ROSEDALE-RIO BRAVO
WATER STORAGE DISTRICT

Kern County, California

VOLUME 1 – CONTRACT DOCUMENTS

SPECIFICATIONS No. RRBWSD 23-01

McCASLIN / BOWLING
WELL DRILLING AND EQUIPPING

FOR BIDDING PURPOSES ONLY

JUNE 2023

Prepared by:

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Mandatory Pre-Bid Conference will begin at 11:00 a.m. on July 12, 2023
Prospective Bidders should meet at the offices of Rosedale-Rio Bravo Water Storage District
849 Allen Rd
Bakersfield, CA 93314

Bids will be received until 2:00 p.m. local time on August 3, 2023
at the offices of Rosedale-Rio Bravo Water Storage District
849 Allen Rd
Bakersfield, CA 93314

ROSEDALE-RIO BRAVO
WATER STORAGE DISTRICT

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CONTRACT DOCUMENTS

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Contract Documents were prepared by or under the direction of the following registered persons(s):

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SECTION A

NOTICE

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
Kern County, California

NOTICE INVITING BIDS

McCASLIN / BOWLING
WELL DRILLING AND EQUIPPING

A-1 Invitation for Bids

NOTICE IS HEREBY GIVEN that sealed bids will be received by the ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT, hereinafter referred to as the District, for furnishing all labor, services, materials, tools, equipment, supplies, transportation, utilities, and all other items and facilities necessary therefore, as provided in the Contract Documents for the acceptable completion of the Work described in Section A-4, together with all appurtenances thereto, in strict accordance with the Plans and Specifications on file at the office of the District.

Bids shall be made in accordance with the prevailing hourly rate of per diem wages for this locality and project as determined by the Director of Industrial Relations pursuant to Labor Code Section 1770 et seq. Prevailing wage schedules for Kern County are available from the Department of Industrial Relations-Division of Labor Statistics & Research via the internet at www.dir.ca.gov. Copies of the prevailing rates of per diem wages are also on file at the office of the District and will be made available to any interested party on request.

This project is being funded in part by a grant from the WaterSMART Drought Response Program: Drought Resiliency Projects, which is being administered by the U.S. Bureau of Reclamation (Reclamation).

The Contractor, its Subcontractors and Suppliers will be required to comply with all applicable Federal requirements.

A-2 Submitting Bids and Bid Opening

Bids will be received at the offices of the District, 849 Allen Rd, Bakersfield, CA 93314, on or before 2:00 p.m., local time, on August 3, 2023. Said bids shall be opened and read aloud commencing at the time and date just specified. Bids shall be timely submitted in

sealed envelopes marked as directed in Section B-16.

It is the sole responsibility of the bidder to ensure that their bid is received in proper time and at the proper location and in the proper format. Facsimile bids will not be accepted. Bids received after said deadline time will be returned unopened to the bidder.

A mandatory pre-bid conference and tour will be held on July 12, 2023 at 11:00 a.m. commencing at the Rosedale-Rio Bravo Water Storage District office located at 849 Allen Rd, Bakersfield, CA 93314, and then continued at the project sites.

A-3 Location of the Work

The work to be constructed hereunder is located within Kern County, California, in the vicinity of Bakersfield, California, near the intersection of State Route 43 (Enos Lane) and Brimhall Road.

A-4 Description of Work

The description of the work is as follows:

1. NEW WELLS MC1 AND MC2

a. Drilling and construction of two (2) 20-inch diameter (internal diameter of casing) water wells approximately 790 feet deep in a recharge pond area north of Stockdale Highway and west of State Route 43 (Enos Lane).

b. Development of both wells, including test pumping as specified.

c. Construction of two (2) 12'x12' concrete well pump foundations.

d. Equipping of two (2) new wells with 12-inch steel discharge piping assembly, complete with valves, flowmeter, air vents, couplings, and all other appurtenances.

e. Furnishing and installation of two (2) well enclosures, one at each well site.

f. Furnishing and installation of electrical control panels, including the installation, construction, or provision of concrete pads, shade structures, security structures, electrical service, wiring & controls, and all other appurtenances.

2. NEW WELL B1

a. Drilling and construction of one (1) 20-inch diameter (internal diameter of casing) water well approximately 710 feet deep in a recharge pond area north of Brimhall Road and east of Superior Road.

b. Development of well, including test pumping as specified.

c. Construction of one (1) 12'x12' concrete well pump foundation.

d. Equipping of one (1) new well with 12-inch steel discharge piping assembly, complete with valves, flowmeter, air vents, couplings, and all other appurtenances.

e. Furnishing and installation of one (1) well enclosure at well site.

f. Furnishing and installation of electrical control panels, including the installation, construction, or provision of concrete pads, shade structures, security structures, electrical service, wiring & controls, and all other appurtenances.

A-5 Classification of Contractors License / Contractor Registration

A contractor submitting a proposal shall possess, at the time the contract is awarded, that classification of contractor's license required by law to enable the contractor to perform the Work contemplated under the Contract Documents. Moreover, the Contractor must possess a C-57 license to drill the wells and the contractor must be on the current list entitled "Well Drillers Registered with the Kern County Environmental Health Services Department" on file with the Kern County Environmental Health Services Department. Contractors shall provide the District with their Contractor's license number and expiration date as provided in the proposal.

No contractor or subcontractor may be listed on a proposal unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

No contractor or subcontractor may be awarded the contract for the project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

A-6 Award of Contract

Each bid shall be made on the proposal forms furnished by the District and shall be in accordance with the Contract Documents. The Proposal Bidding Schedule includes places to enter bid prices for each of the various items of work. Bidders will be required to submit prices for the all items on the bid schedule. Award of the Contract, if made by the District, will be to the responsible Bidder submitting the lowest responsive Bid Proposal on the basis of the prices in the Base Bid in accordance with California Public Contract Code Section 20103.8(a). **See Section B-16 for further particulars of the bidding and basis of award.**

Proposals will be accepted until the date and time specified in the Notice Inviting Bids. The Contract will be awarded as soon as practicable to the lowest responsible bidder that has submitted a responsive bid, price and other factors considered, provided its Bid is reasonable and is in the best interest of the District to accept.

The District reserves the right, after opening bids, to reject any or all bids, or to make award to the lowest responsive and responsible bidder and reject all other bids. Refer to Paragraph B-3 for information regarding "Responsible Bidder" and submission of a "Responsive Bid".

The successful Bidder will be notified in writing by District of the Award of Contract within 30 days after opening of Bids. Accompanying the Notice of Award will be four copies of the Contract, which successful Bidder will be required to execute properly and return to District, together with properly executed Performance Bond, Payment Bond, Certificates of Insurance and Endorsement, and Subcontractor Non-Collusion Affidavits, all within 10 days after date of receipt of such Notice of Award. District will promptly determine whether such Contract, Bonds, and Certificates of Insurance and Endorsement are as required by the Specifications and, upon such determination, will forward a fully signed copy of the Contract to successful Bidder.

A-7 Site Conditions

Each bidder shall carefully examine the Plans, read the Specifications and the forms of the Contract Documents, and shall visit the site of the proposed work to fully inform himself as to all existing conditions and limitations that may affect the execution of work under the Contract, and each such bidder shall include in the bid prices the cost of all incidentals and appurtenances. The failure or omission of any bidder to receive or examine any form, instrument, addendum, or other document, or his failure to visit the worksite and acquaint himself with conditions at the construction site, shall in no respect relieve any such bidder from any obligation imposed by his bid or by the Contract. The submittal of a bid shall be taken as prima facie evidence of compliance with all instructions contained herein. **All Bidders must contact the District to coordinate site visits.**

A-8 Certified Checks and Bonds

Each bid shall be under sealed cover and must be accompanied by a Bid Guarantee in the form of either cash, a certified or cashier's check, or by a corporate surety bond on the form furnished by the District and made payable to the Rosedale-Rio Bravo Water Storage District as a guaranty that the bidder will, if an award is made to him in accordance with the terms of his bid, promptly secure worker's compensation insurance, liability insurance, and any other insurance required by the Contract Documents, execute a contract in the required form, and furnish satisfactory bonds for the faithful performance of the Contract and for the payment of claims of all persons supplying labor and materials

for the construction of the work. Should the successful bidder fail to so perform, the District shall be entitled to retain the moneys represented by said check or bond as liquidated damages on account of the delay and inconvenience occasioned to the District, it being expressly agreed and understood that the amount of said check or bond constitutes reasonable damages and that it is impracticable or extremely difficult to ascertain actual damages. Said cash, check or bidder's bond shall be in an amount not less than ten percent (10%) of the amount of the bid items identified in the Proposal Bond form included in the Contract Documents. The Faithful Performance Bond and Payment Bond shall each be not less than one hundred percent (100%) of the total amount of the bid price named in the contract.

The District reserves the right to reject any bond, if in the opinion of the Engineer or the District's Attorney, the Surety's acknowledgment is not legally sufficient. All sureties utilized by bidders shall be legally qualified to do business in the State of California, shall carry a current Best's Insurance Guide rating of "A" or better, Class X or better, and shall furnish such reports as to their financial condition, from time to time, as may be requested by the District, including the Financial Statement of Bonding Company furnished with the Bond. The premiums for all said bonds shall be paid by the bidder. If any surety becomes unacceptable to the District in the absolute judgment and discretion of the District, then the bidder/contractor shall promptly furnish at its own expense such additional bonds as may be required by the District to protect the District's interests and the interests of persons supplying labor or materials in the prosecution of the work contemplated by these Contract Documents.

In the event of any conflict between the terms of the Contract Documents and the terms of the bonds, the terms of the Contract Documents shall control and the bonds shall be deemed to be amended thereby. The District shall be entitled to exercise any and all rights granted by the Contract Documents in the event of default, without control by the surety, provided that the District promptly notifies the surety at the time or before the exercise of such rights. The exercise by the District of such rights shall not affect the liability of the surety under the bonds.

Bid security of unsuccessful bidder will be returned to the bidder within sixty (60) days of the time the execution of the contract by the District and the successful bidder award of contract is made.

A-9 Contract Retention

At the request and expense of the Contractor and pursuant to Public Contract Code section 22300, securities equivalent to any amount withheld by the District to ensure the Contractor's performance under the Contract shall be deposited with the District as substitute security, or, at the Contractor's request, with a state or federally chartered bank in California as the escrow agent. Escrow instructions shall conform to the requirements of Public Contract Code section 22300.

A-10 Wage Rates / Compliance Monitoring

Bids shall be made in accordance with the prevailing hourly rate of per diem wages for this locality and project as determined by the Director of Industrial Relations pursuant to Labor Code section 1770 et seq. A copy of the prevailing wage rate schedules are on file at the office of the District and by this reference incorporated herein. The Contractor shall post a copy of said documents at each job site. The Contractor and any Subcontractor under him shall pay not less than the specified prevailing rate of per diem wages for general, holiday and overtime work to all workers employed in the execution of this contract.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Each contractor and subcontractor shall furnish the records specified in Labor Code section 1776 directly to the Labor Commissions, in the manner set forth in Labor Code section 1771.4. Contractors shall be required to post job site notices, as prescribed by regulation.

A-11 Use of Apprentices

If the project requires the employment of workers in any apprenticeable craft or trade, once awarded, the Contractor or Subcontractors must apply to the Joint Apprenticeship Council unless already covered by local apprenticeship standards under Labor Code Section 1777.5, and the Contractor shall otherwise comply with Section 1777.5.

A-12 Contract Documents

The Contract Documents shall consist of the Notice Inviting Bids, the Instructions to Bidders, the accepted Proposal and Proposal Bidding Schedule, the Contractor's Licensing Statement, the Information Required of Bidders, the Agreement, the Proposal Bond, the Faithful Performance Bond, the Payment Bond, the Non-Collusion Affidavits, the Notice of Award, Notice to Proceed Checklist and Notice to Proceed Form, General Conditions, Special Conditions, the Plans and Specifications, Appendices and any change order or Addenda, setting forth any modifications or interpretations of any of said Documents, all of which documents are on file or will be on file in the office of the District, 849 Allen Rd, Bakersfield, CA 93314, and which are hereby referred to and made a part of this Notice Inviting Bids. Questions regarding the type of work required may be addressed to the following:

Markus Nygren
Rosedale-Rio Bravo Water Storage District
Tel. 661-525-9945
mnygren@rrbwsd.com

All questions or inquiries regarding the project or the Contract Documents shall be directed solely to the person listed above. Bidders shall not contact any participants in the project regarding the project or the Contract Documents prior to the time that the bids are opened.

A full set of Plans and Specifications is available for inspection without charge at the office of Rosedale-Rio Bravo Water Storage District, 849 Allen Rd, Bakersfield, CA 93314. A .pdf file containing the Plans and Specifications will be provided to prospective bidders via RRBWSD's website, Rosedale-Rio Bravo WSD | (rrbwsd.com).

District may amend any provision or part of the Specifications at any time prior to three days before closing time, provided that the closing time set forth may be extended by District at any time prior to said closing time. Such amendments, if any, will be in the form of addenda which will be issued simultaneously to all persons who have obtained a copy of the Contract Documents from the District, and are on the planholder's list. Addenda will be emailed ONLY to all parties recorded by the Engineer as having received the Contract Documents. If you wish to receive addenda by some means other than email, please advise the Engineer immediately. Questions received less than three days prior to the date for opening of bids will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or responses will be without legal effect and are not to be relied upon by the Bidders unless they are integrated into the written Contract Documents.

A-13 Substitute Securities

Pursuant to Public Contract Code Section 22300, equivalent securities may be substituted for monies withheld to ensure performance of the contract. The District reserves the right to solely determine the adequacy of the securities being proposed by the Contractor and the value of those securities. The District shall also be entitled to charge an administrative fee, as determined by District in its sole discretion, for substituting equivalent securities for retention amounts. The District's decisions with respect to the administration of the provisions of Section 22300 shall be final and shall include, but not be limited to, determinations of what securities are equivalent, the value of the securities, the negotiability of the securities, the costs of administration and the determination of whether or not the administration should be accomplished by an independent agency or by the District. The District shall be entitled, at any time, to request the deposit of additional securities of a value designated by District, in District's sole discretion, to satisfy this requirement. If the District does not receive satisfactory securities within twelve (12) consecutive days of the date of the written request, District shall be entitled to withhold amounts due Contractor until securities of satisfactory value to District have been received.

Date: July 30, 2023

Rosedale-Rio Bravo Water Storage District

By: /s/ Dan Bartel
General Manager

SECTION B

INSTRUCTIONS TO BIDDERS

B-1 Form of Proposal and Signature

The Proposal shall be submitted only on the forms attached hereto or copies thereof and shall be enclosed in sealed envelopes (to be provided at the mandatory pre-bid conference) and marked and addressed as described in Paragraph B-16. The bidder shall state in figures the unit prices or the specific sums, as the case may be, for which he proposes to supply the labor, materials, supplies, or machinery, and perform the work required by the Contract and other Contract Documents, including the Specifications. If the unit price and the total amount named by a bidder for any item are not in agreement, the unit price alone will be considered as representing the bidder's intention and the totals will be corrected to conform thereto.

If the Proposal is made by an individual, it shall be signed by him and his full name and address shall be given; if it is made by a firm, it shall be signed with the co-partnership name by a member of the firm, who shall also sign his own name, and the name and address of each member of such firm shall be given; and if it is made by a corporation the name of the corporation shall be signed by its duly authorized officer or officers attested by the corporate seal, the names and titles of all officers of the corporation shall be given, and the address of the corporation and the state in which incorporated shall be stated.

Proposals will be considered only from persons licensed as required under applicable provisions of the Contractors' State License Law (California Business and Professional Code, Section 7000 et seq.) and rules and regulations adopted pursuant thereto; and each bidder shall insert his license number in the place provided in the Proposal. No oral, telephonic, or telegraphic proposal or modification of a proposal will be considered.

B-2 Preparation of the Proposal

Blank spaces in the Proposal shall be properly filled. The phraseology of the Proposal must not be changed, and no additions shall be made to the items mentioned therein. Unauthorized conditions, limitations, or provisos attached to a Proposal will render it informal and may cause its rejection. If erasures, interlineations or other changes appear on the form, each erasure, interlineation or change must be initialed by the person signing the Proposal. Alternative proposals will not be considered unless specifically provided for in the Proposal Bidding Schedule.

Proposals may be withdrawn without prejudice by written or telegraphic requests received from bidder prior to the time for opening of bids, and Proposals so withdrawn will be returned to bidders unopened when reached in the process of opening bids. No Proposal

may be withdrawn after the hour fixed for opening bids without rendering the accompanying certified or cashier's check or bidder's bond subject to retention as liquidated damages in like manner as in the case of failure to execute the Contract after award, as in the Contract Documents herein provided.

No Proposal received after the time fixed or at any place other than the place stated in the Notice Inviting Bids will be considered. All bids will be opened and read publicly. Refer to Paragraph B-16 of the "Bid Submission and Opening Procedures" for information regarding the procedures for opening of bids. Bidders, their representatives and other interested parties are invited to be present at the opening. Where bonds are required, the bidder shall name in his Proposal the surety or sureties which have agreed to furnish said bonds.

B-3 Responsible Bidder and Responsive Bid

A "Responsive Bid" is one that materially conforms in all respects to the requirements set forth in Section A–Notice Inviting Bids and Section B–Instructions to Bidders. The District reserves the right to waive any irregularities in the bids received.

A "Responsible Bidder" is one that has the qualifications, general competency, and resources to perform the Work covered by the Proposal. Among other matters, a Responsible Bidder is one that can demonstrate successful completion of projects involving work of scope and complexity comparable to that being installed under the Contract Documents. Bids shall identify such projects and provide the information indicated in the "Information Required of Bidder" form. District expressly reserves the right to reject any bid if it determines that bidder's business or technical organization, financial resources, plant and equipment to be used in performing work, or lack of successful experience in performing work of similar scope and complexity, is such that it is not in District's best interest to accept the bid.

B-4 Brokerage of Work Not Favorably Considered

In general, the brokerage of work will not be favorably considered, and the subletting of the entire Contract or of substantial complete units of it will be permitted only upon an adequate showing of the necessity involving some new condition not reasonably foreseen at the time of the Proposal.

B-5 Equalizing Factors

Wherever applicable, equalizing elements or factors not specifically mentioned or provided for herein, such as interest during construction, cost of transportation, inspection (including salaries and travel subsistence expenses), installation and operation, or any other factor or element in addition to that of price which would affect the total cost or value to the District, will be taken into consideration in comparing bids for award of the

Contract.

B-6 Servicing and Maintenance

Each bidder must, if requested, furnish evidence that there is an efficient service organization which regularly carries a stock of repair parts for the proposed equipment to be furnished and installed in the work and that the organization is conveniently located for prompt service.

B-7 Local Conditions

Before submitting a Proposal, the bidder shall carefully examine the Plans, read the Specifications, visit the site of work, and fully inform himself as to all conditions and limitations, including the character of equipment and facilities needed preliminary to and during the prosecution of the work, the uncertainty of weather, site accessibility, groundwater level, and soil conditions along the line of work, and as to all other matters which can in any way affect the work to be done. Failure to do so will not release bidders from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The District makes no representation or warranty regarding the accuracy or interpretation of information derived from maps, plans, specifications, profiles, drawings, borings, or other investigations and will not be responsible for any understanding or representations concerning conditions made by any of its officers or agents, including the Engineer or his assistants, prior to the execution of the Contract. The quantities of work or material stated in the unit price items of the Bidding Schedule are given only as a basis for the comparison of bids, and the District does not represent or warrant that the actual amount of work or material will correspond therewith, but reserves the right to increase or decrease the quantity of any unit price items of the work as may be deemed necessary or expedient by the Engineer.

The project to which the work covered by the Contract Documents pertains is being funded in part by a grant from the WaterSMART Drought Response Program: Drought Resiliency Projects, which is being administered by the United States Bureau of Reclamation (Reclamation).

B-8 Execution of Contract

The District reserves the right to accept or reject bids for a period of sixty (60) days after date of opening, and no bid can be withdrawn during said period. A bidder to whom award is made shall execute a written Contract with the District in the form attached hereto and obtain insurance and faithful performance and labor and material bonds of the types and character and in the amounts required in Paragraph B-9, B-10, and B-11, within ten (10) calendar days from the date of the mailing of a notice from the District to the bidder of the acceptance of his Proposal, or such additional time as may be allowed by the Engineer. If a bidder to whom award is made fails or refuses to so perform, his Bid

Guarantee shall become the property of the District, as provided for in Paragraph A-8, and the award will be annulled, and in the discretion of the District, an award may be made to the bidder whose Proposal is next most acceptable to the District; and such bidder shall fulfill every requirement hereof as if he were the party to whom the first award was made.

B-9 Bonds

In conformance with Paragraph A-8 of the Notice Inviting Bids, a bidder to whom the Contract is awarded shall, within the time specified in Paragraph B-8, furnish a surety bond conditioned upon the full and faithful performance of all obligations required to be performed under the Contract and full performance and verity of all warranties and guarantees therein contained. Said bond, referred to herein as the Faithful Performance Bond, shall be in an amount equivalent to one-hundred percent (100%) of the total amount payable under the Contract Documents. The form of the Faithful Performance Bond set forth in these Contract Documents is a mandatory form.

In conformance with Paragraph A-8 of the Notice Inviting Bids, a bidder to whom the Contract is awarded shall, within the time specified in Paragraph B-8, furnish a Payment Bond, approved by the District, in accordance with the provisions of Civil Code sections 3225-3227, inclusive, and sections 3247-5252, inclusive. Said Payment Bond shall be in the sum of not less than one-hundred percent (100%) of the total amount payable under the Contract Documents. The form of the Payment Bond set forth in these Contract Documents is a mandatory form.

Said bonds shall be of a form satisfactory to the District and shall be obtained from responsible corporate sureties acceptable to the District. All sureties utilized by bidders shall be legally qualified to do business in the State of California, shall carry a current Best's Insurance Guide rating of "A" or better, Class X or better. Said sureties shall furnish reports as to their financial condition from time to time as requested by the District. The premiums for said bonds shall be paid by the bidder.

If any surety becomes unacceptable to the District or fails to furnish reports as to its financial condition as requested by the District, the Contractor shall promptly furnish such additional security as may be required from time to time to protect the interests of the District and of persons supplying labor or materials in the prosecution of the Work contemplated by this Contract.

In the event of any conflict between the terms of the Contract and the terms of said bonds, the terms of the Contract shall govern and said bonds shall be deemed to be amended thereby. Without limiting the foregoing, the District shall be entitled to exercise all rights granted to it by the Contract in the event of default, without control thereof by the surety, provided that the District gives the surety notice of such default at the time or before the

exercise of any such right by the District and, regardless of the terms of said bonds, the exercise of any such right by the District shall in no manner affect the liability of the surety under said bonds.

B-10 Workers' Compensation Insurance

Prior to execution of the Contract as specified under Paragraph C-23 and in conformance with Section 3700 of the California Labor Code, a bidder to whom the Contract has been awarded shall sign and file with the District the following certification: "I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the Work of this Contract." In addition, before the Contract is executed on behalf of the District, a bidder to whom the Contract has been awarded shall furnish satisfactory evidence that he has secured, in the manner required by law, the payment of the workers' compensation provided for in the California Labor Code and all amendments thereto.

B-11 Public Liability and Property Damage Insurance

The Contractor shall at his own expense maintain in effect at all times during the performance of the Work, comprehensive liability insurance in the amounts given below, in a form and with insurance companies acceptable to the District. Such insurance shall contain endorsements as follows: (a) including the District, the Engineer, and other entities described below, and their respective directors, officers and agents as additional named insureds; (b) providing contractual liability coverage for the Contractor's indemnification obligations under the Contract documents; (c) providing coverage for explosion, collapse and underground hazards; (d) personal injury coverage, including injury to the Contractor's own employees; (e) providing that the insurance may not be canceled or reduced until thirty (30) days after the District and the Engineer shall receive written notice of such cancellation or reduction; (f) providing "cross liability" or "severability of interest" coverage for all insureds, providing that the coverage afforded the additional named insureds shall not be prejudiced by any failure of the Contractor to comply with notice requirements of the policy; and (g) providing that any other insurance maintained by the District or the Engineer is excess and not contributing insurance with the insurance required herein.

Contractor shall, at its sole cost and expense, procure and maintain the following insurance coverage:

Commercial General Liability Insurance: Five Million Dollars ($5,000,000) per occurrence or the full per occurrence limits of the policies available, whichever is greater 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 (with the ISO CG 2503, ISO 2504, or insurer's equivalent provided to the District) or the general aggregate limit and products-completed operations aggregate limit shall be twice the required occurrence limit. Coverage must be purchased on a post 2004 ISO occurrence or equivalent and include coverage for, but not limited to, the following:

a. Bodily Injury and Property Damage

b. Personal Injury and Advertising Injury

c. Fire legal liability

d. Products and completed operations

This policy shall also contain the following endorsements or language, which shall be indicated on the certificate of insurance:

a. Waiver of subrogation in favor of and in a form acceptable to District.

b. Additional insured endorsement in favor and in a form acceptable to District.

c. Separation of insureds.

Business Automobile Insurance: This insurance shall contain a combined single limit of at least $1,000,000, and include coverage for, but not limited to the following:

a. Bodily injury and property damage.

b. Any and all vehicles owned, used or hired.

This policy shall also contain the following endorsements, which shall be indicated on the certificate of insurance:

a. Waiver of subrogation in favor of and in a form acceptable to District.

b. Additional insured endorsement in favor of and in a form acceptable to District.

c. Separation of insureds.

Workers' Compensation and Employers' Liability Insurance: This insurance shall include coverage for, but not limited to:

a. Contractor's statutory liability under the workers' compensation laws of the state(s) in which the services are to be performed. If optional under state laws, the

insurance must cover all employees anyway.

b. Employers' Liability with limits of at least $1,000,000 each accident, $1,000,000 by disease policy limit, $1,000,000 by disease each employee.

This policy shall also contain the following endorsements or language, which shall be indicated on the certificate of insurance:

a. Waiver of subrogation in favor and in a form acceptable to District.

Excess Liability (if necessary): The limits of insurance required in these Contract Documents may be satisfied by a combination of primary and umbrella or excess insurance. Any umbrella or excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and non-contributory basis for the benefit of the District and other required additional insureds specified above (if agreed to in a written contract or agreement) before the District or other additional insureds' own primary or self-insurance shall be called upon to protect it as a named insured.

The Contractor shall, within the period stated in Paragraph B-8 and as a condition precedent to execution of the Contract by the District, deliver to the District a certificate of insurance issued by the insurer reflecting the existence of the required insurance, together with signed copies of the above-specified endorsements. If required by the District, the Contractor shall also furnish a complete copy of the policy and all endorsements. The Contractor shall also disclose the amount of the deductible under its policy (ies) and if the District determines that the deductible is excessive, may require the Contractor to post a bond guaranteeing payment of any losses and defense costs within the deductible layer.

B-12 Subcontracts

Bidder shall furnish information regarding its Subcontractors in substantially the form set forth in the bid forms. If no Subcontractors are to be used, bidder shall so state. Bidder's attention is directed to Sections 4100 through 4113 of the California Public Contracts Code for requirements and provisions relative to Subcontractors. No substitution of subcontractors by the bidder shall be consented to or permitted except in accordance with the provisions of Public Contract Code Sections 4107 and 4107.5.

The bidder shall perform with his own organization, work equivalent to at least 60 percent of the total Contract price, and no more than work equivalent to 40 percent of the total Contract price may be performed by subcontractors. The cost of Contractor-furnished materials installed by labor carried on the bidder's own payroll may be included in the above required 60 percent.

In conformance with the provisions of Section 4104 of the Public Contract Code of the

State of California, each bidder shall set forth in his or her Proposal on the form provided therefor:

a. The name and location of the place of business of each subcontractor who will perform work or labor or render service to the Contractor in or about the construction work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specifically fabricates and installs a portion of the work or improvement according to detailed drawings contained in the Plans and Specifications, in an amount in excess of one-half (½) of one percent (1%) of the Contractor's total bid; and

b. The portion of the work which will be done by each such subcontractor and a description of the nature of such work.

B-13 Non-Collusion Affidavits

In accordance with the provisions of Section 7106 of the Public Contract Code, each bidder shall execute and submit with their bid a Non-Collusion Affidavit in the form attached hereto. Additionally, the principal contractor shall secure from each proposed subcontractor a Non-Collusion Affidavit in the form also attached hereto.

B-14 Bidder's Bond

Each proposal must be accompanied by a certified or cashier's check drawn on a responsible bank or a bidder's bond made by a responsible corporate surety, payable to the Rosedale-Rio Bravo Water Storage District, as a guarantee that if the bid is accepted, the bidder will, within the time specified in the Instructions to Bidders, enter into a written contract in the form hereinafter set forth and obtain insurance and faithful performance and labor and material payment bonds of the types and character, and in the amounts as required in said Instructions to Bidders. Said check or bid bond shall be for a sum not less than ten percent (10%) of the aggregate sum of the bid items identified in the Proposal Bond form included in the Contract Documents. Checks will be returned (a) to unsuccessful bidders as soon as practicable after the opening of bids and (b) to the successful bidder as soon as he has executed the contract and obtained the required insurance and bonds, provided he so performs in the manner and within the time stated in the Instruction to Bidders. Should the successful bidder fail to so perform, the District shall be entitled to retain the moneys represented by said check or bond as liquidated damages on account of the delay and inconvenience occasioned to the District, it being expressly agreed and understood that the amount of said check or bond constitutes reasonable damages and that it is impracticable or extremely difficult to ascertain actual damages. There is enclosed following the Proposal for these Specifications a form of Bidder's Bond, and all bidders submitting bonds as bid guarantees are required to make use of this form and to submit the complete form with submitted proposals.

B-15 Construction Schedule

Preliminary Construction Schedule - The Contractor shall submit with his bid a preliminary construction schedule for the District's review, which includes important milestones. **For purposes of preparing said Construction Schedule, Contractors should assume the Notice to Proceed will be issued on September 1, 2023**. The Preliminary Construction Schedule shall be in sufficient detail to show the chronological relationship of all activities of the project, including, but not limited to, estimated starting and completion dates of various activities including shop drawing submittal and approval, mobilization of equipment and resources, procurement of materials, construction of components of project, and completion of closeout of project. The schedule shall be prepared in Critical Path Method (CPM) format.

The CPM schedule shall include at a minimum the following: (1) identification of the basic tasks or activities that must be performed to complete the project; (2) estimation of the duration of the specific activities; and (3) a determination of the logical flow of the work, which includea determination of which activities must be completed before the subsequent ones can commence.

The Preliminary Construction Schedule shall reflect completion of all work under the contract within the specified times and in accordance with the Contract Documents, including the Specifications. The Preliminary Construction Schedule will be used by the District in determining award of the contract.

Post-Bid Pre-Award Construction Schedule - As a condition of award during the period after the opening of bids and prior to actual award of the Contract by the District, the apparent low bidder shall submit a Construction Schedule as set forth in this section. The Construction Schedule shall indicate the time of starting and completion of each major structure or phase of the Work and such intermediate phases as will serve for well-defined chronological order on the Construction Schedule. The schedule shall also indicate the anticipated date of receipt of major items of equipment, and all items of equipment receipt and installation of which is critical to the scheduled progress of the project. The Construction Schedule shall be prepared in Critical Path Method format. Four (4) printed copies and an electronic copy (.pdf format) of the schedule shall be submitted.

Within five (5) calendar days after being notified by the District, the apparent low bidder shall designate in writing an authorized representative who will be responsible for the preparation of the post-bid pre-award Construction Schedule as set forth in this Section.

The apparent low bidder's representative shall have the authority to fulfill the requirements of preparing the schedule in a professional and acceptable manner demonstrating competence in use of the Construction Schedule, including scheduling

experience on projects of similar value and complexity.

B-16 Bid Submission and Opening Procedures

The Proposal Bidding Schedule includes a Base Bid and the lowest bid will be determined based on the submission of a responsive bid from a responsible bidder (refer to Section B-3). Accordingly, the following procedures will be followed:

a. **Bid Envelopes**: Bids must be submitted in a labeled envelope plainly marked in the upper left-hand corner with the name and address of the bidder and shall bear the words "Proposal for", followed by the title of the Contract Documents for this work and the date and hour for opening bids.

b. **Contents of Bid**: To be considered, a bid must include the following:

1. Proposal Bidding Schedule
2. Bidder's Proposal
3. Information Required of Bidder Form
4. Preliminary Construction Schedule (ref. Paragraph B-15)
5. Bidder's Non-Collusion Affidavit (ref. Paragraph B-13)
6. All Issued Addenda (signed front covers only)
7. Bid Security (in the form of a certified or cashier's check or bidder's bond) (ref. Paragraph B-14)
8. Proof that contractor and subcontractors are registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

c. **Delivery of Bid**: It is the bidder's responsibility to make sure that their bid is submitted within the specified time. Late bids will not be accepted regardless of postmark and will be returned unopened to the bidder.

1. Hand Delivery – Bid shall be sealed and submitted prior to the time and place established for receiving bids.

2. Mail or Courier Delivery – Bid shall be sealed and inserted into another envelope or packaging exhibiting all information as required for delivery of the envelope or package to the place established for receiving bids. Bidders submitting Bid Packages via mail or courier delivery are strongly encouraged to notify the District in advance that a bid is being delivered in this manner.

d. **Opening of Bids**: The Bid Opening will be held at the place and time stated in Paragraph A-2. The envelope containing the "Bid" as described in Section B-16b will be publicly opened at the prescribed time and the amount of the Base Bid will be read aloud. This will continue until all bids are announced. A bid tabulation will be prepared during the Bid Opening which lists the Base Bid amounts and the corresponding name of the bidders. At the request of the bidders, the District will transmit a bid tabulation of all bids, to include bidder name and the corresponding Base Bid amount.

e. **Announcement of Bid Ranking and Bidders**: The announcement of bid ranking and bidders will be completed after the public bid opening and evaluation of bids.

****END OF SECTION****

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PROPOSAL

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
Kern County, California

McCASLIN / BOWLING
WELL DRILLING AND EQUIPPING

Proposals received until 2:00 p.m., August 3, 2023

To the Board of Directors,
Rosedale-Rio Bravo Water Storage District ("District")
849 Allen Rd, Bakersfield, CA 93314
Bakersfield, CA 93314

The undersigned hereby declares that the only persons or parties interested in this Proposal as principals are those named herein; that no director or officer of the District is in any manner interested, directly or indirectly, in this Proposal or in the profits to be derived from the contract proposed to be taken; that this bid is made without any connection with any other person or persons making a bid for the same purpose; that the bid is in all respects fair and without collusion or fraud; that the undersigned has read the Notice Inviting Bids and the Instructions to Bidders hereto attached, and agrees to all the provisions thereof; that the undersigned has examined the site of the Work, the form of the Agreement approved by the District, and the Plans and Specifications therein referred to, and proposes and agrees that if this bid as submitted in the attached Bidding Schedules be accepted, he will contract in the form so approved to perform all the Work mentioned and as provided in said approved form of the Agreement and the Plans and Specifications and to complete the same within the time stipulated therein; and that he will accept in full payment therefor the prices named in said Bidding Schedules. Said prices are to include and cover the furnishing of all materials except as otherwise provided in the Specifications, the performing of all labor requisite or proper, and the providing of all necessary machinery, tools, apparatus, and other means of construction, and the performance and completion of all the Work in the manner set forth, described, and shown in the Plans and Specifications for the work and in the form of the Agreement. The undersigned has checked carefully all words and figures inserted in said Bidding Schedules and understands that the District will not be responsible for any errors or omissions on the part of the undersigned in making up this Proposal.

The undersigned hereby agrees to execute the Agreement and furnish the required bonds and insurance within ten (10) days from the date of mailing of notice of acceptance of this Proposal, or within such additional time as may be allowed by the Engineer. A certified or cashier's check or a bidder's bond made payable to the Rosedale-Rio Bravo Water Storage District in the amount of $_____, said amount to be not less than ten percent (10%) of the amount of the bid items identified in the Proposal Bond form included in the Contract Documents, is attached

hereto as a guarantee that the undersigned will so perform. It is understood and agreed by the undersigned that if he does not so perform, the District shall be entitled to retain the moneys represented by said check or bond.

The bidder further declares that the surety or sureties named in the spaces provided below have agreed to furnish bonds in the form and aggregate amounts set forth in Paragraph B-9 of the Instructions to Bidders, in the event Contract is awarded on the basis of this Proposal.

The bidder further declares under penalty of perjury, in accordance with Business and Professions Code Section 7028.15(e), that the statements contained herein are true and correct.

Dated _____, 20__

_____

_____
Bidder

Bidder's post office address: By:

_____ _____

_____ _____
Title

(CORPORATE SEAL)

Names and addresses of all members of the firm or names and titles of all officers:

_____

_____

_____

_____

_____

_____

_____

_____

Corporation organized under the laws of the State of:

_____

Contractor's License No.

_____

Expiration Date

_____

Surety or Sureties

_____

_____

_____

_____

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PROPOSAL BOND

KNOW ALL MEN BY THESE PRESENTS

That we, _____ as Principal(s) (hereinafter called the Principal), and the _____ as Surety (hereinafter called the Surety), are held and firmly bound unto ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT (hereinafter called the Obligee) in the penal sum of ten percent (10%) of the amount of accompanying bid ($_____) for the payment of which, well and truly to be made, we, Principal and Surety, bind ourselves, our heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Principal is submitting herewith a bid, or proposal for the Rosedale-Rio Bravo Water Storage District McCASLIN / BOWLING WELLS DRILLING AND EQUIPPING.

NOW, THEREFORE, if the bid or proposal is not withdrawn within sixty (60) days after the date set for the opening of bids, and notwithstanding the award of the Contract to another bidder, if the bid or proposal of said Principal shall be accepted, and the Contract for such work be awarded to the Principal thereupon by the said Obligee, and said Principal shall within the period specified in the Contract Documents enter into a written Contract and obtain insurance and faithful performance and labor and material bonds of the type and character and in the amount as may be specified, then this obligation shall be null and void; otherwise to be and remain in full force and effect.

In witness whereof, we hereunto set our hands and seals this _____ day of _____, 20__.

_____(SEAL)
(Principal)

By_____

_____(SEAL)
(Surety)

By_____

NOTE: This bond must be acknowledged before a Notary Public, and a legally sufficient power of attorney must be attached to the bond to verify the authority of any party signing on behalf of a surety.

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PROPOSAL BIDDING SCHEDULE

McCASLIN / BOWLING
WELL DRILLING AND EQUIPPING

Bid Schedule A-1 – McCaslin / Bowling – Well Drilling and Development

All Items Furnished and Installed

The following Bid Schedule lists the items necessary to complete the Work. Bidder shall complete the schedule including the unit and total price of each item, including applicable sales and other taxes. If the total cost of any item or the total Base Bid is inconsistent with the unit cost, the unit cost shall prevail. Payment of each item will be based on the plans and those with an asterisk (*) included in the item number are to be considered as "final pay quantity for each item", unless the dimensions of the portion of the work shown on the plans are revised by the Engineer, or unless the portion of the work is eliminated. On all other items with no asterisk (*) included in the item number, payment will be based upon the final quantity installed or completed. If the dimensions of the specific portion of the work are revised, and the revisions result in an increase or decrease in the estimated quantity of the portion of the work, the final quantity for payment will be revised in the amount represented by the changes in the dimensions. If the specific portion of the work is eliminated, the final pay quantity designated for the specific portion of the work will be eliminated. All costs for completing the Work described in the Contract documents and on the plans shall be included in the bid items listed below. Bids will be compared on the basis of the grand total of bid items 1 through 52 and 56 through 65. Contractor shall include all costs to accomplish the project including (but not limited to): mobilization/demobilization, develop water supply, materials, equipment, labor, overhead, profit, taxes, delivery charges, permits etc.

BASE BID

NEW McCASLIN / BOWLING WELLS - GENERAL

Item No.	Description	Estimated Quantity	Unit	Unit Price	Amount
1 *	Mobilization	1	LS	$_____	$_____
2 *	Demobilization	1	LS	$_____	$_____
3 *	Develop and Provide Water Supply	1	LS	$_____	$_____
4 *	Environmental Compliance and Permitting	1	LS	$_____	$_____
5 *	Prepare, Maintain and Restore Access Routes	1	LS	$_____	$_____

General Subtotal (A-1): $_____

McCASLIN / BOWLING – NEW WELLS (MC-1 AND MC-2)

Item No.	Description	Estimated Quantity	Unit	Unit Price	Amount
6 *	Well Move-In, Move-Out, and Clean-up	1	EA	$_____	$_____
7	Drill Hole to 42-inch min. Diameter for Conductor Pipe	50	LF	$_____	$_____
8	Furnish, Install and Grout 36-inch Diameter Conductor Pipe	50	LF	$_____	$_____
9	Drill Pilot Hole to 18-inch max. Diameter	740	LF	$_____	$_____
10 *	Perform E-log of Well	1	EA	$_____	$_____
11 *	Perform Caliper Log of Well	1	EA	$_____	$_____
12	Ream Pilot Hole to 32-inch min. Diameter (for 20" casing)	740	LF	$_____	$_____
13	Furnish and Install 20-inch Diameter HSLA – Corten Unperforated Well Casing	425	LF	$_____	$_____
14	Furnish and Install 20-inch Diameter HSLA – Corten Perforated Well Casing, Roscoe Moss Fulflo, 0.090"[1]	345	LF	$_____	$_____
15	Furnish and Install Gravel Envelope	680	LF	$_____	$_____
16	Placement of Cement Grout Annular Seal	100	LF	$_____	$_____
17	Furnish and Install 3" Gravel Tube	115	LF	$_____	$_____
18	Furnish and Install 3" Air Vent Pipe	5	LF	$_____	$_____
19	Furnish and Install 3" Sounding Tube/Camera Port	538	LF	$_____	$_____
20	Swab and Airlift Well	48	HR	$_____	$_____
21	Develop Well – Pumping and Surging	60	HR	$_____	$_____
22	Test Pump of Well – Step-Drawdown and Continuous	36	HR	$_____	$_____

[1] Roscoe Moss perforated casing opening sizes are subject to change after evaluating initial E-log and bore-hole samples.

23*	Video Log of Well	1	EA	$_____	$_____
24*	Alignment/Deviation Survey	1	EA	$_____	$_____
25*	Gyroscopic Survey	1	EA	$_____	$_____
26*	Dynamic Flow Meter Survey	1	EA	$_____	$_____
27	Chemical Development	345	LF	$_____	$_____
28*	Well Disinfection and Capping	1	EA	$_____	$_____
				Single Well Subtotal:	**$_____**
				Two Well Subtotal (Single Well Subtotal x 2):	**$_____**
29	Zone Testing for One Well – Per Zone (Up to 4 Total – See Item Description)	4	EA	$_____	$_____

Sub-1 **"Two Well Subtotal" plus the cost of item 29** **$_____**

McCASLIN / BOWLING – NEW WELL (B1)

Item No.	Description	Estimated Quantity	Unit	Unit Price	Amount
30 *	Well Move-In, Move-Out, and Clean-up	1	EA	$_____	$_____
31	Drill Hole to 42-inch min. Diameter for Conductor Pipe	50	LF	$_____	$_____
32	Furnish, Install and Grout 36-inch Diameter Conductor Pipe	50	LF	$_____	$_____
33	Drill Pilot Hole to 18-inch max. Diameter	660	LF	$_____	$_____
34*	Perform E-log of Well	1	EA	$_____	$_____
35*	Perform Caliper Log of Well	1	EA	$_____	$_____
36	Ream Pilot Hole to 32-inch min. Diameter (for 20" casing)	660	LF	$_____	$_____
37	Furnish and Install 20-inch Diameter HSLA – Corten Unperforated Well Casing	430	LF	$_____	$_____
38	Furnish and Install 20-inch Diameter HSLA – Corten Perforated Well Casing, Roscoe Moss Fulflo, 0.080" [2]	260	LF	$_____	$_____
39	Furnish and Install Gravel Envelope	410	LF	$_____	$_____

[2] Roscoe Moss perforated casing opening sizes are subject to change after evaluating initial E-log and bore-hole samples.

40	Placement of Cement Grout Annular Seal	300	LF	$_____	$_____
41	Furnish and Install 3” Gravel Tube	315	LF	$_____	$_____
42	Furnish and Install 3” Air Vent Pipe	5	LF	$_____	$_____
43	Furnish and Install 3” Sounding Tube/Camera Port	600	LF	$_____	$_____
44	Swab and Airlift Well	48	HR	$_____	$_____
45	Develop Well – Pumping and Surging	60	HR	$_____	$_____
46	Test Pump of Well – Step-Drawdown and Continuous	36	HR	$_____	$_____
47	Video Log of Well	1	EA	$_____	$_____
48	Alignment/Deviation Survey	1	EA	$_____	$_____
49	Gyroscopic Survey	1	EA	$_____	$_____
50	Dynamic Flow Meter Survey	1	EA	$_____	$_____
51	Chemical Development	260	LF	$_____	$_____
52	Well Disinfection and Capping	1	EA	$_____	$_____
				Single Well (B1) Subtotal:	**$_____**
53	Existing Well Abandonment[3]	400	LF	$_____	$_____
Sub-2				**Single Well (B1) Subtotal plus the cost of item 53:**	**$_____**

TOTAL AMOUNT FOR SCHEDULE “A-1” (Base Contract)

General Subtotal (A-1): $_____

MC1 & MC2 Subtotal (Sub-1): $_____

B1 Subtotal (Sub-2): $_____

Total Bid: $_____

[3] Addendum 2: Existing well abandonment price per linear foot added to bid schedule.

OPTIONAL ITEMS AND ADDS/DEDUCTS (NOT INCLUDED IN BID TOTALS)

Item No.	Description	Estimated Quantity	Unit	Unit Price	Amount
54*	Furnish and Install 20-inch Diameter Well Compression Section	1	EA	$_____	$_____
55	Well Borehole Abandonment	___	LF	$_____	$_____
56	Idle Time (for additional hours not included in the bid per the Specifications)	___	HR	$_____	$_____

PROPOSAL BIDDING SCHEDULE

McCASLIN / BOWLING
WELL DRILLING AND EQUIPPING

Bid Schedule A-2 – McCaslin / Bowling – Well Equipping

All Items Furnished and Installed

The following Bid Schedule lists the items necessary to complete the Work. Bidder shall complete the schedule including the unit and total price of each item, including applicable sales and other taxes. If the total cost of any item or the total Base Bid is inconsistent with the unit cost, the unit cost shall prevail. Payment of each item will be based on the plans and those with an asterisk (*) included in the item number are to be considered as "final pay quantity for each item", unless the dimensions of the portion of the work shown on the plans are revised by the Engineer, or unless the portion of the work is eliminated. On all other items with no asterisk (*) included in the item number, payment will be based upon the final quantity installed or completed. If the dimensions of the specific portion of the work are revised, and the revisions result in an increase or decrease in the estimated quantity of the portion of the work, the final quantity for payment will be revised in the amount represented by the changes in the dimensions. If the specific portion of the work is eliminated, the final pay quantity designated for the specific portion of the work will be eliminated. All costs for completing the Work described in the Contract documents and on the plans shall be included in the bid items listed below. Bids will be compared on the basis of the grand total of bid items 1 through 52 and 56 through 65.. Contractor shall include all costs to accomplish the project including (but not limited to): mobilization/demobilization, develop water supply, materials, equipment, labor, overhead, profit, taxes, delivery charges, permits etc.

BASE BID – WELL EQUIPPING

McCASLIN / BOWLING – NEW WELLS (MC-1, MC-2, AND B1)

Item No.	Description	Estimated Quantity	Unit	Unit Price	Amount
57*	12'x12' Pedestal-Style Concrete Pump Foundation	3	EA	$_____	$_____
58*	Furnish and Install 350 HP Well Pumping Unit With Electric Motor	3	EA	$_____	$_____
59	Furnish and Install 12-Inch Steel Column Tube and Shaft	1,620	LF	$_____	$_____
60*	Furnish and Install Vertical Turbine Pumping Unit	3	EA	$_____	$_____
61*	Furnish and Install Suction Extension	3	EA	$_____	$_____

62*	Furnish and Install 12-Inch Steel Discharge Piping Assembly, Complete With Valves, Flowmeter, Airvents, Couplings, & All Other Appurtenances at Well Site (Details A-19 and B-19)	3	EA	$_____	$_____
63*	Furnish and Install Panel Shade Structure	3	EA	$_____	$_____
64*	Furnish and Install Panel Security Structure	3	EA	$_____	$_____
65*	Furnish and Install Well Enclosure	3	EA	$_____	$_____
66	Furnish and Install Electrical Service (via Pad Mount Transformer), Metering Panel, VFD Control Panel, Instrumentation & Monitoring Panel, All Wiring & Controls, and All Other Electrical Appurtenances at Well Site	3	EA	$_____	$_____

Sub-3 **New Wells Equipping Subtotal: $_____**

TOTAL AMOUNT FOR SCHEDULE "A-2" (Base Contract)

Total Bid: (Should be equal to Sub-3)

$_____

OPTIONAL ITEMS AND ADDS/DEDUCTS (NOT INCLUDED IN BID TOTALS)

Item No.	Description	Estimated Quantity	Unit	Unit Price	Amount
67	Security Pole & Light (Detail C-33)	1	EA	$_____	$_____

Total Bid (A-1):	Total Bid (A-2):	**Grand Total Bid: (Sum of the two bids)**
$_____	$_____	$_____

Bid Submitted by:

Contractor _____

Date _____

SCOPE OF WORK

Measurement and Payment:

Payment for the various items of the Bid Schedule, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of the Work all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of permits and cost of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the California Division of Industrial Safety, and the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, but which is necessary for the complete construction of the work and all costs therefore shall be included in the prices named in the Bid Schedule for the various appurtenant items of work.

