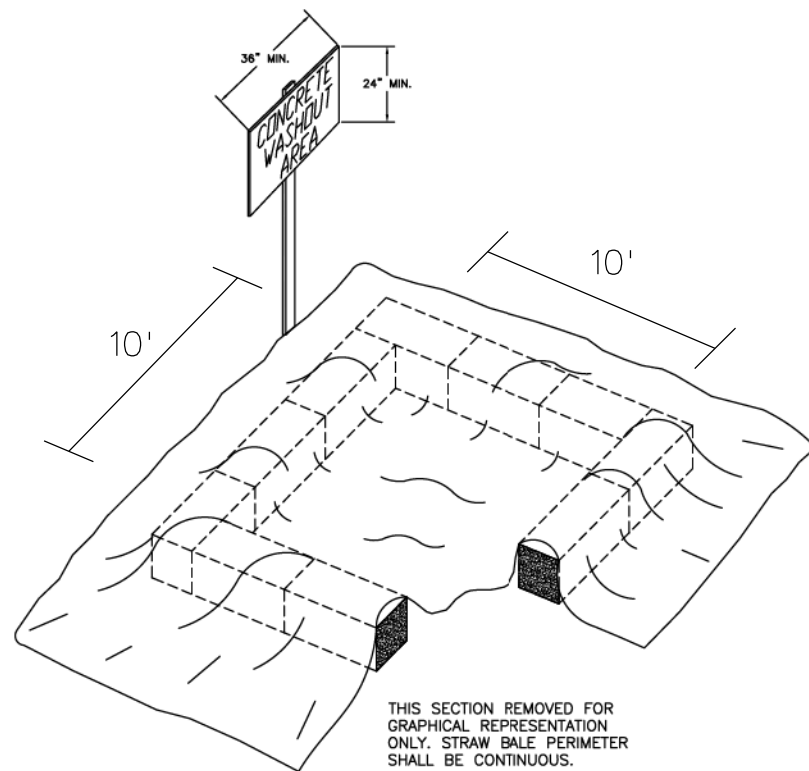


PERSPECTIVE
TEMPORARY CONSTRUCTION ENTRANCE



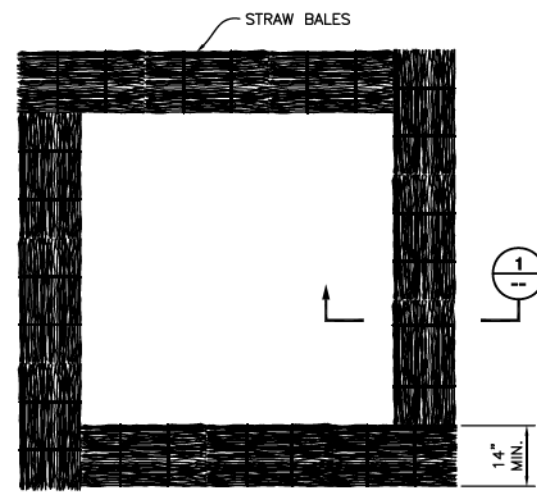
SECTION A-A

TEMPORARY CONSTRUCTION ENTRANCE

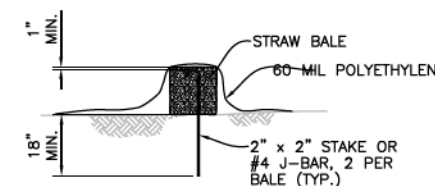


THIS SECTION REMOVED FOR GRAPHICAL REPRESENTATION ONLY. STRAW BALE PERIMETER SHALL BE CONTINUOUS.

CONCRETE WASHOUT BASIN
N.T.S.



CONCRETE WASHOUT BASIN - PLAN
N.T.S.



SECTION 1
N.T.S.

NOTES:

1. PROJECT DISTURBANCE IS LESS THAN 1.0 ACRE AND AS SUCH NOT SUBJECT TO THE REQUIREMENTS OF THE STATE OF CALIFORNIA GENERAL PERMIT FOR STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES, REQUIRING BEST MANAGEMENT PRACTICES. HOWEVER, THE CONSTRUCTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES (BMPs) FOR STORM WATER AND NON-STORM WATER MANAGEMENT.
2. DETAILS ON THIS SHEET ARE PROVIDED AS BEST MANAGEMENT PRACTICES. CONTRACTOR SHALL IMPLEMENT THESE METHODS FOR STORM WATER AND NON-STORM WATER MANAGEMENT FOR THIS PROJECT.

FILE: S:\2695-03 Skyway WellPlan\04_DETAILED.dgn
DATE: 1/22/2020

REVIEWED BY:	DATE:	DESIGNED BY:					
REVIEWED BY:	DATE:	DRAWN BY:					
REVIEWED BY:	DATE:	CHECKED BY:					
		DATE:	1/22/2020	REV.	DATE	DESCRIPTION	APP.

FAIR OAKS WATER DISTRICT
10326 FAIR OAKS BLVD, FAIR OAKS, CA 95628, (916) 967-5723
SKYWAY WELL DRILLING, DEVELOPMENT AND TESTING
BEST MANAGEMENT PRACTICE DETAILS

DATE: Jan 2020
SCALE: N/A
HORIZ: N/A
VERT: N/A
VER: N/A



SHEET G4.0
OF 4 SHEETS 4
PROJECT NUMBER C19WTSTH