If the total cost of any item or the total Base Bid is inconsistent with the unit cost, the unit cost shall prevail. Quantities indicated on the bid schedule are for bidding purposes and subject to change per the District, at the unit rate as bid. Payment of each item will be based on the plans and those with an asterisk (*) included in the item number are to be considered as "final pay quantity for each item", unless the dimensions of the portion of the work shown on the plans are revised by the Engineer, or unless the portion of the work is eliminated. On all other items with no asterisk (*) included in the item number, payment will be based upon the final quantity installed or completed. If the dimensions of the specific portion of the work are revised, and the revisions result in an increase or decrease in the estimated quantity of the portion of the work, the final quantity for payment will be revised in the amount represented by the changes in the dimensions. If the specific portion of the work is eliminated, the final pay quantity designated for the specific portion of the work will be eliminated.

Mobilization (Bid Item Nos. 1*):

a. Mobilization shall include all activities and costs for transportation of personnel, equipment, and operating supplies to and from the site; establishment of portable sanitary and refuse facilities; obtaining an adequate source of fresh water; location, provision and installation of field offices & equipment/materials, storage yards excavation equipment, buildings, and other necessary facilities for the Contractor's operations at the site; premiums paid for performance and payment bonds, including coinsurance and reinsurance agreements as applicable.

The site is not fenced, the contractor will be responsible to provide his own security for equipment, materials, fuel, tools, etc. that he may have on site.

The Contractor shall provide all necessary equipment & materials; all tools, accessories, power, fuel, materials, supplies, lighting, water, and other support equipment; and experienced personnel necessary to execute the work in an orderly an efficient manner.

Mobilization also includes all items necessary to complete the project that are not covered under any other Bid Item.

b. **Measurement and Payment -** The Lump Sum Price paid for Mobilization shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred to complete the mobilization effort and items to complete the project that are not covered under any other line item – including, but not limited to, premiums paid for performance and payment bonds, including coinsurance and reinsurance agreements as applicable.

Demobilization (Bid Item Nos. 2*):

a. Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not included in the contract from the site; including the disassembly, removal and site cleanup, of offices, equipment, buildings, restoration of facilities, roads, fences, facilities etc. modified or disturbed during the course of the project and other facilities assembled on the site for this contract.

b. **Measurement and Payment -** The Lump Sum Price paid for Demobilization shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred to complete the demobilization effort.

Develop and Provide Water Supply (Bid Item Nos. 3*):

a. Contractor will be provided with a source of water for construction at each of the Wellfields – see the Plans for source location.

McCaslin Wellfield – Contractor will be provided water, by the District, at the 1) Ponds adjacent to each well site, 2) Adjacent Goose Lake Slough Channel, or 3) McCaslin Ag well located at the southeast corner of McCaslin Pond 1.

Bowling Well – Contractor will be provided water, by the District, at the 1) Pond adjacent to the well site, 2) Adjacent Goose Lake Slough Channel or 3) Either SUP-5 or SUP-6 wells located east and west of the Bowling pond.

See the plans for the locations of all water supply sources.

b. **Measurement and Payment -** The Lump Sum Price paid for Develop and Provide Water Supply shall include full compensation for making all completed arrangements and permission, furnishing all fees, labor, materials, tools, equipment, and incidentals and for

doing all work involved in developing a sufficient supply of water, furnish pipeline and other necessary equipment to supply water to the water application equipment for all water required for the work as well as supplying all water necessary for completing the work.

Environmental Compliance and Permitting (Bid Item No. 4*):

(PM-10 and SWPPP Compliance)

a. The Contractor shall comply with all local, state and federal requirements for Storm Water Pollution Prevention and Site dust control and if required by law, shall prepare a Storm Water Pollution Prevention Plan (SWPPP) and a PM-10 Dust Management Plan and obtain permits for each. Contractor shall install, construct, maintain all necessary measures to comply with and keep the necessary records in accordance with the requirements of mandated environmental compliance.

As required, the contractor shall prepare all plans and shall obtain all necessary permits prior to commencement of construction and shall comply with all local, state, and federal requirements.

b. **Measurement and Payment -** The Lump Sum Price paid for Environmental Compliance and Permitting shall include full compensation for making all completed arrangements and permission, furnishing all plans, permits, fees, labor, materials, tools, equipment, and incidentals and for doing all work involved in PM-10 and SWPPP Compliance.

Prepare, Maintain and Restore Access Routes (Bid Item Nos. 5*):

a. The Contractor shall perform all dirt work, grading, etc. for proper preparation and maintenance of Construction Access Routes. This includes maintenance and dust control during Construction. Following completion of the project construction, the Contractor shall restore all access routes to original design and fencing to its original location.

b. **Measurement and Payment -** The Lump Sum Price paid for Preparing, Maintaining and Restoring Access Routes shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Well Move-In, Move-Out, and Clean-up (Bid Item No. 6 and 30):

a. Well move-in, move-out, and clean-up shall include all activities and costs for transportation of personnel, equipment, and operating supplies to and from each individual well site that is not covered under the general Mobilization and Demobilization for the project. This also includes mobilization and demobilization of tanks, construction and removal of bermed area, cleanup and disposal of any drilling materials and mud from ponds, etc.

b. **Measurement and Payment -** The Lump Sum Price paid for Well move-in, move-out, and clean-up shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

WELL CONSTRUCTION:

Drill Hole to 42-inch min. Diameter for Conductor Pipe (Bid Item No. 7 and 31):

a. The Contractor shall provide all materials, equipment, labor and incidentals to drill a pilot hole to 42-inch min. diameter 50 ft. deep min. to accommodate conductor pipe installation on each well.

b. **Measurement and Payment –** The Unit Price paid to drill one 42-inch min. diameter pilot hole per well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish, Install and Grout 36-inch Diameter Conductor Pipe (Bid Item No. 8 and 32):

a. The Contractor shall provide all materials, equipment, labor and incidentals to furnish, install and grout a 36-inch diameter 50 ft. deep (minimum below ground surface) conductor pipe at each well site.

b. **Measurement and Payment –** The Unit Price paid for furnish, install and grout 36-inch diameter conductor shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Drill Pilot Hole to 18-inch max. Diameter (Bid Item No. 9 and 33):

a. The Contractor shall provide all materials, equipment, labor and incidentals to drill one 18-inch max. diameter pilot hole below conductor per well to a depth approved by the District Representative.

b. **Measurement and Payment –** The Unit Price paid to drill one 18-inch max. diameter pilot hole per well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Perform E-Log of Well (Bid Item No. 10* and 34*):

a. The Contractor shall provide all materials, equipment, labor and incidentals to perform an E-log on each well.

b. **Measurement and Payment –** The Unit Price paid to perform caliper log of well on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Perform Caliper Log of Well (Bid Item No. 11* and 35*):

a. The Contractor shall provide all materials, equipment, labor and incidentals to perform a caliper log on each well.

b. **Measurement and Payment –** The Unit Price paid to perform caliper log of well on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Ream Pilot Hole (Bid Item No. 12 and 36):

a. The Contractor shall provide all materials, equipment, labor and incidentals to ream pilot hole below conductor on each well to 32-inch min. diameter for 20" casing).

b. **Measurement and Payment -** The Unit Price to Ream Pilot Hole shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all work to Ream Pilot Hole and no additional allowance shall be made therefore.

Furnish and Install 20-inch Diameter HSLA – Corten Unperforated Well Casing (Bid Item Nos. 13 and 37):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install unperforated well casing of identical sizing, design and composition in conformance with the plans and specifications.

b. **Measurement and Payment -** The Unit Price per Linear Foot for Unperforated Well Casing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work for this item and no additional allowance shall be made therefore.

Furnish and Install 20-inch Diameter HSLA – Corten Perforated Well Casing, Roscoe Moss Fulflo (Bid Item Nos. 14 and 38):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install perforated well casing of identical sizing, design and composition in conformance with the casing option that the District chooses to install for each individual well. Quantities and opening size indicated on the bid schedule are for bidding purposes and subject to change per the District after e-log and bore sample evaluation at final design stage, at the unit rate as bid.

b. **Measurement and Payment -** The Unit Price per Linear Foot for Perforated Well Casing shall include full compensation for furnishing all labor, materials, tools,

equipment, and incidentals, and for doing all work for this item and no additional allowance shall be made therefore.

Furnish and Install Gravel Envelope (Bid Item No. 15 and 39):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install a gravel envelope between the casing and enlarged borehole on each well, per the specifications.

b. **Measurement and Payment –** The Unit Price paid to furnish and install gravel envelope on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Placement of Cement Grout Annular Seal (Bid Item No. 16 and 40):

a. The Contractor shall provide all materials, equipment, labor and incidentals to place a cement grout annular seal on each well. This shall include a fine sand seal or approved equivalent between the gravel envelope and cement grout, per the specifications.

b. **Measurement and Payment –** The Unit Price paid to place a cement grout annular seal on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install 3” Gravel Tube (Bid Item No. 17 and 41):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install a 3” gravel tube on each well as shown in the plans. Gravel tube material shall match casing material.

b. **Measurement and Payment –** The Unit Price paid to furnish and install a 3” gravel tube on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install 3” Air Vent Pipe (Bid Item No. 18 and 42):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install a 3” air vent pipe on each well. Air vent material shall match casing material.

b. **Measurement and Payment –** The Unit Price paid to furnish and install a 3” air vent pipe on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install 3" Sounding Tube/Camera Port (Bid Item No. 19 and 43):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install a 3" sounding tube/camera port on each well as shown in the plans. Sounding tube/camera port material shall match casing material.

b. **Measurement and Payment –** The Unit Price paid to furnish and install a 3" sounding tube/camera port on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Swab and Airlift Well (Bid Item No. 20 and 44):

a. The Contractor shall provide all materials, equipment, labor and incidentals to swab and airlift each well as defined in the specifications.

b. **Measurement and Payment –** The Unit Price paid to swab and airlift each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Develop Well – Pumping and Surging (Bid Item No. 21 and 45):

a. The Contractor shall provide all materials, equipment, labor and incidentals to develop each well via pumping and surging. Development pumping shall be per the specifications (minimum) and subject to the District's approval.

b. **Measurement and Payment –** The Unit Price paid to develop each well via pumping and surging shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Test Pump of Well (Bid Item No. 22 and 46):

a. The Contractor shall provide all materials, equipment, labor and incidentals to test pump each well. Test pumping shall be per the specifications, unless otherwise approved by the District.

b. **Measurement and Payment –** The Unit Price paid to test pump each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Perform Video Log of Well (Bid Item No. 23* and 47*):

a. The Contractor shall provide all materials, equipment, labor and incidentals to perform a video log on each well.

b. **Measurement and Payment –** The Unit Price paid to perform a video log on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Alignment/Deviation Survey (Bid Item No. 24* and 48*):

a. The Contractor shall provide all materials, equipment, labor and incidentals to perform an alignment/deviation survey on each well.

b. **Measurement and Payment –** The Unit Price paid to perform an alignment/deviation survey on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Gyroscopic Survey (Bid Item No. 25* and 49*):

a. The Contractor shall provide all materials, equipment, labor and incidentals to perform a gyroscopic survey at the request of the District Representative.

b. **Measurement and Payment:** Measurement for payment shall be per each gyroscopic survey performed. The Quantity Pay Unit Price paid to perform a gyroscopic survey shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Dynamic Flow Meter Survey (Bid Item No. 26* and 50*):

a. The Contractor shall provide all materials, equipment, labor and incidentals to perform a dynamic flow meter survey at the request of the District Representative.

b. **Measurement and Payment –** The Unit Price paid to perform a dynamic flow meter survey shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Chemical Development (Bid Item No. 27 and 51):

a. The Contractor shall provide all materials, equipment, labor and incidentals to chemically develop any or all of the wells at the request of the District Representative as defined in the specifications.

b. **Measurement and Payment –** The Unit Price paid to chemically develop wells shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Well Disinfection and Capping (Bid Item No. 28* and 52*):

a. The Contractor shall provide all materials, equipment, labor and incidentals disinfect and cap any or all wells at the request of the District Representative.

b. **Measurement and Payment –** The Unit Price paid to disinfect and cap any or all wells shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Zone Testing – Per Zone on 1 Well (Bid Item No. 29):

a. The Contractor shall provide all materials, equipment, labor and incidentals to perform zone testing on up to 4 separate zones on a single well on a per-zone basis. It is anticipated that 4 zones will be tested on McCaslin well 2, with no other zone testing anticipated at the time of bidding. Quantities indicated on the bid schedule are for bidding purposes and subject to change per the District, at the unit rate as bid.

b. **Measurement and Payment –** The Unit Price paid to perform zone testing per zone on a single well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Existing Well Abandonment (Bid Item No. 53)[1]:

a. The Contractor shall provide all materials, equipment, labor and incidentals to properly abandon an existing well in accordance with the Kern County Well Ordinance and relevant specifications. This item shall include (but is not limited to) – required permits, a preliminary video log for assessment purposes, tagging (depth confirmation), concrete or neat cement fill from the bottom of the well to 6 feet below grade (or the cap if lower), cutting and capping of the well at least 6' below grade, and compacted backfill to 90% per ASTM D1557 in the resulting hole.

b. **Measurement and Payment –** The Unit Price paid to abandon an existing well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

[1] Addendum 2: Existing well abandonment price per linear foot added to bid schedule.

Furnish and Install 20-inch Diameter Well Compression Section (Bid Item No. 54): (OPTIONAL)

a. The Contractor shall provide all materials, equipment, labor and incidentals to install a well compression section corresponding to the well casing size option selected by the District. The well compression section shall be in accordance to the design shown in the plans. Well Compression Section material shall match the casing material.

b. **Measurement and Payment –** The Unit Price paid to furnish and install a Well Compression Section shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Well Borehole Abandonment (Bid Item No. 55): (OPTIONAL)

a. The Contractor shall provide all materials, equipment, labor and incidentals to abandon a well borehole at the request of the District Representative.

b. **Measurement and Payment –** The Unit Price paid to abandon a well borehole shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Idle Time (Bid Item No. 56): (OPTIONAL)

a. Idle time represents any additional idle time incurred by the Contractor that is not already included in the bid per the Specifications.

b. **Measurement and Payment –** The per Hour Price paid for additional idle time shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred.

WELL EQUIPPING:

12’x12’ Pedestal-Style Concrete Pump Foundation (Bid Item No. 57*):

a. The Contractor shall provide all materials, equipment, labor and incidentals to construct a 12’x12’ pedestal-style concrete pump foundation at each wellsite. The Contractor shall perform all subgrade preparation, installation of conduits, forming, tying of steel, provision and placement of concrete, finishing, and curing of pump foundations.

b. **Measurement and Payment -** The Unit Price per Pedestal-Style Concrete Pump Foundation shall include full compensation for furnishing all labor, materials, forms, tools, equipment, and incidentals, and for doing all work and operations which must be

performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install 350 HP Well Pumping Unit with Electric Motor (Bid Item No. 58):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install a 350 HP well pumping unit with electric motor, pumphead, headshaft, oiler, etc. on each well.

b. **Measurement and Payment -** The Unit Price paid to furnish and install a 350 HP well pumping unit with electric motor on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install 12-inch Steel Column Tube and Shaft (Bid Item No. 59):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install 12-inch column tube and shaft on each well.

b. **Measurement and Payment -** The Unit Price paid to furnish and install 12-inch column tube and shaft on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install Vertical Turbine Pumping Unit (Bid Item No. 60):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install a vertical turbine pumping unit on each well.

b. **Measurement and Payment -** The Unit Price paid to furnish and install a vertical turbine pumping unit on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install Suction Extension (Bid Item No. 61):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install a suction extension on each well as shown on the Plans.

b. **Measurement and Payment -** The Unit Price paid to furnish and install a suction extension on each well shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed, or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install 12-inch Steel Discharge Piping Assembly, Complete with Valves, Flowmeter, Airvents, Couplings & All Other Appurtenances at Well Site (Bid Item No. 62):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install 12-inch steel discharge piping assembly, complete with valves, flowmeter, airvents, couplings & all other appurtenances at each well site as shown on the Plans and described in the Specifications. Included in this line item is a single joint of PIP 15" PVC Class 100 installed as shown in the plans.

b. **Measurement and Payment -** The Unit Price paid to furnish and install 12-inch steel discharge piping assembly, complete with valves, flowmeter, airvents, couplings & all other appurtenances at each well site shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install Panel Shade Structure (Bid Item No. 63):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install a panel shade structure at each well site as shown on the Plans and described in the Specifications.

b. **Measurement and Payment -** The Unit Price paid to furnish and install a panel shade structure at each well site shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install Panel Security Structure (Bid Item No. 64):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install panel security structures at each well site as shown on the Plans and described in the Specifications.

b. **Measurement and Payment -** The Unit Price paid to furnish and install panel security structures at each well site shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install Well Enclosure (Bid Item No. 65):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install a well enclosure at each well site as shown on the Plans and described in the Specifications.

b. **Measurement and Payment -** The Unit Price paid to furnish and install a well enclosure at each well site shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Furnish and Install Electrical Service (via Pad Mount Transformer), Metering Panel, VFD Control Panel, Instrumentation & Monitoring Panel, All Wiring & Controls, and All Other Electrical Appurtenances at Well Site (Bid Item No. 66):

a. The Contractor shall provide all materials, equipment, labor and incidentals to install the electrical service (including the installation of a pad mount transformer), electrical metering panel, variable frequency drive control panel (Yaskawa IQU1000 NEMA 3R Matrix VFD), instrumentation and monitoring panel, all conduits, wiring & controls, lighting and all other electrical appurtenances at each relevant well site as shown on the Plans and described in the Specifications.

b. **Measurement and Payment -** The Unit Price paid to furnish and install the electrical service, electrical panels, all conduits, wiring & controls, and all other electrical appurtenances at each well site shall include full compensation for all labor, materials, transportation, supplies, tools, equipment, and incidentals and for doing all other work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

Security Pole & Light (Bid Item No. 67): (OPTIONAL)

a. The Contractor shall provide all materials, equipment, labor and incidentals to install a Security Pole and Light facility, including related conduits, underground facilities, wiring, switches, etc. per the Plans and Specifications. Item to be installed at the request of the District Representative.

b. **Measurement and Payment -** The Unit Price per Security Pole and Light facility shall include full compensation for furnishing all labor, materials, forms, tools, equipment, and incidentals, and for doing all work and operations which must be performed or costs incurred prior to beginning, during and after the completion of the work on this item and no additional allowance shall be made therefore.

INFORMATION REQUIRED OF BIDDER

EXPERIENCE AND REFERENCES

In conformance with requirements of Sections B and D of these Specifications, the Bidder sets forth the following data:

Listed below are three projects performed under the bidder's supervision during the past ten (10) years involving work of scope and complexity comparable to that to be installed under Contract Specifications:

1. Project Name and Location: _____

Project Description: _____

_____

Size and Depth of Well: _____

_____

Owner: _____

Contract Amount/Completion Date: _____

Reference Contact Name and Telephone Number(s): _____

_____

2. Project Name and Location: _____

Project Description: _____

_____

Size and Depth of Well: _____

_____

Owner: _____

Contract Amount/Completion Date: _____

Reference Contact Name and Telephone Number(s): _____

_____

3. Project Name and Location: _____

Project Description: _____

_____

Size and Depth of Well: _____

_____

Owner: _____

Contract Amount/Completion Date: _____

Reference Contact Name and Telephone Number(s): _____

_____

MATERIAL SUPPLIERS INFORMATION

The BIDDER shall indicate opposite each item of equipment or material listed below the name of the manufacturer or supplier of the equipment or material proposed to be furnished under the bid:

Well Casing: _____

Gravel Pack: _____

E-Log: _____

Awarding of a contract under this bid will not imply approval by the District or Engineer of the manufacturers or suppliers listed by the bidder. No substitution will be permitted after award of contract unless equipment or material of the listed manufacturer or supplier does not meet the requirements of the Specifications.

LIST OF SUBCONTRACTORS

The bidder hereby designates below the names and business addresses of each subcontractor who will perform work or labor. Please fill out as completely as possible when submitting your bid. Use subcontractor's business name style as registered with the License Board.

a. Complete the name and location of the place of business of each subcontractor (i) who will perform work or labor or render service to the Bidder in or about the construction contemplated in the Plans and Specifications or (ii) licensed by the State who, under subcontract to the Bidder, specially fabricates and installs a portion of the work or improvement according to the detailed drawings contained

in the Plans and Specifications in an amount in excess of one-half of one percent of the Bidder's total Bid.

b. Complete the portion of the Work that will be done by each subcontractor. The Bidder shall list only one subcontractor for each portion as is defined by the Bidder in his Bid.

c. Bidders are reminded of the penalties for the improper substitution of a subcontractor pursuant to Public Contract Code Section 4110.

SUBCONTRACTOR:

Business Address:_____

Class_____ License No._____

Item No. or Description of Work:_____

Dollar Amount or Percentage of Total Bid:_____

SUBCONTRACTOR:

Business Address:_____

Class_____ License No._____

Item No. or Description of Work:_____

Dollar Amount or Percentage of Total Bid:_____

SUBCONTRACTOR:

Business Address:_____

Class_____ License No._____

Item No. or Description of Work:_____

Dollar Amount or Percentage of Total Bid:_____

SUBCONTRACTOR:

Business Address:_____

Class_____ License No._____

Item No. or Description of Work:_____

Dollar Amount or Percentage of Total Bid:_____

SUBCONTRACTOR:

Business Address:____

Class___________ License No.____

Item No. or Description of Work:____

Dollar Amount or Percentage of Total Bid:_______________________________________

SUBCONTRACTOR:

Business Address:____

Class___________ License No.____

Item No. or Description of Work:____

Dollar Amount or Percentage of Total Bid:_______________________________________

SUBCONTRACTOR:

Business Address:____

Class___________ License No.____

Item No. or Description of Work:____

Dollar Amount or Percentage of Total Bid:_______________________________________

SUBCONTRACTOR:

Business Address:____

Class___________ License No.____

Item No. or Description of Work:____

Dollar Amount or Percentage of Total Bid:_______________________________________

NOTE: Bidder shall attach all additional sheets and attachments as required. Failure to supply all items of information required of bidders may cause the bid to be considered non-responsive.

AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20__, by and between the ROSEDALE-RIO BRAVO WSD, hereinafter called the "District," and _____, hereinafter called the "Contractor;"

WITNESSETH: That the District and the Contractor, for the consideration hereinafter named, agree as follows:

a. This Contract is for all materials and services necessary to complete the project described in the Contract Documents for the McCaslin / Bowling Well Drilling and Equipping Project. Specifically, the work shall include the following:

b. The Contract includes all of the Contract Documents, to wit: The Contract Documents shall consist of the Notices Inviting Bids, the Instructions to Bidders, the accepted Proposal, the Proposal Bond, Measurement and Payment, the Information Required of Bidder, the Agreement, the Faithful Performance Bond, the Payment Bond, the Non-Collusion Affidavit, the Notice to Proceed, the Notice to Proceed Checklist, General Conditions, Special Conditions, the Plans and Specifications, Appendices and any change order or Addenda, setting forth any modifications or interpretations of any of said Documents. All said Contract Documents are hereby incorporated in and made a part of this Agreement.

c. The Contractor shall furnish all labor, materials, equipment, and other facilities and perform in good and workmanlike manner all work under the Contract for the District in strict conformity with this Contract and the Contract Documents, including but not limited to the Plans and Specifications, and to the approval and entire satisfaction of the Engineer and District.

d. The District will pay the Contractor in current funds for the performance of the Contract the sum stated in the Proposal Bid Schedule, in the manner, at the time and upon the conditions as stated in the Contract Documents, and will otherwise fulfill its obligations as provided in the Contract.

e. All time limits stated in the Contract Documents are of the essence.

f. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, as well as their heirs, successors, and assigns.

g. Schedule/Liquidated Damages – All work to be complete within Three-Hundred (300) Calendar days of the date that the Notice to Proceed was issued.

> Contractor agrees that if the aforesaid schedule is not met, liquidated damages will be withheld from Contractor's payments and be forfeited to Owner as authorized by section 53069.85 of the Government Code of the State of California, in the following amounts and under the following conditions:

One Thousand Dollars ($1000.00) per day.

h. Labor Certification - Contractor states that it is aware of the provisions of Section 3700 of the Labor Code, which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with provisions of that Code, and Contractor agrees to comply with such provisions before commencing the performance of the Work of this Contract.

i. Indemnification:

1. The Contractor shall assume the defense of and indemnify and save harmless the District, the Design Engineer and the Engineer and their respective directors, officers, employees and agents from any and all loss, damage, liability, claims, or causes of action of every nature whatsoever for damage to or destruction of property, including the District's property, or for injury to or death of persons, including Contractor's employees, in any manner, including that alleged to have been caused by the negligence of the indemnities of any of them, arising out of or incident to the performance of this Contract; provided, however, that the Contractor shall have no such obligation with respect to such of the foregoing as are actually caused by the sole negligence or willful misconduct of the indemnities or any of them; and provided further, that the Contractor shall not be liable for damages resulting solely from error or omission in design that were not due to or contributed to by negligence or fault of the Contractor, his Subcontractors, agents or employees.

2. The Contractor shall at all times preserve and protect the Work installed and performed hereunder, and assume full responsibility for the condition thereof until final acceptance by the District. Contractor shall be liable for any loss or damage to any Work in place and to any materials on the Site that may be caused by Contractor, his employees, agents, or guests. Any such damage shall be immediately repaired by Contractor, and, upon failure to do so, the District may remedy the same and deduct the cost thereof from any amount due or to become due to the Contractor.

3. The Contractor shall assume the defense of and indemnify and save harmless the District, the Design Engineer and the Engineer and their respective directors, officers, employees and agents, against any and all liens, claims, demands, and costs, including attorneys' fees, for labor and material furnished to the Contractor or any of his subcontractors in connection with the performance of this Contract. In the event that the Contractor or any of his Subcontractors shall fail to pay for any material or labor used in the performance of this Contract, or any lien is filed against the said property, or any claim is asserted or action is filed against the said

property, or any claim is asserted or action filed on any bond, by any person claiming to have furnished labor or materials to the Contractor or any of his Subcontractors in connection with the performance of this Contract, the District shall be entitled, at its option, to pay for said material or labor, or discharge any such lien, or to pay or settle any such claim or action and to deduct the amount so paid, together with any and all costs and attorney's fees incurred by or on behalf of the District in connection with any such payment, discharge, or settlement, from amounts due or to become due to the Contractor hereunder. The District may also deduct from any amounts due or to become due to the Contractor, any other amounts owing by the Contractor to the District, including the cost of any materials, labor, services, equipment or facilities supplied by the District as to which the Contractor has the obligation to supply the same hereunder. In the event that the balance that otherwise would be due the Contractor, shall be insufficient to so reimburse the District, the Contractor shall pay the District any deficiency upon demand.

4. The Contractor shall pay all royalties and license fees. He shall, at his own cost, expense and risk, defend any and all suits or claims for infringement of any patent rights and shall save the District and its Directors, officers, employees and agents harmless from loss of account thereof; except that the District shall be responsible for all such loss when a particular manufacturer is specified by it, but if the Contract has information that the process or article specified is or may be an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information, in writing, to the Engineer.

5. If the District, the Design Engineer or the Engineer and/or their respective Officials, Officers, Employees, Agents, Consultants, and Engineers are required to testify or contribute time and expense in any other way, in any suit or enforcement action of any kind brought to recover alleged damages or remedy alleged violations resulting from the acts or omissions (including negligent acts or omissions) in connection with, or accidents arising from, the acts, operations, and responsibilities of the Contractor, its Subcontractors, or others associated with or working under Contractor, in direct or indirect relation to the performance of the Work, they shall be reimbursed for any reasonable costs incurred by them for lost time, expert assistance, and incidental expenses in connection with their need to contribute time and expense, whether or not the suit or enforcement action proceeds to final judgment.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first above written.

Rosedale-Rio Bravo WSD

(District Seal) By: _____

_____
Rosedale-Rio Bravo WSD

Contractor

By: _____
(Title)

And: _____
(Title)

(CORPORATE SEAL)

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FAITHFUL PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS

THAT, WHEREAS, the ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT, State of California, entered into a Contract dated_____, 20__, with _____ _____ hereinafter designated as the "Contractor," for _____ _____ _____; and,

WHEREAS, the said Contractor is required under the terms of said Contract to furnish a bond for the faithful performance of said Contract.

NOW, THEREFORE, WE, the undersigned Contractor, as Principal, and _____ _____ (corporate surety), a corporation organized and existing under the laws of the State of _____, and duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT in the penal sum of _____ Dollars ($_____), lawful money of the United States, said sum being equal in amount to one-hundred percent (100%) of the total Contract amount payable by the said ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT under the terms of the Contract, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT, if the above-bonded Contractor, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and agreements in the said Contract and any alteration thereof made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT, its officers and agents, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract or to the Work to be performed thereunder or the Specifications accompanying the same shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alternation, or addition to the terms of the Contract or to the Work or to the Specifications.

IN WITNESS WHEREOF, WE have hereunto set our hands and seals this _____ _____ day of _____, 20__.

Contractor: _____

By: _____

Title: _____

By: _____

Title: _____

Seal

Surety: _____

By: _____

Title: _____

Home Office
Address: _____

Phone: _____

Attorney-
In-Fact: _____

Address: _____

Phone: _____

NOTE: This bond must be acknowledged before a Notary Public, and a legally sufficient power of attorney must be attached to the bond to verify the authority of any party signing on behalf of a surety.

Date of bond shall not be prior to the date of the Contract.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS

THAT, WHEREAS, the ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT has awarded _____

_____

_____hereinafter designated as the "Contractor," for _____

_____

_____

_____; and,

WHEREAS, said Contractor is required by the provisions of Division 4, Part 6, Title 3, of the Civil Code of the State of California, including, but not limited to Civil Code Sections 9550-9566, inclusive, to furnish a bond in connection with said Contract, as hereinafter set forth.

NOW, THEREFORE, WE, _____

_____

the undersigned Contractor, as Principal, and _____

_____

a corporation organized and existing under the laws of the State of _____ and duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto the ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT in the sum of _____ Dollars ($_____ _____), lawful money of the United States, said sum being equal in amount to one-hundred percent (100%) of the total Contract amount payable by the said ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT under the terms of the Contract, for which payment well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT, if said Contractor, his or its heirs, executors, administrators, successors, assigns, or subcontractors shall fail to pay for any materials, provisions, implements, or machinery used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor as required by the provisions of Division 4, Part 6, Title 3, Chapter 5 of the Civil Code; and provided that the claimant shall have complied with the provisions of said Code, the surety or sureties hereon will pay for the same in an amount not exceeding the sum specified in this bond, otherwise the above obligation shall be void. In case a suit is brought upon this bond, the said Surety will pay a reasonable attorney's fee to be fixed by the court. This bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under Division 4, Part 6, Title 3 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond. And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alternation, or addition to the terms of the Contract or to the work to be

performed thereunder or the Specifications accompanying the same shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work or to the Specifications.

IN WITNESS WHEREOF, WE have hereunto set our hands and seals this _____ _____ day of _____, 20__.

In witness whereof, we hereunto set our hands and seals this ____ day of _____, 20__.

Contractor:	_____	Surety:	_____
By:	_____	By:	_____
Title:	_____	Title:	_____
By:	_____	Home Office Address:	_____
Title:	_____	Phone:	_____
		Attorney-in-Fact:	_____
		Address:	_____
_____		Phone:	_____

Seal

NOTE: This bond must be acknowledged before a Notary Public, and a legally sufficient power of attorney must be attached to the bond to verify the authority of any party signing on behalf of a surety.

Date of bond shall not be prior to the date of Contract.

NON–COLLUSION AFFIDAVIT

(TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID)

STATE OF CALIFORNIA)
)
COUNTY OF KERN)

I, _____, declare that I am _____
(sole owner, a partner, president, secretary, etc.)
of _____
the party making the foregoing bid covering _____
_____;
that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that such bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communications, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or date relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Signed: _____

Title: _____

Note: This affidavit must be acknowledged before a Notary Public.

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SUBCONTRACTOR'S NON–COLLUSION AFFIDAVIT

(TO BE EXECUTED BY EACH AWARDEE OF A SUBCONTRACTOR)

STATE OF CALIFORNIA)
)
COUNTY OF KERN)

I, _____, declare that I am _____
(sole owner, a partner, president, secretary, etc.)
of _____
the party making the foregoing bid covering _____
that such bid is not made in the interest of or on behalf of any undisclosed person, partnership, company, association, organization, or corporation; that such bid is genuine and not collusive or sham; that said bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that said bidder has not in any manner, directly or indirectly, sought by agreement, communications, or conference with anyone to fix the bid price of said bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or date relative thereto, or paid, and will not pay, any fee in connection therewith to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, or to any other individual except to such person or persons as have a partnership or other financial interest with said bidder in his general business. The provisions of this affidavit shall not be held as disqualifying a person, firm, or cooperation who has submitted a sub-proposal to one bidder from submitting separate sub-proposals or quoting prices for materials or work to other bidders.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Signed: _____

Title: _____

Note: This affidavit must be acknowledged before a Notary Public.

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NOTICE TO BIDDERS OF JOB SITE TOUR

YOU ARE REQUIRED TO ATTEND a mandatory pre-bid conference and scheduled tour of the Recovery and Return Improvements to District's Spreading Grounds for Drought Resiliency – Well Drilling and Equipping Construction site of the Rosedale-Rio Bravo Water Storage District to be conducted by the District on July 12, 2023. The pre-bid conference will start promptly at 11:00 a.m. commencing at the Rosedale-Rio Bravo Water Storage District, located at 849 Allen Rd, Bakersfield, CA 93314 and then continued in the field. It is anticipated that the conference and tour will last approximately two hours.

This will be the only formal tour of the job site conducted by the District.

/s/ Dan Bartel

General Manager

Rosedale-Rio Bravo Water Storage District
849 Allen Rd.
Bakersfield, CA 93314
Telephone: (661) 589-6045

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NOTICE OF AWARD

TO: _____

PROJECT: ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
McCASLIN / BOWLING
WELL DRILLING AND EQUIPPING

The District has considered the BID submitted by you for the above described WORK in response to its Request for Bids dated _____, and Contract Documents.

You are hereby notified that your BID has been accepted, and the sum of the items amounts to $_____.

You are required by the Contract Documents to execute the Agreement within ten (10) calendar days from the date of this Notice. You are also required to provide all bonds and certificates of insurance required by the Contract Documents within said ten (10) day period.

If you fail to execute said Agreement within ten (10) days from the date of this Notice, or fail to provide the required bonds and certificates of insurance, said District will be entitled to consider all your rights arising out of the District's acceptance of your BID as abandoned. The District will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the District.

Dated this _____ day of _____.

ROSEDALE-RIO BRAVO WSD
OWNER

By: _____
Dan Bartel

Title: General Manager

ACCEPTANCE OF NOTICE

Receipt of the foregoing NOTICE OF AWARD is hereby acknowledged

By:				
this the		Day of		,
By:				
Title				

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NOTICE TO PROCEED FORM

TO: _____

_____

_____

PROJECT: ROSEDALE-RIO BRAVO WSD

McCASLIN / BOWLING WELL DRILLING AND EQUIPPING

_____

DATE: _____

You are hereby notified to commence work in accordance with the Contract Documents for the above-described project on or before _____.

You are to complete the WORK by _____, 20___. If the work is not completed by said date, and if no extension of time has been granted by the District, liquidated damages will be assessed in accordance with the Contract Documents.

OWNER – Rosedale-Rio Bravo WSD

By: _____

Dan Bartel, Assistant General Manager/Engineer

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____, this the _____ day of _____, 20___.

By: _____

Title: _____

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NOTICE TO PROCEED CHECKLIST

To:

_____

_____

From: The Board of Directors,
Rosedale-Rio Bravo WSD

Notice is hereby given that you are authorized and directed to proceed with the following project in accordance with the Contract Documents:

McCaslin / Bowling Well Drilling and Equipping

These documents have been received and are on file with the Rosedale-Rio Bravo WSD:

The Agreement, fully executed	[ ]
Payment Bond (100%)	[ ]
Faithful Performance Bond (100%)	[ ]
Worker's Compensation Insurance Certificate	[ ]
Liability Insurance Policy or Certificate, with Endorsements	[ ]
Post-Award Schedule	[ ]
Non-Collusion Affidavits	[ ]

A copy of the Award of Contract has been mailed by this District to the California Division of Apprenticeship Standards, Department of Industrial Relations.

Under the terms of the Contract, work is to start within ten (10) calendar days after the date set forth below and is to be completed within the time set forth in the Special Conditions.

Rosedale-Rio Bravo WSD

_____ By: _____

Date

Dan Bartel
Assistant General Manager/Engineer

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SECTION C

GENERAL CONDITIONS

C-1 Definitions

The following terms, as used in any of the Contract Documents, are respectively defined as follows:

a. **"Application for Payment" –** the form to be used by Contractor in requesting payments which is to include such supporting documentation as is required by the Contract Documents.

b. **"Board of Directors" or "Board"** – the Board of Directors of the Rosedale-Rio Bravo Water Storage District.

c. **"Certificate of Completion and Final Acceptance"** – the certification and acceptance by Engineer of Work when it has been completed in all respects in accordance with the Contract Documents.

d. **"Change Order" –** a written order to Contractor from Engineer authorizing a change in the Work, or an adjustment in the Contract Price or Contract Time issued after the effective date of the Contract.

e. **"Change Work"** – a substitution, addition, deletion or revision in the Work within the general scope of the Contract necessary to the completion of the Work.

f. **"Contract Documents"** – the Notice Inviting Bids, the Instructions to Bidders, the accepted Proposal and Proposal Bidding Schedule, the Contractor's Licensing Statement, the Information Required of Bidders, the Agreement, the Proposal Bond, the Faithful Performance Bond, the Payment Bond, the Non-Collusion Affidavits, the Notice to Proceed, General Conditions, Special Conditions, the Specifications, Plans, Appendices and any Change Order or Addenda, setting forth any modifications or interpretations of any of said documents.

g. **"Contract"** – the written agreement between District and Contractor covering the Work.

h. **"Contractor"** – the bidder who submitted the accepted Proposal and who executed a Contract to complete the Work in accordance with the Contract Documents, and the legal representatives of said party.

i. **"Contract Price"** – the monies payable by District to Contractor under the provisions of the Contract Documents.

j. **"Contract Time" –** the length of time stated in the Contract Documents for the completion of the Work.

k. **"Construction Schedule" –** an outline of construction activities showing the sequence and timeline for completing the components of the Work.

l. **"Day"** – a calendar day of 24 hours measured from midnight to the next midnight.

m. **"Defective" –** an adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to Engineer's recommendation of final payment, unless responsibility for the protection thereof has been assumed by District.

n. **"Design Engineer" –** Zeiders Consulting Inc., 1655 Greeley Road, Bakersfield, CA 93314.

o. **"Detail Drawings"** – details of standard structures, devices, or installations referred to on the Project Drawings or in the other Contract Documents.

p. **"District"** – the Rosedale-Rio Bravo Water Storage District.

q. **"Effective Date of the Contract"** - the date indicated in the Contract in which a fully executed Contract is delivered by the District.

r. **"Engineer"** – Zeiders Consulting Inc., 1655 Greeley Road, Bakersfield, CA 93314

s. **"Equipment" –** products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items).

t. **"Extra Work" –** Work outside the general scope of the Contract.

u. **"Field Order" –** a written order issued to Contractor by Engineer which orders minor Change Work but which does not involve a change in the Contract Price or the Contract Time, or such an order issued when, as determined, the time required for development and execution of a Change Order would result in delay or stoppage of the Work or would allow a hazardous condition to exist.

v. **"Final Inspection"** – determines if the Work has reached Final Completion.

w. **"Final Completion"** – indicates that the Work has been fully completed in accordance with the Contract Documents and is ready for acceptance and final

payment by the District.

x. **"Final Punch List"** – contains items that remain uncompleted after Substantial Completion but that must be completed prior to Final Completion.

y. **"Materials" –** products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form Work.

z. **"Modification"** – a Written Amendment to the Contract signed by both parties, a Change Order or a Field Order. Any Modification involving a permit must be supported by the written agreement of the agency issuing the permit. A Modification may be issued only after the effective date of the Contract.

aa. **"Notice of Award" –** the written notice by District to the apparent successful Bidder of District's intent to sign and deliver the Contract, upon Contractor's delivery of all Contract Documents.

bb. **"Notice of Completion" –** the written notice filed by District with the County Recorder certifying that the Work has been completed.

cc. **"Notice to Proceed"** – the written notice by District to Contractor fixing the date on which the Contract Time will commence to run and on which Contractor shall start to perform its obligation under the Contract Documents.

dd. **"Plans" or "Drawings" –** means and includes Project Drawings and Detail Drawings.

ee. **"Preconstruction Conference" –** a conference held before Contractor starts Work at the Site, attended by Contractor, Engineer and others as appropriate, to discuss the schedules provided, to discuss procedures for handling Shop Drawings and other submittals and for processing Applications for Payment, and to establish a Working understanding among the parties as to the Work.

ff. **"Products" –** includes purchased items for incorporation into the Work regardless of whether specifically purchased for the Project or taken from Contractor's stock of previously purchased products.

gg. **"Project" –** see Work**.**

hh. **"Project Drawings" –** the drawings developed by District or Engineer, or both, specifically for the Project, which show the character and scope of the Work and are part of the Contract Documents.

ii. **"Record Drawings" or "As-Builts"** – a record set of drawings to be maintained

by the contractor showing all project conditions, locations, configurations, and any other changes or deviations which may vary from the information represented on the original Plans. These master record drawings of the Contractor's representation of as-built conditions, including all revisions made necessary by addenda and change orders shall be maintained up-to-date during the progress of the Work.

jj. **"Release and Certificate of Final Payment"** – the release by Contractor, in consideration of final payment, of District from all claims and obligations of every nature.

kk. **"Schedule of Values" –** a statement furnished by Contractor to Engineer reflecting the portions of the Contract Price allotted for the various parts of the Work and used as the basis for reviewing Contractor's Application for Payment.

ll. **"Semi-Final Inspection" –** determines if the Work has reached Substantial Completion.

mm. **"Shop Drawings" or "Submittals" –** all drawings, illustrations, schedules and other material prepared by or for Contractor to illustrate some portion of the Work, samples, and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams, and other information prepared by a Supplier and submitted by Contractor to illustrate material or equipment for some portion of the Work.

nn. **"Site" –** the location or locations where the Work is to be accomplished.

oo. **"Special Conditions" –** specific clauses setting forth requirements peculiar to the Work and supplementary to the General Conditions.

pp. **"Specifications"** – the manual prepared by District or for District by the Engineer.

qq. **"Subcontractor" –** an individual, firm or corporation having a direct subcontract with Contractor or with any other Subcontractor for the performance of a portion of the Work at the Site, or for the fabrication and installation of a portion of the Work in accordance with drawings contained in the Contract or furnished by Contractor under the Contract.

rr. **"Substantial Completion" –** means the Work has progressed to the point that the Work is ready for beneficial use and occupancy by the District for the intended purpose.

ss. **"Supplier" –** a manufacturer, fabricator, supplier, distributor, material man or vendor.

tt. **"Technical Conditions"** – specific clauses setting forth conditions or requirements for materials, equipment, construction systems, standards, Workmanship, measurement and payment.

uu. **"U.S. BUREAU OF RECLAMATION, USBR, RECLAMATION"** – the United States Bureau of Reclamation Department of the Interior.

vv. **"Work" –** the entire construction or the total of the separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

ww. **"Written Amendment"** – a written amendment of the Contract Documents, signed by District and Contractor on or after the Effective Date of the Contract.

xx. Whenever in the Specifications or upon the Plans the words **DIRECTED, REQUIRED, PERMITTED, ORDERED, DESIGNATED, PRESCRIBED**, or words of like importance are used, it shall be understood that the direction, requirement, permission, order, designation or prescription of the Engineer is intended, and similarly the words **APPROVED, ACCEPTABLE, SATISFACTORY**, or words of like importance, shall mean approved by or acceptable to, or satisfactory to the Engineer, unless otherwise expressly stated.

yy. **"AASHTO"** – the American Association of State Highway and Transportation Officials.

zz. **"ACI"** – the American Concrete Institute.

aaa. **"AISC"** – the American Institute of Steel Construction.

bbb. **"AISI"** – the American Iron and Steel Institute.

ccc. **"ANSI"** – American National Standards Institute.

ddd. **"ASME"** – the American Society of Mechanical Engineers.

eee. **"ASTM"** – the American Society for Testing and Materials.

fff. **"AWS"** – the American Welding Society.

ggg. **"AWWA"** – the American Water Works Association.

hhh. **"CRC"** – California Resources Corporation

iii. **"IEEE"** (formerly AIEE) – The Institute of Electrical and Electronics Engineers.

jjj. **"IPCEA"** – the Insulated Power Cable Engineers Association.

kkk. **"NEMA"** – the National Electrical Manufacturers Association.

lll. **"NFPA"** – National Fire Protection Association.

mmm. **"SSPC"** – the Steel Structures Painting Council.

nnn. **"USAS"** (formerly ASA) – The United States of America Standard(s) Institute.

ooo. **"State Standard Specifications"** – Standard Specifications issued by the State of California, Department of Transportation, latest edition.

ppp. **"County"** – County of Kern, California.

qqq. The figures given in the Specifications or upon the Plans after the word **ELEVATION**, or an abbreviation of it, shall mean distances in feet above U.S. Coast and Geodetic Survey sea level datum, as established by the Engineer.

rrr. All gender specific pronouns shall be interpreted to include all genders.

C-2 Correlation and Intent of Documents

The Contract Documents are complementary, and what is called for in any one shall be as binding as if called for in all. The intention of the Contract Documents is to require a complete and finished piece of Work including all labor, materials, equipment, facilities, and transportation necessary for the proper execution of the Work, with the exception of such items as are definitely stated in the Specifications or on the Plans to be furnished by the District, if any. Should there be a conflict between the Specifications and the Plans, the Specifications shall be controlling. Should there be a conflict between the General Conditions and the Special Conditions, the Special Conditions shall be controlling.

C-3 Assignment

Neither party to the Contract shall assign the Contract nor sublet it as a whole without the prior written consent of the other, nor shall the Contractor assign any money due or to become due to it hereunder without prior written consent of the Engineer.

C-4 Subcontracts

a. The attention of the Contractor is directed to the provisions of Public Contract Code, Section 4100 et seq. as amended, and said provisions are by this reference incorporated herein and made a part hereof.

b. Each subcontract shall contain a suitable provision for the suspension or termination of that subcontract should the Work be suspended or terminated or

should the Subcontractor neglect or fail to conform to every provision of the Contract Documents insofar as such provisions are relevant. The Contractor shall be as fully responsible to the District for the acts or omissions of his Subcontractors and of the persons either directly or indirectly employed by them as he is for the acts or omissions of persons directly employed by him. Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the District. If a legal action against the District is initiated by a subcontractor, the Contractor shall reimburse the District for the amount of legal expenses incurred by the District in defending itself in said action.

c. A copy of each subcontract, if in writing, or if not in writing then a written statement signed by Contractor, giving the name of the subcontractor, and the terms and conditions of such subcontract, shall be filed with Owner before the subcontractor commences performance of the Work. Each subcontract shall contain a reference to the agreement between Owner and Contractor, and the terms of that agreement and all parts thereof shall be made a part of such subcontract insofar as applicable to the Work covered thereby. Each subcontract shall provide for its annulment by Contractor at the order of Owner, if, in Owner's opinion, the subcontractor fails to comply with the requirements of the principal agreement insofar as the same may be applicable to his work. Nothing herein contained shall create any contractual relation between any subcontractor and Owner or relieve Contractor of any liability or obligation hereunder.

d. Contractor is hereby alerted to provisions of Section 7107 of the Public Contract Code, requiring Contractor to pay to each of its subcontractors from whom retention has been withheld, each subcontractor's share of the retention received, within seven (7) days from receipt of all or any portion of such retention proceeds from Owner.

e. Pursuant to Public Contract Code Section 6109, subcontractors who are ineligible to perform work on a public works project as determined by the Department of Industrial Relations pursuant to Section 1777.1 or Section 1777.7 of the California Labor Code shall not perform any portion of the work contemplated herein. Any subcontract between the Contractor and an ineligible subcontractor shall be void as a matter of law, and the ineligible subcontractor shall not receive any payment for performing such work.

C-5 Suspension of Work – Damages for Delay

a. The Engineer may at any time, by notice in writing to the Contractor, suspend any part of the Work for such period of time as may be necessary to prevent improper execution of the Work on the Project, and the Contractor shall have no claim for an extension of time to complete the Work, or for damages or additional

compensation on account of any such suspension.

b. The District may at any time suspend any part or all of the Work upon ten (10) days' written notice to the Contractor, who shall thereupon discontinue all Work suspended except for all operations to prevent loss or damage to Work already executed as may be directed by the Engineer. The Contractor shall be paid on the same basis as Extra Work for costs of Work performed in accordance with such orders of the Engineer during such suspension, provided that this shall not include any costs pertaining to Work not suspended by said notice. Work shall be resumed by Contractor after such suspension on ten (10) days' written notice from the District. In the event of suspension of the entire Work by the District, the Contractor shall be paid the sum of one-hundred fifty dollars ($150.00) for each calendar day during which the entire Work shall have been suspended. Said sum is hereby mutually agreed upon as fixed and liquidated damages in full settlement of all costs and expenses, losses and damages resulting to the Contractor from such suspension.

c. In the event of any suspension of the Work in whole or in part, the Contractor shall be entitled to any extension of time to complete the Work in a length equal to the length of the suspension of the Work. Provided, however, that the Contractor shall not be entitled to an extension of time to complete the Work in the event that the Work is suspended by the Engineer to prevent or correct improper execution of the Work.

C-6 Time of Work –Termination for Delay – Time Extensions

a. The Contractor shall at all times employ such force, plant, materials, and tools as will be sufficient, in the opinion of the Engineer, to prosecute the Work at not less than the rates fixed under the terms of the Contract and to complete the Work or any separable portions thereof within the time limits fixed therein. 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 the Contract, or any extension thereof, or fails to complete said Work within such time, the District 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 may take possession of, and utilize in completing the Work such materials, appliances, equipment, and plant as may be on the site of the Work and necessary for its prosecution. Whether or not the Contractor's right to proceed with the Work is terminated, he and his sureties shall be liable for all damages, including attorney's fees, sustained or incurred by the District in enforcing the provisions hereof against the Contractor due to any refusal or failure to prosecute the Work.

b. The Contractor's right to proceed shall not be so terminated nor the Contractor charged with resulting damage if:

1. The delay in the completion of the Work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to Acts of God (herein to include only the following occurrences or conditions and effect: earthquakes in excess of a magnitude of 3.5 on the Richter Scale and tidal waves), acts of the public enemy, acts of the District in either its governmental or contractual capacity, acts of another Contractor in the performance of a contract with the District, fires, floods, (excluding site flooding due to ground water), epidemics, quarantine restrictions, strikes, lockouts, freight embargoes, unusually severe weather, or delays of subcontractors or suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of either the Contractor or such subcontractors and suppliers; and

2. The Contractor, within ten (10) days from the beginning of any such delay (unless the Engineer grants a further period of time before the date of final payment under the Contract), shall notify the Engineer in writing of the causes of delay and request an extension of time. The Engineer shall ascertain the facts and the extent of the delay and extend the time for completing the Work when, in his judgment, the findings of fact justify such an extension, and his findings of fact shall be final and conclusive on the parties.

c. The rights and remedies of the District provided in this clause are in addition to any other rights and remedies provided by law or under this Contract.

d. A request for an extension of time, or the granting of an extension of time, shall not constitute a basis for any claim against the District for additional compensation. The Contractor shall be deemed to have waived any claim for additional compensation, and does hereby waive any such claim.

e. Contract time extensions will be granted as provided in this Paragraph C-6 and C-11; however, the Contractor is advised that weather-related time extensions will be granted only if conditions are such that it is impossible to perform any productive Work. The Contractor shall make every effort to protect the Work from adverse weather and shall minimize delays and time extensions by taking mitigative measures such as pumping of surface water, utilizing equipment best suited for adverse weather, etc.

C-7 Termination for Reasons Other Than Delay

a. If the Contractor should be adjudged bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed for the Contractor on account of his insolvency and not be discharged within ten (10) days after his appointment, or if the Contractor should fail to make prompt payment to Subcontractors or for material or labor, or should persistently disregard laws, ordinances, or the instructions of the Engineer, or otherwise be guilty of a substantial violation of any provisions of the Contract, then the District, upon the certification of the Engineer that sufficient cause exists to justify such action, may without prejudice to any other right or remedy, and after giving the Contractor ten (10) days written notice, terminate the employment of the Contractor and take possession of the Site and of all equipment, materials, tools, and other facilities thereon and finish the Work by whatever method the District may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If upon completion of the Work the total cost to the District, including attorney's fees, in connection therewith shall be less than the amount which would have been paid if the Work had been completed by the Contractor in accordance with the terms of the Contract, then said difference shall be paid to the Contractor in the same manner as the final payment under the Contract. If the expense, including attorney's fees, incurred by the District on account of termination of employment of the Contractor and subsequent completion of the Work by the District by whatever method the District may deem expedient shall exceed said amount which the Contractor would otherwise have been paid, the Contractor and his sureties shall be liable to the District for the full amount of such excess expense.

b. In addition to its rights under Paragraph C-7(a) hereof, if at any time before completion of the Work under the Contract it shall be determined by the District that reasons beyond the control of the parties hereto render it impossible or against the interests of the District to complete the Work, or if the Work shall be stopped by an injunction of a court of competent jurisdiction or by order of any competent authority, the District may, upon ten days written notice to the Contractor, discontinue the Work, and terminate the Contract. Upon service of such notice of termination the Contractor shall discontinue the Work in such manner, sequence, and at such times as the Engineer may direct, continuing and doing after said notice only such Work until such time or times as the Engineer may direct. The Contractor shall have no claim for damages for such discontinuance or termination, nor any claim for anticipated profits on the Work thus dispensed with, nor any other claim except (1) for the Work actually performed up to the time of complete discontinuance, including any Extra Work ordered by the Engineer to be done, and (2) for any liquidated damages due hereunder in accordance with the provisions relating to suspension of Work.

C-8 Authority of the Engineer

a. The Engineer shall give all orders, lines, grades, and directions contemplated under the Contract. The Engineer may determine the adequacy of the Contractor's methods, tools, plant, equipment, and appurtenances and he shall determine in all cases the quantity, quality, acceptability, and fitness of the several kinds of Work and materials which are to be paid for. The Engineer shall have the authority to determine all questions in relation to said Work and the construction thereof and decide in all cases questions which may arise relative to the fulfillment of this Contract on the part of the Contractor. The Engineer shall also have the authority to reject all Work and materials which do not conform to the Contract and to stop the Work when necessary to prevent its improper execution. Should any discrepancy appear or any misunderstanding arise as to the import of anything contained in the Specifications or Drawings, the matter shall be referred to the Engineer, who shall decide the same in accordance with the true intent and meaning. Any differences or conflicts which may arise between the Contractor and other contractors of the District in regard to their Work will be adjusted and determined by the Engineer. All instructions, rulings, and decisions of the Engineer shall be made promptly and in writing, if so requested, and they shall be final and binding.

b. If at any time the Contractor's Work force, tools, plant or equipment appear to the Engineer to be insufficient, inefficient or inappropriate to secure the required quality of Work or the proper rate of progress, the Engineer may order the Contractor to increase their efficiency, improve their character, to augment their number or to substitute other personnel, new tools, plant, or equipment, as the case may be, and the Contractor shall comply with such order.

c. The undertaking of inspections by the Engineer or the giving of instructions as herein authorized shall not be construed as supervision of the actual construction or make the Engineer or the District responsible for providing a safe place for the performance of Work by the Contractor, Subcontractor, or Suppliers; or for access, visits, use, Work, travel or occupancy by any person.

C-9 Changes and Extra Work

a. Without invalidating the Contract, District may, at any time, order Change Work or request Extra Work to be performed by the Contractor. Change Work may involve increasing or decreasing the quantity of an item or portion of the Work; deleting any item, or items, of the Work; or adding items to the Work.

b. Engineer will provide Contractor with a written description of the scope of Work involved. Unless otherwise required, Contractor shall, within 10 days after receipt of such written material, submit in writing to Engineer a proposal for accomplishing such Work.

The proposal shall reflect any change in cost to Contractor for performing the proposed Change Work or Extra Work under the Contract, in comparison to what the cost would have been otherwise. The proposal shall state the basis for compensation for such Work. Sufficient detail shall be given in the proposal to permit thorough analysis.

The proposal shall state the basis for any change of Contract Time, or for a change in the time required for completion of any items of Work for which a specific completion time or date is set forth in the Contract, due to the Change Work or Extra Work. Sufficient detail shall be given in the proposal to permit thorough analysis.

The proposal shall state if the performance of such Change Work or Extra Work would result in any change in the time required for completion of any items of the Work as shown on Contractor's current construction schedule. A revised construction schedule shall be submitted with the proposal if any such changes are involved.

Engineer will review the information provided by the Contractor and then determine one of the following:

1. A Change Order will be issued ordering Change Work or Extra Work, based upon the Contractor's proposal covering such Work.

2. The proposed Change Work or Extra Work will not be performed under the Contract.

Change Work and Extra Work must be authorized through a Change Order or Field Order. Upon receipt of a Change Order, Contractor shall proceed with the Work involved. All such Work shall be executed under the applicable conditions of the Contract Documents. If, as determined by District, any Change Order causes a change in Contract Price or a change in Contract Time, an equitable adjustment will be made.

c. Engineer may authorize minor Change Work not involving a change in Contract Price or Contract Time, which is consistent with the intentions of the Contract Documents. This will be accomplished by Field Order and shall be binding on District and on Contractor who shall perform the change promptly. If Contractor believes that Work under a Field Order justifies an increase in Contract Price or an extension of Contract Time, Contractor may make a claim as provided for in Paragraphs C-10 and C-11.

Engineer may also issue a Field Order for Change Work where, as determined, the time required for development and execution of a Change Order would result in delay or stoppage of the Work or would allow a hazardous condition to exist. In these cases, a Change Order will be developed as soon as possible to replace the

Field Order.

Additional Work performed without authorization of a Change Order will not entitle Contractor to an increase in Contract Price or an extension of Contract Time.

It shall be solely the responsibility of Contractor to provide any notice to sureties of any change affecting the general scope of the Work or change in Contract Price or Contract Time.

d. Any Change Work or Extra Work will be authorized by written orders to Contractor by Engineer, except that in the event of an emergency which Engineer determines endangers life or property and only in such an event, Engineer may issue oral orders to Contractor for any Work required by reason of such emergency. Any such oral orders will be confirmed in writing as soon as practicable. Such orders, whether written or oral, may be accompanied by drawings and data as are necessary to show the extent of such ordered Work.

Contractor shall commence such Work so that all current Contract Time requirements will be met, except that in the event of an emergency which Engineer determines endangers life or property, Contractor shall commence such Work as required by Engineer.

e. If the time required for completion of any items for which a specific completion date is set forth in the Contract is changed because of the performance of Change Work or Extra Work, an adjustment in the time for completion for the affected items will be made. The construction schedule shall be revised to reflect such adjustment and resubmitted for approval.

f. **Other Work at the Site**

1. Related Work at Site – District may perform other work related to the Project at the Site with District's employees, or have other work performed by utility owners, or enter into direct contracts with other contractors for the performance of other work. If such other work is not noted in the Contract Documents, then:

a) Written notice of the other work to be performed will be given to Contractor prior to starting any such other work; and

b) If District and Contractor are unable to agree on entitlement to or on the amount or extent, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work (if any), Contractor may submit a claim pursuant to the Contract Documents. The Contractor is hereby put on notice of the provisions of the Contract Documents regarding claims: if the

Contractor is dissatisfied with the outcome of the Engineer's Action regarding a request for an adjustment in Contract Price and/or Contract Time the claims procedures of the Contract Documents must be followed. The Contractor's failure to follow those provisions shall be deemed a waiver by the Contractor of any adjustment in Contract Price and/or Contract Time regarding the request.

Contractor shall afford each other contractor or utility owner or District, performing other work pursuant to this Paragraph proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment necessary for the execution of such other work. Contractor shall properly coordinate their Work with any other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any other work by cutting, excavating, or otherwise altering such other work and will only cut or alter such other work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such other contractors, utility owners, and the District (if performing other work). Comparable provisions for the benefit of Contractor will be included in said direct contracts between District and such other contractors or utility owners.

If the proper execution of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

2. Coordination – If the District intends to contract with others for the performance of other work on the Project at the Site, the District shall have sole authority and responsibility of such coordination and shall inform the Contractor in writing of the following.

   a) The individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

b) The specific matters to be covered by such authority and responsibility will be itemized; and

c) The extent of such authority and responsibilities will be provided.

C-10 Changes of Contract Price

a. The Contract Price constitutes the total compensation payable to Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at its expense without change in the Contract Price.

The Contract Price may be changed only by a Change Order. Any claim by Contractor for an increase in the Contract Price shall be based on written notice delivered to Engineer within 15 days after the occurrence of the event giving rise to the claim. Failing such notice, the claim shall be deemed to have been waived by Contractor. Notice of the amount of the claim with supporting data, shall be delivered within 45 days after such occurrence unless Engineer agrees in writing to allow an additional period of time. Any change in the Contract Price will be determined by Engineer.

b. The basis for change of Contract Price through a Change Order shall be either Contract unit or lump sum prices (as already established under the Contract), if applicable, or new unit or lump sum prices, unless otherwise specified.

If the basis of compensation proposed by Contractor for Change Work, or any part thereof, is not acceptable, and if a basis of compensation for such Work, or any part thereof, cannot be agreed upon, the basis of compensation will be determined by Engineer and set forth in the Change Order.

In the event that an agreement cannot be reached for the basis of compensation, such basis of compensation will either be as developed by Engineer (considering the character, location and extent of the Change Work and Contract unit or lump sum prices) or cost-plus as provided in Paragraph C-10(c).

If at any time after Contractor commences such Change Work, another basis of compensation for such Work, or any part thereof, is agreed upon, compensation will be made in accordance with such agreement. In any event Contractor shall keep accurate records of its actual costs for such Change Work.

If the Change Order in a situation where a basis of compensation must be determined by the Engineer, involves deletion of an entire item, or items of Work, payment will be made to Contractor for work performed prior to the date Contractor was notified by Engineer in writing of such deletion. If acceptable material for use in the deleted Work was ordered by Contractor prior to

notification, and if the order for such material cannot be cancelled, as determined by Engineer, Contractor will be paid for such material. Upon such payment said material will become the property of District and District will arrange for its disposition at District expense. All payments to Contractor for material order's that cannot be cancelled will be on a cost-plus basis as provided in Paragraph C-10(c) below. If the order for said material can be cancelled, Contractor will be paid for only actual costs of ordering and canceling.

c. Any Work performed under the Contract on a cost-plus basis shall be in accordance with the following:

1. **Direct Labor Cost** - Payment shall be made for all manual classifications up to and including foremen, but shall not include superintendents, assistant superintendents, general foremen, surveyors, office personnel, time-keepers and maintenance mechanics. The direct labor cost for foremen shall be proportioned to all of their assigned work and only that portion applicable to cost-plus Change Work or Extra Work shall be paid for such Work. The time charged to Change Work or Extra Work shall be subject to daily approval and no charges shall be accepted unless evidence of such approval is submitted by Contractor with its billing. Labor rates used to calculate the direct labor costs shall be those rates in effect during the accomplishment of Change Work or Extra Work. In addition to the direct payroll costs, the direct labor costs shall include payroll taxes and insurance, vacation allowance, subsistence, travel time, overtime premium and any other payroll additives required to be paid by Contractor by law or collective bargaining agreements. Copies of certified pertinent payrolls shall be submitted to Engineer. Overtime shall not be worked without prior written approval by the Engineer. No time or charges will be allowed except when the employees are actually engaged in the proper, efficient, and diligent performance or completion of the Change Work or Extra Work as authorized.

2. **Equipment Costs** - Payment for the rental and operation of the equipment furnished and used by Contractor shall be made for all construction and automotive equipment, except equipment or tools with a current new cost at point of origin of $500 or less each.

Equipment time charged to Change Work or Extra Work will be subject to daily approval and no charges will be accepted unless evidence of such approval is submitted with Contractor's billing.

The equipment rental rates used shall be those rates listed in "Labor Surcharge and Equipment Rental Rates" as published by Caltrans, in effect as of the date of the Contract. These rates shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and

maintenance of any kind, depreciation, storage, insurance, and all incidentals. Such rates shall not include costs for operating labor, which will be paid as provided in Paragraph C-10(c), Item(1) Direct Labor Cost, or for transportation of equipment to and from the location of Change Work or Extra Work. For equipment proposed to be used for which rental rates are not set forth in said publication, the rental rates shall be negotiated with Engineer and agreed upon in writing before such equipment is used on any Change Work or Extra Work.

When the operated use of equipment is infrequent and, as determined, the equipment need not remain at the Site continuously, payment shall be limited to actual hours of use. Equipment not operating but retained at the location of Change Work or Extra Work at Engineer's direction shall be paid for at a rate equal to the rental rate times the right of way delay factor in the above-referenced Caltrans publication.

Transportation costs for bringing equipment that will be used exclusively for cost-plus Work to the Site and for returning equipment to the point of origin, will be reimbursed to Contractor based on invoices, provided that prior written approval for such transport has been given by Engineer to Contractor.

3. **Material Costs** - Payment for the cost of materials furnished and used by Contractor in performing any Change Work or Extra Work shall be made, provided such furnishing and use of materials was as specifically authorized in a Modification and the actual use was verified by Engineer. Charges shall be the net cost to Contractor for such materials delivered at the Site and vendor's invoice shall accompany the billing along with verification by Engineer of use of such materials.

4. **Subcontract and Outside Service Costs** - Payment for Work and services subcontracted by Contractor in the performance of Change Work or Extra Work will be allowed only when both the Subcontractor and the terms of payment to such Subcontractor have been approved in writing before the Subcontractor starts to Work on Change Work or Extra Work. Such charges will be allowed at net cost to Contractor on the same basis as provided in Items (1) through (3) above.

5. **Tools, Supplies, Overhead, Supervision and Profit** - Payment for use of tools and equipment with a current new cost of $500 or less each and for supplies, overhead, supervision and profit will be made in an amount determined as follows:

a) For Work performed by Contractor an amount equal to the following percentages of Items (1), (2) and (3) above:

Direct Labor Costs	20
Equipment Costs	15
Material Costs	15

b) For Work performed by Subcontractor or through outside services an amount equal to the following percentages of Items (1), (2) and (3) above:

Direct Labor Costs	25
Equipment Costs	20
Material Costs	20

No payment shall be made for cost-plus Work except as provided in Items (1) through (5) above. No payment shall be made for extended home office overhead costs. Any other costs for such Work shall be considered to be included in these payments.

C-11 Change of Contract Time

a. All time limits stated in the Contract Documents are of the essence of the Contract. The Contract Time may be changed only by a Change Order.

b. If any Change Work or Extra Work requires a change of Contract Time, or in the time required for the completion of any items of Work for which a specific completion time or date is set forth in the Contract, an adjustment shall be made by Change Order to allow sufficient time for the required Work to be efficiently performed by Contractor, as determined by the Engineer.

c. If Contractor's performance is prevented or delayed by any cause, existing or future, which is beyond the reasonable control and without the fault or negligence of Contractor and which condition was not foreseeable by Contractor at the time the Contract was entered into, such as an act, omission or neglect of the District, or its representatives, or by acts of the public enemy, or by a war in which the United States of America is a participant, or by earthquakes affecting the Site or by area-wide strikes, fire, unusually severe weather, epidemics, or quarantine restrictions, Contractor shall, within ten (10) days after the commencement of any such delay, give to Engineer written notice thereof and of the anticipated results thereof. Within seven (7) days after the termination of any such delay, Contractor shall file a written notice with Engineer specifying the actual duration of the delay

and claim for increase of Contract Time. Failing to meet either of the above notice requirement the claim shall be deemed to have been waived by Contractor. If District determines that the delay was beyond the control and without the fault or negligence of Contractor and not foreseeable by Contractor at the time the Contract was entered into, the Contract Time will be extended in an amount equal to time lost due to such delay and the Contract will be modified by Change Order accordingly.

The Contract Time will not be extended if any such delay is attributed by Contractor to any Subcontractor(s) or Supplier(s) and District determines that the cause of the delay was not beyond the reasonable control or due to the fault or negligence of said Subcontractor(s) or Suppliers(s); or 1) the services, equipment or supplies involved were available in adequate time from other sources; 2) Engineer directed Contractor, in writing, to obtain such services, equipment or supplies from said other sources; and 3) Contractor failed to comply with such directions.

d. When Contractor requests an increase of Contract Time for delay due to inability to obtain materials or equipment, its last written notice, as provided in Paragraph C-11(c), shall include the following:

1. Date Engineer was notified of delay.

2. Date the delay began.

3. Exact description of material or equipment causing delay.

4. Documentation showing when and from whom ordered.

5. Documentation of promised delivery schedule.

6. Documentation of actual delivery schedule.

7. Description of how late delivery caused delay (include current construction schedule).

8. Documentation of measures taken to try and get prompt delivery.

9. Documentation of attempts to get timely delivery from other sources.

10. Description of steps taken to minimize effects of late delivery on progress of Work.

11. Description of steps taken to stay within Contract Time after actual delivery.

12. Statement of actual days lost as a result of late delivery.

C-12 Right-of-Way – Construction Roads

a. The right of way for the Work to be constructed under these Specifications will be provided by the District. Nothing herein contained, however, and nothing marked on the Plans, shall be interpreted as giving the Contractor exclusive occupancy of the territory provided. When two or more contracts are being executed at one time on the same or adjacent land in such a manner that Work on one contract may interfere with that on another, the Engineer shall decide which contractor shall cease Work and which shall continue; or, whether the Work on both contracts shall progress at the same time, and if so, in what manner. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the Engineer to the Contractor so desiring, to the extent, amount, in the manner, and at the time permitted. No such decision as to the method or time of conducting the Work or the use of territory shall be the basis of any claim for delay or damage.

b. Lands to be furnished by the District for construction operations will be specifically shown on the Plans or provided for in the Special Conditions. Should the Contractor find it necessary to use additional land for his purposes during the construction of the Work, he shall provide for the use of such lands at his own expense. A copy of each written agreement between the Contractor and affected landholder(s) for the use of additional lands shall be filed with the Engineer prior to the use of land.

c. The Contractor shall construct and maintain all roads necessary to reach the various parts of the Work and for the transportation thereto of construction material and personnel. The cost of constructing and maintaining such roads shall be borne by the Contractor.

C-13 Notice and Service Thereof

Any notice required or given under the contract shall be in writing, be dated, and signed by the party giving such notice or his duly authorized representative, and be served as follows:

a. If to the District or the Engineer, by personal delivery or by deposit in the United States mail;

b. If to the Contractor, by personal delivery to the Contractor or to his authorized representative at the site of the project or by deposit in the United States mail;

c. If to the surety or any other person, by personal delivery to said surety or other person or by deposit in the United States mail;

d. All mailed notices shall be in sealed envelopes, shall be sent by certified mail with postage prepaid, and shall be addressed to the addresses in the Contract Documents or such substitute addresses which a party designates in writing and serves as set forth herein; and,

e. Any notice served in accordance with this Section C-13, shall be deemed received by the addressee seventy-two (72) hours after deposited, postage prepaid, in the United States mail.

Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other communication upon the Contractor personally.

C-14 Personal Attention

The Contractor shall give his personal attention constantly to the faithful prosecution of the Work, and shall be present, either in person or by duly authorized and competent representative, on the site of the Work continually during its progress to receive directions or instructions from the Engineer. Whenever the Contractor is not present on any part of the Work, and where it may be desired to give instructions or directions, they may be given by the Engineer and they shall be received and obeyed by the superintendent or foreman who may have charge of the particular part of the Work in reference to which said instructions or directions are given.

C-15 Construction Program

Post-Award Schedule - Within five (5) days of award of Contract by the District, the Engineer will return the post-bid pre-award Construction Schedule to the Contractor. The Contractor shall modify the schedule to include any modifications, or changes and to reflect final phasing and scheduling of Work.

The Contractor shall complete these modifications within five (5) calendar days from date the schedule is returned to him and shall resubmit it for review. Upon receiving written notice from the Engineer that the schedule, as revised, has been accepted, it will then become the Construction Schedule by which the Contractor shall construct the Work and shall be subject to progress reporting, revision, and updating procedures implemented during the course of construction.

The initial Construction Schedule shall contain no Contract changes or delays which may have occurred during the interim submittal period. Changes shall be entered at the first update revision as specified under Revisions to Construction Schedule produced below.

At any time during the progress of the project, if Contractor's progress has fallen behind the accepted Construction Schedule, Contractor shall take such corrective steps as may be required, including but not limited to, increasing the number of personnel, shifts, overtime operations, days of work, and amount of construction equipment until such time as the Work is back on schedule, at no additional cost to the District. He shall also submit at the next weekly construction progress meeting such supplementary schedule or schedules as may be deemed necessary to demonstrate the manner in which the approved rate of progress will be regained.

On the last working day of every week, or during the planned weekly construction field progress meetings, the Contractor shall submit to the Engineer, Contractor's plan of activities for the following two (2) weeks. The plan of activities shall describe the activity and location of the activity and shall be consistent with the approved Construction Schedule.

Revisions to Construction Schedule - The Contractor shall submit a revised Construction Schedule within five (5) days of the occurrence of any of the following:

a. When delay in completion of any activity or group of activities indicates an overrun of the Contract time by thirty (30) working days.

b. Delays in submittals, deliveries, or work stoppage are encountered which make re-planning or rescheduling of the Work necessary.

c. The schedule does not represent the actual prosecution and progress of the project as being performed in the field.

The revised Construction Schedule shall be submitted to the Engineer for review with a letter describing the reasons for submitting a revised Construction Schedule with any supporting documentation. The cost of revisions to the Construction Schedule resulting from Contract changes will be included in the cost for the change in the Work.

The cost of revision to the Construction Schedule not resulting from authorized changes in the Work shall be the responsibility of the Contractor.

C-16 Survey Requirements

Survey reference and control staking for construction will be done by a Licensed Land Surveyor provided by the District, at the District's expense. Contractor shall be provided with adequate Survey Site Control to establish the grade, position and alignment to complete the construction project per the plans and specifications. See Section D-22 for specific reference and control staking provided by the District.

Contractor shall be responsible for preserving permanent survey monuments, benchmarks, and reference stakes/hubs. If any permanent or temporary survey

monuments or benchmarks, including the above reference staking, are lost or disturbed and need to be replaced as set forth in Section 8771 of the California Business and Professions Code, such replacement shall be made by the Engineer at the expense of the Contractor.

The Contractor shall notify the Engineer at least three (3) working days before he will require survey services in connection with constructing any portion of the Work.

C-17 Plans and Specifications

Plans furnished herewith are for bidding purposes. The Engineer will furnish the Contractor, free of charge, all copies of working Plans and Specifications reasonably necessary for the execution of the Work. The Contractor shall have no claim for excusable delay on account of the failure of the Engineer to deliver necessary Plans or Specifications unless the Engineer shall have failed to deliver the same within two (2) weeks after receipt of written demand for the Plans and Specifications by the Contractor.

The Contractor shall keep one (1) copy of all current Plans and Specifications relating to the Work, in good order, available to the Engineer and his representatives, and convenient to the Site.

If the Contractor, in the course of the Work, finds any discrepancy between the Plans and the physical condition of the locality, or any errors or omissions in the drawings, or in the layout as given by points and instructions, it shall be his duty to inform the Engineer in writing, and the Engineer will promptly verify the same. Any Work done after such discovery, until authorized, will be done at the Contractor's risk. All Plans, Specifications, and copies thereof furnished by the Engineer shall not be reused on other Work and, with the exception of the signed Contract sets, are to be returned to him, on request, at the completion of the Work.

The Contractor shall not take advantage of any errors, discrepancies or omissions which may exist in the Plans and Specifications but shall immediately call them to the attention of the Engineer whose interpretation or correction thereof shall be conclusive.

It is intended that the information pertaining to conditions that may affect the cost of the Work will be shown on the contract drawings or indicated in the Specifications; however, the District does not warrant the completeness or accuracy of such information. The Contractor shall ascertain the existence of conditions that would affect the cost of the Work which would have been disclosed by a reasonable examination.

Existing improvements visible at the Site for which no specific disposition is made on the Plans but which could reasonably be assumed to interfere with the satisfactory completion of the improvements contemplated by the Plans shall be removed and disposed of by the Contractor.

When deemed necessary by the Engineer, additional Detail Drawings will be furnished to the Contractor during the progress of the Work.

C-18 Inspection of Work

a. The Design Engineer, Engineer, District, the US Bureau of Reclamation and their representatives shall at all times have access to the Work wherever it is in preparation or progress, and the Contractor shall provide safe and convenient facilities for such access and for inspection. If the Specifications, the Engineer's instructions, laws, ordinances, or any public authority require any material, equipment or Work to be specially tested or approved, the Contractor shall give the Engineer timely notice of its readiness for inspection, and if the inspection is by an authority other than the Engineer, of the time fixed for inspection. Inspections by the Engineer will be made promptly and, where practicable, at the source of supply.

b. Work performed without inspection may be required to be removed and replaced under proper inspection and the entire cost of removal and replacing, including the cost of District-furnished materials used in the Work, shall be borne by the Contractor, regardless of whether or not the Work exposed is found to be defective. Examination of questioned Work may be ordered by the Engineer and, if so ordered, the Work must be uncovered by Contractor. If such Work is found to be in accordance with the Contract Documents, the District will pay the cost of reexamination and replacement. If such Work is found to be not in accordance with the Contract Documents, Contractor shall pay such cost, unless he shows that the defect in the Work was caused by another contractor, and in that event the District will assume responsibility for such costs.

c. The inspection of the Work shall not relieve the Contractor of his obligation to fulfill the Contract as herein prescribed or in any way alter the standard of performance provided by Contractor. Defective Work shall be made good and unusable materials may be rejected, notwithstanding that such Work and materials have been previously overlooked by the Engineer and accepted or estimated for payment. If the Work or any part thereof shall be found defective, Contractor shall, within ten (10) calendar days, make good such defect in a manner satisfactory to the Engineer. If the Contractor shall fail or neglect to make ordered repairs of defective Work or to remove the condemned materials from the Work within ten (10) calendar days after direction by the Engineer in writing, the District may make the ordered repairs, or remove the condemned materials, and deduct the cost thereof from any moneys due the Contractor.

d. Contractor shall give Engineer timely notice of the Work for all required inspections, tests or approvals and shall cooperate with inspection and testing personnel to facilitate the required inspections or test.

e. The Contractor shall furnish promptly, without additional charge, all facilities, labor and materials reasonably needed by the Engineer for performing all inspection and tests. Contractor shall be charged with any additional cost of inspection when material and workmanship are not ready at the time specified by the Contractor for its inspection.

C-19 Conditions Affecting Work

The Contractor shall be responsible for ascertaining the nature and location of the Work, and the general and local conditions which can affect the Work or the cost thereof. Any failure by the Contractor to do so will not relieve him from responsibility for successfully performing the Work without additional expense to the District. Except as expressly provided to the contrary in the Contract, the Contractor assumes all risk with respect to unforeseen difficulties which may be encountered in performance of the Work, including and without limiting the generality of the foregoing: obstacles, obstructions or adverse ground water conditions in or along the line of Work and variance of the quality or quantity of surface and subsurface materials from that which was assumed.

C-20 Compliance with Laws – Permits – Taxes

The Contractor is an independent contractor and shall, at his sole cost and expense, comply with all laws, rules, ordinances and regulations of all governing bodies having jurisdiction over the Work, obtain all necessary permits and licenses therefor, pay all manufacturers' taxes, sales taxes, use taxes, processing taxes, and all Federal and State taxes, insurance and contributions for Social Security and Unemployment which are measured by wages, salaries or any remuneration paid to the Contractor's employees, whether levied under existing or subsequently enacted laws, rules, or regulations. The Contractor shall also pay all property tax assessments on materials or equipment used until acceptance by the District. Without limitation, materials furnished and performance by the Contractor hereunder shall comply with Safety Orders of the Division of Industrial Safety, State of California.

The Contractor, upon request, shall furnish evidence satisfactory to the Engineer and/or to the District that any or all of the foregoing obligations have been or are being fulfilled. The Contractor warrants to the District that he is licensed by all applicable governmental bodies to perform this Contract and will remain so licensed throughout the progress of the Work, and that he has, and will have, throughout the progress of the Work, the necessary experience, skill, and financial resources to enable him to perform this Contract.

C-21 Indemnification

a. The Contractor shall assume the defense of and indemnify and save harmless the District, the Design Engineer, the Engineer, the US Bureau of Reclamation and their respective directors, officers, employees and agents from any and all loss, damage, liability, claims or causes of action of every nature whatsoever for damage to or destruction of property, including the District's property, or for injury to or death of persons, including Contractor's employees, in any manner, including that alleged to have been caused by the negligence of the indemnitees or any of them, arising out of or incident to the performance of this Contract; provided, however, that the Contractor shall have no such obligation with respect to such of the foregoing as are actually caused by the sole or active negligence or willful misconduct of the indemnitees or any of them; and provided further, that the Contractor shall not be liable for damages resulting solely from error or omission in design which were not due to or contributed to by negligence or fault of the Contractor, his subcontractors, agents or employees.

b. The Contractor shall at all times preserve and protect the Work installed and performed hereunder, and assume full responsibility for the condition thereof until final acceptance by the District. The Contractor shall be liable for any loss or damage to any Work in place and to any materials on the Site which may be caused by the Contractor, his employees, agents or guests. Any such damage shall be immediately repaired by the Contractor, and, upon failure to do so, the District may remedy the same and deduct the cost thereof from any amount due or to become due the Contractor.

c. The Contractor shall assume the defense of and indemnify and save harmless the District, the Design Engineer, the Engineer, the US Bureau of Reclamation and their respective directors, officers, employees and agents, against any and all liens, claims, demands and costs, including attorneys' fees, for labor and material furnished to the Contractor or any of his Subcontractors in connection with the performance of this Contract. In the event that the Contractor or any of his Subcontractors shall fail to pay for any material or labor used in the performance of this Contract, or any lien is filed against the said property, or any claim is asserted or action filed on any Bond, by any person claiming to have furnished labor or materials to the Contractor or any of his Subcontractors in connection with the performance of this Contract, the District shall be entitled, at its option, to pay for said material or labor, or discharge any such lien, or to pay or settle any such claim or action and to deduct the amount so paid, together with any and all costs and attorneys' fees incurred by or on behalf of the District in connection with any such payment, discharge, or settlement, from amounts due or to become due the Contractor hereunder. The District may also deduct from any amounts due or to become due to the Contractor, any other amounts owing by the Contractor to the District, including the cost of any materials, labor, services,

equipment or facilities supplied by the District as to which the Contractor has the obligation to supply the same hereunder. In the event that the balance which otherwise would be due the Contractor shall be insufficient to so reimburse the District, the Contractor shall pay the District any deficiency upon demand.

d. The Contractor shall pay all royalties and license fees. Contractor shall, at his own cost, expense and risk, defend any and all suits or claims for infringement of any patent rights and shall save the District and its directors, officers, employees and agents harmless from loss on account thereof; except that the District shall be responsible for all such loss when a particular manufacturer is specified by it, unless the Contractor has information that the process or article specified is or may be an infringement of a patent, in which case Contractor shall be responsible for such loss unless he promptly gives such information, in writing, to the Engineer.

C-22 Protection of Work Site, Existing Structures, Roadways, Utilities, and Private Property

a. The Contractor shall effectively secure and protect adjacent property.

b. The Contractor shall be responsible for all damage to any property resulting from trespass by the Contractor or his employees in the course of their employment, whether such trespass was committed with or without the consent or knowledge of the Contractor.

c. The Contractor shall see that the Site is kept drained and free of all ground water.

d. The Contractor shall be responsible for any damage caused by drainage or water runoff from construction areas and from construction plant areas.

e. In the event of an emergency or unusual conditions endangering life, the Work, or adjacent property, the Contractor may, without special instructions or authorization, act at his discretion to prevent or eliminate such danger. Should the Engineer deem an emergency condition to exist, the Contractor shall immediately do those things and take those steps ordered by the Engineer. The decision of the Engineer in this respect shall be final. Any claims for compensation made by the Contractor on account of emergency Work shall be determined by agreement.

f. The Contractor shall be responsible for locating, removal, relocation and protection of all public and private utility facilities, including irrigation facilities, located on the site of the Project and the Contractor shall not be entitled to any extension of time or claim for damages or extra compensation in connection therewith. Provided however, if and to the extent that existing main or trunk line public utility facilities as defined by Government Code Section 4215 (“Public Utility Facilities”) are not identified in the Contract Documents, as between the

Contractor and the District, the District will be responsible for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating Public Utility Facilities not indicated in the plans and specifications with reasonable accuracy, and for equipment on the project necessarily idled during such Work regarding said Public Utility Facilities, as the case may be, but the Contractor shall perform any such Work in conformance with applicable provisions of Paragraphs C-9 and C-10 if so directed by the Engineer. The Contractor will not be assessed liquidated damages for delay in completion of the project, when such delay was caused by the failure of the public agency or the owner of the Public Utility Facilities to provide for removal or relocation of any Public Utility Facilities. If the Contractor, while performing the Contract Work, discovers utility facilities not identified by the District in the Contract Documents, he shall immediately notify the Engineer in writing.

C-23 Workers and Wages

a. **Character of Workers** – Only qualified, careful and efficient workers shall be employed. When required in writing by the Engineer, the Contractor or any subcontractor shall remove from the Work any person who is, in the opinion of the Engineer, incompetent, unfaithful, disorderly, or otherwise unsatisfactory, and shall not again employ such person on the Work except with the consent of the Engineer. Such removal shall not be the basis for any claim for compensation or damages against the District, or any of its officers or agents.

b. **Convicts** – No convict labor shall be directly employed by the Contractor or any subcontractor in the performance of any Work done under this Contract.

c. **Hours of Work** – Eight (8) hours of labor shall constitute a legal day's work upon all the Work hereunder and the time of service of any worker employed by the Contractor or by any Subcontractor under him shall be limited and restricted to eight (8) hours during any one (1) calendar day, except that work performed by employees in excess of eight (8) hours per day and forty (40) hours in any one (1) calendar week will be permitted upon compensation for all hours worked in excess of said limitations at not less than one and one-half times the basic rate of pay or as otherwise may be required by applicable law. The Contractor and all Subcontractors under him shall keep record of hours worked as required by Section 1812 of the California Labor Code. As required by Section 1813 of the California Labor Code, the Contractor shall forfeit as a penalty to the District twenty-five dollars ($25) for each worker employed in the execution of the Contract by him or by any Subcontractor under him for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any one (1) calendar day and forty (40) hours in any one (1) calendar week in violation of the provisions of this subsection.

d. **Compliance with State Requirements for Employment of Apprentices** – The Contractor's attention is directed to Section 1777.5 of the California Labor Code; provisions of said section pertaining to employment of registered apprentices are hereby incorporated by reference into these Specifications. As applicable, the Contractor or any Subcontractor employed by him in the performance of Contract Work shall take such actions as necessary to comply with provisions of said Section 1777.5.

e. **Wage Rates** – Bids shall be made in accordance with the prevailing rate of per diem wages for this locality and project as determined by the Director of Industrial Relations pursuant to Labor Code Section 1770 et seq.

The Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Pursuant to Article 2 (commencing at Section 1770), of the California Labor Code, the Director of the State of California, Department of Industrial Relations has ascertained the generally prevailing rate of per diem wages and the generally prevailing rates for legal holiday and overtime work in the locality in which the work is to be performed, for each craft or type of worker needed to execute the Contract. The Contractor and all Subcontractors under him shall pay not less than said specified rates to all workers employed in the execution of the Contract, a copy of which wage rate schedule is on file at the office of the District and by this reference incorporated herein. The Contractor shall post a copy of said documents at each job site. As required by Section 1775 of the California Labor Code, the Contractor shall, as a penalty to the District, forfeit an amount determined by the Labor Commissioner, not more than fifty dollars ($50), for each calendar day, or portion thereof, for each worker paid less than the specified prevailing rates for work done under the Contract by him or by any subcontractor under him. The Contractor and all subcontractors under him shall keep records of wages paid as required by Section 1776 of the California Labor Code. The Contract and each Subcontractor shall furnish the record specified in section 1776 of the California Labor Code to the Labor Commission in the manner required by section 1171.4 of the California Labor Code. The Contractor and each Subcontractor shall pay travel and subsistence payments to each worker needed to execute the Work required by the Contract, as such travel and subsistence payments are defined in the applicable collective bargaining agreements filed in accordance with Section 1773.8 of the California Labor Code. The labor rates determined by the Department of Industrial Relations are set forth in a schedule located at the District office, and is available to any interested party upon request.

Prevailing wage schedules for Kern County are also available from the Department of Industrial Relations-Division of Labor Statistics & Research via the internet at www.dir.ca.gov.

f. **Worker's Compensation Insurance** – In accordance with the provisions of Section 3700 of the California Labor Code, every Contractor shall secure the payment of compensation to his employees. Prior to commencing Work, Contractor shall sign and file with the District a certification as follows: "I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the Work of this Contract."

g. **Labor Discrimination** – The Contractor's attention is directed to Section 1735 of the California Labor Code. The Contractor agrees to comply with provisions of said section that read as follows:

"No discrimination shall be made in the employment of persons upon public works because of the race, religious creed, color, national origin, ancestry, physical handicap, mental condition, marital status or sex of such persons, except as provided in Section 12940 of the Government Code, and every contractor for public works violating this section is subject to all the penalties imposed for a violation of this chapter."

The Contractor's attention is further directed to Section 1777.6 of the California Labor Code, and the Contractor agrees to ensure compliance with the provisions of said section which provide as follows:

"It shall be unlawful for an employer or a labor union to refuse to accept otherwise qualified employees as registered apprentices on any public works, on the ground of the race, religious creed, color, national origin, ancestry, sex or age, except as provided in Section 3077, of such employee."

C-24 Clean-up

During the progress of the Work, the Contractor shall maintain the Site and related structures and equipment in a clean, orderly condition and free from unsightly accumulation of rubbish. Additionally, the Contractor shall supply its own trash bin to dispose of all trash. Upon completion of the Work and before the final estimate is submitted, the Contractor shall at his own cost and expense remove from the vicinity of the Work all plants, buildings, rubbish, unused Work materials, concrete forms, and temporary bridging and other like material, belonging to him or used under his direction during construction. In the event of Contractor's failure to do so, the same may be removed by the District after ten (10) calendar days' notice to the Contractor at the expense of the Contractor. Where the construction has crossed yards or driveways, the yards and driveways shall be restored by the Contractor to the complete satisfaction of the Engineer at the Contractor's expense.

C-25 Safety

a. Contractor shall be solely and completely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The duty of the Engineer to conduct construction review of the Contractor's performance and the undertaking of inspections by the Engineer or the giving of instructions as authorized herein is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the construction site and shall not be construed as supervision of the actual construction nor make the Engineer or the District responsible for providing a safe place for the performance of Work by the Contractor, Subcontractors, or Suppliers; or for access, visits, use, work, travel or occupancy by any person. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

   1. All persons on the Site or who may be affected by the Work;

   2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

   3. Other property at the Site or adjacent thereto, including crops, trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

b. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and/or underground facilities (including districts and utility districts) when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

c. All damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor.

d. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is fully completed and accepted. Such duties and responsibilities shall be extended, however, to include any time period in which warranty Work or other Work by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any

of them to perform any of the Work, or anyone for whose acts any of them may be liable, remains in progress.

e. The Contractor shall have at the work Site, copies or suitable extracts of Construction Safety Orders, issued by Cal-OSHA. The Contractor shall comply with the provisions of these and all other applicable laws, ordinances and regulations.

The Contractor shall submit to the District a copy of his permit for the project issued by Cal-OSHA, within ten (10) calendar days after the mailing of the Notice of Award and before the commencement of any operations.

If there is any non-compliance with the Cal-OSHA Construction Safety Orders, the Contractor shall stop forthwith all affected Work until there is compliance in the opinion of the State Division of Industrial Safety. The District, Engineer, officers, employees, consultants, and agents of the aforementioned, shall not be liable for costs incurred by the Contractor due to work stoppage. The Contractor will not be eligible for an extension of time to complete the Work within the time set forth in this Contract due to the Work stoppage.

C-26 Accidents

The Contractor shall provide, at the site, such equipment and medical facilities as are necessary to supply first aid service to anyone who may be injured in connection with the Work. The Contractor must promptly report to the Engineer in a writing giving full details and statements of witnesses of all accidents whatsoever arising out of, or in connection with the performance of the Work, whether on or adjacent to the Site, which cause death, personal injury, or property damage. In addition, if death or serious injury or serious damage are caused, the accident shall be reported immediately by telephone or messenger to the Engineer. If any claim is made by anyone against the Contractor or any Subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

C-27 Guarantee

In addition to warranties, representations and guarantees stated elsewhere in the Contract and in addition to any warranties implied by law, the Contractor unconditionally guarantees all Contractor furnished materials and workmanship furnished hereunder, and agrees to replace at Contractor’s sole cost and expense, and to the satisfaction of the Engineer and the District, any and all materials which may be defective or improperly installed, whether such defects of material and installation are of patent or latent nature.

C-28 Payments to Contractor and Completion

a. **Schedule of Values** – Within fourteen (14) calendar days after receiving the Notice to Proceed, the Contractor shall submit a detailed Schedule of Values to the Engineer for approval. The Schedule of Values shall be used as a basis for determining progress payments on a lump sum contract or any designated lump sum bid item. The Schedule of Values shall be a schedule of cost loaded construction activities equal, in total, to the lump sum bid and shall be in such form and sufficient detail to correctly represent a reasonable apportionment of the lump sum.

Each lump sum bid item on the Bid Schedule must be broken down separately. The breakdown of each lump sum bid item must cover the cost of construction required by the Contract Drawings and Contract Documents for that item. The sum of the values for the construction activities, within a bid item, must equal the total bid amount for that item. The breakdown shall include subcontract amounts which shall not deviate from the amounts submitted in the Proposal Bidding Schedule. The Contractor shall provide certification from the Subcontractors certifying the subcontract amounts.

b. **Applications for Payment**

1. An Application for Payment for each calendar month of Contract Work (but not more often than once a month), shall be submitted by the Contractor to Engineer for review covering the Work completed as of the date of the Application for Payment and accompanied by all supporting documentation as is required by the Contract Documents.

2. Contractor may apply for payment for materials and equipment to be used in the Work but not yet incorporated therein, which have been delivered to, and are suitably stored, at the Site. The application shall be accompanied by data satisfactory to District to establish District's title to such materials and equipment or otherwise protect District's interest, and shall be subject to approval by Engineer. Payment for such materials and equipment will not include any amount for Contractor's overhead or profit, or relieve Contractor of its obligation to protect and install such materials and equipment in accordance with the Contract Documents, or to restore damaged or defective Work involving such materials and equipment.

3. Beginning with the second Application for Payment, each Application for Payment shall be submitted with all release forms confirming that all previous progress payments received on account of the Work have been applied on account to discharge Contractor’s legitimate obligations associated with prior Applications for Payment.

4. As provided in Section 7201 of the Public Contract Code, a five percent (5%) retention of payment will be withheld on all progress payments.

5. The provisions pertaining to the withholding of specified percentages of the Contract price, may, at the Contractor's request and expense, be satisfied by depositing with the District or State or Federally chartered bank as escrow agent, securities equivalent to the amount to be withheld. Securities eligible for investment include those listed in California Government Code Section 16430 and bank and savings and loan certificates of deposit.

c. **Review of Applications**

1. Engineer will, within five (5) days after receipt of each Application for Payment, either prepare a recommendation of payment and present to the District or return the Application of Payment to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. If the Application for Payment has been returned to the Contractor, the Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will represent by Engineer to District, that:

   a) The Work has progressed to the point indicated; and

   b) The quality of the Work is generally in accordance with the Contract Documents.

3. Engineer may refuse to recommend the whole or any part of any payment for any of the following reasons:

   a) Any claims are filed against Contractor by District, Engineer, or third parties, or if reasonable evidence indicates the probability that such claims will be filed;

   b) Contractor is in default of any Contract condition;

   c) The Work is defective, or completed Work has been damaged, which will require that the Work be corrected or replace;

   d) District has been required to correct defective Work or complete Work; or

   e) The Contractor has failed to provide the required waivers and releases.

d. **Payment Becomes Due**

1. Partial payments will be made as the Work progresses and following the District's monthly Board meeting, or as soon thereafter as practical.

2. The Contractor is hereby notified that because of the need for payments to be reviewed by the District's Board of Directors and because the Board only regularly meets once a month, delays of as much as sixty (60) days may occur in Contractor's receipt of payment for progress pay estimates and the final pay estimate. The Contractor is urged to process his request for payment in a timely manner to minimize payment delays. The Contractor agrees that such a delay shall not entitle Contractor to any remedy provided for in the Contract Documents or law.

e. **Reduction in Payment**

1. The District may refuse to make payment of the full amount recommended by Engineer because:

a) Claims have been made against District on account of Contractor's performance;

b) Stop notices or liens have been filed in connection with the Work;

c) There are other items entitling the District to a set-off against the amount recommended;

d) Failure of the Contractor to make payment properly to Subcontractors or for material or labor;

e) A reasonable doubt that the Contract can be completed for the balance then unpaid;

f) Damage to another Contractor, Subcontractor, Supplier, or Individual;

g) Failure of the Contractor to keep his Work progressing in accordance with the time schedule; or

h) Where Work on unit price items is substantially complete but lack clean-up and/or correction ordered by the Engineer.

2. If District refuses to make payment of the full amount recommended by Engineer, District will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so

withheld. District shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by District and Contractor, when Contractor corrects to District's satisfaction the reasons for such action.

f. **Substantial Completion and Final Review**

1. When the Work has been completed and ready for its intended use, Contractor shall notify District and Engineer in writing that the Work is Substantially Complete and request that Engineer issue a certificate of Substantial Completion, which will be in the form of a letter.

2. When the Work has been Substantially Completed and the Contractor so notifies the Engineer in writing, the Engineer and Contractor will jointly make a Semi-Final Inspection and may prepare a Punch List. As a result of this inspection, the Engineer may determine that (l) the Work is not sufficiently complete to warrant a Semi-Final Inspection or the preparation of a Final Punch List, (2) the Work is sufficiently complete for the Engineer to prepare a Final Punch List but certain incomplete or Defective Work prohibits use of the Work for its intended purpose and therefore, the Work is not Substantially Complete, or (3) that the Work is Substantially Complete and usable for its intended purpose and the Engineer can prepare a Final Punch List. In preceding cases 1 and 2, the Contractor shall continue the Work and call for a second Semi-Final Inspection when the Work is ready. In case (3), the Engineer will prepare a Final Punch List and a notice of Substantial Completion which shall establish the date of Substantial Completion and shall state the time agreed to by the District and the Contractor (not to exceed 30 days) in which the Contractor shall complete all Work ready for Final Inspection. The date of Substantial Completion shall be revised if necessary such that it is no more than 30 days prior to the actual date of Final Completion. The Engineer shall attach a copy of the Final Punch List to the notice of Substantial Completion. If the Contractor does not achieve Substantial Completion on the second attempt, it shall reimburse the District the cost of the Engineer's services for additional inspections.

3. When the Contractor has completed or corrected all the items on the Engineer's Final Punch List, the Contractor shall give the Engineer written notice that the Work is ready for Final Inspection and acceptance and the Engineer shall make a Final Inspection. If the Engineer finds the Work is not fully complete, it shall notify the Contractor of items still requiring completion or correction. The Contractor shall immediately correct these deficiencies and call for a re-inspection. When the Engineer finds to the best of the Engineer's knowledge, information and belief, and on the basis of the Engineer's observations and inspections, the Work is acceptable and fully complete in accordance with the Contract Documents, the Engineer

will recommend that the District issue and file a Notice of Completion, designating Final Completion, and accept the Work in accordance with the terms and conditions of the Contract Documents. The Notice of Completion will be file once the Final Completion has been achieved.

4. The District shall file the Notice of Completion with the Kern County recorder's office within 10 days of acceptance of the Work and Final Completion. This will be the date when the Contractor is relieved from responsibility to protect the Work.

5. Contractor is herein put on notice and acknowledges that the date of the filing of the Notice of Completion is the date by which any liquidated damages will be computed for the Work as a whole and that the District is under no duty to place the Contractor on notice that Liquidated Damages are about to run, or have begun to run.

g. **Partial Utilization**

1. Prior to Substantial Completion of all the Work, District may use or occupy any Substantially Completed part of the Work which District and Engineer agree constitutes a separately functioning and usable part of the Work that can be used by District for its intended purpose without significant interference with Contractor's performance of the remainder of the Work.

2. When provided for in the Contract Documents or agreed to in writing by the District and the Contractor, the District may notify the Contractor and begin using a portion of the Work even though the overall Work is not Substantially Complete. The Contractor, the District and the Engineer shall agree on and document responsibilities for security, operation, safety, maintenance, utilities, insurance, warranties and guarantees for that portion of the Work being used by the District. The District, the Contractor and the Engineer shall inspect such portion of the Work and shall prepare a list of Work to be completed or corrected before final acceptance. The District's use of any portion of the Work shall not constitute final acceptance of that portion of the Work prior to Final Completion and acceptance of the Work as a whole. Provided, however, the warranty for such Work will commence upon Substantial Completion for that portion of the Work that is Substantially Complete. The District shall allow the Contractor reasonable access to complete or correct Work in areas being used by the District. Partial beneficial occupancy shall not relieve the Contractor of liquidated damages unless the Contract Documents expressly provide for and identify the portion of Work that may be considered Substantially Complete before the remaining portions of the Work.

h. **Final Payment**

1. **Application for Payment**

a) After Contractor has, in the opinion of Engineer, satisfactorily addressed all items in the Final Punch List and has delivered, in accordance with the Contract Documents, all operation and maintenance manuals, warranties, record drawings, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents etc. and other documents, Contractor may make application for final payment following the procedure for progress payments.

b) The final Application for Payment shall be accompanied (except as previously delivered) by:

1) All documentation called for in the Contract Documents;

2) Consent of the surety, if any, to final payment;

3) A list of all claims against District that Contractor believes are unsettled; and

4) Complete and legally effective releases or waivers (satisfactory to District) of all lien rights arising out of or liens filed in connection with the Work.

2. **Engineer's Review of Application and Acceptance**

a) If, on the basis of Engineer's observation of the Work during construction and Final Inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within five (5) days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to District for payment. At the same time Engineer will also give written notice to District and Contractor that the Work is acceptable. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

b) Neither the acceptance of the Work by the District nor the payment of all or part of the sum due the Contractor hereunder shall constitute a waiver by the District of any claim which the District may have against the Contractor or surety under this Contract or otherwise.

3. **Payment Becomes Due**

a) Final payment shall not be due until thirty-five (35) days after either the Notice of Completion has been recorded, in compliance with the Code of Civil Procedure of the State of California, or after such time as the Contractor has submitted all documents required in Paragraph C-28h and has addressed all items in the Final Punch List, whichever is later. The Contractor is hereby notified that because of the need for payments to be reviewed by the District's Board of Directors and because the Board only regularly meets once a month, delays of as much as sixty (60) days may occur in his receipt of payment for progress pay estimates and the final pay estimate. The Contractor is urged to process his request for payment in a timely manner to minimize payment delays. The Contractor agrees that such a delay shall not entitle Contractor to any remedy provided for in the Contract Documents or law.

C-29 Contract Closeout

Prior to submitting the Final Application for Payment and issuance of the Final Payment, as described in Paragraph C-28h, the Contractor must complete the Work described below.

a. **Cleaning** –Throughout the period of construction, the Contractor shall keep the Site free and clean of all rubbish and debris, and shall promptly remove from the Site, or from property adjacent to the Site, all unused and rejected materials, surplus earth, concrete, plaster, and debris, excepting select material which may be required for refilling or grading. Contractor shall provide its own trash bins and containers for disposal of all material.

b. **Final Site Clean-Up** – Upon completion of the Work, and prior to final acceptance, the Contractor shall remove from the vicinity of the Work all surplus material, and equipment belonging to him or used under his direction during construction.

c. **Waste Disposal** – The Contractor shall provide trash bin (dumpster) for use. The Contractor shall dispose of surplus materials, waste products, demolition materials, and debris. The Contractor shall transport and dispose of waste materials in accordance with applicable laws and regulations.

d. **Project Record Documents** – The Contractor shall maintain at the Site, available to the District and Engineer, one copy of the Contract Documents, Plans, Shop Drawings, Change Orders, and other modifications in good order and marked to record all changes made during construction. These foregoing documents shall be delivered to the Engineer upon completion of the Work and will be known as Project Record Documents. Project Record Documents shall be reviewed during progress meetings to ascertain that all changes have been recorded. Contractor shall store Project Record Documents separately from documents used for construction.

e. **Touch-Up and Repair** – The Contractor shall touch-up or repair finished surfaces on structures, equipment, fixtures, or installations that have been damaged prior to final acceptance. Surfaces on which such touch-up or repair cannot be successfully accomplished shall be completely refinished or in the case of hardware and similar small items, the item shall be replaced. Such items shall include, but not be limited to, the following:

1. Road surfaces (paved and unpaved)

2. Structure concrete surfaces

3. Equipment exposed surfaces

4. Piping exposed surfaces

f. **Final Equipment Check** – After test operation and before final acceptance, each piece of machinery shall be lubricated and all components and couplings checked for proper alignment and adjustment.

Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's and District's final review.

Provide submittals to District that are required by governing or other authorities.

Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

g. **Warranties**

1. Provide Manufacture's Equipment Warranties as required by these Specifications.

2. Execute and assemble documents from Subcontractors, Suppliers, and manufacturers.

3. Provide Table of Contents and assemble in binder with durable plastic cover.

4. Submit prior to final Application for Payment.

5. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing date of acceptance as start of warranty period.

h. **Record Drawings –** Refer to Section D-34.

i. **Operation and Maintenance (O&M) Manuals**

1. Provide four (4) original O&M manuals and one (1) electronic copy (in pdf) to the Engineer prior to final Application for Payment. All O&M manuals shall be provided in a three-ring binder, with tabs and an index describing the contents of the binder. One binder containing the O&M manual for each piece of equipment shall be furnished and be included in a separate binder. All O&M manual copies whose original pages are color shall be provided in color. The binder cover sheet shall include at a minimum: (1) the name of the project; (2) the contents of the binder; (3) the District's name; (4) the Date; and (5) the volume number (i.e. Vol. 1 of 2 etc.). One hardcopy of the O&M manual shall be provided to the Engineer and District for review prior to reproducing all four sets. Once the sample copy has been approved, the Contractor may proceed with preparing the four original sets.

2. Operation and maintenance instructions shall include, at a minimum, the below listed following data for each item of mechanical, electrical, and instrumentation equipment. All equipment manufacturers shall be made aware of these requirements and all associated costs shall be included in the costs for furnishing the equipment or system.

a) All information provided as part of the Shop Drawings.

b) All information required as part of the Specifications.

c) Manufacturer's O&M manual customized for equipment provided. Cross out equipment not provided.

d) Bill of material listing every component of equipment listed by make and part number. An insufficient bill of materials shall result in O&M manual submittal rejection.

e) An itemized list of all data provided.

f) Name and location of the manufacturer, the manufacturer's local representative, the nearest supplier, and spare parts warehouse.

g) Equipment function, normal operating characteristics, and limiting conditions.

h) Recommended maintenance procedures during storage of equipment prior to installation and after installation but prior to start-up.

i) Recommended installation, adjustment, start-up, calibration, and troubleshooting procedures.

j) Recommended lubrication, lubrication intervals, and an estimate of yearly quantity needed.

k) Recommended step-by-step procedures for all modes of operation. Operating instructions for startup, routine and normal operation, regulation and control, shutdown, and emergency conditions. Instructions shall include keystrokes and procedures required for adjusting control set points for equipment operation.

l) Complete internal and interconnect wiring diagrams of actual installation.

m) Equipment maintenance.

n) Test data and performance curves, where applicable.

o) Recommended preventive maintenance procedures and schedule.

p) Complete parts lists (bill of materials), by generic title and identification number (part number), with exploded views of each assembly.

1) Every component shall be listed on the bill of material with its corresponding part number.

2) A recommended spare parts list shall include generic title and identification numbers (part numbers).

q) Recommended spare parts and any special tools required.

r) Disassembly, overhaul, and reassembly instructions.

s) Factory and field test results (if applicable).

t) Manufacturer's contact information and local certified service representative's contact information.

3. Following completion of an item, instructions and procedures shall be modified by the Contractor to reflect field changes. In addition, the O&M manuals shall contain reproducible prints of the Contract record wiring diagrams, schematics, and installation drawings required. Information not applicable to equipment installed in the Work shall be excluded.

4. Individual O&M manuals shall be broken into sections and indexed. Under each section there shall be a description of the operation and maintenance, and installation instructions of each item. Sections shall be labeled and each item shall be sub-labeled. No acceptance of equipment will be made until the individual manual has been approved. Contractor's copy of each individual O&M manual shall be available at the site of the Work for use by field personnel and the Engineer during start-up and testing of the equipment.

C-30 Satisfaction of Liens

If any liens or claims remain unsatisfied after final payment to the Contractor, the Contractor shall pay or refund to the District any money that the latter may be compelled to pay to discharge such liens and costs together with reasonable attorneys' fees incurred by the District in enforcing the Contractor's obligations hereunder.

C-31 Claims against the District and Payment of Attorneys' Fees

In the event that any litigation of any nature between the District and the Contractor becomes necessary to enforce or interpret all or any portion of this Contract, it is mutually agreed that the prevailing party therein shall receive from the other, in addition to such sums as may be reduced to judgment, an amount sufficient to reimburse such prevailing party for reasonable attorneys' fees and litigation costs paid or owing as a result of such litigation.

C-32 Waiver of Interest in Certain Situations

The District shall have no obligation to pay and the Contractor hereby waives the right to recover interest with regard to monies which the District is required to withhold by reason of judgment, order, statute or judicial process.

C-33 Assignments of Antitrust Actions

In entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of

action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

C-34 Notice of Latent or Hazardous Conditions

In accordance with Section 7104 of the Public Contract Code, where the Specifications require digging trenches or excavating deeper than four (4) feet below the surface, the Contractor shall promptly, and before the following conditions are disturbed, notify the District, in writing, of any:

a. Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law;

b. Subsurface or latent physical conditions at the Site differing from those indicated in the Plans and Specifications; and

c. Unknown physical conditions at the Site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Specifications.

Upon receipt of written notice by the Contractor of such conditions, the District shall promptly investigate the conditions. If the District finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work, the District will issue a change order under the procedures described in the Contract.

In the event a dispute arises between the District and the Contractor as to whether the conditions materially differ, or involve hazardous waste, or cause decrease or

increase in the cost of or time required for performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, and Contractor shall retain any and all rights provided either under the Contract or by law which pertain to the resolution of disputes and protests between the District and the Contractor.

C-35 Claims

Claims by the Contractor shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed with the District on or before the date of final payment. Nothing herein is intended to extend the time limit or supersede notice requirements otherwise provided by the Contract for the filing of claims.

For claims of less than fifty-thousand dollars ($50,000), the District will respond in writing to any written claim within forty-five (45) days of receipt of the claim, or may request, in writing, within thirty (30) days of receipt of the claim any additional documentation supporting the claim or relating to defenses to the claim or claims the District may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the District and the Contractor. The District's written response to the claim, as further documented, shall be submitted to the Contractor within fifteen (15) days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

For claims greater than or equal to fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), the District will respond in writing to all written claims within sixty (60) days of receipt of the claim, or may request, in writing, within thirty (30) days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim or claims the District may have against the Contractor. If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the District and Contractor. The District's written response to the claim, as further documented, will be submitted to the Contractor within thirty (30) days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or request documentation, whichever is greater.

If the Contractor disputes the District's written response, or the District fails to respond within the time prescribed, the Contractor may so notify the District, in writing, either within fifteen (15) days of receipt of the District's response or within fifteen (15) days of the District's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the District will schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

If following the meet and confer conference the claim or any portion remains in dispute, the Contractor may file a claim pursuant to Government Code Section 900 et seq. and a lawsuit on the claim may be filed in the appropriate state court.

The court shall submit the matter to non-binding mediation. The parties are to select a mediator within fifteen (15) days of submittal to mediation, and the mediation must be commenced within thirty (30) days of the submittal to mediation.

If the matter remains in dispute, the case shall be submitted to judicial (non-binding) arbitration pursuant to Code of Civil Procedure Section 1141.10 et seq. If either party objects to the arbitrator's award, the matter can then go to trial de novo in the trial court.

Any party who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment shall, in addition to payment of costs and fees as provided by applicable law, pay the attorneys' fees of the other party arising out of the trial de novo.

****END OF SECTION****

SECTION D

SPECIAL CONDITIONS

D-1 The Requirement

It is required that the Project be constructed in accordance with the Contract Documents. The Work is to be performed in Kern County, within the vicinity of Bakersfield, California.

D-2 Special Provisions

a. Americans with Disabilities Act – Contractor and its Subcontractors shall comply with the Americans with Disabilities Act (ADA) of 1990, (42 U.SC., 12101 *et seq.*), which prohibits discrimination on the basis of disability, as well as applicable regulations and guidelines issued pursuant to the ADA.

b. Audits

1. The Contractor and its Subcontractors shall maintain books, records, and other documents, pertinent to their work in accordance with generally accepted accounting principles and practices. Records are subject to inspection by the State at any and all reasonable times.

2. The State reserves the right to conduct an audit at any time between the execution of the Contract work and the completion of the Project. The Contactor and its Subcontractor shall comply with any request by the District and the State for such an audit. The awarding department, the Bureau of State Audits, or their designated representative(s) shall have the right to review and copy any records and supporting documentation pertaining to the Contract Work to the extent permitted by Government Code sections 6250 *et. seq.*, or other applicable laws. The Contractor and its Subcontractors agree to maintain such records for a possible audit for a minimum of three (3) years after completion of the project, unless a longer period of records retention is requested. The Contractor and its Subcontractors agree to allow the auditor(s) access to such records during normal business hours and to allow for interviews of any employees who might reasonably have information related to such records.

c. Child Support Compliance

The Contractor acknowledges in accordance with Public Contract Code 7110, that:

1. The Contractor recognizes the importance of child and family support obligations and shall fully comply with all applicable state and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Chapter 8 (commencing with section 5200) of Part 5 of Division 9 of the Family Code; and

2. The Contractor, to the best of its knowledge is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.

d. Drug-Free Workplace Certification

1. Certification of Compliance: By signing this Contract, the Contractor and its Subcontractors hereby certify, under penalty of perjury under the laws of State of California, compliance with the requirements of the Drug-Free Workplace Act of 1990 (Government Code 8350 *et seq.*) and have or will provide a drug-free workplace by taking the following actions:

   a). Publish a statement notifying employees, contractors, and subcontractors that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees, contractors, or subcontractors for violations, as required by Government Code Section 8355(a).

   b). Establish a Drug-Free Awareness Program, as required by Government Code Section 8355 to inform employees, contractors, or subcontractors about all of the following.

      1). The dangers of drug abuse in the workplace;

      2). Grantee's policy of maintaining a drug-free workplace;

      3). Any available counseling, rehabilitation, and employee assistance programs; and

      4). Penalties that may be imposed upon employees, contractors, and subcontractors for drug abuse violations.

   c) Provide as required by Government Code Sections 8355, that every employee, contractor, and/or subcontractor who works under this project:

1). Has read the drug-free policy statement above; and

2). Will agree to abide by terms of his condition of employment, contract or subcontract.

e. Inspections

1. State shall have the right to inspect the work being performed at any and all reasonable times during the term of the project.

f. Nondiscrimination

1. During the performance of this Project, the Contractors, its Subcontractors and Suppliers shall not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS), mental disability, medical condition (cancer), age (over 40), marital status, and denial of family care leave. Contractors, its Subcontractors and Suppliers shall ensure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. Contractors, its Subcontractors and Suppliers shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12990 (a-f) *et seq*.) and the applicable regulations promulgated there under (California Code of Regulations, Title 2, Section 7285 *et seq*.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code Section 12990 (a-f), set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations, are incorporated by reference and made a part hereof as if set forth in full. Contractors, its Subcontractors and Suppliers shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. Contractors shall include the nondiscrimination and compliance provisions of this clause in all contracts to perform work under the project.

g. Permits, Licenses, Approvals, and Legal Obligations

1. Contractor shall be responsible for obtaining any and all permits, licenses, and approvals required for performing its obligations under this Project.

2. Without limiting the foregoing, Contractor shall keep informed of and take all measures necessary to ensure compliance with California Labor Code requirements, including but not limited to Section 1720 *et seq.* of the California Labor Code regarding public works, limitations, on use of volunteer labor (California Labor Code Section 1720.4), labor compliance

programs (California Labor Code Section 1771.5), and payment of prevailing wages for work done under this project.

D-3 Description of Work

The principal components of Work to be performed under these Specifications includes the following:

Schedule A-1 and A-2:

Project-Wide:

1. Mobilization includes all activities and costs for transportation of personnel, equipment, and operating supplies to and from the site; establishment of portable sanitary and refuse facilities; procuring an adequate source of fresh water; location, provision and installation of field offices & equipment/materials, storage yards excavation equipment, buildings, and other necessary facilities for the Contractor's operations at the site; premiums paid for performance and payment bonds, including coinsurance and reinsurance agreements as applicable. This line item also includes all other items not specifically included in other line items of the proposal.

2. Demobilization provides for the removal of all work related items from the job site and reversal of temporary items completed in mobilization and construction.

3. The Contractor will be provided with access to a source of water for construction. See Section D-7 of these Special Conditions for further details. The source of water will be available from one of Rosedale-Rio Bravo Water Storage District's (RRBWSD's) existing facilities as follows: Primary source of water for each well site shall be the recharge ponds immediately adjacent to the respective well sites (all well locations are located next to existing ponds) when sufficient water is present; If recharge ponds cannot provide sufficient water supply, water may be taken from the Goose Lake slough with District coordination; If recharge ponds and Goose Lake Slough cannot provide sufficient water supply, existing McCaslin Ag Well located at the southeast corner of the McCaslin ponds may be used as a water supply for the McCaslin well sites with District coordination, and either SUP-5 or SUP-6 (existing wells), located on the west and east sides of the Bowling Recharge pond, may be used as a water supply for the Bowling well site with District coordination.. The Contractor shall provide means to pump, store, and distribute the water.

4. The Contractor shall comply with all local, state, and federal requirements

for the prevention of stormwater pollution and for dust control. This item includes, but is not limited to, using Best Management Practices (BMP's) to control runoff and fugitive dust, the preparation of a Storm Water Pollution Prevention Plan (SWPPP) and a PM-10 Dust Management Plan (if required by law), and the obtaining of permits for each (if required by law). The Contractor shall install, construct, and/or maintain all necessary measures to remain in compliance with all applicable environmental requirements, as well as keep the necessary records in accordance with the requirements of, the SWPPP and PM-10 Dust Management Plan (should they be required by law).

5. The Contractor shall perform all dirt work, grading, , etc. for proper preparation and maintenance of site access routes. Following completion of the project construction, the contractor shall restore all access routes to original design and fencing to its original location.

Three (3) New Wells MC1, MC2, and B1:

1. Drilling, installing and equipping of two (2) approximately 790' deep water wells and one (1) approximately 710' deep water well with 20" diameter casing. Contractor shall install 36" conductor pipe, drill 18" pilot hole, perform E-log, ream pilot hole to a 32" minimum, install casing, gravel tube, gravel envelope and annular seal, swab and airlift well, develop well by pumping and surging, test pump well via step-drawdown, and cleanup of site including disposal of drilling materials and drilling mud.

The order of well construction shall be as follows:

1. McCaslin Well 2 (MC2)
2. McCaslin Well 1 (MC1)
3. Bowling Well 1 (B1)

2. Construction of three (3) 12'x12' concrete well pump foundations. This item includes, but is not limited to, all necessary subgrade preparation, installation of conduits, forming, tying of steel, provision and placement of concrete, finishing, and curing of pump foundations.

3. Furnishing and Installation of three (3) deepwell pumping units, including turbine pump, column, tube and shaft, pumphead with electric motor, oiler, etc for a complete pumping unit.

4. Furnishing and Installation of three (3) 12" steel well discharge piping assemblies, complete with valves, flowmeter, air vents, couplings, and all

other appurtenances at each well site.

5. Furnishing and Installation of electrical facilities at each well site. This item includes, but is not limited to, the installation of electrical service (via pad mount transformer), metering panel, VFD control panel, instrumentation & monitoring panel, all wiring & controls, and all other electrical appurtenances.

6. Furnishing and Installation of panel shade structures and panel security structures at each well site.

7. Furnishing and Installation of well enclosures at each well site.

D-4 Beginning and Completion of Work

a. General

Unless otherwise ordered by the Engineer, as hereinafter provided, the Contractor shall begin the Work within ten (10) calendar days after issuance of the Notice to Proceed. The Contractor shall complete the work as follows:

Schedule A-1 and A-2: Drill, develop, test, and equip wells within **300 calendar days** of issuance of the Notice to Proceed.

b. Completion of Work

The work will be considered completed when the following has been met:

1. Drilling and developing of wells will be considered complete when wells have been drilled, casing installed, developed, test pumped, baled, video logged, disinfected/capped and the well completion report has been filed with the Kern County Health and the State of California.

2. Equipping of wells will be considered complete when all pumping, electrical, and security facilities are installed, tested and fully functional/operational and all site work including grading, cleanup and demobilization is complete and all required documentation has been submitted, all spare parts have been delivered and all equipment adjustment, testing and operator training, etc. has been completed.

c. Sequencing of work

1. A well-site will be chosen to be drilled first. The first well in the wellfield is anticipated to have an analysis per the requirements of Section H, to determine basic well design for the other well in that wellfield, so that the

casing perforations/gravel gradation, etc. can be determined.

2. Contractor shall include this sequencing in the Construction Schedule listed in Paragraph C-15 of the General Conditions.

d. Contractor Notifications

1. Schedule

a) The Contractor shall submit a schedule per the requirements of paragraph C-15 of the General Conditions. The schedule shall contain sufficient detail to allow the District and the Engineer to schedule personnel.

b) Work shall not commence until the schedule has been submitted and approved.

2. Regular Updates

a) After receiving the Notice to Proceed, the Contractor is expected to notify the Engineer daily of the progress of work and any scheduling changes.

b) The Contractor shall notify the Engineer 24 hours prior to periods when the Engineer is to be present as identified in each of the items identified in the technical specifications, of this document. Failure to notify the Engineer in a timely manner may cause delays in the work, which shall not impact the District's cost. Failure to notify the Engineer when they are to observe the work may cause the Contractor to repeat the work in the presence of the Engineer at no additional cost to the District.

e. Special conditions

1. Wells will be constructed adjacent to existing District recharge ponds. It is anticipated that there will be water in the recharge ponds, and work space will be limited to the well pad areas and tops of levees. Additionally, no discharge or disposal of drillings, mud, or other turbid fluid into the ponds without District approval. Drillings, mud, and turbid discharge must be disposed in areas outside of ponds designated by the District or off site. Contractor shall work around those obstacles/operations and be prepared to construct the wells under those conditions.

2. Some of the proposed wells are inside of fenced areas with limited access. Contractor will need to enter and exit site at designated access points and

unless indicated otherwise by the District Representative, the gates are to remain closed and locked except while traveling on and off the site.

D-5 Liquidated Damages for Delays

It will be impractical or extremely difficult to fix the actual damages to the District which may result from any delays in completion of the Work beyond the time agreed upon. It is, therefore, stipulated and agreed that if all of the Work is not completed on or before the expiration of the completion time or times specified in Paragraph D-3, or within such extensions of time as may be granted, the District may retain the sum of $1,000 each day thereafter, Sundays and holidays included, that the Work remains uncompleted, which sum is agreed upon as the proper measure of liquidated damages which the District will sustain per day by the failure of the Contractor to complete the Work within the time stipulated, and this sum is not to be construed in any sense a penalty or forfeiture.

D-6 Qualifications of Bidders

The Contractor's attention is directed to Paragraph B-3 which requires that, in addition to certifying to financial ability to perform Contract Work, each bidder shall submit a statement verifying his experience in performing work comparable to that required under this Contract. Bids will be considered only from contractors who can demonstrate a record of experience satisfactory to the District. Under "Information Required of Bidder," each bidder shall submit with his proposal a listing of at least three projects constructed under the supervision of his organization during the past ten (10) years involving work of size and complexity comparable to that to be installed under these Contract Documents. Moreover, the Contractor must possess a C-57 license to drill the wells and the Contractor must be on the current list entitled "Well Drillers Registered with the Kern County Environmental Health Services Department" on file with the Kern County Environmental Health Services Department. In conformance with Paragraph B-12, it is further required that the Contractor shall perform with his own organization, work equivalent to at least sixty percent (60%) of the total Contract price. The cost of Contractor-furnished materials installed by labor carried on the Contractor's own payroll may be included in the above required sixty percent (60%).

No contractor or subcontractor may be listed on a proposal (if submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

No contractor or subcontractor may be awarded the contract for the project (if awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

D-7 Materials

a. **Materials Furnished by the Contractor** – Unless otherwise specified, the Contractor shall provide and pay for all materials, labor, tools, equipment, lights, power, fuel, transportation and other facilities necessary for the execution and completion of the work. All materials shall be new and both workmanship and materials shall be of a good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials, including the furnishing of written manufacturers' certifications of compliance with applicable designated governing reference specifications.

b. **Materials Furnished by the District –** No materials will be furnished by the District as part of this Contract.

c. **Use of District Water –** District does not make any guarantees as to availability of water from its facilities. Use of District water for Contract construction work and testing shall be subject to verification by the Contractor and determination of exact details as to possible availability; cost and methods of obtaining and conveying water shall be the responsibility of the Contractor. It is expressly understood that the District makes no warranty as to availability, or time of availability of District water. It is the responsibility of the Contractor to furnish all water necessary for Contract construction work, including sufficient water for earthwork, fire protection, dust abatement and testing requirements.

1. The water supply for the project shall be available from the existing District facilities as follows:

   a) Primary water source for all well sites shall be immediately adjacent recharge ponds when adequate water is present. Removal methods shall not disturb existing grades unless otherwise approved by the District.

   b) When adequate water is not present in adjacent ponds, the Goose Lake Slough may be utilized as an alternate water source in coordination with District direction. Removal methods shall not disturb existing grades unless otherwise approved by the District, and access roads along Goose Lake Slough may not be blocked.

   c) When adequate water is not present in adjacent ponds or the Goose Lake Slough, existing District water wells may be used as an alternate water source in coordination with District direction. For the McCaslin wells, the existing McCaslin Ag well located at the southeast corner of McCaslin pond 1 may be the secondary water

supply with District coordination. For the Bowling well, either SUP-5 or SUP-6 (existing district wells) located on the east and west sides of the Bowling pond may be used as secondary water supply with District coordination.

Any equipment, materials, etc. needed to develop the Contractor's water supply for construction will be the Contractor's responsibility.

d. **Equipment and Materials to be Furnished as Listed** – Each bidder shall submit with his proposal under the "Information Required of Bidder" form, a listing of the names of manufacturers and model numbers or types of listed items of Contractor-furnished equipment and materials and said equipment and materials shall be furnished without change or deviation from the listing unless a change or deviation is approved in writing by the Engineer, and unless equipment or material of the listed manufacturer or supplier does not meet the requirements of the Specifications.

D-8 Submittals

a. **Schedule of Submittals** - Within (10) calendar days after the effective date of the Notice to Proceed, the Contractor shall submit a completed submittal schedule and list of products for all items requiring the Engineer's review and approval as follows:

2. Submittals, including description of the item and name of manufacturer, trade name, and model number.

3. Specification section reference.

4. Intended submission/resubmission dates.

5. Order release date.

6. Lead time to delivery/anticipated delivery date(s).

7. Highlight any items that require expedited review to meet the project schedule.

These schedules shall be presented in a form acceptable to the Engineer in both electronic and hardcopy and shall be updated. Identify all submittals that are required by the Contract Documents and determine the date on which each submittal will be submitted in conformance with the schedule submitted.

b. **Technical Submittals – General**

1. Each submittal shall contain material pertaining to no more than one equipment or material item, and shall have the specification section and applicable paragraph number clearly identified. Each submittal shall be sequentially numbered starting with the first one delivered. Re-submittals shall include the number of the original submittal plus the suffix ".1" for the first re-submittal, ".2" for the second re-submittal, etc. (e.g. submittal 3.0, 3.1, 3.2, etc.) Submittals not conforming to these requirements will be rejected.

2. Designation of Work "by others," if shown on Shop Drawings, shall mean that the Work will be the responsibility of the Contractor rather than the Subcontractor or Supplier who has prepared the Shop Drawings.

3. Submittals shall be submitted at least 30 calendar days before the specified installation date. Submittals will be acted upon by the Engineer as promptly as possible, and returned to the contractor not later than the time allowed for in Paragraph D-8c.1 below. The Contractor shall provide in his Construction Schedule the time for this review. If the Contractor is required by the Engineer to resubmit data, then the time required for the Contractor to prepare and resubmit such data, and the required time for Engineer review, shall not be a cause for delay in Contract completion or a cause for an extension of Contract time delay shall be assigned solely to the Contractor.

4. Additional costs of the Engineer's review beyond the second submission shall be borne by the Contractor. This applies to all submittals including Shop Drawings.

5. After a submittal has been reviewed and accepted, no changes or substitutions in that submittal will be allowed.

6. Shop Drawings and submittals will be reviewed for general conformance with the Plans and Specifications. The intent of the review is to determine if the Contractor is submitting materials and equipment which are in general conformance with the Contract Documents. Detailed review of dimensions, sizes, space requirements, coordination with other equipment, and other construction details is not performed. Engineer’s review of submittals shall not relieve Contractor from responsibility for errors, omissions, or deviations, nor responsibility for compliance with the Contract Documents. The Contractor shall indicate on the submittal transmittal form any deviation, the reasons, and how the submittal deviates from the Contract requirements.

c. **Submittal Procedures**

1. The Contractor shall submit to the Engineer for his review **(1) electronic copy in pdf format** (hard copies are to be provided at the Engineer's request) of each submittal (Shop Drawings, electrical diagrams, and catalog cuts for fabricated items and manufactured items furnished under this Contract, etc.). Electronic copies will be returned to the Contractor. Shop Drawings shall be submitted in sufficient time to allow the Engineer not less than fifteen (15) calendar days for examining the Shop Drawings.

2. Unless otherwise specified, submittals shall be delivered to:

Markus Nygren,
Rosedale-Rio Bravo Water Storage District
Tel. 661-525-9945
mnygren@rrbwsd.com

3. The Contractor shall prepare and maintain an accurate submittal log for the duration of the project. The log shall contain a listing of submittals and shall include the following information for each listed item:

   a) Specification section reference

   b) Projected submission date

   c) Actual submission date

   d) Projected need date for approval of the submittal

   e) Actual return date from the Engineer

   f) Notation of the Engineer's response

   g) Notation if resubmittal or record copy is required

4. A separate letter of transmittal, in a form acceptable to the Engineer, shall be used to transmit submittals for each specific item or class of material or equipment. A sample letter of transmittal has been provided at the end of this Section.

5. Submittal of multiple items using a single letter of transmittal will be permitted only when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates review of the group or package as a whole. If multiple submittal items are transmitted under one transmittal letter, then the Contractor shall tab each individual submittal item in the package and provide a table of contents at the beginning of the submittal package.

6. The letter of transmittal for each submittal shall show the transmittal number, date of transmittal, project title, construction contract number, specifications section or drawing number to which the submittal pertains, brief description of the material or equipment submitted, and the company name or the originator of the submittal. Material descriptions shall include the following: type, size, trade name, manufacturer's/supplier's name, and other appropriate summarizing information. Submittal letters for Shop Drawing descriptions shall include the complete list of drawings/sheet numbers that are included in the submittal package. Each letter of transmittal shall be clearly marked to indicate the cases when the material is being submitted as a variation.

7. The transmittal number shall be indicated on every page of each copy of each submittal, and shall correspond to the number given in the letter of transmittal. Only the first sheet of a bound set of originally published or printed brochures or catalogs shall be numbered.

    a) Submittals shall be consecutively numbered beginning with the number 1.

    b) Multiple-page submittals (more than 25 pages) shall be collated into sets, and each set shall be put in a folder or bound before transmittal to the Engineer.

    c) When material or equipment is resubmitted for any reason, a new letter of transmittal shall have the original submittal number followed by a decimal and a number corresponding to the number of resubmittal. An example is 50.2, where 50 is the submittal number and 2 is the number of times submittal 50 has been resubmitted. The letter of transmittal shall indicate that it is a resubmittal.

8. Shop Drawings shall be accurate and complete, and shall contain all required information, including satisfactory identification of items in relation to the Plans and Specifications.

9. Shop Drawings shall be submitted only by the Contractor, who shall indicate by a signed stamp on the Shop Drawings, or other approved means, that Contractor has checked and approved the Shop Drawings, and that the Work shown is in accordance with Contract requirements and has been checked for dimensions and relationship with Work of all other trades involved. Incomplete Shop Drawings and Shop Drawings that have not been checked by the Contractor will be returned to the Contractor for resubmission in the proper form.

10. After review by the Engineer, the appropriate number of submittals will be returned to the Contractor appropriately marked. If major changes or corrections are necessary, the Shop Drawing shall be rejected and returned to the Contractor with the need for such changes or corrections indicated. The Contractor shall correct and resubmit rejected Shop Drawings in the same manner and quantity as specified for the original submittal. If changes are made by the Contractor (in addition to those requested by the Engineer) on the resubmitted Shop Drawings, such changes shall be clearly explained in a transmittal letter accompanying the resubmitted Shop Drawings.

11. The review of Shop Drawings and catalog cuts by the Engineer shall not relieve the Contractor from responsibility for correctness of dimensions, fabrication details, coordination with other Work, space requirements, or for deviations from the Plans or Specifications, unless the Contractor has called attention to such deviations in writing by a letter accompanying the Shop Drawings and the Engineer approves the change or deviation in writing at the time of submission; nor shall review by the Engineer relieve the Contractor from the responsibility for errors in the Shop Drawings.

12. The Contractor agrees that Shop Drawing submittals processed by the Engineer do not become Contract Documents and are not Change Orders; that the purpose of the Shop Drawing review is to establish a reporting procedure and to permit the Engineer to monitor the Contractor's progress and understanding of the design.

13. Submittals of substitutions, changes, and deviations shall be in accordance with this section and may be permitted subject to the following requirements:

    a) The proposed substitution, change, or deviation is conspicuously marked on the Shop Drawings or data.

    b) The corresponding line item on the letter of transmittal is conspicuously marked as a variation.

    c) Proof shall be provided of the comparative quality and suitability of alternative equipment or materials for proposed substitutions. Description, information, performance data, and other information as may be required by the Engineer shall be submitted showing the equality of the materials or equipment offered to those specified.

    d) A written explanation of the necessity for the proposed change or deviation shall be indicated in the Letter of Transmittal.

e) The Engineer will be the sole judge as to the comparative quality and suitability of alternative equipment or materials, and his decision will be final.

f) A sample substitution request form has been provided at the end of this Section.

d. **Shop Drawing Requirements**

1. General: Shop Drawings shall include catalog cuts, information schematic diagrams, and other submittals for both shop and field-fabricated items. The Contractor shall submit, as applicable, the following for all prefabricated or manufactured structural items, material, and equipment.

2. For structures, submit all shop, setting, equipment, miscellaneous iron and reinforcement drawings and schedules necessary for construction. The foregoing shall include detailed "pour drawings" which shall show the sequence of concrete placement, and the type, quantity and location of all embedment items (sleeves, anchor bolts, etc.).

3. For exposed and buried pipelines, submit a detailed layout of the pipeline with details of bends and fabricated specials, and furnish any other details necessary.

4. For electrical submittals, submit detailed information to show power supply requirements, MCC and control panel elevations, wiring diagrams, control and protection schematics, shop test data, operation and maintenance procedures, outline drawings, and manufacturer's recommendation of the interface/interlock among the equipment.

5. For mechanical equipment submit all data pertinent to the installation and maintenance of the equipment including Shop Drawings, anchorage requirements, manufacturer's recommended installation procedure, detailed installation drawings, performance data, test data and curves, operation and maintenance manuals, and other necessary details.

6. For architectural fabrication submit all data pertinent to the installation of the fabrications, including Shop Drawings, manufacturer's recommended installation procedure, detailed installation drawings, and other details necessary for operation and maintenance.

7. Installation or placing drawings for equipment, drives, and bases, include dimensions, size and location of connections to other Work, and weight of equipment.

8. Supporting calculations for equipment and associated supports, or hangers required or specified to be designed by equipment manufacturers. Include seismic restraint information and details.

9. Complete manufacturer's specifications, including materials description and paint system.

10. Seismic design calculations and restraint details for equipment and piping supports.

11. Samples of finish colors for selection.

d. **Review by Engineer**

1. One copy of each submittal will be returned to the Contractor marked with one of the following notations:

a) No Exceptions Taken

b) Make Corrections Noted

c) Revise and Resubmit

d) Rejected – Resubmit

Returned copies of submittals marked with either notation (a) or (b) authorize the Contractor to proceed with the fabrication, installation or construction, or any combination thereof, covered by such returned drawings, provided that such fabrication, installation or construction shall be subject to the comments, if any, shown on such returned copies. Although fabrication may proceed on a notation (b), Contractor shall incorporate the comments, resubmit, and obtain notation (a) before release for shipment can be granted.

Returned copies of submittals marked with notation (c) shall be corrected as necessary and revised drawings shall be submitted in the same manner as before. Returned copies of drawings marked with notation (c) shall be resubmitted not later than ten (10) calendar days after date of transmittal by Engineer of such copies of such drawings.

Returned copies of submittals marked with notation (d) are found not acceptable. Submittals shall be corrected as necessary and be resubmitted in its entirety in the same manner as before. Returned copies of drawings marked with notation (d) shall be resubmitted not later than 7 calendar days after date of transmittal by Engineer of such copies of such drawings.

2. Engineer will review with reasonable promptness Contractor's submittals, but Engineer's review will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents. The Engineer's review shall not extend to means, methods, techniques, sequences or procedures of construction, except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, or to safety precautions or programs incident thereto. Contractor shall make corrections required by Engineer.

   Neither the Engineer's review or failure to review Contractor's submittals, nor the Engineer's authorization for Work to proceed, shall relieve Contractor of any of its obligations to meet all the requirements of the Contract, or relieve Contractor of the responsibility for the correctness of any items submitted, including full compliance with the Contract Documents, and the performance of the Work in a safe and satisfactory manner. Contractor shall, at his expense, make any changes in the design which are necessary to make the Work conform to the provisions and intent of the Contract.

f. **Requests for Information**

1. Requests for information about the Contract Documents shall be directed by Contractor to Engineer using a Request for Information (RFI) form. Such requests will not be accepted by the Engineer from a Subcontractor or Supplier.

2. A separate RFI form shall be used for each specific item for which information is required. Requests for information for more than one item using a single RFI form will be permitted only when the items are so functionally related that expediency indicates review of the group of items as a whole.

3. The Engineer will reply to the Contractor's request for information within seven (7) regular working days following receipt by the Engineer.

g. **Operation and Maintenance Manuals**

Refer to C-29(i) for information.

D-9 Temporary Use of Facilities

Subject to the approval of the District, the Contractor will be permitted to make temporary use of any available, District-owned land in the vicinity of the Site or storage

areas and all such areas shall be returned to a neat and presentable condition as approved by the Engineer, upon termination of such usage.

D-10 Trade Names or Approved Equals

a. Where shown in the Contract Documents, or whenever materials or other items are specified using the trade name or the name of a particular Supplier, the specification is intended to establish the type, function, appearance, craftsmanship and quality required.

1. ***"Or-Equal" Items:*** A proposed item of material or equipment will be considered functionally equal to an item so named if:

a) it is at least equal in materials of construction, quality, durability, appearance, strength, craftsmanship and design characteristics;

b) it will reliably perform at least equally and achieve the results imposed by the design concept;

c) it has a proven record of performance and availability of responsive service; and

d) if approved by the Engineer in writing and incorporated into the Work:

1) there will be no increase in cost to the District or increase in Contract Times; and

2) It will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. **Substitute Items**

a) If in the opinion of the Engineer an item of material or equipment does not qualify as an "or-equal" item, it will be considered a proposed substitute item. Below is a description of the steps that the Contractor must follow when submitting requests for substitution.

b) Contractor shall submit sufficient information to the Engineer to allow the Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute. Requests for substitutions of material or proposed equipment will not be accepted by the Engineer unless it

is submitted by the Contractor. Subcontractors or Suppliers shall not submit such requests.

c) The Contractor shall submit a request to the Engineer requesting review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The written request:

1) shall demonstrate that the proposed substitute item will:

(a) perform adequately,

(b) be similar in substance to that specified, and

(c) be suited to the same use as that specified;

2) will state:

(a) whether the use of such proposed substitute item require any changes in Contract price or Contract Time; and

(b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents;

3) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item.

4) Contractor shall submit a Substitution Request Form as provided by the Engineer when requesting any substitutions. The form must be filled out entirely. A copy of this form can be found at the end of this section.

D-11 Underground Facilities

e. ***Shown or Indicated:*** The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to District or Engineer by the owners of such Underground Facilities, including District, or by others. Unless it is otherwise expressly provided in the Special Conditions:

1. District and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. The cost of all of the following will be included in the contract price, and Contractor shall have full responsibility for:

   a) reviewing and checking all such information and data,

   b) locating all Underground Facilities shown or indicated in the Contract Documents,

   c) coordination of the Work with the owners of such Underground Facilities, including District, during construction, and

   d) the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

3. The Contractor shall expose and demarcate, prior to staking, earthwork, and excavation, all existing utilities and existing facilities which could be damaged by or conflict with the work. Two working days notice shall be given to the Engineer prior to commencing this work. The Contractor shall contact Underground Service Alert (USA) at 811 at least two working days prior to any excavation work to identify any buried utilities within the proposed excavation area. Full compensation for all costs involved in locating, verifying, protecting, exposing, and otherwise providing for utilities shall be included in the amounts bid for the various items of work, and no separate payment shall be made therefore.

4. **Protection** - The Contractor shall not interrupt the service function or disturb the supporting base of any Utility by disrupting any facility identified in the Plans and Specifications without authority from the District or order from the Engineer. Where protection of such facilities is required to ensure support of utilities, the Contractor shall, unless otherwise provided, furnish and place the necessary protection at the Contractor's expense. The Contractor shall develop and execute a workplan, subject to Engineer's approval to protect underground facilities. The Contractor shall be prepared at all times with labor, equipment, and materials to make repair on damaged mains or Utility facilities. The Contractor shall immediately notify the Engineer and the Utility district if he disturbs, disconnects or damages any Utility. The Contractor shall bear the costs of repair or replacement of any Utility facility described with reasonable accuracy in the Plans and Specifications which is damaged by the Contractor. No extra compensation will be made for the repair of any services or mains damaged by the Contractor, nor for any damage incurred if the neglect or failure of providing protective barriers, lights and other devises or means required to protect such existing utilities or facilities described with reasonable accuracy in the Plans and Specifications.

5. **Relocation** - When the Plans or Specifications provide for the Contractor to alter, relocate or reconstruct a Utility, or landowner facility (pipeline, fence, etc.) all costs for such work shall be absorbed in the Contractor's Bid or paid for at the unit price indicated. Temporary or permanent relocation or alteration of utilities desired by the Contractor for the Contractor's own convenience shall be the Contractor's responsibility, and the Contractor shall make all arrangements and bear all costs. The Contractor may, for the Contractor's own convenience or to expedite the work, agree with the District of any Utility to disconnect and reconnect interfering service connections. The District shall not be involved in any such agreement, but the Contractor shall give the District written notice of such an agreement upon its execution.

f. **Not Shown or Indicated**

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith, identify the District and the Engineer of such Underground Facility and give written notice to the District and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If District and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, District or Contractor may make a Claim therefore as provided in the contract specification.

3. Contractor shall develop and execute a work-plan, subject to Engineer's approval to protect underground facilities.

4. The Contractor shall expose, prior to staking and trenching, all existing utilities and existing facilities which may control proposed facility grades, and alignment. Two (2) working days notice shall be given to the Engineer prior to commencing this work. Full compensation for all costs involved in locating, verifying, protecting, exposing, and otherwise providing for utilities shall be included in the amounts bid for the various items of work, and no separate payment shall be made therefore.

5. As specified in Government Code, Section 4215, the Contractor shall be compensated as Extra Work for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the plans and specifications with reasonable accuracy, and for equipment on the project necessarily idled during such work. As specified in Government Code, Section 4215, the contractor shall not be assessed liquidated damages for delay in completion of the project, when such delay was caused by the failure of the district or the district of the utility to provide for removal or relocation of such utility facilities.

g. **Protection** - The Contractor shall not interrupt the service function or disturb the supporting base of any Utility by disrupting any facility identified in the Plans and Specifications without authority from the District or order from the Engineer. Where protection of such facilities is required to ensure support of utilities, the Contractor shall, unless otherwise provided, furnish and place the necessary protection at the Contractor's expense.

The Contractor shall be prepared at all times with labor, equipment and materials to make repair on damaged mains or Utility facilities. The Contractor shall immediately notify the Engineer and the Utility district if he disturbs, disconnects or damages any Utility. The Contractor shall bear the costs of repair or replacement of any Utility facility described with reasonable accuracy in the Plans and Specifications that is damaged by the Contractor. No extra compensation will be made for the repair of any services or mains damaged by the Contractor, nor for any damage incurred if the neglect or failure of providing protective barriers, lights and other devices or means required to protect such existing utilities or facilities described with reasonable accuracy in the Plans and Specifications.

h. **Relocation** - When the Plans or Specifications provide for the Contractor to alter, relocate or reconstruct a Utility, or landowner facility (pipeline, fence, etc.) all costs for such work shall be absorbed in the Contractor's Bid or paid for at the unit price indicated. Temporary or permanent relocation or alteration of utilities desired by the Contractor for his own convenience shall be his responsibility, and he shall make all arrangements and bear all costs. The Contractor may, for his own convenience or to expedite the work, agree with the District of any Utility to

disconnect and reconnect interfering service connections. The District shall not be involved in any such agreement.

D-12 Site Access

The site may be accessed from the following, as detailed on the Plans:

a. There is a primary site access route for the McCaslin wells 2600 feet south of a point approximately 8000 feet west of the intersection of Highway State Route 43 (Enos Lane) and Rosedale Highway.

b. There is a primary site access route for the Bowling well from Superior road, approximately 1400 feet east of a point on Superior road approximately 2700 feet south of Rosedale Highway.

The Contractor may not at any time block the aforementioned access routes.

D-13 Intentionally Omitted

D-14 Responsibility for Repair of Facilities

All existing District facilities or other public or private facilities, including but not limited to pipelines, structures, telephone or power cables, roadways and driveways and embankments disturbed by the Contract construction shall be repaired and replaced to match existing. In addition, the Contractor shall be responsible for any settlement damage to such facilities or adjoining areas, for a period of one (1) year after District acceptance of such repaired facilities.

D-15 Relief from Duty of Protecting Work

The Contractor's responsibility for protection of, and liability for, damage to the Work shall be as stated in the Contract Documents. However, the District may issue written permission to relieve the Contractor of the duty of maintaining and protecting portions of the Contract Work which have been completed in all respects in accordance with applicable requirements of the Specifications. Relief from the duty of maintaining and protecting any portion of the Contract Work shall not release the Contractor from his obligations under Paragraph C-27 of the General Conditions.

D-16 Guarantees and Warranties

a. In addition to any other warranties, representations and guarantees stated elsewhere in the Contract and any warranties implied by law, the Contractor guarantees the Work for a period of one (1) year after the date of acceptance of the Work by the District.

The Contractor shall repair or remove and replace any and all such Work, together with any other Work which may be displaced in so doing, that is found to be defective in workmanship and/or materials within said one (1) year period, without expense whatsoever to the District, ordinary wear and tear and unusual abuse or neglect excepted. In the event of a failure to comply with the above-mentioned conditions within seven (7) days after being notified in writing, the District is hereby authorized to proceed to have the defects remedied and made good at the expense of the Contractor who hereby agrees to pay the cost and charges therefor immediately on demand. Such action by the District will not relieve the Contractor of the guarantees required by this Paragraph or elsewhere in the Contract Documents.

The performance bond and the payment bond shall continue in full force and effect for the duration of the guarantee period.

If, in the opinion of the District, defective Work creates a dangerous condition or requires immediate correction or attention to prevent further loss to the District or to prevent interruption of operations of the District, the District will attempt to give the notice required by this Paragraph. If the Contractor cannot be contacted or does not comply with the District's request for correction within a reasonable time as determined by the District, the District may, notwithstanding the provisions of this Paragraph, proceed to make such correction or provide such attention; the costs of such correction or attention shall be charged against the Contractor. Such action by the District will not relieve the Contractor of the guarantees required by this Paragraph or elsewhere in the Contract Documents.

No guarantee, whether provided in this Paragraph or elsewhere in the Contract, shall in any way limit the guarantee of any items for which a longer guarantee is specified, or any items for which a manufacturer or Supplier gives a guarantee for a longer period. The Contractor agrees to act as co-guarantor with such manufacturer or Supplier, and the Contractor shall furnish the District with all appropriate guarantee or warranty certificates upon completion of the Project. No guarantee period, whether provided in this provision or elsewhere, shall in any way limit the liability of the Contractor or his sureties or insurers under the indemnity.

b. The District's remedies, whether provided in this part or elsewhere in the Contract, shall be in addition to any other available legal and equitable remedies.

D-17 Access Roads and Staging Area

a. The Contractor shall maintain access roads to and on the Site to provide for delivery of material and for access to existing and operating plant facilities on the Site. For a road to be considered adequately maintained, it shall be reasonably dust free.

b. Adequately maintained access roads shall be maintained to all storage areas and other areas to which frequent access is required. Similar roads shall be maintained to all existing facilities on the Site to provide access for maintenance and operation. Where such temporary roads cross, buried utilities that might be injured by the loads likely to be imposed, such utilities shall be adequately protected by steel plates or work planking, or bridges shall be provided so that no loads shall discharge on such buried utilities.

c. The District will designate a storage area for Contractor's use while constructing the Project. It shall be the Contractor's responsibility and he shall bear all expense for any temporary fence and/or other security measures the Contractor may deem necessary for protection of the equipment and materials.

d. Contractor may store equipment in fencing area or their own Connex type containers. Reference the Contract Drawings for acceptable storage and/or laydown areas.

e. The Contractor shall provide any additional temporary storage required for the protection of equipment and materials as recommended by manufacturers of such materials.

f. Storage and protection:

1. Materials and equipment shall be stored in accordance with Supplier's written instructions, with seals and labels intact and legible. Exposed metal surfaces of valves, fittings and similar materials shall be coated in accordance with manufacturers' recommendations to prevent corrosion.

2. Storage shall be arranged to provide access for inspection. The Contractor shall periodically inspect to assure materials and equipment are undamaged and are maintained under required conditions.

D-18 Cooperation with Others

At all times the Contractor shall extend full cooperation to all others performing work authorized by the District within or adjacent to Contract Work areas including all landholders performing necessary private work. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other contractor or by District employees. The Contractor shall have no claim for damages on account of interference. Exact methods of coordination of work involving the Contractor and others will be as determined by the Engineer, whose decision will be final.

D-19 Fire Protection

The Contractor shall use all precautions to prevent fires and shall provide adequate facilities and equipment for extinguishing fires at no cost to the District. Waste disposal by burning will not be allowed at any time.

D-20 Excavation Safety Plan

a. As applicable and if required by law, not less than fourteen (14) days before beginning excavation required under this Contract, the Contractor shall furnish to the Engineer for review working drawings of his excavation safety plan. Contractor shall not begin excavation until said plan has been reviewed by the Engineer.

b. The excavation safety plan shall include all of the Contractor's excavation operations, and working drawings shall be a detailed plan showing the design or shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground. Plans varying from the shoring system standards established by the Construction Safety Orders of the Cal-OSHA or the Federal Safety Standards of the Department of Health, Education and Welfare, must be prepared by a registered civil or structural engineer. In no event shall the Contractor use a shoring, sloping, or protective system less effective than that required by said Construction Safety Orders, or less effective than that required by said Federal Safety Standards.

D-21 Claims for Extra Cost

If the Contractor claims that any instructions by Plans or otherwise that are issued after the Notice to Proceed involve extra cost under this Contract, he shall give the Engineer written notice thereof within ten (10) calendar days after the receipt of such instructions. No such claim shall be valid unless so made.

D-22 Survey Requirements

Survey reference and control staking for construction will be done by a Licensed Land Surveyor provided by the District, at the Districts expense. Contractor shall provide adequate Survey Site Control to establish the grade, position and alignment to complete the construction project per the plans and specifications. The Contractor shall be responsible for preserving permanent survey monuments, benchmarks and/or stakes/hubs. If any permanent or temporary survey monuments or benchmarks are lost or disturbed and need to be replaced as set forth in Section 8771 of the California Business and Professions Code, such replacement shall be made by the Engineer at the expense of the Contractor.

At least Two (2) site control points will be set for each well site or area of construction (including the borrow sites). Contractor will be given coordinates and elevations of the control points for reference.

The Contractor shall notify the Engineer at least three (3) working days before he will require survey services in connection with constructing any portion of the Work.

Well Location:

A well location stake and elevation reference stake and hub shall be provided to locate well for drilling at each well location.

Well Pad Grading:

The existing well pads shall be restored and finish graded after the completion of the drilling and equipping.

Well Site Layout:

One set of reference stakes sufficient for the contractor to locate and orient concrete well foundation and to locate and align electrical panel pads (including top of pad elevation) shall be provided at each well site.

Borrow Sites:

The limits of the Borrow Sites will be identified in the field by the District Representative. Should elevation reference information be required, the District will provide an elevation reference hub in proximity to Borrow area.

D-23 Verification of Existing Dimensions

Layout dimensions shown on the Plans are subject to change to meet field conditions and/or based upon the final in-place location of Contractor-furnished and installed facilities, as determined by Engineer. It shall be the responsibility of the Contractor to

verify all pertinent dimensions, to insure satisfactory fitting of all existing facilities with new Contract materials and equipment.

D-24 Quality Control

All items specified under the Specifications and the Proposal Bidding Schedule shall be of the sizes, shapes and materials as specified herein. All materials shall be new, free from defects impairing strength, durability and appearance, shall be of the best commercial quality for the purposes specified and made with structural properties to withstand all stresses and strains to which they normally will be subjected. Items furnished, unless otherwise specified, shall be standard, approved products of recognized manufacturers and fabricated in accordance with the best shop methods. All incidental items and accessories not specified herein, but which are required to fully carry out the specified intent of the Work, shall be furnished without additional cost. Welding shall be in accordance with the latest revision of the Standard Code for Arc and Gas Welding in Building Construction as issued by the AWS. All welding shall be performed by certified welders qualified under the standard qualification procedures of the AWS. At all times, the manufacturer shall provide and maintain adequate inspection and quality control procedures for all items or Work, whether manufactured or fabricated in manufacturer's plant or elsewhere. In order to insure that all items of Work meet material quality and performance requirements of the Specifications, if so directed by the Engineer, for those items of Work manufactured or fabricated elsewhere than his plant, the Contractor shall furnish written certification that adequate supervision, inspection and quality control procedures have been provided.

D-25 Right to Operate Unsatisfactory Equipment

If, following installation of any equipment or facilities furnished by the Contractor, defects requiring correction by the Contractor are found, the District shall have the right to operate such unsatisfactory equipment and make reasonable use thereof until the equipment can be shut down for correction of defects without injury to the District.

D-26 Deleted

D-27 Crossing of Existing Creeks, Reservoirs, and Ponds

The Contractor shall repair and replace all existing embankments, dikes, and/or levees for existing canals, creeks, sumps, reservoirs, and ponds that are disturbed during construction. Suitable earth materials for affected dikes and levees shall be placed and compacted in conformance with requirements of Section E. No separate payment, unless specified, will be made for repair and replacement of existing dikes and levees, including compaction thereof.

D-28 Deleted

D-29 Prevention of Water Pollution and Prevention of Air Pollution

If required by law, the Contractor shall prepare and submit to the Engineer a Stormwater Pollution Prevention Plan (SWPPP) within 10 calendar days after the Notice to Proceed is issued. The following BMPs will be required irrespective of whether a formal SWPPP plan is required or not:

a. Establish an erosion control perimeter around active construction and contractor layout areas including silt fencing, jute netting, straw waddles, or other appropriate measures to control sediment from leaving the construction area.

b. Stockpiled soils shall be watered, covered, or otherwise managed to prevent loss due to water and wind erosion.

c. Install containment measures at fueling stations and at fuel and chemical storage sites.

d. Employ good house-keeping measures including clearing construction debris and waste materials at the end of each day.

As applicable, and if required by law, the Contractor shall maintain a copy of SWPPP onsite at all times and shall abide by the SWPPP throughout the duration of the Project. It will be the Contractor's responsibility to 1) obtain, on behalf of the District, a Construction Storm Water Permit from the State Water Resources Control Board online via their website; 2) submit all the reports to maintain compliance; and 3) close out the Permit upon completion of the Work. Additionally, the Contractor shall take measures as necessary to effect water pollution control. Construction operations shall be so conducted as to prevent discharge of wastes and pollutants into surface waters and underground water sources. Such water pollution control measures shall be directed toward eliminating discharge, or averting accidental spillage, of such industrial and domestic wastes as oils, gasses, fuels, sewage, toxic materials, and other substances which may be hazardous to public health and welfare or harmful to fish and wildlife. The Contractor shall be responsible for compliance with the applicable State and local regulations for prevention and abatement of pollution of surface and underground water. The Contractor's pollution control methods shall be subject to approval of the Engineer. The District shall have the right to require the Contractor, at his expense, to initiate and maintain such pollution control measures as deemed necessary to eliminate pollution of water caused by, or resulting from the contractor's operation. No separate payment will be made for prevention of water pollution, the costs for all work and materials required under this paragraph shall be borne by the Contractor.

As indicated above, if required by law, a Site dust control and PM-10 Dust Management Plan within 10 calendar days after the Notice to Proceed is issued. The Contractor shall maintain a copy of said plan onsite at all times. The Contractor shall take measures as

necessary to effect air pollution control. Construction operations shall be so conducted as to prevent generation of fugitive dust and dispersion of pollutants into the air. Such air pollution control measures shall be directed toward eliminating particulates and potentially toxic or harmful materials from becoming airborne and polluting the air, as these airborne substances may be harmful to public health and/or harmful to wildlife. The Contractor shall be responsible for compliance with the applicable State, regional (APCD) and local regulations for prevention and abatement of pollution of the air and any associated reporting requirements. The Contractor's pollution control methods shall be subject to approval of the Engineer as well as applicable governmental entities with regulative power over air quality. The District shall have the right to require the Contractor, at his expense, to initiate and maintain such pollution control measures as deemed necessary to eliminate pollution of air (and/or nuisance or fugitive dust) caused by, or resulting from the contractor's operation. No separate payment will be made for prevention of air pollution, the costs for all work and materials required under this paragraph shall be borne by the Contractor.

D-30 Landscape Preservation

a. **General** – The Contractor shall exercise care to preserve the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the Work. Except where clearing is required for permanent works, for approved construction roads and for excavation operations, all trees, native shrubbery, and vegetation shall be preserved and shall be protected from damage which may be caused by the Contractor's construction operations and equipment. No special reseeding or replanting will be required under the Specifications; however, on completion of the Work, all Work areas shall be smoothed and graded in a manner to conform to the natural appearance of the landscape. Where unnecessary destruction, scarring, damage, or defacing may occur as a result of the Contractor's operations, the same shall be repaired, replanted, reseeded, or otherwise corrected at the Contractor's expense.

b. **Construction Roads** – The location, alignment, and grade of construction roads shall be subject to approval of the Engineer. When no longer required by the Contractor, construction roads shall be made impassable to vehicular traffic and the surfaces shall be scarified and left in a condition which will facilitate natural revegetation.

c. **Contractor's Campsite** – The Contractor's camp, shop, office, and yard area shall be located and arranged in a manner to minimize disruptions to District Operations to the maximum practicable extent. On abandonment, all camp, storage, and construction buildings, including concrete footings and slabs, and all construction materials and debris shall be removed from the Site. The camp area shall be left in a neat and natural appearing condition.

D-31 Valley Fever – Notices to Employees

A special biological problem of the Project area is the presence of tiny organisms living in the soil which can cause Valley Fever (coccidioidomycosis) in humans. As is typical of many desert areas in the southwestern United States, Valley Fever is endemic to Kern County. Although everyone living in the valley has some contact with the disease-causing organisms, the illness is especially hazardous to those whose work brings them into close contact with the soil, as for example, agricultural and construction workers. The Contractor and all his Subcontractors shall advise all their employees, in writing, of the dangers of Valley Fever, and of precautions which can be taken such as wearing dust masks while working under dusty conditions.

D-32 Superintendence

a. The Contractor shall submit a statement of the qualifications of its proposed superintendent to the Engineer for review. The statement shall include the superintendent's name, the name of each project that is the basis of the qualifications, each project site location, a brief description of each project, and the name and mailing address of the owner for each project.

b. The Contractor shall assign a duly authorized and competent person continually on the site during the work. The superintendent shall have not less than 7 years experience as a contractor's general superintendent on heavy engineering work with not less than 4 years as a superintendent on projects with complexity and configuration similar to the work described in the contract documents.

c. If the superintendent is not deemed qualified or if the superintendent's performance on the work is determined to be unsatisfactory by the Engineer, the superintendent shall be immediately removed from the project.

d. The Contractor shall furnish to the Engineer a written statement of the qualifications of the proposed substitute superintendent if a substitute superintendent is required.

e. A substitute superintendent shall meet the same requirements and shall be subject to approval by the Engineer.

D-33 Special Environmental Requirements

a. Cultural and Paleontological Resources Requirements

1. The Contractor shall immediately stop work and provide an oral notification to the Engineer of the discovery of any and all antiquities or other objects of cultural, historic, paleontological, or scientific interest. Objects under consideration include, but are not limited to, historic or prehistoric ruins,

human remains, or artifacts discovered as the result of activities under this Contract. The Contractor shall cease activity, stabilize, and protect such discoveries until authorized to proceed by the Engineer.

2. The Contractor shall immediately stop work and provide an oral notification to the Engineer of the discovery of human remains. The Contractor shall cease activity, stabilize, and protect such discoveries until authorized to proceed by the Engineer.

b. **Environmental Requirements-** In addition to all other applicable provisions of the Contract Documents, the Contractor shall:

1. **All Contractor personnel that will be involved in the construction of the** Work, shall be required to attend a Worker's Environmental Awareness Program (WEAP) that will consist of a brief consultation by a qualified biologist. The training will consist of presenting the status, biology and protection measures associated the project to promote their awareness, and implementation measures if a species is encountered or impacted. The project proponent shall provide the WEAP training to all personnel working on the site during proposed project construction and operation. The program should include the following: A description of the species that may be affected by the project, including San Joaquin kit fox and its habitat needs; an explanation of the status of the species and its protection; and a list of measures being taken to reduce impacts to the species during proposed project construction and implementation. A fact sheet conveying this information should be prepared for distribution to the previously referenced people and anyone else who may enter the proposed project site.

2. Prior to Contractor initiating work, a certified biologist will conduct a preconstruction biological survey and prepare a report of his findings. The surveys shall include migratory bird and raptor nesting, Swainson's hawk nesting, burrowing owls, and San Joaquin Kit Fox. The Engineer will notify the Contractor when such environmental clearance has been obtained and the Contractor may initiate the Contract work. In this regard, no work shall begin until 15 days after a pre-construction biological survey has been conducted. Contractor shall notify the District when it proposes to commence with the work so that it may arrange the survey to take place and minimize any impacts to the Contractor's schedule;

3. After completion of the preconstruction biological surveys, the following shall apply:

a) If an active migratory bird and raptor nest is confirmed by the biologist, no construction activities shall occur within 250 feet of the nesting site for migratory birds and within 500 feet of the nesting site for raptors. The buffer zones around any nest within which project-related construction activities would be avoided can be reduced as determined acceptable by a qualified biologist. Construction activities may resume once the breeding season ends (February 1 - September 30), or the nest has either failed or the birds have fledged.

b) If a Swainson's hawk nest is found, the qualified biologist shall determine the appropriate buffer zone around the nest within which project-related construction activities would be avoided.

c) If owls are identified on or adjacent to the site:

1) A qualified biologist shall provide a pre-construction Worker's Environmental Awareness Program to contractors and their employees that describe the life history and species protection measures that are in effect to avoid impacts to burrowing owls.

2) Construction monitoring will also occur throughout the duration of ground-disturbing construction activities to ensure no impacts occur to burrowing owl.

3) Construction exclusion areas shall be established around the occupied burrows in which no disturbance shall be allowed to occur while the burrows are occupied.

4) If occupied burrows cannot be avoided, a qualified biologist shall develop and implement a Burrowing Owl Management Plan..

d) If it is determined that the San Joaquin kit fox has the potential to utilize the property then the following measures are required to avoid potential adverse effects to this species:

1) The District shall initiate discussions with the USFWS to determine appropriate project modifications to protect kit fox, including avoidance, minimization, restoration, preservation, or compensation.

4. The following measures shall be implemented during the course of construction to minimize impacts to San Joaquin Kit Fox or burrowing owls:

a) All excavated, steep-walled holes or trenches in excess of two feet in depth shall be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps not to be greater than 1000'. Trenches shall also be inspected for entrapped wildlife each morning prior to onset of construction and immediately prior to the end of each working day. Before such holes or trenches are filled, they shall be thoroughly inspected for entrapped animals by a designated inspector or qualified biologist. Any animals so discovered shall be allowed to escape before construction activities resume, or removed from the trench or hole by a qualified biologist;

b) Inspect all Contract pipe, culverts or similar structures with a diameter of four inches or greater that are stored within the Contract work area for one or more overnight periods for kit fox before moving, installing or capping the pipe. If a kit fox is discovered inside the pipe, that section of pipe will not be moved, except as directed by the Biologist from the Department of Fish and Game, or until the kit fox has escaped;

c) Dispose of all food-related trash in closed containers and regularly remove the trash from the worksite;

d) Contractor to report to the Engineer immediately if during the course of construction, an animal is found dead, injured or entrapped. In the case of entrapped animals, escape ramps or structures shall be installed by the Contractor to allow the animal to escape;

e) Contractor to report to the Engineer if a potential kit-fox den or burrowing owl den has been encountered during the course of Construction. Excavation shall cease until appropriate consultations are completed with the U.S. Fish and Wildlife Services and the California Department of Fish and Game. Destruction of kit-fox and burrowing owl dens is prohibited;

f) Contractor to post signs and/or fencing around the work sites to restrict access of vehicles and equipment unrelated to site operations;

g) Contractor to ensure that all project-related vehicle traffic will be restricted to established roads, construction areas, storage areas, and staging and parking areas. Off-road traffic outside of designated project areas is prohibited;

h) Observe a speed limit of twenty miles per hour within the Contract work area and on access roads in the vicinity of endangered species habitat;

i) The use of rodenticides and herbicides on the sites is prohibited;

j) No firearms are allowed on the project Site;

k) No pets are permitted on the project Site;

l) Immediately clean up all spills of hazardous materials (oil, grease and other potentially toxic materials);

m) Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. shall be recontoured if necessary, and revegetated to promote restoration of the area to pre-project conditions; and

n) Boundaries of approved work areas shall be clearly delineated by stakes, flagging, and/or rope or cord to minimize inadvertent degradation or loss of adjacent wildlife habitats during facility construction.

c. A biological monitor with documented experience monitoring construction projects for the protection of biological resources may be appointed if required after the applicable surveys have been completed. The biological monitor will be the contact source for the contractor who might inadvertently kill or injure a special-status species or who finds a dead, injured or entrapped species.

The biological monitor shall be present during all phases of construction in sensitive Habitats, as required.

The biological monitor will possess any required permits or certifications to recover and relocate special-status species as encountered during construction, including kit fox.

If an injured or dead special-status species is encountered during construction, the on-call biological monitor has the authority to stop work within the immediate vicinity until the issue has been resolved.

The on-call biological monitor shall notify the Kern County Planning Department and the appropriate resources agency (e.g.,USFWS or CDFW) before construction is allowed to proceed.

D-34 Record Drawings

a. The Contractor shall maintain one record set of drawings at the Site. On these, it shall mark all project conditions, locations, configurations, and any other changes or deviations which may vary from the information represented on the original Plans, including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated, or which were not indicated on the Plans. Said record drawings shall be supplemented by any detailed sketches as necessary or directed to fully indicate the Work as actually constructed. These master record drawings of the Contractor's representation of as-built conditions, including all revisions made necessary by addenda and change orders shall be maintained up-to-date during the progress of the Work. Red ink shall be used for alterations and notes. Notes shall identify relevant Change Orders by number and date. Record drawings shall be maintained up to date on a daily basis.

b. Changes shall be marked directly on the drawings. Green color-coding shall be used when showing information deleted from Drawings. Red color-coding shall be used when showing information added to Drawings. Blue color shall be used for clouding an area or areas affected by the change(s). Information shall be legible and completely detailed. The level of detail shall be sufficient to allow a draftsman to incorporate the changes into a CAD file without reference to other documents besides the marked-up drawing(s). It is not acceptable to simply reference change directives or to mark drawings: "see RFI-XX" or "see survey notes". If there is insufficient space on a drawing to markup the change, the Contractor will be required to draw additional sketches to completely explain the change and attach the sketches to the drawing.

c. The Engineer has the right to inspect the Contractor's marked-up drawings at any time to ascertain that they are being kept up to date and show sufficient details. The Engineer may require that all as-built records, survey field notes and other documentation be submitted at the completion of certain construction elements of the overall project. Should the Contractor's marked-up drawings, survey field notes, and other as-built documentation not be up to date or lack necessary details, the Engineer may withhold five percent (5%) from each monthly progress payment, until the drawings, survey field notes and other as-built documentation are brought up to date and properly detailed.

d. Copies of the record drawings shall be submitted on upon completion of all Work.

e. In the case of those drawings which depict the detail requirement for equipment to be assembled and wired in the factory, such as motor control centers and the like, the record drawings shall be updated by indicating those portions which are superseded by Change Order drawings or final Shop Drawings, and by including appropriate reference information describing the change orders by number and the Shop Drawings by manufacturer, drawing, and revision numbers.

f. Record drawings shall be accessible to the Engineer at all times during the construction period.

g. Final payment will not be acted upon until the record drawings have been prepared and delivered to the Engineer. Said up-to-date record drawings shall be in the form of a set of prints with carefully plotted information overlaid.

h. Prior to final acceptance of the Work, the Contractor shall finalize and deliver a complete set of record drawings to the Engineer for transmittal to the District, conforming to the construction records of the Contractor. This set of record drawings shall consist of corrected drawings showing the reported location of the Work. The information submitted by the Contractor and incorporated by the Engineer into the record drawings will be assumed to be correct, and the Contractor shall be responsible for the accuracy of such information, and for any errors or omissions which may appear on the record drawings as a result.

D-35 Special Controls

a. **Traffic Control** – Contractor shall conduct his work to interfere as little as possible with public travel, whether vehicular or pedestrian. Whenever it is necessary to cross, obstruct, or close roads, driveways and walks, whether public or private, Contractor shall provide and maintain suitable and safe bridges, detours, or other temporary expedients for the accommodation of public and private travel, and shall give reasonable notice to owners of private drives before interfering with them. Such maintenance of traffic will not be required when Contractor has obtained written permission from the owner and tenant of private property involved, to obstruct traffic at the designated point.

Where required by the authority having jurisdiction thereover that traffic be maintained over any construction Work in or around a public street, road, or highway, and the traffic cannot be maintained on the alignment of the original roadbed or pavement, Contractor shall, at his own expense, construct and maintain a detour around the construction Work. Each detour shall include all necessary barricades, guardrails, approaches, lights, signals, signs, and other devices and precautions necessary for protection of the Work and safety of the public.

b. **Surface and Stormwater Control** – The Contractor shall divert or otherwise control surface water and waters flowing from existing projects or structures from coming onto its Work areas. The method of diversions or control shall be adequate to ensure the safety of stored materials and of personnel using these areas. Following completion of Work under the Contract, ditches, dikes, or other ground alterations made by the Contractor shall be removed and the ground surfaces shall be returned to their former condition, or as near as practicable, in the Engineer's opinion. Surface and storm water that enters the Contractor's Work area shall be controlled, treated, and disposed in a lawful manner.

c. **Dust Control** – The Contractor shall provide effective measures to prevent operations from producing dust in amounts damaging to personnel, property, District plant operations, plants, or animals, and to prevent causing a nuisance to persons living or occupying buildings in the vicinity.

Areas used by the Contractor for construction roads or other purposes in connection with the Work shall be given an approved dust inhibiting surface treatment to avoid production of dust. This surface condition shall be continuously maintained during the entire construction period. The Contractor's construction facilities shall be operated in a manner ensuring minimum dust production.

The Contractor shall meet all requirements set forth by the San Joaquin Valley Air Pollution Control District, and shall submit a dust control plan.

Trucks transporting soil, or cement, or debris shall be covered or moistened with water to suppress the dispersion of dust.

d. **Light Abatement** – The Contractor shall exercise special care to direct floodlights to shine downward at an angle less than horizontal. These floodlights shall also be shielded to avoid a nuisance to the surrounding areas. No lighting shall include a residence in its direct beam. The Contractor shall correct lighting nuisance whenever it occurs.

e. **Air Pollution Control** – The Contractor shall not discharge smoke, dust, or other air contaminants into the atmosphere in a quantity that exceeds the legal limit.

The Contractor shall maintain equipment in proper mechanical adjustment to minimize the volume of exhaust emissions.

f. **Noise Control** – The Contractor shall conduct operations to abate noise wherever possible and to minimize noise where complete abatement is not possible.

To limit noise, construction vehicle equipment shall be kept in proper working order for the duration of the construction activities.

To reduce temporary construction related noise impacts, the following BMP's shall be implemented at a minimum by the construction contractor:

1 Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.

2 Locate equipment staging in areas that will create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.

3 Ensure proper maintenance and working order of equipment and vehicles and that all construction equipment is equipped with manufacturers approved mufflers and baffles.

Install sound-control devices in all construction and impact equipment, no less effective than those provided on the original equipment.

g. **Restoration of Improvements** – Upon completion of the Work, the Contractor shall reconstruct existing roads to a condition equivalent to that which existed before the start of Work.

h. **Security** – The Contractor shall prevent unauthorized personnel or vehicular entry into the project site.

The Contractor shall be responsible for providing security within the Site as the Contractor deems necessary for the protection of its own equipment, materials, or Work from vandalism or theft. District shall not be responsible for theft or damage to the Contractor's equipment, materials, or Work.

All staff working for or representing the Contractor, including Subcontractors, shall possess a valid California identification with a photograph of the staff member.

The Contractor shall provide the names of its lead persons, supervisors and all employees working on the project.

D-36 Products, Materials and Equipment

a. **General** – The word "Products" as used in the Contract Documents is defined to include purchased items for incorporation into the Work regardless of whether specifically purchased for the Project or taken from Contractor's stock of previously purchased products. The word "Materials" is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form Work, The word "Equipment" is defined as products with operational parts, regardless of whether

motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items). Definitions in this Paragraph are not intended to negate the meaning of other terms in the Contract Documents including "specialties", "systems", "structure", "finishes", "accessories", "furnishings", "special construction", and similar terms, which are self-explanatory and have recognized meanings in the construction industry.

Neither "Products" nor "Materials" nor "Equipment" includes machinery and equipment used for preparation, fabrication, conveying, and erection of the Work.

b. **Product Delivery and Storage –** The Contractor shall deliver and store the Work in accordance with manufacturer's written recommendations and by methods and means that will prevent damage, deterioration, and loss including theft.

c. **Transportation and Handling –** Products shall be transported by methods to avoid damage and shall be delivered in undamaged condition in manufacturer's unopened containers and packaging. The Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling and damage. The Contractor shall provide additional protection during handling to prevent marring and otherwise damaging Products, packaging, and surrounding surfaces.

d. **Storage and Protection –** Products shall be stored in accordance with manufacturer's written instructions and with seals and labels intact and legible.

Sensitive Products shall be stored in weather-tight climate controlled enclosure and temperature and humidity ranges shall be maintained within tolerances required by manufacturer's recommendations.

For exterior storage of Products, items shall be placed on sloped supports above ground. Products subject to deterioration shall be covered with impervious sheet covering and ventilation shall be provided to avoid condensation.

Storage shall be arranged to provide access for inspection. The Contractor shall periodically inspect to assure Products are undamaged and are maintained under required conditions.

Storage shall be arranged in a manner to provide access for maintenance of stored items and for inspection.

e. **Maintenance of Products in Storage –** Stored Products shall be periodically inspected on a scheduled basis. The Contractor shall maintain a log of inspections and shall make the log available on request. The Contractor shall comply with manufacturer's Product storage requirements and recommendations. The Contractor shall maintain manufacturer-required environmental conditions continuously. The Contractor shall ensure that surfaces of Products exposed to the

elements are not adversely affected and that weathering of finishes does not occur. For mechanical and electrical equipment, the Contractor shall provide a copy of the manufacturer's service instructions with each item and the exterior of the package shall contain notice that instructions are included.

D-37 Project Meetings

a. **Pre-Construction Conference** – Upon receipt of the Notice to Proceed, or at an earlier time if mutually agreeable, the District will arrange a preconstruction conference to be attended by the Contractor, Contractor's superintendent, the District, the Engineer or his representative, and representatives of utilities, major Subcontractors, and others involved in the execution of the Work.

The purpose of this conference shall be to establish a working understanding between the parties and to discuss the Construction Schedule (Critical Path Method format required), Shop Drawing submittals and processing, applications for payment and their processing, and such other subjects as may be pertinent for the execution of the Work.

b. **Progress Meetings**

1. The District may arrange and conduct progress meetings. These meetings shall be attended by the Engineer or his representative, Contractor, Contractor's superintendent and representatives of all Subcontractors, utilities, and others, that are active in the execution of the Work. The purpose of these meetings shall be to expedite the Work of any Subcontractor (if acceptable to the District) or other organization that is not up to schedule, resolve conflicts, and in general, coordinate and expedite the execution of the Work.

2. The agenda of progress meetings shall include review of progress and schedule, of payment request, and of the latest Construction Schedule update. To the maximum extent practicable, Contractor shall contact the District and Engineer at least twenty-four (24) hours in advance of the meetings regarding items the Contractor wishes to have added to the agenda.

3. Persons designated by the Contractor to attend and participate in project meetings shall have the authority to commit the Contractor to the resolution of problems as agreed upon in the project meetings.

4. A meeting will be held every week (unless the District determines otherwise) for the duration of the Project. The location of the meetings shall be determined by the District prior to the first meeting.

5. The Contractor shall designate persons to attend these meetings who are

familiar with the Construction Schedule and with the current construction problems and activities and with the logic of the Work sequences used in preparing the schedule and the updates.

6. On the last working day of every week, Contractor shall submit to Engineer, Contractor's plan of activities for the following two (2) weeks (a "two-week look-ahead schedule"). The plan of activities shall describe the activity and location of the activity. Failure to submit a two-week look-ahead schedule, shall subject the contractor to withholding of monthly progress payment for month that the schedule(s) was not submitted.

c. **Progress and Schedule Review**

1. The progress of the Work and the Construction Schedule shall be reviewed to verify:

a) Actual start and finish dates of completed activities since the last progress meeting.

b) Durations and progress of all activities not completed.

c) Reason, time, and cost data for Change Order Work that is to be incorporated into the Construction Schedule or payment request form.

d) Payment due to the Contractor based on percentage complete of items in the submitted payment request.

e) Reasons for, and duration of, required revisions in the Construction Schedule.

f) After each progress meeting, upon request the Contractor shall submit to the Engineer three (3) prints of the last accepted Construction Schedule, revised in accordance with the progress review.

g) If the progress meeting coincides with the beginning of the month when Applications for Payment are due, the Contractor shall have his copy of the payment request form and all other data required by the Contract Documents completed prior to the progress meeting. The Engineer will process Contractor's payment request after satisfactory review of the schedule update.

D-38 Specification Drawings

The location of the Work, its general nature and extent, and the form and general dimensions of all appurtenant works are shown on the Plans to be attached to and made a part of these Specifications.

Drawings applicable to the work described in the Contract Documents are listed on the front page of the Drawings.

D-39 Special Construction Conditions

a. **Groundwater Conditions** – The Contractor shall have full responsibility for evaluation of available data, including logs of exploration, and development of any necessary additional information on groundwater condition at construction site(s) and for draining and dewatering the sites of any groundwater or surface water during execution and completion of the contract work.

b. **Existing Uses of Lands and Roads** – In addition to all other applicable provisions of these Specifications, the Contractor shall:

1. Effectively secure and protect adjacent property, structures, livestock, crops and other vegetation;

2. Exercise extreme care during construction to prevent damage from dust to crops and adjacent property;

3. Be responsible for all damage to any property resulting from trespass by the Contractor or his employees in the course of their employment, whether such trespass was committed with or without the consent or knowledge of the Contractor;

4. See that the work site is kept drained and free of all surface and ground water;

5. Be responsible for any damage caused by drainage or water runoff from construction areas and from construction plant areas;

6. Maintain all existing roadways, roadway traffic, and irrigation or other water utilities and utility crossings, in an adequate and safe manner to meet all existing service requirements and shall not interfere with any roadway or utility system without prior written permission of the owner/operator thereof, and only for any time period permitted by said owner/operator.

7. Provide for all water courses, ditches and pipelines and perform the construction work so that no damage will result to either public or private

interests, and be liable for all damage that may result from failure to so provide during the progress of the work

8. Groundwater recharge is anticipated to occur during well construction (i.e. the ponds around the well sites are expected to be full of water). This condition incurs the following requirements:

   a) Drilling mud must be contained and not released into ponds.

   b) Disposal of Swab and Airlift discharge as follows:

      1) For McCaslin wells 1 and 2: Swab and Airlift discharge may be transported to designated area immediately west of McCaslin Well 1. Means and method to be coordinated with and approved by the District.

      2) For Bowling Well: Swab and Airlift discharge is to be transported to designated area north of the Bowling well. Means and methods to be coordinated with and approved by the District.

   c) Disposal of Tailings from drilling as follows:

      1) For McCaslin wells 1 and 2: Tailings may be transported to and spread over area immediately west of McCaslin Well 1. Means and method to be coordinated with and approved by the District.

      2) For Bowling Well: Tailings may be spread on outsides of levees away from ponds and Goose Lake Slough. Location(s) must be approved by District prior to spreading.

****END OF SECTION****

LETTER OF TRANSMITTAL

SUBMITTAL NO.

CONTRACTOR:
ADDRESS:
PHONE:
FAX:

TO:

DATE: _____
CONTRACT NO:_____
PROJECT: _____
SPEC. NO:_____

WE ARE SUBMITTING THE ENCLOSED:

☐ SHOP DRAWINGS ☐ EQUIPMENT DATA ☐ MATERIAL DATA
☐ SAMPLES ☐ CERTIFICATES OF COMPLIANCE ☐ OTHER

FOR YOUR:
☐ APPROVAL ☐ INFORMATION

PLEASE RETURN _____ COPIES FOR OUR RECORDS

ITEM NO.	DESCRIPTION OF ITEM	NO. OF COPIES	CONTRACT REFERENCE SPEC. SECTION OR DRAWING SHEET NO.	VARIATION

REMARKS: All deviations from the construction contract shall be explained in detail.

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

NAME/SIGNATURE OF CONTRACTOR _____

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SUBSTITUTION REQUEST FORM

TO: Zeiders Consulting

PROJECT: McCaslin / Bowling – Well Drilling and Equipping

We hereby submit for your consideration the following product instead of the specified item for the above project:

SECTION:	PARAGRAPH:	SPECIFIED ITEM:

Proposed Substitution: _____

Reason for Substitution: _____

Attach: 1) Complete technical data, including laboratory tests, if applicable.
2) Complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

Fill in Blanks Below:

A. Does the substitution affect dimensions on Drawings?

B. Will the undersigned pay for changes to the project design, including engineering and detailing costs caused by the requested substitution?

C. What affect does substitution have on other trades?

D. Differences between proposed substitution and specified item?

E. Manufacturer's guarantees of the proposed and specified items are:

____Same _____ Different (explain on attached sheet)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

Submitted By:

Signature _____

Firm _____

Address _____

Date _____

Telephone _____

For Use by Design Consultant
Accepted Accepted as Noted Not Accepted Received Late By_____ Date_____ Remarks_____

SECTION E

EARTHWORK

E-1 General

The Contractor shall provide all labor, materials, and equipment and perform all operations necessary to complete all required earthwork as specified, shown on the Drawings, or as directed. Included is all clearing and grubbing for work site areas, earthwork for the construction of well sites, excavation and backfill for pipe trenches, site grading, and all required miscellaneous earthwork.

E-2 Clearing and Grubbing

As indicated on the Drawings and as directed, the Contractor shall perform all clearing and grubbing work for areas within the well construction sites as indicated on the Plans. Such areas shall be cleared and grubbed of all trees, vines, stumps, roots, brush, rubbish, fence materials and other unsuitable or deleterious materials. No waste materials from the clearing operation shall be incorporated into compacted backfill or embankments. The subgrade beneath all permanent embankments shall be grubbed and cleared of all stumps, roots, rubbish and objectionable organic matter. Where directed by the District, all work specified herein shall be accomplished by the Contractor prior to placement of construction stakes. All cleared, grubbed, and demolished materials shall become property of the Contractor and shall be removed from the work site or District right-of-way before the date of completion of Contract or otherwise disposed of as approved by the District. Upon completion of the work, the Contractor shall perform all required clean-up operations as directed, including all excavation, backfill and grading to lines shown on the Drawings or as directed in order to leave affected areas in a condition satisfactory to the District. No materials or debris shall be burned within the District right-of-way, except as directed or approved by the District.

E-3 Excavation

a. **Classification of Excavation –** Excavated materials will not be classified for payment. Fill and backfill shall consist of suitable unclassified material from Contract excavation or selected imported material as approved by the District, and shall be free of trash, organic matter or other debris. No object having a largest dimension greater than five (5) inches shall be included in any compacted embankment or structural fill or backfill.

b. **Tolerances –** All excavation and embankments shall be graded to provide uniform surfaces to the lines and grades shown on the Drawings, or as specified, or as directed by the District. Tolerances for finished earth line and grade elevations and thickness shall be as given below.

1. All excavation or compacted embankments shall have a tolerance of plus or minus 0.1 foot or be governed by concrete tolerances, whichever is more restrictive.

2. All specified material thickness shall have a tolerance of plus 10 percent (10%) or minus 5 percent (5%).

c. Payment – Exclusive of authorized excavation in excess of specified requirements, no separate payment will be made for any excavation work. All costs therefore shall be included in the prices bid for other items of work. Costs for excavation for pipe trenches shall be included in the prices bid for applicable sizes and types of piping. Payment for authorized excess excavation will be made in accordance with the provisions for extra work found in these documents.

E-4 Dewatering

a. General – All water encountered in excavation for structures or pipe trenches shall be disposed of by the Contractor in such manner as will not damage public or private property. The Contractor shall furnish, install, and operate pumps, pipes, appliances and equipment of sufficient capacity to keep all excavations free of water until backfilling is completed.

b. Payment – No direct payment will be made for dewatering any excavation. All costs therefore shall be included in the prices bid for other items of work.

E-5 Compaction and Moisture Conditioning

a. Laboratory Density Determination – For cohesive materials, the maximum laboratory density at optimum moisture content will be determined by test methods in conformance with ASTM D698. For cohesionless materials, the relative density shall be based on the following formula, wherein the maximum density is the highest dry unit weight of the soil, minimum density is the lowest dry unit weight of soil, and in-place density is the dry unit weight of the soil in place:

$$\text{Rel. Den.} = \frac{\text{max. den. x (in-place den. – min. den.) x 100}}{\text{in-place den. x (max. den. – min. den.)}}$$

b. Compaction Requirements – In all cases, compaction equipment and methods shall be adequate for and consistent with achieving the specified degree of compaction. Unless otherwise specified or directed, a minimum of 95 percent of the laboratory standard maximum density for cohesive materials and a minimum relative density of 70 percent for cohesionless materials will be required. In addition to all other compaction requirements provided by the Specifications or shown on the Drawings, placement and compaction of earthwork material within County road right-of-way limits shall be in conformance with all applicable standards of the County of Kern.

c. Moisture Conditioning of Cohesive Materials – Prior to and during compaction operations, the materials shall have a moisture content of not more than 1 percentage point wet or 3 percentage points of optimum moisture content, and the moisture content shall be uniform throughout each layer. If the moisture content is less than the approved requirement, compaction operations shall not proceed until the Contractor has added the necessary amount of water. If the moisture content is greater than the approved requirement, compaction operations shall not proceed until such time as the materials have dried sufficiently or have been otherwise mechanically dewatered or replaced with materials having the approved moisture content. The term “moisture conditioning,” as

used in the Specifications, is defined to refer to the above methods of obtaining approved moisture content for materials to be compacted. Included under moisture conditioning requirements are the furnishing of all required water and the furnishing of all other necessary labor, materials, and equipment required to provide the approved percent of moisture content. Moisture conditioning, where required, shall be performed for all materials specified to be compacted regardless of whether or not such requirement is specifically stated.

d. **Payment –** No adjustment in the price of any bid item will be made for any or all operations of the Contractor pertaining to moisture conditioning or from delays occasioned thereby. The cost of all such work shall be included in the unit prices stated for applicable bid items requiring compaction of earthwork materials.

E-6 Backfill

a. **General –** Methods allowed for placement of compacted backfill shall be one or both of the methods listed following:

1. Mechanical compaction of native materials;

2. Hydro-compaction of suitable imported or native free-draining backfill material. Hydro-compaction, for the purposes of this work is defined as follows: "A backfill compaction method which consists of injecting water under pressure into the backfill while internal vibrators are applied as required to obtain the specified density." The material for this method shall be sand, gravel, crushed aggregate or native free-draining material having a sand equivalent of not less than 30. All of said material shall pass a 1-1/2 inch screen and not more than 15 percent of said materials shall pass a No. 200 sieve.

b. **Structure Backfill –** Prior to backfilling any structure, all forms shall be removed and the excavation to be backfilled cleaned of all trash and debris. The Contractor shall place all backfill structures to the lines shown on the Drawings or as directed. Backfill shall be obtained from approved materials removed in excavating for structures, or from other Contract excavation. Backfill about structures shall be compacted by bringing the backfill material to approved moisture content, depositing it in layers eight (8) inches thick after compaction, and compacting it by means of hand or mechanical tampers to the appropriate density specified in Paragraph E-5. Backfill shall be brought up uniformly about any structure, and at no time during backfilling operations shall the differential elevation at the top of backfill on any two sides of a structure exceed two (2) feet. Each layer of compacted backfill shall be inspected and approved by the District before placement of any subsequent layer of material, including testing for specified densities in conformance with Paragraph E-5 if so required, as determined by the District.

c. **Payment –** No separate payment will be made for any backfill work. All costs therefore shall be included in the prices bid for Construction of Well Pads. Payment for authorized excess backfill will be made in accordance with the provisions for additional required work in these documents.

E-7 Embankment Construction

a. **General –** Compacted embankments shall be constructed of suitable approved material from Contract excavation, or shall be constructed of suitable material obtained from approved local borrow sites in the vicinity of the Contract work. Before the material for the first layer of the embankment is placed, the foundation of the embankment shall be prepared as provided in Paragraph E-7(b) and shall be moistened and compacted in the manner specified in Paragraphs E-5 and E-7(c). Compacted embankments shall be constructed to the elevations and to the top width and side slope shown on the Drawings. Embankments shall be built in approximately horizontal layers carried across the entire width of the embankment to the required slopes. Embankments shall not be widened with loose material dumped from the top. At all times, there shall be an acceptable and uniform gradation of embankment materials so that a stable structure shall result. Cobbles and gravel shall be well distributed through other materials and not nested in any position within or under the embankment.

b. **Preparation of Surfaces Beneath Embankments –** Where the existing ground surfaces beneath permanently constructed embankments contain unsuitable materials, as determined by the District, the Contractor shall strip these areas of such unsuitable materials to a depth as directed by the District. Removed material shall be disposed of as provided in Paragraph E-8. All depressions or holes in the foundations of compacted embankments, whether caused by removal of debris, unacceptable materials or other conditions, shall be backfilled with approved material and compacted to a level surface before the construction of overlying embankment layers. For all embankments, the foundation subgrade shall be scarified or plowed to a depth of not less than six (6) inches. Prepared surfaces of embankment foundations shall be brought to approved moisture content before subsequent layers of the embankment are placed thereon.

c. **Compacted Embankments –** The Contractor shall construct compacted embankments to a minimum of 95 percent of the maximum laboratory density. When the material has been moisture conditioned as specified under Paragraph E-5, it shall be compacted by sheepsfoot rollers of sufficient weight for proper compaction or by other compaction equipment satisfactory to the District. No hydro-compaction of embankments will be allowed. Approved embankment materials shall be deposited in horizontal layers of a satisfactory thickness determined by the Contractor and approved by the District. The layers shall be brought up in the full required width from the bottom of the embankment to avoid widening lower edges after the center has been brought up to grade.

d. **Site Grading –** As shown on the Drawings and as directed, the Contractor shall perform all final grading work at the well sites. Included in the work shall be furnishing and placing Class 2 untreated aggregate base as shown on the Drawings. The aggregate base surfacing shall be compacted to a minimum of 95 percent of the laboratory standard maximum density.

e. **Measurement and Payment –** No separate payment will be made for compacted embankment. All costs therefore shall be included in the prices bid for Construction of Well Pads.

E-8 Disposal of Materials

a. **General –** Unless otherwise specified, all suitable materials removed in Contract excavation, or as much thereof as required, shall be used in the construction of embankments or for backfill. All additional excess or unsuitable excavated material shall be wasted within District owned right-of-way or deposited at other specified locations, all as shown on the Drawings or as designated by the District.

b. **Measurement and Payment –** No separate payment will be made for disposal of materials as described above or for any required stockpiling or rehandling of excavated materials. The cost of all such work shall be included in the unit prices bid for other items of work.

E-9 Construction at Roadways, Crossings and Private Driveways

a. **General –** Unless otherwise specified or directed, all roads subject to interference by Contract works shall be kept open or suitable detours shall be provided by the Contractor. The cost of providing and maintaining detours, including dust abatement by sprinkling or other effective methods, shall be borne by the Contractor.

b. **Measurement and Payment –** No separate payment will be made for labor, equipment and materials for temporary or permanent construction work at roadway crossings as specified under E-9; all costs therefore shall be included in the unit prices stated in the Bidding Schedule for other items of work.

SECTION F

CONCRETE

F-1 General

The Contractor shall provide all labor, materials and equipment and perform all operations required to furnish and install, complete, all cast-in-place concrete, grout, and mortar work as shown on the Plans and specified herein. Included under this section of the Specifications is the following work:

a. Furnishing all required forms, concrete, concrete slurry, grout, and mortar materials including cement, aggregates, reinforcing steel, curing compound and all specified and approved admixtures.

b. Performing all mixing, forming, placing and finishing operations required to furnish concrete and concrete slurry of the strength and mix design as specified herein. Included is placement of reinforcement steel.

c. Performing all required chemical and physical tests as specified herein.

d. Performing all operations required for repairing, curing, protecting and maintaining concrete work until final acceptance.

e. All other miscellaneous work, whether or not specifically mentioned herein, that is required to complete the work specified under this section of the Specifications.

Not included herein is mortar and grout work for pipe joints and for shop and field applied mortar coatings and linings for pipe; where applicable, said work is specified elsewhere in these Specifications.

The structures shall be built to the lines, grades, and dimensions shown on the Plans. The dimensions of each structure as shown on the Plans will be subject to such modifications as may be found necessary by the Engineer to adapt the structure to the conditions disclosed by the excavation or to meet other conditions. Where the thickness of any portion of a concrete structure is variable, it shall vary uniformly between the dimensions shown.

Concrete work shall be properly formed and prepared to allow utilities and metalwork to pass through or to be embedded in concrete work in conformance with details shown on the Plans.

The Contractor shall place and attach to each structure, all timber, metal, and other accessories necessary for its completion, as shown on the Plans.

The cost of furnishing all materials and performing all work for installing timber, metal, and other accessories for which specific prices are not provided in the schedule shall be included in the applicable prices bid in the schedule for the work to which such items are appurtenant.

Unless otherwise shown or directed, all anchor bolts and dowels shall be cast in concrete; where shown or directed, anchor bolts and dowels shall be installed in preformed or drilled holes. Unless otherwise shown, specified or directed, approved cast iron sleeves or flanged castings shall be furnished and installed to sheath openings for pipes and ducts passing through concrete work.

For any matters not addressed in these Specifications, the "Concrete Manual" (U.S. Bureau of Reclamation, formerly the Water and Power Resources Services) shall be referred to for guidance.

F-2 Contractor Submittals

The Contractor shall furnish the following submittals in accordance with the General Conditions.

a. Mix Design

Prior to beginning work the Contractor shall submit preliminary concrete mix designs which shall show the proportions and gradations of materials proposed for each class and type of concrete. The mix designs shall be checked by an independent testing laboratory acceptable to the Engineer. Costs related to the checking shall be the Contractor's responsibility. When a water reducing admixture is used the Contractor shall furnish mix designs both with and without the admixture.

b. Delivery Tickets

When ready-mix concrete is used the Contractor shall furnish certified delivery tickets at the time of delivery of each load of concrete. Each ticket shall state the design 28 day compressive strength of the mix, the certified equipment used for measuring, the total quantities by weight of cement, sand, each class of aggregate, admixtures, the amounts of water in the aggregate, the amount of water added at the batching plant, and the amount of water allowed to be added at the site for the specified mix design. The tickets shall also state the mix number, total yield in cubic yards, and the time of day to the nearest minute at which the batch was dispatched, when it left the plant, when it arrived at the site, when unloading began, and when unloading was finished.

c. **Shop Plans**

1. The Contractor shall submit shop Plans of reinforcing steel including bending diagrams and placement lists prior to fabrication.

2. The Contractor's reinforcement detail Plans shall be prepared following the recommendations of ACI 315, Manual of Engineering and Placing Plans for Reinforced Concrete Structures, unless otherwise shown on the reinforcement design Plans and the requirements of this specification. The shop bending diagrams shall show the actual lengths of bars to the nearest inch. Bar placement diagrams shall be provided and shall clearly indicate the dimensions of each bar splice.

   The Contractor's reinforcement detail Plans shall be clean, legible, and accurate and checked by the Contractor before submittal. If any reinforcement detail drawing or group of Plans requiring review is not of a quality acceptable to the Engineer, the entire set or group of Plans will be returned to the Contractor, to be corrected and resubmitted. Acceptable reinforcement detail Plans will be reviewed by the Engineer for adequacy of general design and controlling dimensions. Errors, omissions, or corrections will be marked on the prints or otherwise relayed to the Contractor. The Contractor shall make all necessary corrections. Such review shall not relieve the Contractor of his responsibility for the correctness of details or for conformance with the requirements of these Specifications.

3. The Contractor shall submit concrete placement Plans showing the location and type of joints and concrete placement sequence for each structure. The Contractor's Plans shall show necessary details for checking the bars during placement.

4. Where mechanical couplers are required or permitted to be used to splice reinforcing steel the Contractor shall submit manufacturer's literature containing instructions and recommendations for the installation of each type of coupler used, certified test reports verifying the load capacity of each size and type of coupler used, and shop Plans showing the location of each coupler and details of how they are to be installed in the formwork.

5. If reinforcing steel is to be spliced by welding at any location the Contractor shall submit mill test reports containing the information required for the determination of the carbon equivalent per AWS D1.4 of the Structural Welding Code – Reinforcing Steel. In addition the Contractor shall submit a welding procedure for each type of weld and size of bar which is to be welded, certification of procedure qualifications,

and welder qualifications for each welding procedure for each welder performing the work.

d. **Manufacturer's Information**

The Contractor shall submit manufacturer's information demonstrating compliance with these specifications for the following items:

1. Form ties and related accessories

2. Mill tests for cement

3. Admixture certification indicating that all ASTM standards have been met including chloride ion content.

4. Manufacturer's product description, instructions, recommended dosage, chloride content, precautions, and MSDS for all admixtures.

5. Aggregate gradation test results and certification

6. Certification that aggregate meets all requirements of these specifications

7. Materials and methods for curing including manufacturer's product description, instructions, application recommendations, cautions, and MSDS.

8. Certification that pozzolan meets all requirements of these specifications.

9. Manufacturer's product description and instructions and certified test results for all types of grout to be used.

10. Manufacturer's certification that non-shrink grout does not include aluminum, zinc, or magnesium powders as a method of expansion.

F-3 Quality Assurance

a. **Testing of Materials**

1. Tests for compressive strength of concrete and tests on component materials will be performed as required herein.

2. Testing for aggregate shall include reactivity, sand equivalence, reactivity, organic impurities, abrasion resistance, and soundness in accordance with ASTM C33, Concrete Aggregates.

3. The cost of laboratory tests for quality on cement and aggregates shall be performed by the supplier or the Contractor. The tests on the concrete will be performed by the Engineer. The Contractor shall pay the cost of any additional tests and investigations on Work that does not meet the Specifications. The laboratory will meet or exceed the requirements of ASTM C 1077, Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for laboratory Evaluation.

4. The Contractor shall provide Concrete and other materials as required for testing at no cost to the Owner. The Contractor shall assist the Engineer in obtaining samples and with clean-up and disposal of excess material.

b. **Field Compression Tests**

1. Cylinders for concrete compression tests shall be taken during construction from the first placement of each class of concrete and at intervals thereafter as determined by the Engineer. Each set of test cylinders shall consist of a minimum of 5 cylinders.

2. Test cylinders for concrete shall be made in accordance with Section 9.2 of ASTM C 31, Standard Practice for Making and Curing Concrete Test Specimens in the Field. Each cylinder shall be 6-inches in diameter and 12-inches high.

3. Compression tests will be performed in accordance with ASTM C 39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens. One cylinder will be tested at 7 days, one at 14 days and 2 at 28 days. The remaining cylinder(s) will be held to verify test results, if needed.

c. **Evaluation and Acceptance of Concrete**

1. Evaluation and acceptance of the compressive strength of concrete shall be according to the requirements of ACI 318, Building Code Requirements for Reinforced Concrete, Chapter 5, Concrete Quality, and as indicated herein.

2. If any concrete fails to meet these requirements, immediate action shall be taken to increase the compressive strength of subsequent batches of the type of concrete affected.

3. Concrete that fails to meet the ACI requirements and the requirements of these Specifications is subject to removal and replacement as part of the Work.

d. **Construction Tolerances**

The Contractor shall set and maintain forms and perform finishing operations such that the concrete is within the tolerances herein. Surface defects and irregularities are defined as finishes and are to be distinguished from tolerances. Tolerances are the permissible variations from lines, grades, or dimensions indicated. Where tolerances are not indicated, permissible deviations shall be in accordance with ACI 117, Standard Tolerance for Concrete Construction and Materials.

F-4 Materials

a. **Forms and Accessories**

1. Except as approved in writing by the Engineer all lumber used as forms, shoring, or bracing shall be new material. Form materials shall be metal, wood, plywood, or other material that will not adversely affect the concrete and will facilitate placement of the concrete to the shape, form, line, and grade required.

2. Exterior corners of concrete members shall have 3/4-inch chamfers or be tooled to a 1/2-inch radius unless otherwise indicated. Re-entrant corners shall not have fillets unless otherwise indicated.

3. Forms and falsework which support roof or floor slabs shall be designed for the total dead load plus a minimum live load of 50 psf.

4. Form ties shall be provided with a plastic cone or other suitable means for forming a conical hole to insure that the form tie may be broken off inside the face of the concrete. The maximum diameter of removable cones for tie rods or other removable form tie fasteners having a circular cross-section shall be 1 1/2-inches. Fasteners shall be designed to leave holes of a regular shape for reaming. Form ties shall be Wrench Head Snap Ties by MeadowBurke, Snap Ties by Dayton/Richmond, or approved equal.

5. Removable taper ties may be used where approved by the Engineer. Taper ties shall be Taper Ties by MeadowBurke, Taper Ties by Dayton/Richmond, or approved equal.

b. **Concrete**

1. Cement - The Contactor shall furnish cementitious materials in accordance with Type V Portland cement or Type II Low Alkali Portland cement meeting physical requirements for Type V.

Portland cement shall meet the requirements of ASTM designation: C 150, Portland Cement for Type V or Type II Low Alkali meeting physical requirements for Type V. The cement shall be free from lumps and contamination by water and other foreign matter when used in concrete.

If cement is shipped from a commercial bin, a manufacturer's certification that the material was tested during production or transfer in accordance with the reference specification, together with a report of the test results shall be furnished at the time of shipment. Certifications and mill-test reports shall be submitted for each lot of cement from which shipments are drawn and shall be delivered to the location designated by the Engineer. The Contractor shall assure that cement shipments accepted and used are from only those bins for which proper certification and mill-test reports have been received. Manufacturer's certification and mill-test reports shall in no way relieve the Contractor of the responsibility for furnishing materials meeting specifications requirements. The Contractor shall be responsible for the accuracy and completeness of certifications and mill-test reports furnished.

The Contractor shall not change the cementitious materials option selected or the source of cement and pozzolan under this option, without the written permission of the Engineer.

2. Pozzolan — **The use of Pozzolan (fly ash) is not permitted.**

3. Water—Water shall be potable, clean, and free from objectionable quantities of silt, organic matter, salts, and other impurities. The Engineer will determine whether or not such quantities of impurities are objectionable. The water shall contain less than 500 ppm of chlorides.

4. Sand and Coarse Aggregate—Sand and coarse aggregate shall consist of clean, hard, dense, durable, uncoated rock fragments that are free from injurious amounts of dirt, organic matter, and other deleterious substances. Sand and coarse aggregate shall meet all requirements of ASTM designation C 33. The term "sand" is used to designate aggregate in which the maximum size particle will pass through a 3/16-inch (No. 4) test sieve. Coarse aggregate shall conform to ASTM designation C 33 gradings for either size No. 467 (1 ½ inch to No. 4 United States standard sieve), size No. 57 (1 inch to No. 4), or size No. 67 (3/4 inch to No. 4). The percentage of sand by weight to total aggregates shall not exceed forty percent (40%).

   The coarse aggregate to be used in concrete shall be the largest of the specified sizes that is practicable, consistent with required strength, spacing of reinforcement and embedded items, and placement thickness.

Maximum size of aggregate for canal lining shall not be greater than one-half the lining thickness; provided that, for canal lining 2 ½ inches thick or less the maximum size of aggregate shall be ¾ inch. The size of coarse aggregate to be used for other placements will be determined by the Contractor in accordance with these specifications, subject to review by the Engineer.

5. Admixtures—The Contractor shall furnish air-entraining and chemical admixtures for use in concrete. Admixtures shall be of uniform consistency, quality, and strength of solution. Admixtures shall be batched separately in liquid form in dispensers capable of measuring at one time the full quantity of each admixture required for each batch. Final approval of an admixture shall not be given until it has performed satisfactorily at the job site.

   a) Air-Entraining Admixture—An air-entraining admixture shall be used in all concrete. The air-entraining admixture shall conform to ANSI/ASTM C260, provided that the air-entraining admixture used with type F or G chemical admixture shall be a neutralized vinsol resin formulation.

      The amount of air-entraining admixture used shall be the amount necessary to result in a total air content in the concrete at placement of 3 to 5 percent. Concrete floors to receive a dry-shake floor hardener shall have an air content of not more than 3 percent. Air content shall be tested at the point of placement.

   b) Chemical Admixtures – Admixtures shall contain no free chloride ions, shall be non-toxic after 30 Days, and shall be compatible with and made by the same manufacturer as the air entraining admixture. Chemical admixtures that will introduce more than 0.1% chloride, by weight of cementitious materials, shall not be used in concrete in which aluminum, galvanized metalwork, or prestressing steel is to be embedded. Admixtures shall conform to the requirements of ASTM C 494, Chemical admixtures for Concrete.

      Accelerator—Accelerating admixtures shall not be used in the concrete.

      1) Water-Reducing and/or Set-Controlling Admixtures—The Contractor shall use a water-reducing and/or a set-controlling admixture, referred to herein as WRA, in all concrete. Only one water-reducing admixture may be used.

The admixture shall conform to ASTM C494 for type A, D, F, or G chemical admixture.

If use of the WRA chosen by the Contractor is accompanied by an abnormal setting of the fresh concrete or if the WRA does not perform in accordance with these specifications, the Contractor shall furnish and use other brands of WRA until an acceptable admixture is found. Normally, the amount of WRA used shall be that amount necessary to effect the requirements of ASTM C494. However, the Engineer reserves the right to adjust the quantities or eliminate its use.

2) Superplasticizer or high range water reducing admixture conforming to ASTM C494 type F or G may be used as needed to ease concrete placement.

6. Curing Compound—Curing compounds shall be white pigmented and resin based liquid membrane-forming curing compounds conforming to the requirements of ASTM C 309, Liquid Membrane-Forming Compounds for Curing Concrete. Curing compounds shall meet local VOC requirements.

7. Reinforcing Steel—Reinforcing steel shall be deformed bars conforming to the requirements of ASTM A615, Grade 60. Weldable Reinforcing steel shall be ASTM A706, Grade 60.

Welded wire fabric shall be electrically welded-wire fabric and shall conform to the requirements of ASTM A 185 for smooth steel wire or ASTM A 497 for deformed steel wire, except that for wire with a specified yield strength exceeding 60,000 pounds per square inch, the yield strength shall be the stress corresponding to a strain of 0.35 percent. Welded wire fabric with longitudinal wire of W4 size wire and smaller shall be furnished in flat sheets or in rolls with a core diameter of not less than 10-inches. Welded wire fabric with longitudinal wires larger than W4 size shall be furnished in flat sheets only.

Accessories shall include necessary chairs, slab bolsters, concrete blocks, tie wires, supports, spacers, and other devices to position reinforcement during concrete placement. Bar supports shall meet the requirements of the CRSI Manual of Standard Practice. Concrete dobies used to support and position reinforcing steel shall have the same or higher compressive strength as the required strength of the concrete in which they are located. Where concrete blocks are used on concrete surfaces which will be exposed to view, the color and texture of the concrete blocks shall match

that of the finished concrete surface. Wire ties shall be embedded in the concrete doby bar supports.

8. Mechanical Couplers – Mechanical couplers shall be provided where indicated and where approved by the Engineer. Couplers shall develop a tensile strength that exceeds 125 percent of the yield strength of the reinforcing bars spliced.

9. Lap Splices – Lap splices shall be a minimum of 40 diameters and double wrapped with a distance between wraps of no greater than 24".

10. Welded Splices – Welded splices shall be provided where indicated and approved by the Engineer. Welded splices of reinforcing steel shall develop a tensile strength of 125 percent of the yield strength of the bars welded. Materials required to perform the welded splices to the requirements of AWS D1.4 shall be provided.

11. Joint Materials – Materials for joints in concrete shall conform to the following requirements:

    a) Sponge Rubber Filler—Sponge rubber for joints shall conform to Federal Specification HH F 341F, Type II, Class A.

    b) Preformed elastomeric joint sealant shall conform to ASTM D2628.

12. Water Stops—Waterstops shall be 3/8-inch thick polyvinyl chloride resin plastic in conformance with U.S. Corps of Engineers Specifications CRD C572. Waterstops shall be of the type and size shown on the Plans and as manufactured by Water Seals, Inc., or approved equal.

13. Grout

    a) Non-settling grouting mortar shall be a non-shrink, non-metallic, cementitious grout, SikaGrout 212 by Sika Corporation, Masterflow 928 Grout by Master Builders, Five Star Grout by Five Star Products, or approved equal.

    b) Epoxy grout for grouting reinforcing bars shall be specifically designed for such application, for the moisture condition, application temperature, and orientation of the hole to be filled.

F-5 Concrete Composition

Concrete shall be composed of cementitious materials, sand, water, and admixtures as specified, all well-mixed and brought to proper consistency. With prior approval of the

Engineer, the exact proportions in which concrete materials shall be mixed may be varied by the Contractor to secure maximum economy and workability, subject to the overall requirements of concrete impermeability, density and durability, and the specific limitations placed herein on materials, content, strength and slump. However, the suitability of the mix shall be determined by the Engineer, and any adjustments in mix ordered by the Engineer to insure concrete of proper quality shall be made at no extra cost to the Agency. The Contractor, through approved testing laboratory, shall design the mix for each strength of concrete required.

The mix design shall be based on representative samples of aggregates, cement, water and admixtures to be used on the project. The mix design submittal shall include in addition to proportions of the ingredients, the results of testing of trial mix including water-cement ratio, air entrainment, slump and strength. A separate proposed mix design for each strength of concrete shall be submitted to the Engineer for review at least fifteen (15) days prior to placement of concrete in the work. If the Contractor elects to change aggregate source during the process of work, new mix designs meeting these requirements shall be submitted to the Engineer at least fifteen (15) days before such material is to be placed in the work.

The net water-cement ratio or water-cement ratio of the concrete, exclusive of water absorbed by the aggregates, shall not exceed (0.48) by weight for structural concrete. Structural concrete shall contain a minimum of 564 (6 sack) pounds of cement per cubic yard concrete.

Except as hereinafter specified, the slump of the concrete when placed shall not exceed 5 inches plus 1 inch. If the specified slump is exceeded at placement, the concrete is unacceptable. Uniformity in concrete consistency from batch to batch will be required. To maintain concrete at the proper consistency, the amount of water and aggregates batched for concrete shall be adjusted to compensate for variations in the moisture content or grading of the aggregates as they enter the mixer. Addition of water in excess of the design water content to compensate for stiffening of the concrete after mixing, known as re-tempering, will not be permitted.

The compressive strength of the concrete shall be sufficient to ensure that each concrete mix meets the following requirements in accordance with ASTM C 39.

The test cylinders shall have a compressive strength at twenty-eight (28) days in excess **4,000 pounds per square inch**.

Concrete slump shall not exceed 5 in conformance with ASTM C143.

Air-entraining admixture shall be used in such amount as will effect the entrainment of from 3 to 5 percent of air, by volume, of the concrete at the placement.

F-6 Mixing of Concrete

Concrete may be mixed at the site of the work or by transit mix methods in conformance with ASTM C 94. The mixing time shall be sufficient to thoroughly mix the concrete but excessive over-mixing requiring the addition of water to preserve the required consistency will not be permitted. Concrete shall not be mixed or placed while the atmospheric temperature is above 100°F, unless adequate means are employed to cool the aggregate and water and satisfactory provisions have been made for protecting the work. When concrete is to be placed during periods when the atmospheric temperature is above 100°F, the Contractor shall redesign the concrete mix specifically for hot weather conditions, and shall demonstrate the adequacy of the design by testing.

Mixers shall be capable of mixing and discharging concrete of the specified slump. Concrete shall be discharged within 1 ½ hours after the introduction of the mix water and cementitious materials into the mixer.

F-7 Forms

Forms shall be of such size and shape to yield formed concrete work conforming to the shape, line, grade and dimensions as shown on the Plans. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete and shall be maintained rigidly in position. Forms shall be sufficiently tight to prevent loss of mortar from the concrete. Chamfer strips shall be placed in the corners and at the top of the wall line of the forms so as to produce beveled edges on permanently exposed concrete surfaces. Interior angles on such surfaces and edges of formed joints will not require beveling, except where shown on the Plans. The form sheathing or lining shall be so placed that the joint marks on the concrete surfaces will be in general alignment, both horizontally and vertically. Embedded wire ties for holding forms will not be permitted. Bolts and rods for form ties shall be so arranged that when the forms are removed, no metal shall be within one inch of any surface. Forms shall be removed as soon as practical after the concrete is placed, but not until the concrete has attained the necessary strength to support all live and dead loads occurring during the construction period. The specified repair and curing shall be commenced immediately thereafter. Forms shall be removed in such a manner as to prevent injury to the concrete. Wood forms shall be of sound lumber, free from loose knots or other defects, and of such quality that when treated or coated, there shall be no chemical deterioration or discoloration of the formed concrete surfaces. Plywood of adequate stiffness shall be used on all surfaces exposed to air or water. Lumber reused in forms shall be cleaned prior to reuse. Before concrete is placed, the forms shall be coated with an approved, non-staining commercial form oil.

F-8 Handling and Placing of Concrete

a. General

No concrete shall be placed until all form work, installation of parts to be embedded, and preparation of surfaces involved in placing have been approved by

the Engineer. Placing of concrete shall conform to the applicable requirements of Chapter 8 of ACI 301 and the requirements of this specification.

Reinforcement, anchor bolts, sleeves, inserts, and similar items shall be set and secured in the forms at the locations indicated on the shop Plans and shall be acceptable to the Engineer before any concrete is placed. Accuracy of placement is the sole responsibility of the Contractor.

All surfaces of foundations upon or against which concrete is to be placed shall be free from standing water, mud, and debris. The surfaces of absorptive foundations, against which concrete is to be placed, shall be moistened thoroughly so that moisture will not be drawn from the freshly placed concrete.

Construction joints shall be cleaned of all laitance, loose or defective surface concrete and foreign materials by sandblasting and shall be thoroughly moist before concrete is placed against them.

Concrete shall not be deposited around any metal reinforcement until the Engineer has approved the reinforcement placed in the forms.

The concrete in each integral part of the structure shall be placed continuously. The Contractor will not be allowed to commence work on any monolithic part of a structure unless the inspected and approved materials on hand are sufficient to complete the part without interruption in placing of the concrete.

If for any reason the placing of concrete is interrupted long enough for the concrete to take a set, the working face shall be given a shape by the use of forms or other means, that will insure proper union with subsequent work. Such construction joints shall only be made where acceptable to the Engineer.

The concrete shall be placed as nearly as possible in its final position by means that avoid segregation of the materials and displacement of reinforcement. In no case shall the free fall of concrete exceed 4-feet in walls and 8-feet in columns below the ends of ducts, chutes, or buggies. No re-tempering of concrete will be permitted.

b. **Joints in Concrete**

Concrete surfaces upon or against which concrete is to be placed, where placement of the concrete has been stopped or interrupted so that as determined by the Engineer, the new concrete cannot be incorporated integrally with that previously placed, are defined as construction joints, the surfaces of horizontal joints shall be given a compacted, roughened surface. Except where the Plans call for the joint surfaces are to be coated, the joint surfaces shall be cleaned of laitance, loose or defective concrete and foreign material, and be roughened to a

minimum ¼-inch amplitude. The cleaning and roughening shall be accomplished by hydro-blasting. Pools of water shall be removed from the surface of the construction joints before the new concrete is placed.

c. **Required Temperatures for Concrete**

The temperature of concrete as mixed and placed shall not be less than 55°F, nor greater than 90°F. If, during day or night, the ambient temperature falls below, or is predicted to fall below 40°F, concrete shall be protected from freezing during placement and curing by means of heating of materials and other approved methods, as directed by the Engineer. The concrete mix for cold weather placement shall be maintained at a minimum temperature of 55°F during placement and this minimum temperature shall be maintained for the first seventy-two (72) hours of curing, minimum. At all times, the maximum temperature of concrete as placed shall be less than 90°F. When the temperature of concrete as placed may be 90°F or higher, as may be reasonably foretold from current temperatures of materials and the likelihood of rises in weather temperatures, the Contractor shall employ effective means, such as precooling aggregates and mixing water, use of ice as a part of the mixing water, shading aggregates, or placing at night, as necessary, to maintain the temperature of concrete as placed below 90°F.

d. **Vibration**

All concrete placed in forms shall be placed in layers not over twenty-four (24) inches deep, and each layer shall be vibrated into place to its maximum practicable density, free from pockets of coarse aggregate and in such a manner that surfaces shall be smooth and free from voids. Approved internal vibrators shall be used for all sections which are sufficiently large and shall be supplemented by platform or screed type vibrators in the event that satisfactory top surfaces cannot be obtained solely with the internal type; or internal vibrators shall be supplemented with vibrators operated against the outside of forms to improve vertical surfaces, as required. Form vibrators shall be used when sections are too small for the internal type. Vibrators shall be adequately powered and capable of transmitting to the concrete not less than 7,000 impulses per minute when operating under load. The vibration shall be sufficiently intense to visibly affect the concrete over a radius of at least 18 inches. A sufficient number of vibrators shall be used so that the required rate of placement vibration is achieved uniformly throughout the entire volume of each layer of concrete and maximum consolidation of concrete is secured. With form or internal vibrators, vibration shall be such that concrete becomes uniformly plastic and there shall be at least twenty (20) seconds of vibration per square foot of surface of each layer of concrete, computed on the basis of the visibly affected radius and taking overlapping into consideration; however, over-vibration will not be allowed. At all times, the Contractor shall have available at least one (1) spare, workable

vibrator of each type used. Either over-vibrated or under-vibrated concrete is subject to test and rejection.

e. **Removal of Forms**

Careful procedures for the removal of forms shall be strictly followed. This Work shall be done with care to avoid damage to the concrete. No heavy loading on green concrete shall be permitted. Members which must support their own weight shall not have their forms removed until they have attained at least 75 percent of the 28-day strength of the concrete. Forms for vertical walls and columns shall remain in place at least 48 hours after the concrete has been placed. Forms for parts of the Work not specifically mentioned herein shall remain in place for periods of time as recommended in ACI 347.

F-9 Tolerances for Concrete Construction

Deviations from established lines, grades and dimensions will be permitted to the extent set forth in the following list of tolerances:

Elevation of pipe inverts in structures	1 inch
Elevation of top of structure	1/2 inch
Elevation of bottom of structure	1 inch
Variation of structures from specified grades, alignment or plumb in vertical members	1/2 inch in 10 feet and 1/2 inch total if over 10 feet
Departure from specified thickness of operating deck slabs	-1/8 inch, + 1/4 inch
Departure from cross sectional dimensions of columns, walls, beams, slabs	-1/4 inch, + 1/2 inch
Departure from cross sectional dimensions of footings	-0 inch

F-10 Reinforcing Steel

a. General

Reinforcing bars shall be cut, bent, and placed in the concrete where shown on the Plans or where directed. The Contractor shall furnish all reinforcing bars required for completion of the work. Unless otherwise indicated, dowels shall match the size and spacing of the spliced bars.

Reinforcing bars shall not be straightened or re-bent in a manner that will injure the material. Bars shall be bent or straight as indicated. The Contractor shall not use bends different from the bends indicated. Bars shall be bent cold unless otherwise permitted by the Engineer. No bars partially embedded in concrete shall be field bent except as indicated or specifically allowed by the Engineer.

b. Placing Reinforcing Bars

The placement of reinforcing shall conform to the requirements of ACI 318/318R 87, unless otherwise shown on the design Plans.

Reinforcing bars will be required to be placed in lengths up to 40 feet.

Splices shall be located where shown on the Plans, provided that the location of splices may be altered subject to the Engineer's written approval.

Subject to the Engineer's written approval, the Contractor may, for the Contractor's convenience, splice bars at additional locations other than those shown on the Plans. In order to meet design and space limitations on splicing, some bent bars may exceed usual shipping clearances. Cutting and bending of such bars from stock lengths may be required at the site.

Unless otherwise prescribed, placement dimensions shall be to the centerlines of the bars. Reinforcement will be inspected for compliance with the requirements as to size, shape, length, splicing, position, and amount after it has been placed.

Before reinforcement is embedded in concrete, the surfaces of the bars and the surfaces of any supports shall be cleaned of heavy flaky rust, loose mill scale, dirt, grease, or other foreign substances that, in the Engineer's opinion, are objectionable. Heavy flaky rust that can be removed by firm rubbing with burlap or equivalent treatment is considered objectionable. After being placed, reinforcement shall be maintained in a clean condition until the concrete is placed.

Reinforcement shall be accurately placed to meet the following tolerances:

1. The amount of concrete cover protecting reinforcement shall not deviate from that specified by more than 1/2 inch if the specified cover is more than 2 1/2 inches, nor by more than 1/4 inch if the cover specified is 2 1/2 inches or less.

2. The spacing of reinforcing bars shall not deviate from the required spacing by more than 1 inch. The minimum spacing requirements of ACI 318 shall be adhered to.

Reinforcement shall be secured in position so that it will not be displaced while the concrete is placed, and special care shall be exercised to prevent any disturbance of the reinforcement in concrete that has already been placed. Bars shall not be field-bent to the extent of permanent set, nor straightened, except as approved by the Engineer or shown in the Plans. Bars bent without approval shall be replaced. Welding or tack welding of reinforcing bars will not be permitted except at locations shown on the Plans or where approved by the Engineer. Chairs, hangers, spacers, and other supports for reinforcement shall be of concrete, metal, or other approved material. Where portions of such supports will be exposed on concrete surfaces that will be exposed to view, the exposed portion of the supports shall be galvanized or of other corrosion-resistant material, except that concrete supports will not be permitted. Unless otherwise shown on the Plans, reinforcement in structures shall be so placed that there will be a clear

distance of at least 1 inch between the reinforcement and any anchor bolts, form ties, or other embedded metalwork.

Welded wire fabric reinforcement placed over horizontal forms shall be supported on slab bolsters having gray, plastic-coated standard type legs. Slab bolsters shall not be spaced at more than 30-inch centers and shall extend continuously across the entire width of the reinforcing mat.

Welded wire fabric placed over the ground shall be supported on wired concrete dobies spaced at not more than 3-feet on center in any direction. The construction practice of placing welded wire fabric on the ground and hooking it into place in freshly placed concrete shall not be permitted.

Laps of welded wire fabric shall be in accordance with ACI 318. Adjoining sheets shall be securely tied together with No. 14 tie wire, one tie for each 2 running feet. Wires shall be staggered and tied in such a manner that they cannot slip.

F-11 Concrete Finishes

a. General

Surfaces shall be free from fins, bulges, ridges, offsets, honeycombing, or roughness of any kind, and shall present a finished, smooth, continuous hard surface. Allowable deviations from plumb or level and from the alignment, profiles, and dimensions indicated are defined as tolerances and are indicated above. These tolerances are to be distinguished from irregularities in finish as described below. Aluminum finishing tools shall not be used.

b. Formed Surfaces

Formed surfaces against which backfill will be placed require no treatment after form removal except filling of holes left by removal of fasteners and repair of defective concrete.

Formed surfaces of walls which will be exposed to view will be given a smooth finish.

c. Unformed Surfaces

Surfaces that are covered by backfill shall be formed by sufficient leveling and screeding to produce even, uniform surfaces. Unformed surfaces of structures not covered by backfill or concrete, shall receive a “float” finish. Floating shall be the minimum necessary to produce a surface free from screed marks and uniform in texture. Joints and edges shall be tooled where shown on the Plans or as directed. For linings, hand finishing shall only be used to smooth out surface irregularities.

F-12 Curing and Protection

The Contractor shall protect all concrete against injury until final acceptance. Unless otherwise directed, all concrete shall be cured by membrane curing, using a white-pigmented liquid membrane curing compound. One coat of curing compound shall be spray-applied to concrete surfaces to provide a continuous, uniform white membrane over all areas. Coverage shall not exceed one-hundred fifty (150) square feet per gallon and on rough surfaces the coverage area per gallon shall be decreased as necessary or directed to obtain the required continuous membrane. When used on an unformed surface, application shall begin immediately after finishing operations are complete. When used on a formed concrete surface, the surface shall first be continuously moistened with a light spray of water until the surface will not readily absorb any more water. As soon as surface moisture film has disappeared and there is an approach to surface dryness, the curing compound shall be applied. In all cases, the curing compound shall be applied as soon after finishing operations as is possible without marring the surface. The light fog spray of moisture shall be continued to be applied to all surfaces if application of curing compound is delayed. Concrete shall be protected with temporary coverings during any appreciable delay between placing and finishing. Equipment for applying curing compound and the method of application shall be in accordance with the provisions of Chapter VI of the Eighth Edition of the Bureau of Reclamation Concrete Manual.

F-13 Repair of Concrete

Concrete that is damaged from any cause and concrete that is honeycombed, fractured, or otherwise defective shall be removed and replaced with dry-pack mortar, or concrete as directed and in accordance with Bureau of Reclamation "Standard Specification for Repair of Concrete". Repairs on concrete shall be made within twenty-four (24) hours after form removal. Each repair surface after being finished, shall be moistened and coated with curing compound.

F-14 Joints and Waterstops

Unless otherwise specified, all details as to location, spacing and construction of joints shall be as shown on the Plans. No construction joints shall be made unless shown on the Plans or directed by the Engineer.

Construction joints either shall be keyed joints or butt-type joints as shown on the Plans or directed. Keyed construction joints shall be in conformance with details shown on the Plans. Butt-type joints shall be made at right angles to the concrete surface affected. The butting surface of concrete placed to form the first face of the joint shall be sandblasted, moistened and slushed with a coat of neat cement grout before new concrete is placed to complete the joint.

Where shown, expansion joints shall be formed by two concrete surfaces sandwiching a layer of sponge rubber filler cut to the size and shape of the joint surface. The filler shall

be secured to the concrete in an approved manner, with copper nails at 12-inch centers, embedded in the first-placed concrete in such a manner that the nails protrude from the joint surface to be covered or by adhesive applied between the filler and the first-placed concrete. Elastomeric sealer shall also be furnished and placed in the joints where shown. The adhesive shall be a non-bituminous adhesive as recommended by the manufacturer of the filler material. Waterstops shall be installed in joints where shown on the Plans.

F-15 Grout for Equipment and Metalwork

a. **General**

Non-settling grouting mortar shall be a non-shrink, non-metallic, cementitious grout, SikaGrout 212 by Sika Corporation, Masterflow 928 Grout by Master Builders, Five Star Grout by Five Star Products, or equal. Grout placement shall be performed in accordance with the Manufacturer's instructions and recommendations.

b. **Preparation of Surfaces and Placing Grouting Mortar**

Before placing grouting mortars, the surface of base concrete to which the mortar will be bonded shall be roughened and cleaned of all laitance loose or defective concrete, curing compound and other coatings, and other foreign material by effective means, followed by thorough washing with water. If any delay occurs between the washing of the concrete and placing of the mortar, the surfaces of the concrete shall be lubricated by washing with water immediately before placing of the mortar. Forms shall be used where required to confine the non-settling grouting mortar. The mortar shall be placed completely filling spaces adjacent to equipment and metalwork as shown on the Plans.

c. **Curing**

The exposed surfaces of mortar shall be cured for seventy-two (72) hours by keeping them covered with moist burlap, damp sand, or by other effective means.

Loads shall not be applied to the mortar sooner than seventy-two (72) hours after placement and shall be applied only after the mortar has attained a compressive strength of at least 3,000 pounds per square inch. Care shall be taken when applying loads on the hardened mortar and the Contractor shall be responsible for any damage thereto resulting from impact loads when positioning equipment or metalwork.

F-17 Concrete Slurry

a. **General –** Concrete slurry shall be composed of cement, aggregates (sand), water and any specified admixtures of the qualities and proportions specified herein, all

well mixed and brought to the proper consistency and all mixed in proportions as directed or approved by the District. A concrete mix design shall be submitted to the District for review and approval prior to delivery to the site.

Mix – The concrete slurry mix shall contain not less than 1 1/2 sacks of cement per cubic yard – unless otherwise indicated on the Plans.

b. **Placement –** Concrete Slurry shall be placed within trench as a monolithic pour and consolidated using vibratory equipment such that the concrete slurry is consolidated into a continuous wall with no voids between the re-constructed levee sections and around the pipe as shown on the plans. Surfaces that are covered by backfill shall be formed by sufficient leveling and screeding to produce even, uniform surfaces.

F-20 Measurement and Payment

Measurement and payment for Concrete and Concrete Slurry shall include the cost of all work and materials specified in this section including transportation and delivery. Such payment shall constitute full compensation for all labor, equipment, tools and all other items necessary and incidental to the completion of the work. Payment shall be as stated in the Bidding Schedule.

END OF SECTION

SECTION G

DISCHARGE PIPE AND APPURTENANCES

G-1 General Scope

The Contractor shall provide all labor, materials and equipment and perform all operations required to furnish and install piping as shown on the drawings and specified herein, and field testing as required.

G-2 Pipe Requirements

All well discharge piping, defined as above ground and buried pipe between the well head and the connection piping, shall be steel pipe conforming to these specifications.

G-3 Guarantee and Maintenance Warranty

Special attention is directed to Section D. As specified therein the Contractor shall furnish a one (1)-year guarantee and maintenance warranty for all work and materials involved in the installation of any pipe system specified herein, effective the date of final acceptance for such system

G-4 Mobilization Demobilization

a. Scope

Mobilization and demobilization shall include the transportation of personnel, equipment, and operating supplies to and from the site; establishment of portable sanitary and refuse facilities; obtaining an adequate source of fresh water; location, provision and installation of field offices & equipment/materials storage yards and mobilization for work required by the Contractor.

The Contractor shall provide all necessary equipment; all tools, accessories, power, fuel, materials, supplies, lighting, water, and other support equipment; and experienced personnel necessary to conduct efficient pipeline installation operation.

b. Equipment and Materials

Mobilization shall include all activities and costs for transportation of personnel equipment, and operating supplies to the site; establishment of offices and storage yards, dewatering equipment, excavation equipment, buildings, and other necessary facilities for the Contractor’s operations at the site; premiums paid for

performance and payment bonds, including coinsurance and reinsurance agreements as applicable.

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not included in the contract from the site; including the disassembly, removal and site clean up, of offices, equipment, buildings, and other facilities assembled on the site for this contract.

G-5 Survey Control

Surveying Control for pipeline alignment, stationing and elevations will be provided by the District on a one time basis. Prior to construction of each pipeline, said control will be established in the field.

G-6 Shop Drawings

Prior to fabrication of any pipe materials specified under this section of the Specifications for pipe, the Contractor shall submit shop drawings showing all pertinent details for field installation and shop fabrication of pipe, pipe fittings and specials for piping, including joint details, for approval by the District. All shop drawings of pipe fittings and specials shall be reviewed and approved by the pipe manufacturer and Contractor before submittal to the District.

G-7 Steel Pipe for Well Discharge Piping

a. Scope

The Contractor shall furnish and install well discharge piping, including inline bends and elbows, fittings, couplings in accordance with details shown on the Drawings and as specified herein. The steel pipe shall be manufactured and tested in accordance with this section.

b. Materials

1. Steel Pipe – Steel pipe for discharge piping shall be in conformance with AWWA C200. All steel pipe shall be furnished with a minimum wall thickness of 1/4-inch or as shown on the Drawings. Steel pipe fabricated in conformance with AWWA C200 shall be electrically welded pipe, fabricated from steel plate in conformance with ASTM A572, Grade 42. There shall be no more than one longitudinal seam per section of pipe. No seam shall intersect an outlet. Unless otherwise specified or shown on the Drawings, all pipe ends shall be prepared for single bevel field welded joints. Pipe ends may be prepared for butt-strap connections for

pipe closures and make-up pieces, as required. After complete fabrication of all items, the Contractor shall shop fit each fabricated section to its adjoining section to insure that all parts fit properly for field erection.

2. Specials and Fittings – The Contractor shall furnish and install all required in-line fabricated steel plate specials and fittings; specials to be provided under this Contract shall include, as applicable, the following:

a) Bends, elbows and outlets

b) Reducers

c) Blind flange at end of manifold pipe

d) Butt-straps

e) Flanges including blind flanges

f) All required nuts, bolts and gaskets including nuts, bolts, and gaskets for flanged connections with District-furnished equipment

g) All special appurtenances as shown on the Drawings or as specified

Except where otherwise indicated, all steel plate specials and fittings shall be fabricated in accordance with AWWA C200 with dimension in accordance with AWWA C208. Where shown on the Drawings, special welding fittings shall be provided; all welded fittings shall be suitable for 150-psi service. For all fabricated specials and fittings, including crotch plates, steel plate shall be in conformance with ASTM A572 Grade 42. Unless otherwise specified or shown on the Drawings, all steel pipe flanges and bolts, nuts and gaskets therefore shall be in conformance with AWWA C207, Class D, for 150 psi service with flanges in conformance with ASTM A283, Grade C for plate, or ASTM A181 Grade I for flange forgings. All steel plate flanges shall be faced after welding onto pipe. All above ground bolts and nuts shall be galvanized or cadmium plated. **All below ground bolts and nuts shall be non-corroding stainless steel.** Steel castings shall be in conformance with ASTM A27, Grade 70-36. Steel for all other miscellaneous structural steel shapes shall be in conformance with ASTM A36. Steel plate thicknesses for all specials and fittings shall be as shown on the Drawings; however, in no case shall any plate thickness be less than ¼ inch (for reducers, the larger diameter shall govern).

3. **Curves and Bends –** Shall be manufactured, long radius fittings unless otherwise approved by District.

4. **Screwed Fittings –** Federal Specification WW-P-521G, Type II

5. **Class D Flanges –** AWWA standard C207, shall be faced after welding.

6. **Flange Gaskets –** AWWA standard C207, full face.

c. Fabrication

The fabrication of the steel piping shall be in accordance with these Specifications and Drawings and with the requirements of AWWA standard C200. Welding and welded joints shall be done in accordance with AWWA C206. Welding shall be performed by any welding process that will produce a joint meeting the minimum strength requirements of the base metals and meet the welding pre-qualification procedures outlined in AWS D1.1. All other joint welding procedures to be used for work shall comply with Section 3, AWWA C206.

Surfaces to be welded shall be free from scale, slag, heavy rust, grease, paint, cement, or any other foreign material. Joint surfaces shall be smooth, uniform, and free for defects that adversely affects proper welding. All pipe joints shall be accurately aligned and retained in position during the welding operation.

All work performed under this specification shall be subject to rigid inspection. Inspection or a lack of inspection shall not relieve the Contractor of the responsibility for performing work in accordance with the standards listed herein.

Testing for joint leaks shall be performed unless otherwise specified by the District. Defects in welds or defective welds shall be removed, and that section of the joint shall then be rewelded and the epoxy coating repaired.

d. Coating, Lining and Painting of Pipe and Appurtenances

Discharge piping and appurtenances shall be coated in accordance with Section L of these Specifications.

Buried portions of the steel pipe shall be wrapped with 50% overlap using 10 mil. Polyken 900 (polyethylene) pipe tape or approved equivalent.

e. Installation

Steel piping shall be installed to line and grade as shown on the Drawings. Welding shall conform to AWWA standard C206, except testing of the field welds is not required. The Contractor shall furnish and install supports and bracing as may be required to hold the steel piping in place and prevent distortion during erection, placing of concrete, and backfilling. The Contractor shall field verify the location and alignment of all pipelines to which the steel piping is to be connected. The Contractor shall make all connections between the steel piping and the pipelines including any fittings and fabrication required to complete the connections.

f. **Concrete Thrust Blocks**

Unless specified otherwise, all concrete shall be 5 sack and meet a 2500 psi minimum compressive strength. All concrete mixes, placement and curing shall be per the standards governed by ACI. Concrete thrust blocks shall be constructed at all changes in direction, dead ends, hydrants and locations where thrust may be developed. Thrust blocks shall be constructed per ASAE S376.2, Figure 1 – Thrust blocking and anchors for underground irrigation pipelines. Thrust blocks shall be poured against undisturbed native soils or soils compacted to 95% relative compaction per Section E of the Specifications.

G-8 Piping Appurtenances

a. Quality Control

1. General – All items specified under this paragraph shall be of the sizes, shapes and materials as indicated on the Drawings or specified herein. All materials shall be new, free from defects impairing strength, durability and appearance, shall be of the best commercial quality for the purposes specified and made with structural properties to withstand all stresses and strains to which they normally will be subjected. Items furnished, unless otherwise specified, shall be standard approved products of recognized manufacturers and fabricated in accordance with the best shop methods. All incidental items and accessories not shown on the Drawings or specified herein, but which are required to fully carry out the specified intent of work, shall be furnished without additional cost. Welding shall be in accordance with the latest revisions of the Standard Code for Arc and Gas Welding in Building Construction as issued by the American welding Society. All field and shop welding shall be performed by certified welders qualified under the standard qualification procedure of the American Welding Society.

2. **Shop Drawings and Mill Reports –** Shop drawings of all fabricated units shall be submitted to the District. The District reserves the right to reject any material at any time before final acceptance of Contract work, if, in the opinion of the District, the materials and workmanship do not conform to any or all requirements of the Specifications.

b. Butterfly Valves

The Contractor shall furnish and install all required butterfly valves for above-ground and below-ground installations. All butterfly valves and operator shall conform to AWWA C504, Class 150B, and shall be rubber seated. Butterfly valves shall be as manufactured by Pratt Valves, flanged model 2FII with travel nut actuator and handwheel or Fresno Grayline 8500 Valve, or District approved equivalent.

c. Split-Disk Check Valves

Check valves shall be of the split-disk type with fusion epoxy coated cast iron body and flanged ends. Valves shall be designed for a working water pressure of 150 psi, minimum. The valve shall be spring-loaded with stainless steel rod as manufactured by Waterman Industries, Inc., Model PC-150, Fresno Valve, Series 3700, or approved equal. Valves shall be suitable for outdoor, above-ground, horizontal, inline installation. Valve ends shall be suitable for connection with pipe flanges conforming to AWWA C207 for Class D (150 psi) service.

d. Air Valves

1. **General –** Valves shall be equipped as shown on the drawings. Valve bodies and covers shall be cast aluminum with cast iron bases. Air valves shall have a pressure rating for all parts of 100 psi.

2. **Air Vents –** 3-inch air vents on the well discharge piping shall be Waterman Air Vent Model AV-150, or approved equal.

3. **Air Vent and Vacuum Valves –** 4-inch air vent and vacuum relief valves on the well connection piping shall be Waterman Continuous Acting Air Vent and Vacuum Relief Valve Model CR-101, or approved equal. Combination air release valves shall be installed at the locations identified on the drawings or as located by the District. The bottom of the airvent body shall be placed at an elevation no lower than the top of the adjoining pond levee elevation, so as to prevent water from entering the airvent openings when the recharge ponds are flooded. The District will provide said elevation control to the Contractor at the time of construction. The inlet to the valve shall be provided with a ball valve to

provide positive closure between the pipeline and the air valve. The air valves shall release air during pipeline charging procedures, shall automatically release air from the pipeline when under pressure and shall allow air to enter the pipeline when the internal pressure drops below atmospheric. Air valves shall be designed for 100 psi working pressure.

4. **Steel Pipe and Fittings -** All 2-inch, 3-inch and 4-inch pipe and fittings unless otherwise noted on the drawings, shall be schedule 40 galvanized steel.

5. **Ball Valves -** Ball valves shall be ½-inch to 4-inch high quality Bronze body type, rated for 150 psi operating pressures.

6. **Plastic Tape -** All buried galvanized pipe, swing joints, and fittings shall be wrapped with a 10 mil layer of Polyken 900 (polyethylene tape) or equivalent. Additionally, that portion of the pipe riser that runs through concrete shall have an additional 10 mil polyethylene film wrap placed around the pipe for additional protection.

e. Couplings

1. **Bolted Sleeve-Type –** Flexible couplings shall be suitable for water transmission main applications and shall conform to AWWA C219. Couplings shall be Smith-Blair No. 41, Dresser style 253 or approved equal. The flexible couplings shall be installed with provisions for thrust restraint ties attached to the steel piping as shown on the drawings. The thrust restraint ties on the pipe shall be welded lugs, lugs integrally cast with the pipe, or friction collars. Anchor studs placed perpendicular to the long axis of the pipe are unacceptable. Resistance to hydraulic thrust shall be adequate to sustain a force developed by a test pressure of 150 psi.

f. Flowmeter

Flowmeter shall be Seametrics Mag Meter (Reads in CFS [0 to 8 cfs] and Totalizes in Acre-Feet) or approved equivalent. Flowmeter shall be installed with manufacturer approved vane straighteners (If recommended by Manufacturer). **Flowmeter(s) must be wired for power from VFD panel with battery backup and have both 4-20mA and pulse outputs. Units without both outputs are not allowed.**

g. Pressure Transducer

Pressure Transducer shall have a minimum effective operating range of 0 to 100 psi and be accurate to the nearest tenth of a psi. The transducer shall be all-weather rated for outdoor use and direct coupled to its respective conduit, unless otherwise approved.

h. Pressure Gauge

Pressure Gauge shall be 3" oil filled, 100 psi max, equipped with ¼ turn ball valve to provide positive closure between gauge and pipeline. Pressure gauged shall be tee-d off of the same union as the pressure transducer.

i. High Pressure Kill

High Pressure Kill shall be Mercoid DAW-7000 rated at 100 psi shut-off or approved equivalent.

j. Saddle Support

Saddle Support shall be adjustable support, Grinnell Figure 265, B-Line B3093/3089 or approved equivalent with a pipe stanchion and u-bolt, Grinnell Figure 259, B-Line B3090 or approved equivalent. All non-stainless steel supports shall be coated or painted per the specifications.

G-9 Hydrostatic Testing of Piping

a. General – In addition to any tests required by any standard specifications referred to in these Specifications, and in addition to any specified hydrostatic shop or plant tests for pipe specified herein, hydrostatic field tests shall be required for piping installed under this Contract.

b. Test Pressures – The distribution system may be tested in its entirety upon completion, or the system may be tested in reaches by use of installed valves or by bulkheading. In any case, for each reach of the system, said reach shall be tested at operating pressure.

c. Test Requirements – The Contractor shall test all well connection and discharge piping to the specified hydrostatic head in conformance with provisions specified herein. The Contractor shall provide all labor, materials, and equipment required to perform the tests, including all required measuring devices, water and means for conveying water and establishing required hydrostatic heads. Tests shall be made as soon as practical after completion of system construction, but in no event sooner than three days after the placing of any mortar or concrete that will be subjected to hydrostatic pressure during a test. No test shall be performed without 48 hours prior written notice of intent to test being given to the District,

and no test shall be performed without the presence of the District's authorized representative. All test and testing procedures will be subject to the approval of the District. The District will not be responsible for any damage, including damage, connected with testing. Leaks exposed by the tests shall be repaired by and at the expense of the Contractor. The Contractor shall continue testing and repair until the line shows no evidence of leakage over a 24-hour test period. Sweating that does not develop into a flow or drip will not be considered as leakage. If pipe repair is unsatisfactory or if leakage persists after repair, as determined by the District, pipe shall be removed and replaced by new pipe of equivalent type, size, and pressure class and the new pipe similarly retested.

G-10 Measurement and Payment

a. **Well Discharge Piping –** Payment for furnishing and installing well discharge piping, including all valves, meters, airvents, adapters and appurtenances will be included in the Bid Item "Furnishing and Installing Well Discharge Piping" and as per the Plans.

b. **Flow Meters –** No separate payment will be made for Flow Meters. All costs therefore shall be included in the unit price stated in the Bidding Schedule for the well discharge piping of which it is a part.

c. **Check Valves** - No separate payment will be made for Check Valves. All costs therefore shall be included in the unit price stated in the Bidding Schedule for the well discharge piping of which it is a part.

d. **Air Vents –** No separate payment will be made for air vents on the well discharge piping. All costs therefore shall be included in the unit price stated in the Bidding Schedule for the well discharge piping of which it is a part. Payment for furnishing and installing air vent and vacuum valve assemblies on the well connection piping, including pipeline outlet, piping, and associated concrete work, will be made at the unit price stated in the Bidding Schedule.

SECTION H

WELL CONSTRUCTION

H-1 General

a. Scope of Work Summary

1. Introduction

The scope of work encompassed by these specifications consists of providing all labor, equipment, materials, and forces, in addition to performing all operations necessary to provide the Rosedale Rio-Bravo Water Storage District (the District) with new, complete and fully developed water supply wells (the Work); includes 3 wells for the McCaslin and Superior East (Bowling) Recharge Ponds. All Work is to be conducted in strict accordance with these specifications unless otherwise modified and approved by the Rosedale Rio-Bravo Water Storage District (District).

2. Definitions

District Representative: Engineer/Project Manager or other individual designated by the District.

3. Site Location and Description

a) The proposed well sites are located as shown on the Plans.

b) The well design specification presented herein has been based, in part, on the results of drilling and testing existing wells in the area.

4. Drilling Method

The wells shall be drilled using the reverse circulation rotary drilling method in which the uncased wall of the drilled borehole is held in place at all times with a circulating fluid. The new well shall be drilled and completed in such a manner as to produce from all water-bearing zones of acceptable properties and water quality identified by the Designated District Representative. For bidding purposes, the wells shall be completed as shown on the Plans. The final well design, however, will be determined after examination of the formation samples, sieve analyses of drill cuttings, downhole geophysical logs and results of isolated aquifer zone sampling. If the water-bearing zones encountered during drilling are considered adequate to produce the desired quantity and quality of water at each Well Site, then that well will be completed. At

any drilling location where the data collected from the pilot borehole shows that the water-bearing zones are not adequate to produce the desired quantity and quality of water, the pilot borehole at that location will be destroyed and Work at that location will be terminated.

5. **Work Summary**

The general Work required for construction, development and testing at each well site shall include, but may not be limited to, the following:

a) Move on and off the well site.

b) Setup and maintain a temporary field office, electrical service and sanitary facilities.

c) Provide mud tanks for settlement of solids from drilling and development water prior to removal to bermed area for additional settlement before conveying clean water to the point of discharge.

d) Provide temporary pipeline and appurtenances required to convey well development and testing water to the point of discharge.

e) Install permanent conductor casing and sanitary seal.

f) Drill and sample pilot borehole.

g) Conduct downhole geophysical surveys and a gyroscopic alignment survey in the pilot borehole.

h) Ream the pilot borehole to the specified final diameters and depths.

i) Complete a caliper survey of the final reamed borehole.

j) Install blank and perforated well casing, tubing, gravel pack, annular seals, and annular grout seal in accordance with these Detailed Technical Specifications, and the final well design specified by the District Representative and approved by the District.

k) Complete initial well development by airlift swabbing (mechanical development) and/or chemical development.
Install a test pump at a capacity and intake depth specified by the District Representative.

l) Complete well development by pumping and surging.

m) Conduct well production tests (step-drawdown and constant rate discharge tests).

n) Conduct a dynamic flow meter survey where directed by the District Representative.

o) Conduct a color video survey of the completed well.

p) Conduct a well alignment test by gyroscopic methods.

q) Disinfect the completed well in the presence of, and where directed by the District Representative.

r) Complete final site cleanup and restoration to the satisfaction of the District Representative.

s) Provide all records required by the specifications and requested by the District.

b. **Key Project Personnel**

OWNER	Rosedale Rio-Bravo Water Storage District
PROJECT MANAGER/ ENGINEER	Mr. William (Bill) Zeiders Zeiders Consulting (661) 332-5535
HYDROGEOLOGIST	Thomas Harder & Co. Mr. Tom Harder (714) 779-3875

c. **Contractor Site Supervision and Communication**

1. The Contractor shall provide a qualified and experienced foreman and drilling superintendent, one of whom shall be constantly in attendance throughout drilling, construction, development, and testing of the well. In addition to directing all well drilling, construction, development and testing, the foreman shall be capable of coordinating the work with all personnel, subcontractors, the District Representative and the District so that the overall project is successfully executed and completed without undue conflicts or delays. No changes in key Contractor personnel will be allowed without approval of the District Representative. Approval may be granted

provided the qualifications and experience of the replacement worker are equivalent or better than the initial worker.

2. At all times the Contractor shall have at the work site the means for communicating (i.e. cellular telephones) between all workers at the site, their office and the District Representative. Two-way radios are not an acceptable form of communication. The telephone numbers for all workers shall be provided to the District Representative at the pre-construction meeting so that the Contractor's personnel are available at all times for status updates. Telephones with a vibrating mode shall be made available to crewmembers so that the incoming calls may be detected above the noise at the work site.

d. **Contractor Responsibilities**

1. The Contractor is solely responsible for making all necessary provisions for mobilizing onto and demobilizing from the well sites with their equipment, tools, supplies, materials, and personnel.

4. The Contractor shall satisfy himself of all local conditions affecting his work. The Contractor is responsible to have inspected the well sites prior to submitting a bid and commencing construction activities.

2. The Contractor shall remove from the work area all drill cuttings and drilling fluids and dispose of them as directed by the District Representative. All costs associated with collecting, removing, and disposing of drill cuttings shall be incorporated into the Contractor's bid and paid for solely by the Contractor.

3. The Contractor shall convey all water discharged during development and testing in a closed pipe to a discharge point as directed by the District Representative.

4. The Contractor shall submit all required reports and data to the District Representative and other appropriate agencies.

5. The Contractor shall keep the District Representative continuously informed of the on-site work schedule so that drilling, construction and testing activities can be monitored as required by the District Representative.

6. The Contractor shall restrict ingress, egress, and Work activities at each well site to the established basin levees, roads and well pads as shown on the Plans. The Contractor is responsible for any damage to properties adjacent to the well sites caused by Contractor activities associated with the Work described herein and shall restore these properties to their original condition.

e. **Well Construction Standards**

The new well shall be constructed in compliance with (1) the latest edition or supplement(s) of: *State of California Water Well Standards, Bulletin No. 74-81* dated December 1981 and *Bulletin No. 74-90* dated June 1991, (2) local modifications to these Standards, (3) Sections 13800 through 13806 of the California Water Code, and (4) American Water Works Association (AWWA) Standard for Water Wells (AWWA A100-97 or later).

f. **Contractor Equipment**

1. **General**

a) The Contractor shall provide all equipment, tools, supplies, materials, power and personnel required to complete the work.

b) All equipment supplied by the Contractor shall be in good working condition and available for inspection by the District Representative prior to the beginning of the Work. If, in the opinion of the District Representative, any of the equipment is not suitable for well drilling, construction, development and testing operations, either because of mechanical problems, excessive noise, deviation from the specifications, or the build-up of substances which could cause well contamination (i.e., from oil, diesel, hydraulic leaks or exhaust residue, etc.), the Contractor shall adjust, replace or decontaminate it with suitable equipment at the Contractor's expense.

2. **Drilling Equipment**

a) Each new well shall be drilled using a reverse circulation rotary drilling method in which the uncased wall of the drill borehole is held in place at all times with a circulating fluid. The Contractor shall provide a complete drilling unit with all tools, accessories, power, lighting, water, other equipment and experienced personnel necessary to conduct efficient drilling operations at the site.

b) The drilling equipment shall be in good condition and of sufficient mast capacity to drill each borehole required by these specifications to a depth specified on the Plans. All drilling equipment including mast and draw-works, air compressors, drilling fluid pumps, drill pipe, etc., must be of requisite size, sufficient capacity, and in suitable condition to drill and set casing to the anticipated depths in each well. The mast and all running gear (hoists, cables, etc.) shall have sufficient and demonstrated capacity to lift two (2) times the buoyant weight of either the drill string or the blank and perforated well casing assembly (whichever is greater). The drill rig utilized must have the ability to fully lift and land the anticipated

casing loads without the use of cranes, float plugs, or other similar methods. Minimum Rig lift capacity shall be 180,000 lb. pull.

c) The Contractor shall submit, upon request, detailed information documenting the capacity and type of required equipment including, but not limited to:

1) Derrick/mast height and load capacity

2) Total available rig horsepower

3) Drill pipe type and rating

4) Deviation survey mechanical drift indicator

5) All line and hook load capacities

6) Air compressor rating (minimum capacity rating of 750 cfm @ 200psi)

7) Specifications for single and dual swab tools

8) Specifications for discharge water storage tanks

9) Specifications and calibration information for the inline flow meter

10) Types and manufacturers of all drilling fluids and other chemicals to be used

11) Mud pump capacity

12) Variable speed test pumping equipment

13) Size and type of bowl and column assembly

All drill pipes and tremie pipes must utilize flush threaded or upset tool joints, or equal, as approved by the District Representative.

Drilling equipment shall be disinfected on site prior to use. The methods, chemicals and dosages employed shall be approved by the District Representative.

3. **Mud Tanks**

Excavated mud pits will not be allowed. Portable tanks are required, which allow the drill cuttings to settle. The tanks will have a minimum of three chambers and have sufficient capacity to allow for proper settling of drill cuttings as approved by the

District Representative. The tanks will be cleaned periodically to ensure that the drilling fluid remains clean prior to its re-entry into the borehole. At no time shall the height of the material settled in the tanks exceed two feet. Drilling fluid re-circulated to the borehole shall not contain in excess of one percent sand. Materials cleaned from the tanks shall be properly disposed of at the Contractor's expense. Drill cuttings may be disposed of on site at the approval and direction of the District Representative.

4. **Containment of Heavy Fluid**

The Contractor shall berm up an area adjacent to each well site (sites to be approved by the District Representative) sufficient to contain the Heavy Fluids to prevent discharge outside of the designated area (300' x 300' or equivalent area). If no area is available for heavy fluids containment, they must be removed and disposed of offsite. Upon completion of each well and when containment area has dried sufficiently for all fines to be removed from the containment area, said fine materials from well construction operations shall be removed and disposed of on-site as directed by the District Representative.

5. **Discharge Piping**

The Contractor shall provide temporary discharge piping of adequate capacity and length to convey water pumped during well development and testing to the point of water discharge specified by the District Representative.

g. **Water Source**

The District will provide a water source for the Work. For bidding purposes, water may be obtained as shown on the Plans and as indicated in the Bid Documents. The Contractor is responsible for providing a water truck or other means for delivery of water from the well to each respective drilling site. All costs for delivery of water to each drilling site shall be the responsibility of the Contractor.

h. **Discharge Of Water Generated During Well Drilling, Construction, Development, and Testing**

1. Clean water generated during the Work that is not contained within the Containment Area shall be discharged to a point within the existing basin that is at least 100 ft. from each well pad as directed by the District Representative.

2. Any water related to the Work that is not contained in the Mud Tanks or storm water runoff during the Work shall be contained on each well site. As necessary, the Contractor will provide sand bags or other means for containing water onsite.

3. At the completion of the Work, residual solids within the area of discharge shall be transported to the site designated by the District Representative for proper disposal at the Contractor's expense.

i. **Work Hours**

1. Work at each site shall be continuous from the start of the drilling of the pilot borehole to the placement of the casing, screen, filter pack material and annular seals (except for the time spent waiting for the final well design), unless otherwise approved by the District Representative. Continuous drilling shall minimize both the risk of borehole collapse and the time that the formations are in contact with the drilling fluid.

2. No work shall be performed on major holidays, unless otherwise agreed to by the District.

j. **Noise Control**

1. **General**

This section covers the installation of noise control devices and other measures required to meet local noise ordinances and to minimize disturbances to persons living and/or working nearby the well site. The Contractor shall be responsible for becoming familiar and complying with local noise ordinances.

2. **Materials and Equipment**

Where applicable, measures to be used in effecting noise suppression shall include (but are not limited to):

a) Equipping all internal combustion engines with critical residential silencers (mufflers).

b) Shielding noise-producing equipment from nearest areas of human occupancy by locating in such positions as to direct greatest noise emissions away from such areas.

c) Installing sound blankets over equipment, and shielding noise-producing equipment.

3. **Execution**

Location appropriate noise suppression shall be practiced at all times to minimize disturbance to persons living or working nearby, and to the general public. Noise control measures shall be installed to direct the greatest noise emissions away from these receptors. Operations shall be conducted in a manner to minimize noise generation consistent with the execution of the contract in a timely and economic manner.

k. **Dust Control**

The Contractor shall take all measures necessary to control the generation of dust during all Work. Dust control measures could include (but not be limited to) periodic application of water to the unpaved areas on and immediately adjacent to each work site, providing a gravel cover for access points to each work site, modification of operations to prevent dust generation, or other. In the event that the District Representative identifies a dust control problem, the Contractor shall take immediate steps to mitigate the dust.

l. **Required Permits**

1. The Contractor shall be required to obtain the necessary number of well construction permits from the Kern County Public Health Services Department, Environmental Health Division, prior to beginning the Work. A copy of the well permits shall be kept on the work sites at all times during the Work. The Contractor shall be responsible for all costs necessary to comply with the well permits.

2. Upon completion of each well, the Contractor shall be responsible to file well completion reports with the California Department of Water Resources (CDWR). A copy of the well completion reports shall be provided to the District upon completion.

m. **Records**

1. The Contractor shall keep a daily log and progress record at each site readily available for inspection during drilling of the pilot borehole, construction and testing of each new well.

2. Specific records associated with each on-site activity are listed in Sections H Table 1 of these Detailed Technical Specifications. In general, the Contractor shall keep records providing the following information for each well site:

a) Driller's description of formation materials penetrated at 10-foot intervals and at each major change of formation (from both the conductor casing borehole and pilot borehole).

b) Log of drill bit types, diameters and changes.

c) Log of drilling penetration rate.

d) Drilling fluid properties at 4-hour intervals including mud weight, Marsh funnel viscosity, sand content, solids content, water additions and mud additives used.

e) Borehole deviation measurements at 100-ft intervals.

f) Results of downhole geophysical surveys completed in the pilot borehole.

g) Results of downhole alignment survey of the pilot borehole.

h) Results of caliper survey of the final reamed borehole.

i) Well construction activities including final schedule and diagram of installed blank and perforated well casing, gravel feed tube, air vent tube, sounding tube(s) and annular fill materials.

j) Cross-sectional diagram illustrating the design and structure of the splice section in the well casing for entry of the sounding tube.

k) Installation of test pump and appurtenances including summary descriptions of pump type, diameter, intake depth, make, model, horse power, rated capacity, flow control valves, flow meter and discharge piping.

l) Records of well development by mechanical methods (swabbing and airlift pumping) and pumping methods using a test pump.

m) Records of pumping test results using a test pump. Records shall be maintained at the time intervals requested showing static water level, production rate, pumping water level, drawdown, gravel pack settlement and additions, water clarity, depth interval developed and other information requested by the District Representative.

n) Sand production test results from development and test pumping.

o) Setup and results of flow meter survey.

p) Results of well alignment and deviation surveys.

q) Records of chlorine concentrations used for well development and disinfection.

r) Results of the downhole color video survey of the completed well.

s) Schedule of well destruction, if applicable.

The District will not be responsible for any "excessive" drilling or other well construction activity prior to well abandonment that could have been avoided, should the Contractor fail to maintain and provide any of the above mentioned records.

n. **Submittals**

All records shall be available to the District Representative and/or the District at all times at each job site. Submit submittals in accordance with Section D-7 of the Special Conditions. Section H of these detailed technical specifications lists submittals required for specific well construction and destruction activities.

H-2 Well Pad Construction – Not Applicable

Well Pads are already constructed for each well site as shown on the Plans.

H-3 Well Drilling and Construction

General requirements, materials and execution for construction of the District wells are presented in the following sections. The well locations and construction drawings are shown on the Plans.

a. **Mobilization, Demobilization, and Temporary Facilities**

1. **General**

a) Mobilization shall include: (1) transportation of personnel, equipment, and operating supplies to and from the well sites, (2) establishment of temporary field office, power and portable sanitary facilities, (3) obtaining an adequate source of fresh water (4) setup of temporary water storage facilities, discharge line and appurtenances, and (5) other preparatory work required to complete construction of a new well or wells including equipment and related facilities. Other preparatory work may include (but not necessarily limited to) traffic control, noise control measures, signs, ramps, dust control, and earthworks.

b) Demobilization shall include removal of all equipment, materials, and temporary facilities installed during mobilization, well drilling, completion, and development phases of the Work. Demobilization will also include restoration of

the site to its original condition to the satisfaction of the District Representative and the District.

c) Submittals

Well Driller's Permits from the Kern County Public Health Services Department, Environmental Health Division.

d) Measurement and Payment

Payment for mobilization and demobilization shall be at the lump sum price bid.

2. **Materials**

Requirements for Contractor equipment are specified in Section H-1f.

3. **Execution**

a) At no time shall equipment, tanks and/or facilities, for performing the work, be allowed to encroach on the adjacent basin bottoms or field areas unless authorized by District Representative.

b) The Contractor shall secure and maintain temporary water service for the work as described in Section H-1g.

c) The Contractor shall provide a temporary field office at the well sites for the joint use of Contractor personnel and District Representatives. The field office shall be of adequate size and equipped to: 1) protect personnel, field and sampling equipment, other material, and documents from the elements; and 2) provide a workspace where the aforementioned parties can meet and review, analyze, and discuss drilling data and logs, contract drawings, final well design and construction, or other issues. A house-type trailer, mobile office, or container office (8-ft x 16-ft minimum size) supplied with electricity and lighting is considered acceptable as a field office. Special plan racks, heating or air conditioning, and hot running water are not required.

d) The Contractor shall provide portable sanitary facilities for use by all personnel connected with the well construction project. These facilities shall remain in place during all phases of the work.

e) The Contractor shall keep the well sites free from accumulations of waste materials, rubbish, and other debris resulting from the work. At completion of the

work, the Contractor shall remove all waste materials, rubbish, and debris from and about the well sites as well as all tools, construction equipment, fuel tanks, machinery, temporary structures, and surplus materials. The Contractor shall leave each site clean and ready for use by the District. The Contractor shall restore all temporary work areas at each site to their original condition.

f) The Contractor shall prevent damage to the well sites and adjacent properties associated with pumping water during drilling, development, or testing or due to interruption or diversion of storm or wastewater during execution of the work.

g) Dirt and sediment shall be kept out of water disposal/drain lines at all times. The Contractor shall properly dispose of all drilling, waste, and nuisance water.

h) The Contractor shall perform necessary work to contain/control leaking equipment. Generation of hazardous materials by the Contractor during the course of work caused by his negligence (e.g., oil, and/or hydraulic spills or leaks) shall be cleaned, removed, and properly disposed of at the sole cost of the Contractor. Any materials suspected by the District Representative of being contaminated due to ambient conditions will be analyzed by the Contractor for potential contaminants, at his/her expense. Any sample that contains levels of contaminants in excess of Federal and State disposal standards shall be properly disposed of by the Contractor. The Contractor, not the District, shall be listed as the generator of the hazardous waste on all manifests. The Contractor shall provide the District with a copy of the initial manifest and the final manifest, which indicates waste receipt by the disposal site.

i) Well development and testing water for each well site shall be conveyed to the discharge location as designated by the District Representative.

j) Drill cuttings shall be disposed of in accordance with all local and state laws prior to demobilization to the satisfaction of the District Representative. An approved disposal site on District property may be designated by the District Representative.

k) The Contractor shall provide all equipment and personnel to restore each site as required by the individual site conditions. Demobilization and site restoration will include, but not be limited to grading restoration, etc. All restoration and resurfacing work will be deemed acceptable upon approval of the District Representative. Payment for site clean-up will not be made until the site restoration has been approved by the District Representative. If each site is not accepted, the Contractor will make the necessary adjustments to make the site(s) acceptable.

l) The Contractor shall repair or replace all existing improvements that are damaged or removed as a result of his operations. Such improvements include curbs, gutters, sidewalks, pavements, utility installations, structures, berms, levees, etc. Repair and replacements will be at least equal to existing improvements and will match them in finish and dimension. All cuts in asphalt and concrete shall be repaired by saw cutting around the damaged area and replacing it with the appropriate patching material. Repair or replacement of asphalt, concrete, or other existing features damaged due to Contractor's negligence (i.e., diesel or hydraulic leaks or spills) shall be the sole responsibility of the Contractor. Damaged asphalt will be properly repaired as required by governing city or county agency.

b. **Conductor Borehole, Casing and Sanitary Seal**

1. **General**

a) For each site, this item includes drilling a conductor borehole, installation of conductor casing and installation of a cement grout sanitary seal in the annulus between the borehole and conductor casing to 50 ft.

b) Each sanitary seal installed shall meet the requirements of California Department of Water Resources Bulletins 74-81 and 74-90, and all requirements of the Kern County Public Health Services Department, Environmental Health Division.

c) Submittals and Notifications

1) Certified test reports to show compliance with both the physical and chemical properties of the steel.

2) Cement weight or batch tickets.

3) The Contractor shall notify the District Representative and the Kern County Public Health Services Department, Environmental Health Division (PHSD) at least 48 hours in advance of drilling and setting the conductor casing and cement grout sanitary seal around the conductor casing. Unless pre-approved, installation shall not proceed without the District Representative, and PHSD inspectors being present at each site.

d) Measurement and Payment

1) Payment for this work item will be based on the unit price bid for the vertical feet of continuous grout seal placed adjacent to the conductor casing measured from the ground surface, excluding any lower portions of the annulus

backfilled with non-grout materials. Payment shall include all materials, labor, tools, and equipment required to drill the conductor borehole, collect formation samples, protect the borehole from collapse, supply and install conductor casing, and supply and install the cement grout sanitary seal at each site.

2) Any conductor casing and/or sanitary seal installed to a depth less than the minimum specified in the bid schedule will not be accepted for payment and shall be replaced by the Contractor at the Contractor's expense.

2. **Materials**

a) Conductor Casing

1) Each conductor casing shall be constructed of mild steel in accordance with ASTM Specification A53, Grade B. The casing shall have an outside diameter as indicated on the plans with a minimum 3/8-inch wall thickness.

2) A minimum of 50 feet of conductor casing shall be installed in each conductor borehole. Each conductor casing shall not be fabricated in less than 20-foot lengths. It shall be spiral welded or contain one longitudinal seam parallel to the casing axis and not more than one circumferential seam in 10 feet, or as otherwise approved by the District Representative. All spiral or longitudinal and circumferential seams shall be butt-welded with shielded arc electrodes to assure full fusion with the parent metal and complete penetration.

3) The ends of each joint shall be machine-beveled.

4) All joints in each conductor casing shall be securely welded in continuous passes and shall be watertight. All welding shall be done with shielded arc electrodes and shall be performed in accordance with American Welding Society Standards.

5) All casing material shall be new.

b) Sand-Cement Grout

1) The grout used to fill the annulus between the conductor borehole and conductor casing shall consist of a 10.3-sack sand-cement mixture. The cement shall consist of standard brand Portland Type II cement (ASTM C150). Unless specified otherwise, there shall be not more than two parts by weight of sand to one part by weight of cement. The water cement ratio shall

be about 7 gallons per sack of cement (94 pounds). All on-site water additions shall be metered.

2) The seal installed shall meet the requirements of *California Department of Water Resources Bulletins 74-81 and 74-90*, and all requirements of the Kern County Public Health Services Department, Environmental Health Division.

3) Water used for cement and grout mixtures shall be clean and of potable quality.

4) Materials used as additives for Portland cement mixtures in the field shall meet the requirements and latest revisions thereof, ASTM-C494, Standard Specifications for Chemical Admixtures for Concrete.

5) Special quick-setting cement, retardants to setting, and other additives, including hydrated lime to make the mix fluid (up to 10 percent of the volume of cement), and bentonite (up to 5 percent) to make the mix more fluid and to reduce shrinkage, may be used.

3. **Execution**

a) Conductor Casing Borehole

1) Each borehole shall be drilled at a location confirmed in the field with the District Representative. Drilling shall not commence without the District Representative on-site unless previously agreed by the District Representative.

2) The Contractor shall drill each conductor borehole to a diameter as indicated on the Plans using a bucket auger or other drilling method approved by the District Representative.

3) During drilling, the Contractor shall collect and preserve representative samples of formation materials at 10-feet intervals and each major change in formation, in accordance with sampling procedures specified in Section H-3c. - Pilot Borehole.

4) Upon completion of drilling, the Contractor shall condition each borehole and take whatever steps are necessary to maintain and prevent collapse of any borehole prior to and during placement of the conductor casing and cement grout sanitary seal.

b) Installation of Conductor Casing

1) When the drilling operation has been completed to the satisfaction of the District Representative at each site, the conductor casing shall be installed. The MINIMUM length of the conductor casing installed below the ground surface shall be 50 ft. The final length shall be approved by the District Representative. Each conductor casing shall extend to the ground surface, be held in plumb position and shall be placed on the bottom of the borehole.

2) All field joints shall be properly butt-welded to assure complete penetration during welding with a minimum of two passes. All joints shall be watertight. Special care shall be exercised to ensure that the casing is straight. All field welding shall be performed in accordance with American Welding Society Standards by a certified welder.

3) Centering guides shall be securely welded to each conductor casing with a minimum of two sets of guides installed (one near the bottom and one near the top). Each set shall consist of three guides equally spaced circumferentially. The guides shall be fabricated and placed as shown on the Plans.

c) Installation of the Grout Seal

1) After each conductor casing is installed and aligned, the annular space between the conductor casing and the conductor casing borehole shall be filled with cement grout from the bottom of the borehole to the ground surface**. The MINIMUM depth of each grout seal shall be 50 ft.** Prior to grouting, the Contractor shall fill the inside of the conductor casing with water to balance the hydrostatic pressure between the inside and outside of the casing during placement of the grout.

2) The grout shall be pumped into each annular space through a tremie pipe installed to the bottom of the borehole. The bottom of the tremie pipe shall remain submerged in the grout throughout the placement of the grout. The placement procedure shall be approved by the District Representative prior to installation of the grout seal. The Contractor shall take all precautions to prevent the collapse of any conductor casing and borehole during placement of the grout.

3) Each grout seal shall be placed in one continuous pour.

4) The Contractor shall not operate any equipment on-site during the 24-hour period immediately after the grout has been placed at any site.

5) In the event any borehole or part of any borehole collapses prior to completion of grouting, the Contractor shall take whatever steps are necessary to reopen

the borehole, reset the casing and place the grout as required. Any such remedial action shall be conducted at the Contractor's expense.

c. **Pilot Borehole**

1. **General**

a) This item includes drilling a nominal 17.5-inch (18" maximum) diameter pilot borehole by the approved drilling method to a total depth as shown on the Plans or as directed by the District Representative.

b) Related Work Specified Elsewhere

Drilling Fluid – Section H-3d

c) Submittals

1) Daily activity report.
2) Samples of formation materials.
3) Lithologic log.
4) Drilling rate log.

d) Measurement and Payment

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

2. **Materials**

a) Drilling Fluid

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

3. **Execution**

a) Pilot Borehole Drilling

1) Each nominal 17.5-inch diameter pilot borehole shall be drilled from the bottom of the conductor casing to a total depth as shown on the Plans or as directed by the District Representative. The Contractor shall take all measures necessary to protect the borehole from caving or raveling.

2) Deviation surveys shall be conducted at 100-ft intervals as the drilling proceeds at each site using either Eastman, Totco, or Martin-Decker mechanical drift indicators, or as otherwise approved. Three-degree (3°), metal targets shall be used. Paper targets will not be allowed without explicit approval from the District Representative. A maximum deviation of 1/2° from vertical per 100 ft. will be allowed at any site. If this amount is exceeded at any site, the Contractor will be required to correct the deviation at that time. **If the deviation is not corrected, the borehole will be abandoned and will be re-drilled at the Contractor's expense**. The District is not responsible for any unnecessary drilling that results from the Contractor not performing deviation surveys or failing to provide deviation surveys to the District Representative in a timely manner.

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

b) Formation Sampling

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

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

d. **Drilling Fluid**

1. **General**

a) Description

This section describes requirements for fluids used during drilling. The Contractor may use fresh water or a combination of fresh water, bentonite clay, and polymer (both drilling additives) during well construction. It the Contractor elects to use a drilling mud additive at any time during well construction, the fluid properties shall conform to standards set forth in this Specification. This section describes requirements for optional fluids used during drilling. **The use of drilling mud additives shall result in no additional cost to the District, and shall not be classified for payment.**

b) Submittals

Concurrently with contract submittals, the Contractor shall provide a description of the drilling method and fluids to be used. The drilling fluid program described shall include: (1) information regarding the types of fluid to be used, (2) intended fluid weights, viscosities, sand and solids contents, (3) name of the supplier of the drilling fluid additives, and (4) name and qualifications of the mud engineer the Contractor would intend to use, if required.

c) Measurement and Payment

Payment for maintaining, testing, and disposal of drilling fluids shall be included in the unit prices bid for drilling (see Bidding Sheets). The cost associated with the use of bentonite, drilling gel, or any other additive to fresh water not specified herein (at the Contractor's option) shall be included in the appropriate line items for the base bid and District-Option bid (i.e. Drilling, Reaming, Swabbing and Airlifting, Chemical Development, etc.)

2. **Materials**

a) Fresh Water

1) All water used during construction shall meet standards of irrigation water as determined by the Engineer.

b) Drilling Fluid

1) Only fresh potable water shall be used in the drilling fluid whether employed alone or in combination with drilling additives. All water used during drilling shall meet California State Department of Public Health standards for irrigation water. Only high grade approved commercial clays or commercial chemical products in common usage in Kern County for water well drilling

shall be used in the make-up of any drilling fluid. **Organic drilling additives shall not be used unless previously approved by the District Representative.** Drilling with a mixture of water and unprocessed mud, clay or other material will not be permitted.

2) The drilling fluid shall possess such characteristics as are required to (a) adequately maintain the walls of the borehole to prevent caving, (b) permit recovery of representative samples of drill cuttings, (c) prevent the swelling of clay zones, (d) prevent loss of shear strength or other borehole stability problems, and (e) allow the fluid and mud cake to be readily removed from the borehole and borehole wall during placement of the gravel pack and development of the well. All drilling fluid test equipment and procedures shall be equal to those used in the oil well drilling industry.

3) The drilling fluids shall have the following properties in accordance with API Code RP 13B (or recent modification), "Recommended Standard Procedure for Testing Drilling Fluids." In the event the Contractor cannot attain these properties, drilling shall be halted and the mud replaced.

4) Weight - a maximum of 9.5 pounds per gallon during pilot borehole drilling, a maximum of 9.5 pounds per gallon during pilot borehole reaming, and a maximum of 8.5 pounds per gallon during well construction and gravel packing.

5) March Funnel Viscosity - a maximum of 38 seconds during pilot borehole drilling and pilot borehole reaming, and a maximum of 29 seconds during well completion and gravel packing.

6) Filter Cake - a maximum of 2/32 inches.

7) Sand Content of Mud Entering the Pump - a maximum of one (1) percent by volume during all stages of drilling.

8) pH – seven (7) to nine (9) units.

3. **Execution**

a) The Contractor shall provide adequate baffled above ground tanks with solids control equipment, for the collection and removal of drill cuttings/solids from the fluid before re-circulation to each borehole. The mud tank capacity shall be sufficient to effectively separate drill cuttings from the fluid and keep sand and solids contents below the specified amounts. Sediment shall be removed

periodically from the tanks in order to maintain tank volume and keep drilling fluid properties within specifications.

b) The Contractor shall maintain controlled drilling fluid characteristics during the entire operation of well construction. If proper control of the drilling fluid is not maintained to the satisfaction of the District Representative, the Contractor shall be required to retain at the Contractor's own expense a qualified drilling fluid engineer during all operations to supervise and maintain drilling fluid properties.

c) The Contractor shall maintain the minimum viscosity of the drilling fluid that will raise cuttings and adequately condition the wall of the borehole. The Contractor shall remove all mud cake on the wall of the borehole during the development of the well or placing of the gravel.

d) The sand content of the drilling fluid shall be measured and recorded a minimum of every four (4) hours during drilling or circulation. The sand content of the fluid returning to the borehole shall be maintained at one (1) percent (by volume), or less, at all times.

e) In the event that drilling additives are used, the Contractor shall maintain careful mud control. Procedures must be adopted to ensure removal of these additives during the development process. The Contractor shall maintain a continuous log of mud weight, funnel viscosity, 30-minute water loss, wall cake thickness, pH and sand content. Fluid checks shall be taken at a minimum of every four (4) hours during drilling, whenever conditions appear to have changed, or if difficulties arise.

f) The Contractor shall provide a District Representative-approved device or system for collection of whole representative samples of formation materials drilled. **Samples collected off a shaker screen are not acceptable unless previously approved by the District Representative.**

g) All drill cuttings and drilling mud shall be removed from each work site and disposed of in accordance with applicable ordinances and regulations of governmental agencies having jurisdiction. No additional compensation will be paid to the Contractor for fluid disposal or treatment prior to disposal.

h) After each borehole has been reamed, and before the caliper survey is run, the drilling fluid shall be appropriately thinned in preparation for installation of the well casing and gravel pack.

e. **Downhole Geophysical Surveys**

1. **General**

a) Description

This item includes completion of downhole geophysical logs to be conducted in each pilot borehole by a logging firm retained by the Contractor and approved by the District Representative. Geophysical surveys to be completed in each pilot borehole shall include:

1) Gyroscopic borehole alignment survey

2) Resistivity (including curves for spontaneous potential, point resistance, 16-inch normal resistivity, 64-inch normal resistivity, and focused guard resistivity or lateralog)

3) Natural Gamma-ray Log

4) Sonic Velocity Variable Density Log

b) Submittals

1) Within ten (10) days of Notice of Award, the Contractor shall submit to the District Representative the name and qualifications of the firm proposed for completing geophysical surveys.

2) The Contractor shall provide five (5) field copies of the surveys to the District Representative for interpretation upon completion. Within one week of log completion and at no additional cost, the Contractor shall provide the District Representative with five (5) final copies of each survey and a compact disk containing survey results in a digital format(s) approved by the District Representative.

c) Measurement and Payment

1) Payment for geophysical surveys will be based on the lump sum price bid (see Bidding Sheets). Payment shall include full compensation for fluid circulation, removal of drill string, operation of the drilling rig and other equipment, furnishing and operating geophysical surveying equipment as specified, field and final copies of the surveys, digital copies of the surveys, and providing whatever assistance may be required to complete the surveys.

2) There will be no additional payment for rig time and idle time while waiting for the surveying firm to arrive or while the surveys are being conducted.

3) Upon receipt of copies of geophysical surveys, the District Representative may require an evaluation period of up to 72 hours, excluding weekends and holidays, to interpret the data and prepare schedules for final well design. No standby time will be paid during the evaluation period. The evaluation period begins after receipt of geophysical logs and Contractor's lithologic log of drill cuttings for each site. Standby time will be paid for each hour after the specified evaluation period for which the Contractor waits to receive instructions.

2. **Materials**

Geophysical logging equipment shall have the capability of producing representative borehole resistivity logs (16-inch and 64-inch normal), spontaneous potential, guard resistivity or lateralog, natural gamma and sonic velocity logs.

3. **Execution**

a) Upon completion of each pilot borehole, downhole geophysical surveys shall be conducted. Before conducting geophysical surveys, the Contractor shall cease drilling and circulate fluid for not less than one (1) hour.

b) The geophysical surveys shall be conducted in the presence of the District Representative. The surveys shall become the property of the District Representative at the time the surveys are completed.

c) The logging speed for all surveys shall be 40 feet per minute, unless otherwise approved by the District Representative.

d) If a survey probe fails to descend to the completed depth of any borehole, the Contractor shall at the Contractor's own expense, re-condition that borehole to permit the probe to descend to the maximum depth drilled or other depth approved by the District Representative. No additional payment will be made for time required to clean or condition the borehole for logging.

e) The Contractor shall provide whatever assistance may be necessary to complete the geophysical surveys.

f) The Contractor shall ensure the stability of each pilot borehole during the analysis period following completion of the geophysical surveys.

g) Within the 72-hr evaluation period, the District Representative will submit to the Contractor a written schedule for the final well design. Schedules submitted will be based upon an evaluation of formation samples, results of sieve analyses and the downhole geophysical surveys.

h) If available information indicates well completion is not warranted at a particular site, the District reserves the right to terminate further work at that site under the contract. In this event, the borehole will be destroyed in accordance with Section H-6b of these Technical Specifications.

f. **Isolated Aquifer Zone Testing**

1. **General**

a) Description

This item includes installation of a zone testing tool in the each borehole, development pumping, water quality sampling and analyses, and water level monitoring to be completed at the option of the District Representative in isolated aquifer zones selected by the District Representative. For bidding purposes, it is assumed that testing will be conducted within three (4) isolated aquifer zones at one site. The final number and depth of individual tests will be determined by the District Representative after analysis of a lithologic log of drill cuttings, results of sieve analyses and downhole geophysical logs.

b) Submittals

1) Daily activity reports.

2) Results of aquifer zone testing including description of zone isolated (perforated interval, schedule of annular fill materials installed, water production rates, water levels and water samples collected).

c) Measurement and Payment

Payment for isolated aquifer zone testing will be based on the unit price bid per zone. **There will be an evaluation period of five (5) working days (not including weekends) to commence immediately following collection and submittal of water quality samples from the final isolated aquifer zone at each site.** The evaluation period will allow time to obtain water quality results, analyze the data from the pilot borehole, and develop the final design for the well. No standby time will be paid during the District Representative's evaluation period. Standby time will be paid for each hour after the analysis period for

which the Contractor waits to receive instructions for pilot borehole reaming and final well construction.

2. **Materials and Equipment**

a) Slotted Sampling Tool

1) The tool used to sample groundwater quality and water level in an isolated aquifer zone shall consist of a minimum 6-inch diameter mill-slotted steel pipe with minimum 0.060-inch slots.

2) The length of the slotted pipe shall be 10 to 20 feet as approved by the District Representative.

3) The approximate open area of the slotted pipe shall be 5.5 square inches per foot of pipe.

b) Gravel Pack

Gravel pack materials installed around the slotted sampling tool shall be coarse-grained sand or pea gravel washed clean of fine-grained sediment.

c) Annular Seals

Fill material used to seal the annulus at the top and bottom of the slotted sampling pipe shall consist of bentonite chips, pellets, or otherwise approved by the District Representative.

d) Air Compressor

The compressor used for air-lift pumping shall be capable of overcoming up to 1,000 ft. of lift.

e) Submersible Pump

An environmental sampling submersible pump with a capacity of up to 200 gallons per minute shall be provided by the Contractor and used at the District Representative's option to provide an indication of zone yield and enable the collection of groundwater samples from each zone test. The pump and column pipe shall be clean and assembled using a threaded joint compound approved for environmental use.

3. **Execution**

a) Schedule of Sampling

Upon completion of the downhole geophysical surveys, the District Representative will prepare a schedule of testing and sampling for specific isolated aquifer zones at each site chosen for such testing. The schedule will specify the number and depth of individual zones to be tested, depth intervals for gravel pack and seals, specific sampling requirements and method of pumping for sample collection (air-lift and/or submersible pump).

b) Construction and Testing of Individual Isolated Aquifer Zones

Figure 1 shows a schematic diagram depicting requirements and dimensions for isolating a specific aquifer zone for testing at each site. Testing shall commence with the deepest zone selected and proceed progressively to shallower zones until all specified zones have been tested. General procedures for zone construction and testing at each site include:

1) Install the slotted sampling tool to the specified depth. Fill the borehole annulus with gravel pack materials to a depth of approximately 30 feet below the lowest slots of the sampling tool. Install a 10-feet thick lower bentonite seal in the annulus above the gravel pack. Install gravel pack materials above the lower annular seal to a depth of approximately 20 feet above the upper-most slots of the sampling tool. Install a 5-feet thick layer of plaster sand. Install a 10-feet thick upper bentonite seal in annulus above the plaster sand. Install a 20-feet thick layer of gravel pack materials in the annulus above the upper seal**. Fill materials shall be installed in the annulus using a tremie pipe and District Representative-approved procedures.** Upon completion, the Contractor shall allow sufficient time (minimum of 4 hours) for the bentonite/barite seals to hydrate and setup before beginning air-lift development.

2) Install an air-line inside the sampling tool string to a depth of at least 150 feet below the static water level in the isolated aquifer zone. Adjust the depth of the air-line as needed to accommodate conditions encountered

3) Record the static water level in the sampling tool prior to starting air-lifting operations.

4) Develop the isolated aquifer zone by airlifting methods for a minimum of 6 hours or until the discharge water is essentially free of drilling mud and fine sediment and the specific conductance stabilizes to the satisfaction the District Representative. Assist the District Representative in the collection of

representative samples of discharge water for water quality testing, as requested by the District Representative. Collect and preserve water samples at one-half hour intervals during air-lifting using containers acceptable to the District Representative.

5) Record the final stabilized static water level in the isolated zone after air-lift pumping has stopped.

6) At the District Representative's option, install a submersible pump inside the sampling tool string to a depth specified by the District Representative (generally on the order of 150 feet below the static water level in the zone tested). Record the static water level. Commence pumping and pump the isolated aquifer zone for a minimum of 2 hours after the discharge water clears and/or the specific conductance, pH, and temperature of the discharge water stabilizes to the satisfaction of the District Representative. Measure and record the pumping rate and pumping water level. Assist the District Representative with sample collection as requested.

7) After a final water sample is collected, cease pumping and allow the water level in the isolated zone to stabilize. Measure and record the stabilized water level. Remove the sampling pump and repeat the above procedures to construct and test the next isolated aquifer zone, as applicable.

g. **Final Reamed Borehole**

1. **General**

a) Description

This item includes enlarging (reaming) the pilot borehole to the final borehole diameter and depth specified by the District Representative for each final well design. Each pilot borehole will be enlarged from a minimum of 17.5-inch diameter to the diameter shown on the Plans from 50 ft. below ground surface to the total depth specified by the District Representative. For bidding purposes, the total ream depth will be as shown on the Plans.

b) Related Work Specified Elsewhere

Drilling Fluid – Section H-3d

Contractor Equipment – Section H-1f.

c) Submittals

Daily activity reports.

d) Measurement and Payment

Payment for reaming operations at each site shall be for the number of linear feet of pilot borehole reamed to the specified diameter(s) (see Bidding Sheets). Measurement for payment for borehole reaming shall be from the bottom of each conductor casing to the bottom of the interval reamed as verified by the caliper survey and approved by the District Representative.

2. **Materials**

a) Drilling Fluid

The Contractor shall maintain controlled drilling fluid characteristics during the entire reaming operation at each site as specified in Section H-3d.

3. **Execution**

a) Upon receipt of a written final well design from the District Representative and only after all well materials are present on site and approved by the District Representative, the Contractor shall ream each pilot borehole to the depths and maximum diameters specified.

b) A record shall be kept showing any variation in the addition and amount of drilling fluid or water required during the drilling operation. The depths at which such changes are required shall be shown in the daily reports.

c) Upon completion of the reaming operations, a caliper survey shall be run to verify the final diameters and depths reamed.

h. **Caliper Survey**

1. **General**

a) Description

This item includes a required three-arm caliper survey to be conducted by a firm retained by the Contractor and approved by the District Representative. The three-arm caliper survey shall accurately measure the final diameter(s) of each reamed borehole.

b) Submittals

1) Per the General Bid Requirements, the Contractor shall submit to the District Representative, the name and qualifications of the firm proposed to conduct the caliper survey.

2) The Contractor shall provide five (5) field copies of the caliper survey to the District Representative for interpretation upon completion. Within one (1) week of survey completion, the Contractor shall provide the District Representative with five (5) final copies of the caliper survey and survey results in a District Representative-approved digital format on compact disk or other approved digital storage device.

3) Based upon an examination of caliper survey results, the Contractor shall estimate and report to the District Representative the volumes of gravel pack and other annular fill materials required to complete the final well design at each site.

c) Measurement and Payment

Payment for each caliper survey will be based on the lump sum price bid (see Bidding Sheets). Payment shall include full compensation for fluid circulation, removal of the drill string, operation of the drilling rig and other equipment, furnishing and operating caliper survey equipment as specified, and providing whatever assistance may be required to complete the caliper survey at each site.

2. **Materials**

The caliper equipment used to perform each survey shall have a minimum of three arms and be capable of measuring a borehole diameter to 48 inches.

3. **Execution**

a) Upon completion of reaming, each caliper survey shall be conducted. Before starting the survey, the Contractor shall ensure the borehole is free of loose drill cuttings by circulating the drilling fluid for a period of at least one (1) hour.

b) The caliper survey shall become the property of the District Representative at the time the survey is completed. The survey will be conducted in the presence of the District Representative.

c) The logging speed for the caliper survey shall be 40 feet per minute, unless approved otherwise by the District Representative.

d) If any caliper survey shows the reamed borehole to be less than the specified diameter(s) at any point or the final borehole is less than the specified depth, then that borehole shall be re-reamed or re-drilled and re-surveyed at the Contractor's expense.

e) The Contractor shall provide whatever assistance may be necessary to complete each caliper survey.

f) During the evaluation period following completion of the caliper survey, the Contractor shall remain continuously responsible for the integrity of each final reamed borehole. The Contractor shall take all steps necessary to stabilize and preserve the borehole.

i. **Well Casing and Accessory Tubing**

1. **General**

a) Description

1) This item includes the supply and installation of blank and perforated well casing, end cap, cover plate, and gravel feed tube, sounding tube, and air vent tube required by the final well design at each site. For bidding purposes, tentative schedules of completion (quantities) for the Wells are shown on the Plans and indicated on the Bid Sheets.

2) A final schedule of well casing and tubing will be prepared by the District Representative for each site and submitted to the Contractor upon completion of analyses of the lithologic log, sieve analyses of drill cuttings, downhole geophysical surveys and results of isolated aquifer zone testing (where applicable).

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

b) Submittals

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

c) Measurement and Payment

1) Payment for installation of blank well casing at each site will be based on measurement of the vertical feet of well casing installed, complete and in place, exclusive of perforated well casing (see Bidding Sheets).

2) Payment for installation of perforated well casing at each site will be based on measurement of the vertical feet of perforated well casing installed, complete and in place, exclusive of the blank well casing (see Bidding Sheets).

3) Payment for the sounding tube(s) at each site will be based on measurement of the vertical feet of tubing installed from the ground surface complete and in place, including the spliced section to connect a sounding tube to the well casing (see Bidding Sheets).

4) Payment for the permanent gravel feed tube at each site will be based on the vertical feet of tubing installed from the ground surface, complete and in place (see Bidding Sheets).

5) Payment for the air vent tube at each site will be based on the lump sum price bid.

6) Payment for the blank and perforated well casing, sounding tube(s), air vent tube and permanent gravel feed tube at each site shall include supply and installation of welding collars, centralizers, cover plate, end cap, tubing caps and all equipment, materials and labor required for successful installation at the specified depths.

2. **Materials**

Casing Pipe Specification

Roscoe Moss Ful-Flo or approved equal – 5/16” wall, 20” I.D., High Strength Low Alloy (HSLA) steel conforming to ASTM A242.

a) Blank Well Casing

1) All blank well casing shall have the same I.D., thickness, physical and chemical properties as the perforated well casing at each site.

2) All casing shall be fabricated in lengths of 10, 20 or 40 feet. Random lengths of casing are not permitted. All blank casing shall be spiral welded.

3) The ends of all casing joints shall be machined perpendicular to the casing axis to ensure the straightness of each assembled section. Joints shall be furnished with collars for welding. Collars shall be of the same thickness and have the same physical and chemical properties as the corresponding casing section. The collars shall be rolled to fit the outside diameter of the casing and factory welded to one end. Three equally spaced 5/16-inch diameter alignment holes shall be provided in each collar to ensure proper matching of the ends upon assembly.

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

5) All casing materials shall be new.

b) Perforated Well Casing

1) The perforated well casing shall have the same I.D., thickness, physical and chemical properties as the blank well casing at each site.

2) All perforated well casing shall consist of 20-inch I.D., 5/16-inch wall **Roscoe Moss Ful Flo Louvered Well Casing or approved equal.** All louvers shall be machine made openings that are horizontal to the axis of the casing with an aperture facing downward.

3) All perforated well casing shall be provided with welded collars attached. The perforated well casing shall be spiral welded.

4) For bidding purposes, the aperture size of all perforated well casing is as indicated on the plans and Bid Documents. The final aperture size will be selected after examination of the lithologic log and sieve analyses of drill cuttings and the downhole geophysical surveys and will be specified in the final well design prepared by the District Representative.

5) The ends of all casing joints shall be machined perpendicular to the casing axis to ensure the straightness of each assembled section. Joints shall be furnished with collars for welding. Collars shall be of the same thickness and have the same physical and chemical properties as the corresponding perforated well casing section. The collars shall be rolled to fit the outside diameter of the perforated well casing and factory welded to one end. Three equally spaced 5/16-inch diameter alignment boreholes shall be provided in each collar to ensure proper matching of the ends upon assembly.

6) All perforated well casing shall be factory assembled in 10-feet, 20-feet or 40-feet lengths as specified by the District Representative.

7) The Contractor shall ensure the inside diameter of all perforated well casing is the same as the inside diameter of the blank well casing.

8) All welding shall be done with shielded arc electrodes compatible with the casing material and shall be performed by certified welders in accordance with American Welding Society Standards.

9) All perforated well casing materials shall be new.

c) Casing Centralizers and Bottom End Cap

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

d) Sounding/Camera Access Tube(s)

1) One (1) 3-inch I.D., Schedule 40 sounding/camera access tube shall be provided per well as shown on the Plans. The sounding/camera access tube and box at each site shall be fabricated from steel having the same physical and chemical properties as the well casing.

2) The final depth of the sounding/camera access tube connection into each well casing will be specified in the final well design provided by the District Representative. For bidding purposes, the depth of the sounding/camera access tube is as indicated on the bid sheet.

3) All sounding/camera access tube materials shall be new.

e) Gravel Feed Tube

1) One (1) 3-inch I.D. Schedule 40 gravel feed tube shall be provided at each well as shown on the Plans. The gravel feed tube shall be fabricated from steel having the same physical and chemical properties as the well casing.

2) The final depth of the gravel feed tube at each site will be specified in the final well design provided by the District Representative. For bidding purposes, the depth of the gravel feed tube is as indicated on the bid sheet.

f) Welding Electrodes

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

E-7018 (E-7024 may be used on casing with collars for horizontal welds).

The following electrode sizes shall apply:

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

3. **Execution**

a) General

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

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

b) Joints

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

c) Centralizers

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

d) Gravel Feed Tube

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

e) Construction Tremie Pipe

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

f) Air Vent Tube

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

g) Sounding/Camera Access Tubes

1) Sounding/camera access tube(s) shall be installed as specified in the final well design at each site and as shown on the Plans.

2) During installation, sounding tubes shall be secured to the outside of the well casing at 40-ft intervals by welding a ½-inch by 1-inch HSLA steel bar to the casing and welding a sounding tube to the bar.

3) Sounding tubes shall enter each well casing at the depth specified in the final well design. At the point of entry, a sounding tube shall be securely welded to the casing in a manner and at an angle approved by the District Representative. All rough cut edges shall be ground smooth prior to completing the splice. The spliced section shall be reinforced as needed to prevent collapse of the well casing.

4) The Contractor shall be solely responsible for ensuring the structural integrity of the external sounding tube and spliced section of well casing.

h) Blank and Perforated Well Casing

1) Prior to casing installation at each site, the Contractor shall inspect for and remove any tags, labels or other deleterious material attached to the interior or exterior of the blank and perforated well casing.

2) Each assembled well casing string shall be suspended in tension from the surface by means of an appropriate hanger or clamp. Steel bars (clamp anchors) pre-welded to the casing to hold the casing clamp in place during casing installation, shall be removed prior to lowering a new casing section into the borehole. The use of float plugs to land and set any casing will not be permitted. All casing strings shall be plumb and centered in the borehole. The bottom of the casing shall not rest on the bottom of the borehole.

3) If for any reason the entire casing cannot be landed in the correct position at any site, or at a depth acceptable to the District Representative, the Contractor shall rectify the situation by either (1) removing the casing, re-reaming the borehole and re-installing the casing, or (2) constructing another well in accordance with the specifications, plans and final well design at a location immediately adjacent to the original well. All such remedial work shall be at no additional cost to the District. The borehole of the abandoned well shall be properly destroyed at the Contractor's expense in accordance with Section H-7b.

4) If any of the casings should collapse or be damaged prior to well completion, they shall be withdrawn and replaced at the Contractor's expense.

5) All work required to be repeated, and all additional materials, labor and equipment required, shall be furnished at the expense of the Contractor and no claim for additional compensation shall be made or be allowed therefore, except as specifically provided herein.

6) Alignment holes in all collars at casing joints shall be welded completely closed to prevent the entry of water from outside the casing.

7) The top of the well casing string shall extend at least 24 inches above the ground surface.

8) The bottom of each permanent gravel feed tube shall be placed approximately 10 feet below the top of the gravel pack at each site. The top of each gravel feed tube shall extend at least 12 inches above ground surface.

9) Following casing installation, the tops of all well casings shall be covered with a welded steel plate at all times when personnel are not on the site.

j. **Gravel Pack**

1. **General**

a) Description

This item covers the supply and installation of gravel pack materials in the annulus adjacent to the blank and perforated well casing at each site.

b) Submittals

1) Initial description and recent certified sieve analysis of gravel pack materials to be used for well construction. The sieve analysis shall be submitted to the District Representative for approval at least five (5) business days prior to the anticipated date of gravel shipment from the supplier.

2) Copies of weigh tickets for gravel delivered on-site.

3) Measurement of the total volume of gravel installed in the well annulus.

c) Measurement and Payment

Payment for the gravel pack will be based on measurement of the vertical feet of gravel installed in the annulus from the bottom of the borehole up and includes payment for any consolidation of the gravel pack which occurs during well development (see Bidding Sheets).

2. **Materials**

a) Gravel Pack

1) For bidding purposes, assume 1/4 x 16 gradation, TACNA, SRI or District Representative approved equal. The final gravel gradation will be specified in the final well design for each site, as provided by the District Representative after evaluation of the formation sieve analysis, as applicable.

2) Gravel shall be delivered to and contained on-site in 3,000 lb. bags ("super sacks").

3) At the request of the District Representative, the Contractor shall complete up to three (3) sieve analyses of gravel pack materials delivered on-site. Gravel re-delivered or re-mixed to replace any rejected material shall be sampled and tested at the District Representative's request and Contractor's expense.

4) The final gradation and uniformity required at each site shall be specified in the final well design submitted by the District Representative after examination of the lithologic log and sieve analyses of drill cuttings.

5) All gravel or coarse-grained sand for packing shall be hard, water-worn, and washed clean of silt, fine sand, dirt, and foreign matter. Crushed gravel will not be accepted. The gravel shall be well-rounded and graded, and subject to the approval of the District Representative.

6) District Representative may elect to have a certified testing laboratory perform sieve analyses of the gravel delivered on-site to verify conformance with the final gravel specification. Failure to meet the gradation specified in the final well design shall be grounds for rejection. If rejected, the Contractor shall correct the gradation to meet District Representative requirements.

7) The gravel shall be delivered on-site and shall be protected and kept free of all foreign matter.

3. **Execution**

a) Prior to placement of the gravel pack, the drilling fluid shall be thinned with clean potable water (freshwater down the gravel feed tube).

b) Muddy borehole fluid displaced during gravel packing at each site shall be conveyed to the on-site settling area for clarification prior to discharge.

c) Tanks used for fluid clarification shall be setup prior to commencing well construction.

d) Contractor shall provide gravel tremie pipe in lengths sufficient to ensure the drop during placement of the gravel is acceptable to the District Representative. Five and ten feet lengths of pipe shall be available as needed.

e) The gravel pack at each site shall be installed in the annular space between the reamed borehole and well casing through a construction tremie pipe from the bottom of the borehole. A circulating system with one or more positive displacement pumps utilizing fresh water shall be used for the purpose of introducing the gravel into the annulus. Under no circumstances will the gravel pack be allowed to "free-fall" down into the annular space.

f) A device approved by the District Representative shall be used to sound the level of the gravel during its placement.

g) During placement, the gravel shall be disinfected with liquid sodium hypochlorite at the rate of one gallon per cubic yard.

h) After the gravel pack has been placed to the depth specified by the District Representative, all rock, sand, gravel, and foreign materials shall be removed from the casing by bailing.

i) The Contractor shall record the volume of gravel installed. The volume shall not be less than the calculated volume of the annular space between the casing and the borehole wall based on the caliper survey at each site. A significant discrepancy may be grounds for rejection of the well by the District Representative.

j) After installation of the gravel pack, an upper annular grout seal shall be installed as specified in the final well design and shown on the Plans.

k. **Annular Grout Seal**

1. **General**

a) Description

1) This item includes installation at each site of a grout seal in the upper portion of the annulus between the blank well casing and borehole wall or blank well casing and conductor casing from the top of the gravel pack to the ground surface.

2) For bidding purposes, a tentative seal depth of 160 feet below ground surface is to be used. The final depth of the seal will be specified in the final well design submitted by the District Representative after evaluation of the lithologic log and sieve analyses of drill cuttings, geophysical surveys. Minimum seal depth shall be in conformance with Section 14.08.260 of the Kern County Water Well Ordinance.

b) Submittals

1) Daily activity logs.

2) Cement weight tickets.

3) Record of depth of placement and volume of grout placed in the annulus.

c) Measurement and Payment

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

2. **Materials**

a) The material used for the grout seal shall consist of standard brand Portland cement conforming to ASTM C150, Type II.

b) The grout shall be a 10.3-sack sand-cement mix. There shall be not more than two parts by weight of sand to one part by weight of cement. The water-cement ratio shall be about 7 gallons per sack of cement (94 pounds). All on-site water additions shall be metered. Up to 5 percent bentonite gel may be added.

c) Clean fine-grained sand shall be used to separate the gravel pack from the annular seal.

3. **Execution**

a) The grout seal at each site shall be installed in the annulus **in a sufficient number of pours to preclude collapse of the well casing.** Prior to installing the seal, a five-foot thick layer of clean, washed and graded #60 fine-grained sand (or other sand approved or specified by the District Representative) shall be pumped into place at the top of the gravel pack using a tremie pipe.

b) The grout for the seal shall be pumped into the annulus between the blank well casing and borehole wall using a tremie pipe. The pipe shall extend from the ground surface to the bottom of the zone to be grouted. Grout shall be placed from bottom to top in a continuous operation unless determined by the Contractor that a staged placement is required to prevent casing collapse. The grout pipe shall be raised slowly as grouting proceeds. **The Contractor shall provide grout (tremie) pipe sections in incremental lengths sufficient to ensure the discharge end of the pipe remains continuously submerged in the grout at all depths during placement**.

c) Installation of the tremie pipe required for grouting and placement of the seal shall not commence until the District Representative is on-site.

d) The Contractor shall be responsible for determining the collapse potential of each well casing during grouting and shall take whatever precautions are necessary to prevent casing collapse. In the event a casing collapses prior to completion of seal installation, the Contractor shall take whatever steps are necessary to reopen that casing and place the seal as required by the final well design. Any such remedial action shall be conducted at the Contractor's expense.

e) The Contractor shall keep a record of the actual depth and volume of grout installed at each site. The volume shall not be less than the calculated volume of the annular space between the conductor casing or reamed borehole and the pump house casing.

f) The Contractor shall supply to the District Representative, adequate evidence showing that the cement seal has been completed to the surface.

g) The Contractor shall not operate any heavy equipment on-site during a 24-hour period immediately following placement of the seal.

H-4 Well Development

a. Initial Development By Airlifting and Swabbing

1. General

a) Description

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

b) Submittals

The Contractor shall maintain a **daily** record of development activities at each site. The record shall include: (1) depth interval and time developed, (2) measurements of settlement of the gravel pack, (3) volume of gravel added through the gravel feed tube, (4) volume of sediment bailed from the bottom of the well, (5) static water level, (6) approximate well discharge during air-lifting, and total hours developed daily.

c) Measurement and Payment

1) Payment for well development will be made at the unit price bid per hour of swab and airlift (see Bidding Sheets).

2) The time required for well development will be recorded by the hour with 15-minute intervals as the smallest unit of recorded time. The time recorded for payment shall commence when the equipment installed in the well is placed in operation (when airlift begins), pause when airlift ceases until airlift resumes, and shall end when development is stopped at the direction of the District Representative. No additional payment will be made running equipment into or out of the well or any time which airlift is not occurring. The time required to run equipment into and out of the well, including the rig time between joints when no airlift is occurring, shall be anticipated by the Contractor and included in the hourly rates bid for well development (see Bidding Sheets).

3) No payment will be made for delays resulting from: (a) equipment stuck in the borehole, (b) equipment breakdown, (c) arranging major drilling, pumping or testing apparatus, or (d) failure to conduct the operations in a diligent and

workmanlike manner by which the desired results could ordinarily be expected.

4) No additional payment shall be made for gravel added to the annulus as the gravel pack settles.

2. **Equipment and Materials**

a) Swab Tool

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

b) Air Compressor

The Contractor shall provide an air compressor, airline and educator pipe that are capable of airlifting a minimum of 300 gpm during initial redevelopment by airlifting and swabbing. Minimum air compressor size shall be 750 cfm @ 200psi. Air compressor shall be rated for local conditions and capable of maintaining aforementioned flow rates regardless of weather and temperature conditions.

3. **Execution**

a) Contractor shall not commence development until solids settlement, discharge and sound control (where applicable) facilities are installed at each site to the satisfaction of the District Representative.

b) Mechanical development by simultaneous airlifting and swabbing shall commence within 24 hours after completion of the idle period following placement of the upper annular grout seal at each site. During swab and airlifting, the Contractor shall airlift a minimum of 300gpm. Development shall be completed in two stages as described below.

c) Stage One - Initial Development with Single Swab

1) Initial mechanical development shall be completed with an open-ended single swab attached to the end of the drill pipe.

2) Swabbing shall be completed to remove sediment and heavy fluids from the well casing.

3) The tool shall be moved up and down three to four times in a section of perforated well casing while airlifting at sufficient speeds to disturb any settled material within zone (i.e. swabbing should produce dirty discharge until zone is cleaned). Static airlift (no movement of the swab) longer than 5 minutes at any location is unacceptable unless significant amounts of sediment are still present in the discharge after 5 minutes or explicitly approved by the District Representative. After working the tool to the bottom of the well, airlifting shall continue until all sediment is removed.

d) Stage Two - Development with a Double Swab

1) Development with a double swab at each site shall commence immediately following completion of development with a single swab.

2) Simultaneous airlifting and swabbing using the double-swab tool shall commence in the upper-most perforated interval and proceed to the lower-most perforated interval. Each perforated interval shall be swabbed and airlifted in 10-ft increments until the discharge water becomes substantially clear as determined by the District Representative. Static airlift (no movement of the swab) longer than 5 minutes at any location is unacceptable unless explicitly approved by the District Representative.

3) Development in each 10-ft increment of perforated well casing shall include raising and lowering the double swab tool three to four times or more in a shorter section of the perforated well casing as needed to produce sediment-filled discharge water while airlifting continues. Air-lift swabbing shall be followed by a period of airlifting without swabbing until the discharge water clears. Static airlift (no movement of the swab) longer than 5 minutes at any location is unacceptable unless significant amounts of sediment are still present in the discharge after 5 minutes or explicitly approved by the District Representative. This process shall be repeated until water produced from the 10-ft section of perforated well casing becomes substantially clear and no additional settlement of the gravel pack is observed. Upon completion, the dual-swab tool shall be moved to the next 10-ft section of perforated well casing and the process repeated until all perforated intervals have been fully developed. Swab and Airlifting shall not exceed the bid amount without written authorization from the Engineer. Tool handling time, to include all trips and time spent adding or removing joints during swab and airlift shall not

be classified as mechanical development (swab and airlift) hours, nor shall they be classified for payment.

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

b. **Chemical Development (Mud Dispersant) – Required if drilling mud (Bentonite or Drilling Gel) is added during the drilling process.**

1. **General**

If the Contractor elects to use a drilling mud additive at any time during well construction, **additional** chemical development over and above and prior to the mechanical development described in Section H-4a is required. This additional chemical development shall be conducted during the mechanical well development phase (swab/airlift) as directed by the Engineer.
When only clean water is used as a drilling fluid, chemical development process (during swab and airlift) is not required – only the chemical development during the development pumping process as described in H-4d will be required.

Introduction of an approved Clay-dispersing Agent during mechanical well development (swab/airlift) development of the well:Introduction of the Clay-dispersing Agent shall commence when directed by the Engineer. The approved clay-dispersing Agent shall be introduced and swabbed into the well without airlifting, at a rate recommended by the manufacturer per foot of well screen. Introduction of the calculated amount Clay-dispersing Agent will take place through the double swab tool, followed by flushing the drill pipe with sufficient water to move the Clay-dispersing Agent into the well screen. The pipe shall then be stroked 3-4 time to agitate the zone. Upon completion, the Clay dispersing Agent shall be allowed to stand in the well for a period of not less than 12 hours and not more than 24 hours or other period recommended by the manufacturer and approved by the Engineer. After the idle period, mechanical well development using a double-swab tool shall continue in accordance with Section H-4a. Clay-dispersing Agent idle time does not count toward mechanical development hours.

a) Description

This item includes introduction of chemicals to augment initial (mechanical) development of the well. Chemical development will be completed, if bentonite, drilling gel or other "drilling mud" is added to the fresh water during the drilling

process. A chlorine solution and clay dispersing agent shall be introduced and swabbed into the well and gravel pack in successive stages.

b) Submittals

1) Daily activity log.

2) Descriptions and quantities of chemicals added to the well during development.

c) Measurement and Payment

1) Payment for chemicals introduced into each well, if conducted, shall be included in the unit price for mechanical well development.

2) Payment for time required to swab the chemicals into the well and airlift the chemicals from the well shall be at the price per hour bid for mechanical well development. No standby time shall accrue or be paid for idle time required to allow the chemicals to remain in well for the periods specified.

2. **Materials**

a) Chlorine Solution

Chlorine shall be added to the well, as appropriate during mechanical development and at the direction of the District Representative, at a dose of approximately ten (10) gallons per 20 feet of well screen, or per the manufacturer's recommendations, whichever is greater. See bidding sheets for estimated total quantity.

b) Dispersant Polymer

Dispersant polymer (NW-220®, AQUA-CLEAR PFD®, or equivalent) shall be added to the well, as appropriate during mechanical development and at the direction of the District Representative, at a dose of approximately one (1.5) gallon per 20 feet of well perforations, or per the manufacturer's recommendations, whichever is greater. See Bidding Sheets for estimated total quantity.

3. **Execution**

Chemical development shall be conducted in two stages and shall be integrated with mechanical well development.

a) Stage One - Chlorination

1) A 10 percent chlorine solution shall be introduced into each well upon completion of stage one of mechanical development using a double-swab tool.

2) A pre-mixed solution of chlorine and water shall be swabbed into the perforated intervals of each well from the bottom of the well to the top.

3) The chlorine solution shall remain in each well for a minimum period of 12 hours, or as approved by the District Representative. Following the idle period, the Contractor shall use the double-swab tool to remove the chlorine solution from the well by airlifting.

b) Stage Two - Introduction of Clay-dispersing Agent (NW-220) or approved equal

1) Introduction of NW-220, or approved equal, shall commence immediately upon completion of removal of the chlorine solution from each well. NW-220 shall be introduced and swabbed without airlifting, into each 10-ft section of well perforations for a period of 30 minutes (or other period approved by the District Representative) using a double-swab tool. Upon completion of swabbing, the NW-220 shall be allowed to stand in the well for a period of 24 hours, or other period approved by the District Representative.

2) After the idle period, mechanical well development using a double-swab tool shall continue in accordance with Section H-4a.

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

1. **General**

a) Description

This item includes mobilization and demobilization of equipment, materials and personnel for pumping development and well production tests at each site. For bidding purposes, the pump intake shall be installed to a depth of 630 ft. below ground surface. A final depth will be specified in the final well design submitted by the District Representative after evaluation of the lithologic log, sieve analyses of drill cuttings, geophysical logs, and results of isolated aquifer zone testing, as applicable.

b) Submittals

1) Daily activity log.

2) Record of pump type, diameter, capacity range, intake depth, number of bowls.

3) Certification of the accuracy of the flow meter, completed within 6 months of delivering the meter to the site.

c) Measurement and Payment

No separate Payment shall be made for mobilization and demobilization. All costs therefore shall be included in the unit price stated in the Bidding Schedule for the Chemical Development of which it is a part.

2. **Materials**

a) Test Pump

1) Installation of equipment for development pumping and testing shall commence immediately upon completion of development by swabbing and airlifting at each site.

2) The Contractor shall furnish, install and upon completion of testing remove a deep well turbine pump powered by diesel or gasoline. The prime mover shall be a variable-speed type equipped with suitable throttling devices to control the well discharge. The prime mover shall meet all noise control requirements during development and test pumping.

3) The pump capacity shall have a minimum pump capacity of 4,000 gpm at 500’ TDH.

4) The pump shall not be equipped with a foot valve.

5) The pump intake shall be set at a depth of 630 ft. unless specified otherwise by the District Representative in the final well design for each site.

6) The pumping unit and engine shall be capable of continuous operation without interruption for a period of at least 72 hours.

b) Discharge Piping and Appurtenances

The Contractor shall provide adequate discharge piping to convey well development water from each well to the designated heavy fluids settlement area

and from the temporary water storage tanks to the point of discharge. The discharge piping shall include at least one water sampling port for the purpose of collecting groundwater quality samples.

c) In-Line Flow Meter

The Contractor shall provide a flow control (butterfly) valve and dual-reading flow meter or other approved device to accurately control, maintain and measure the accurate rate of well discharge at each site. The flow meter shall provide instantaneous flow measurements in gallons per minute and shall be equipped with a totalizer that provides measurements in gallons x 100. Prior to mobilization, the Contractor shall provide certification of the accuracy of the flow meter, completed within 6 months of delivering the meter to the site.

d) Centrifugal Sand Separating Meter

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

e) Turbidity Meter

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

f) Water Level Sounder

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

3. **Execution**

a) Prior to installing the test pump, the bottom of each well shall, in the presence of the District Representative, be bailed or pumped clean of any sediment.

b) The Contractor shall install a deep well turbine test pump to a depth of 630 ft. below ground surface.

c) The Contractor shall furnish, install and connect all aboveground discharge piping, complete with valves, inline flow meter, and a water sampling port.

d) Upon completion of testing and after removal of the test pump, the Contractor shall, in the presence of the District Representative, remove any oil (e.g., pump lubricating oil) from the water surface at each site. An acceptable method of removal shall be to lower, via a cable, an oil absorbent "sock" or similar material designed to absorb spilled oil.

e) After removal of the test pump and any lubricating oil from the well, the Contractor shall, in the presence of the District Representative, sound the depth of each well and record the depth to which sediment has accumulated as a result of test pumping. The well shall be then bailed or pumped clean of all sediment and debris.

d. **Final Development By Pumping**

1. **General**

a) Description

This item includes development of each new well by surge pumping using a test pump.

b) Submittals

Daily log of pumping development including static water level, totalizer readings, well discharges, pumping water levels, specific capacities, sand content, description of water discharged and hours pumped at each site.

c) Measurement and Payment

1) Payment for pumping development will be made at the unit price per hour bid (see Bidding Sheets).

2) The time required for well development will be recorded by the hour with 15-minute intervals as the smallest unit of recorded time. The time recorded for payment shall commence when the equipment installed in the well is placed in operation and shall end when pumping is stopped. Time required to run equipment into and out of the well shall be included in the unit price stated in the Bidding Schedule for the Development Pumping of which it is a part and no separate payment shall be made therefore. Payment for development pumping will only be made for time that the pump is operating.

3) No payment will be made for delays resulting from: (a) equipment stuck in the borehole, (b) equipment breakdown, (c) arranging major drilling, pumping or testing apparatus, or (d) failure to conduct the operations in a diligent and workmanlike manner by which the desired results could ordinarily be expected.

4) No additional payment shall be made for gravel added to the annulus as the gravel pack settles during development.

2. **Materials**

Requirements for the test pump, discharge line, and other equipment for pumping development at each site are described in Section H-4c Mobilization and Demobilization of Test Pump and Appurtenances.

3. **Execution**

a) Well development using the test pump shall commence within 14 days after completion of initial development by airlift swabbing and pumping at each site. Once started, development pumping shall proceed on a schedule approved by the District Representative.

b) Each new well shall be developed by intermittent pumping and surging at an initial rate approved by the District Representative and the District and continued until the water is clear. Surging shall allow water to flow back through the bowls with free backspin and through the casing perforations. The pump shall then be started and stopped several times and then pumped at the current rate until the water is clear. The procedure shall be repeated at District Representative approved discharge increments up to the maximum pump or well capacity, as specified by the District Representative.

c) During initial pumping development, water clarification may be required in on-site water storage tanks to allow for settling of sediment prior to conveying the water to the specified point of discharge.

4. **Chemical development is required during development by pumping process and shall be conducted by the contractor and be integrated with the surge development procedure.**

a) Contractor must submit and receive approval for brand and type of Clay-dispersing Agent intended to be used during surge development of the well.

b) Introduction of the approved Clay-dispersing Agent (such as Mud Nox) shall be introduced and surged into the well without discharging, at a rate recommended by the manufacturer per foot of well screen for a period of not less than one (1) hour. Upon completion, the Clay-dispersing Agent shall be allowed to stand in the well for a period of not less than 12 hours and not more than 24 hours, or other period recommended by the manufacturer and approved by the Engineer.

c) Measurement and Payment

1) Payment for chemicals introduced into each well, shall be included in the unit price for development by pumping.

2) Payment for time required to surge the chemicals into the well shall be included in the development by pumping. No standby time shall accrue or be paid, for idle time required to allow the chemicals to remain in the well for the periods specified.

5. **Surge Development Procedure**

a) Development records shall be maintained on at least a half-hour basis showing production rate, pumping level, drawdown, specific capacity, sand production, and all other pertinent information concerning well development at each site. A representative static water level shall be measured and recorded at least once a day.

b) The rate of sand production at each site shall be measured using the centrifugal sand separating meter. The results of all sand production tests shall be expressed in parts per million at 5-minute intervals and shall be provided to the District Representative immediately. The final sand production test shall be conducted in the presence of the District Representative.

c) Clean water shall be added continuously down the gravel feed tube during development.

d) If during development operations the gravel pack settles, more gravel shall be added as needed and the quantity recorded and reported to the District Representative.

e) Development shall continue at each discharge rate until the following conditions have been met:

1) No further settlement of gravel pack.

2) Well specific capacity (gpm/ft. drawdown) remains relatively constant over an approximate 4-hour period or as specified otherwise by the District Representative.

3) Sand content at the end of development pumping is no greater than 3 ppm measured 15 minutes after beginning a surge cycle.

4) The duration of development pumping shall not exceed the bid amount without prior District Representative authorization.

f) Upon completion of development pumping, the Contractor shall (in the presence of the District Representative) measure the depth of each new well to determine the amount of sediment deposited in the bottom. If the sediment level extends into the perforated interval of any well, the Contractor shall pull the pump, clean the well of all accumulated sediment and foreign material, and reinstall the test pump prior to running the production tests.

H-5 Pumping Tests

a. Step Drawdown and Constant Rate Pumping Tests

1. General

a) Description

This item includes both a step-drawdown test and 24 hour constant-rate discharge test (aquifer tests) in each new well.

The step-drawdown test shall include pumping the well at stepped rates of discharge for specified periods. The long-term pumping test shall include pumping the well at a fixed rate of discharge continuously for 24 hours.

b) Submittals

Daily test pumping records.

c) Measurement and Payment

1) Payment for testing will be made at the unit price per hour bid (see Bidding Sheets).

2) The time required for test pumping will be recorded by the hour with one-half hour intervals as the smallest unit of recorded time. The time recorded for payment shall commence when the equipment installed in the well is placed in operation and shall end when a test is stopped at the direction of the District Representative.

3) No payment will be made for delays resulting from: (a) equipment stuck in the borehole, (b) equipment breakdown, (c) arranging major drilling, pumping or testing apparatus, or (d) failure to conduct the operations in a diligent and workmanlike manner by which the desired results could ordinarily be expected.

4) No payment will be made for tests aborted due to the malfunction of testing equipment or inability of the Contractor to maintain the well discharge, as specified by the District Representative, within the limits described herein.

5) No additional payment shall be made for gravel added to the annulus as the gravel pack settles.

6) The costs of labor and equipment associated with providing assistance during the recovery period following a pumping test shall be included in the unit prices bid for test pumping (see Bidding Sheets).

7) No additional payment shall be made for measuring water level in the well during the recovery period after completion of step drawdown testing and long term testing.

2. **Equipment and Materials**

Requirements for the test pump, discharge line, and other equipment for pumping tests are described in Section H-4c Mobilization and Demobilization of Test Pump and Appurtenances.

3. **Execution**

a) General

1) Within 48 hours after the completion of well development with a test pump in each new well, the Contractor shall commence well pumping tests. Unless authorized otherwise by the District Representative, there shall be a period of at least 24 hours of non-pumping conditions prior to the start of the step-drawdown test to allow groundwater levels to stabilize at a static condition. The Contractor shall schedule all tests sufficiently in advance so that the District Representative can be on-site throughout the testing period.

2) The Contractor shall provide qualified personnel on a 24-hour basis during both the step-drawdown and constant rate tests to assure proper operation of the pumping and testing equipment and assist the District Representative when necessary.

3) When production tests are complete, the Contractor shall remove the pump and clean the well of all accumulated sediment, foreign material and lubricating oil. The Contractor shall demonstrate the well has been properly cleaned by measuring the depth of the well in the presence of the District Representative.

b) Step-Drawdown Test

1) The well shall be tested at up to four (4) discharge rates (steps) with step durations of two (2) to three (3) hours pumping at each rate. The number of steps, pumping rate at each step, and duration of each step will be specified by the District Representative after review of pumping development results.

2) The rate of discharge shall be controlled by both a butterfly valve and engine throttle. The rate shall be controlled and maintained at the desired discharge for each step with an accuracy of at plus or minus five percent (+/- 5%).

3) Prior to starting the test, the Contractor shall record the static water level in the well. During the test, the Contractor shall record the time, pumping level, drawdown, discharge rate, specific capacity and rate of sand production.

4) The rate of sand production shall be measured by the Contractor at 30-minute intervals using a centrifugal sand separating meter such as Rossum Sand Tester or approved equal. The results shall be expressed in parts per million.

c) Long Term Continuous-Rate Discharge Test

1) A constant-rate discharge test shall be conducted for a period of 24 hours, or as specified by the District Representative in each well.

2) The continuous constant rate discharge test (aquifer test) shall commence not less than 12 hours and not more than 48 hours after completion of the step-drawdown test. The well static water level shall be allowed to recover after the step-drawdown test to a level acceptable to the District Representative, prior to starting the constant rate test.

3) The test shall include a period of continuous constant-rate pumping followed by a period of recovery after the pump is stopped. The groundwater level recovery duration shall be up to 48 hours, or as specified by the District Representative. The temporary test pump shall not be removed from the well until the specified recovery period has elapsed.

4) During pumping, the Contractor shall record the pumping rate, pumping water level, drawdown and specific capacity at 15-minute intervals. The well static water level shall be recorded prior to starting the test.

5) Throughout the test, the Contractor shall ensure the pumping rate remains within plus or minus 5 percent (+/- 5%) of the pumping rate specified by the District Representative. When necessary, adjustments in the pumping rate shall be made using the in-line butterfly valve rather than engine throttle.

6) District Representative may elect to collect its own measurements during testing using either manual or automated measurement equipment. The Contractor shall assist the District Representative, as requested, with

equipment installation and measurements during both the pumping and recovery periods.

7) During pumping, final sand content testing shall be conducted by the Contractor. The sand content shall be determined by averaging the results of samples collected at the following times during the pumping test:

- 10 minutes after start of the test
- After ¼ of the total planned test time has elapsed
- After ½ of the time has elapsed
- After ¾ of the time has elapsed
- Near the end of the pumping test

8) The District Representative may measure the pH, electrical conductivity (EC), temperature, oxidation reduction potential (ORP), and dissolved oxygen in the discharge during the constant-rate pumping test. Field measurements will be obtained at approximate 1-hr intervals. The Contractor shall provide a sampling port in the discharge line for collecting water quality samples. The Contractor shall also provide whatever assistance may be required by the District Representative for monitoring water quality parameters.

9) During the pumping test, the Contractor shall assist the District Representative in the collection of representative samples of discharge water for water quality testing, as requested by the District Representative. Water samples shall be delivered by the District Representative to the District's approved laboratory.

10) At the end of the Continuous Rate test, water level (recovery) measurements shall be taken at 5, 10, 15, 30, 60 minute and 24 hr. intervals, or other intervals requested by District Representative.

11) During the recovery portion of the test after the pump is stopped, the temporary test pump shall remain in the well, undisturbed, for the full recovery period.

d) Aborted Tests

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

2) No payment will be made to the Contractor for pumping tests interrupted by the malfunction or failure of pumping equipment or failure to maintain the rate of pumping within the prescribed limits (as defined by the District Representative). If a test is interrupted, the well water level will be allowed to fully recover, after which the test will be restarted.

e) Discharge Water

Discharge water shall be conveyed from the pump to the discharge point designated by the District Representative. The Contractor shall ensure that no damage by flooding or erosion is caused to the point of discharge.

f) Records

1) The Contractor shall keep accurate records of all pumping tests and furnish copies of all records to the District Representative upon completion of the tests. The records shall be available also to the District Representative for inspection at any time during a test. For each test, the records shall include physical data describing the construction features such as, but not limited to: 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, the methods used in measuring water levels and pumping rates.

2) The Contractor shall also keep records on the type of pumping equipment used including engines, drive components, bowls, lines, and shafts. The Contractor will keep records of operation of equipment during the test

including engine rpm and horsepower, fuel use, and other essential information that will be useful in designing a pump system.

3) The Contractor will, upon completion of testing, deliver a copy of development and testing records to the Engineer. At the completion of test pumping, all sand and debris shall be removed from the bottom of the well.

4) Upon completion of all work with development and test pumping, the well shall be capped by welding a ¼" steel plate over the top of the casing.

b. **Flow Meter Survey**

1. **General**

a) Description

This item includes a downhole flow meter (spinner) survey at each site, to be conducted at the option of the District, by a firm retained by the Contractor and approved by the District.

b) Submittals

1) Within ten (10) days of Notice of Award, the Contractor shall submit the name and qualifications of the firm retained to conduct the flow meter survey.

2) Immediately upon completion of the flow meter survey, the Contractor shall provide the District with five (5) field copies of the survey results.

3) Within one week of survey completion, the Contractor shall provide the District with ten (10) final copies of the survey results, one Mylar copy, and a compact disk or 3.5-inch floppy disk containing digital files of survey results in District-approved formats.

c) Measurement and Payment

1) Payment for the flow meter survey will be based on the lump sum price bid (see Bidding Sheets). Payment shall include full compensation for installing and removing all equipment and tools, operating survey equipment, field and final copies of survey results, and providing whatever assistance may be required of the Contractor to accomplish the survey.

2) There will be no additional payment for rig time and idle time while waiting for the survey firm to arrive, during setup and removal of survey equipment, or while the survey is in progress.

2. **Materials**

Equipment provided for the flow meter survey shall be capable of completing both stationary and dynamic measurements. The downhole meter used shall be of a diameter compatible with the temporary access tube installed for the survey.

3. **Execution**

a) Prior to commencing the constant-rate discharge test, the District and Contractor shall set a start time for the flow meter survey.

b) Downhole equipment required to complete the flow meter survey shall be installed inside the well casing through a temporary access tube. The Contractor shall provide whatever assistance or measures are necessary to install and remove the testing equipment and help complete the survey.

c) The flow meter survey shall be run at the rate of discharge selected for the constant rate discharge test. Unless agreed otherwise by the District Representative prior to installation of survey equipment, the flow meter survey completed will include both stationary (stop counts) and dynamic tests.

d) Stationary tests shall consist of two-minute readings made at 10-foot increments, unless otherwise requested by the District Representative. Dynamic tests shall be conducted at a rate of 1-foot per second, unless otherwise requested by the District Representative. The record for each test shall indicate either meter speed or percentage of total meter speed with depth.

e) The meter used for the survey shall be calibrated in the uppermost and lowermost blank sections of the well casing.

f) Survey results shall become the property of the District at the time the survey is completed. The survey shall be run in the presence of the District Representative.

H-6 Finish Work

a. Color Video Camera Survey

4. General

a) Description

This item includes completion of a downhole color video camera survey over the full depth of each new well. The survey shall be conducted (1) after all sediment accumulating in the well from test pumping has been removed, (2) after fresh water has been introduced from the surface to clarify water standing in the well, and (3) before final disinfection of the well. Video survey results will serve as a final inspection document for each new well. The survey shall be conducted by a firm retained by the Contractor and approved by the District.

b) Submittals

1) Within ten (10) days of Notice of Award, the Contractor shall submit the name and qualifications of the firm retained to perform the camera survey.

2) Five (5) copies of the survey results shall be provided to the District Representative in DVD format immediately upon completion at the well site.

c) Measurement and Payment

1) Payment for the video survey shall be at the lump sum price bid (see Bidding Sheets).

2) There will be no additional payment for rig time or idle time while the survey is being run.

5. Materials

a) Camera

The camera used for the survey shall be equipped with vertical- and side-view cameras (dual-cam) and with centralizers. The equipment used to complete the video survey shall produce a tape with an automatic depth indication (to the nearest 0.1 feet).

b) Recordings

The Contractor shall provide the District Representative with recordings of the survey results as specified above.

6. **Execution**

a) The video survey shall be conducted before final disinfection of the well.

b) Prior to conducting the survey, the test pump shall be pulled, the well bailed clean of lubricating oil, sediment and debris, and allowed to remain idle for at least 24 hours.

c) The video equipment shall be disinfected prior to lowering into the well.

d) Prior to conducting the survey, the Contractor shall introduce clear water into the well for a sufficient period and at sufficient quantity to produce clear viewing conditions during the survey to the satisfaction of the District Representative. Should the survey fail to produce a clear picture of the internal casing conditions, additional clear water shall be introduced and additional surveys conducted until a clear video is obtained to the satisfaction of the District Representative. All such remedial work and re-surveys shall be conducted at the Contractor's expense.

e) The Contractor shall provide whatever assistance may be required to accomplish the camera survey and shall take whatever steps are necessary to ensure the well water clarity is adequate to produce acceptably clear video images of internal casing conditions.

f) The video survey shall be conducted throughout the entire length of the well casing and screen. The video equipment shall include a real-time monitor, which records the camera depth readout superimposed on the video picture.

g) The survey shall become the property of the District at the time the survey is completed.

b. **Alignment/Deviation Tests**

1. **General**

a) Description

1) The Contractor shall conduct alignment/deviation tests through the entire length of each casing and screen using a gyroscopic tool to determine the plumbness and straightness of the well casing

2) Alignment tests shall be performed after the downhole color video survey has been completed and prior to final disinfection.

b) Submittals

1) Within ten (10) days of Notice of Award, the Contractor shall submit to the District Representative the name and qualifications of the firm proposed for completing the alignment/deviation tests.

2) Report of deviation and directional survey measurements and interpretation of well plumbness and alignment.

c) Measurement and Payment

Payment for the alignment tests shall be at the lump sum price bid (see Bidding Sheets).

2. **Materials**

a) Gyroscopic Tool

The deviation and direction survey shall be performed with a gyroscopic-type tool or a similar type tool as approved by the District Representative.

3. **Execution**

a) Alignment/deviation testing shall be conducted in the presence of the District Representative.

b) The alignment/deviation test shall be conducted from the top of well casing to the full depth of the well.

c) The well shall be constructed in such vertical alignment that a line drawn from the center of the well casing at ground surface to the center of the well casing at the bottom of the alignment test interval shall not deviate from the vertical more than 6 inches in 100 feet of length and shall be no closer to the inside wall of the casing than 5 inches.

d) Testing shall be conducted using a gyroscopic tool as specified above.

c. **Well Disinfection and Capping**

1. **General**

   a) Description

   This item includes disinfection of the well and temporary well capping. Well disinfection shall be completed after the downhole color video camera survey and alignment tests have been conducted and in the presence of the District Representative. The quantity of disinfectant used shall be sufficient to produce a chlorine residual as specified by the District Representative. Upon completion of disinfection, the well shall be temporarily capped with a steel plate.

   b) Submittals

   1) Daily activity log.

   2) Record of methods and concentration of chlorine used to disinfect the well.

   c) Measurement and Payment

   Payment for well disinfection shall be made at the lump sum price bid (see Bidding Sheets). Payment shall include all time and materials to disinfect and temporarily cap each new well.

2. **Materials**

For bidding purposes, the Contractor shall assume the following chemicals and estimated quantities (quantities are based on the volume of water estimated in the well casing or approximately 6,500 gallons for 20" casing):

Chemical	***Quantity (gallons)***
Sodium Hypochlorite – 100mg/L Concentration (12.5% Commercial Grade)	5.2
Chlorine Enhancer (NuWell 410 or approved Equal) ~ 1 gal per 1,000 gallons of water	6.5

The quantity of sodium hypochlorite is based on the following:

$$\frac{6{,}500 \text{ gals} \times 0.01\%}{12.5\%} = 5.2 \text{ gallons}$$

The Contractor shall deliver all chemicals to the work site in original closed containers. Chlorine containers shall have the original label indicating the percentage of available chlorine. All chemicals shall be delivered to the work site as close to the time needed as possible to avoid long onsite storage times. The Contractor shall not use chlorine products that have exceeded their expiration date. During temporary storage onsite, the Contractor shall keep all chemicals in capped or sealed containers and out of the direct sunlight.

3. **Execution**

a) To increase the effectiveness of chlorine treatment, the pH of the water in the well shall be adjusted to 6.0 pH units before adding the hypochlorite solution. Extreme caution must be exercised when using acids and chlorine together as toxic chlorine gas can be released when a hypochlorite solution is added to solutions that are less than six pH units.

b) The Contractor shall dose the well by adding chlorine solution into the well to obtain a minimum concentration of 100 parts per million but no greater than 200 parts per million.

c) The chlorine solution shall be introduced into the well by placement through a tremie, double swab tool, or nylon brush. Chemicals may be introduced by either pumping or gravity feed, however chemicals shall not be allowed to be poured into the casing from the surface. The Contractor shall introduce the chlorine solution at multiple depth intervals in measured proportional volumes. Immediately following dosing, the water column shall be swabbed using the double swab tool or nylon brush.

d) Following the introduction of chemicals into the well using the swab tool, the water in the well shall be tested for residual chlorine and pH using a small sampling bailer. If the residual chlorine concentration is less than 100 mg/L, steps 1 through 3 shall be repeated. Again, the entire depth of the well shall be thoroughly agitated as described above before sampling and measuring the residual chlorine concentration. If necessary, additional hypochlorite solution may be added to the well, separate from the chlorine enhancer. This procedure will be repeated until residual chlorine is at least 100 mg/L.

e) 24 hours after dosing the well, the water in the well shall again be tested for residual chlorine and pH using a small sampling bailer that is lowered to the bottom of the well prior to retrieval. If the residual chlorine concentration is

greater than 50 mg/L, the Contractor shall evacuate the well by simultaneous swabbing and airlifting/pumping, until the residual concentration is less than 50 mg/L.

f) Unless pre-approved otherwise by the District Representative, all chlorinated water discharged from the well shall be de-chlorinated.

g) Upon completion of disinfection, the well shall be capped with a welded steel plate. The cap shall completely cover the opening to the pump house casing and be sufficiently welded to prevent entry into the well casing by unauthorized personnel.

H-7 Final Clean up and Grading

Upon completion of all construction, the Contractor shall remove all temporary structures, fences, equipment and all drilling mud from the site and the bottom of the recharge ponds. All excavation or pits dug by the Contractor shall be backfilled with clean dirt. The premises shall be graded to the original elevation and left in neat condition. Pond bottoms that have been compacted due to contractor's activity shall be ripped to 36" deep to loosen the pond bottom to restore recharge percolation.

H-8 Other

a. Standby Time

1. General

a) Description

During the progress of well construction, it may be necessary for the District Representative to perform work that will require the drilling crew and equipment to stand idle. In such event, the District will request in writing the Contractor cease operations and will state the anticipated extent or duration of the idle period. The Contractor shall promptly cease operations.

b) Submittals

1) Daily log summarizing idle resources (description, basis of claim and hours).

2) Written claim for standby time.

c) Measurement and Payment

1) Payment for standby time shall be based upon the hourly rate bid and the number of hours approved by the District Representative.

2) As indicated in various sections of these detailed technical specifications, idle periods associated with specific work items are known to be required and shall be incorporated in the unit prices bid for these items. Idle time incurred during these periods shall not be the basis for a claim of standby time.

d) Prescribed Idle Periods **NOT** Covered by Standby Time:

1) District Representative's review of downhole geophysical logs: up to 72 hours (excluding weekends and holidays).

2) Idle period following placement of upper annular grout seal: 24 hours.

3) Chemical development: up to 12 hours (post-chlorination), up to 24 hours (post initial introduction of NW-220).

4) Idle time between step drawdown test and constant rate test: minimum 12 hours.

5) Idle time to clarify well water prior to video survey: as needed.

6) Idle time in excess of the maximum period specified for a particular work item, shall accrue if specified Contractor obligations have been met and the District Representative exceeds the specified time period through no fault of the Contractor. Payment for this idle time shall be at the unit price bid for standby time.

2. **Material (NOT USED)**

3. **Execution (NOT USED)**

b. **Destruction Of New Well**

1. **General**

a) Description

This item includes destruction of the borehole or casing for any new well. Destruction may be initiated due to actions of the Contractor or at the request of the District Representative.

b) Submittals

1) Daily activity log.

2) Final schedule of destruction.

c) Measurement and Payment

1) Payment for destruction at the request of the District Representative shall be at the unit price per foot bid (see Bidding Sheets).

2) No payment will be made for destruction required due to actions of the Contractor.

2. **Materials**

a) Sealing Materials

1) Acceptable impervious sealing materials that may be employed in the destruction of the borehole or well include neat cement or sand-cement grout.

2) A neat cement mixture shall be composed of one 94-pound sack of Portland cement and 5 to 6 gallons of clean water. Bentonite may be used to a total of 5 percent of the volume of cement to make the mix more fluid and reduce shrinkage.

3) Sand-cement grout shall be composed of not more than 188 pounds of sand and one 94-pound sack of Portland cement (2 parts sand to 1 part cement by weight) to about 7 gallons of clean water. This is equivalent to a 10.3 sack mix. Bentonite, to make the mixture more fluid and reduce shrinkage, may be used to a total of 5 percent of the volume of cement.

4) Quick setting cement, retardants to setting, hydrated lime and additives to make the mix more fluid may be used up to a total of 10 percent of the volume of the cement. Bentonite, to make the mix more fluid and reduce shrinkage, may be used to a total of 5 percent of the volume of cement.

b) Filler Material

Suitable filler materials include clay, silt, sand, gravel, crushed stone and those described in the previous section. Material containing organic matter shall not be used.

3. **Execution**

a) Destruction Prior to Installation of Casing

1) Destruction Due to Actions of the Contractor. If destruction of the borehole is by reason of any actions of the Contractor, including but not limited to such causes as losing tools, damaging the well, misalignment, or any other cause attributed to careless or poor workmanship, the borehole shall be completely filled with bentonite, cement or other impervious earth materials in accordance with applicable State and County Standards. No payment will be made for drilling and filling the borehole so destroyed or for mobilization and demobilization of this procedure. The Contractor shall drill a new borehole as specified in the Plans within fifty (50) feet of the original location, or as specified by the District Representative.

b) Destruction at Request of the District.

1) If destruction of the drilled borehole is specifically requested by the District in writing, including but not limited such causes a total lack of potential

aquifers, insufficient number of potential aquifers, or unacceptable quality, the borehole shall be filled completely with bentonite, cement, or other impervious materials in accordance with applicable State and County Standards. In this event, the Contractor will be paid for mobilization and demobilization at the site, as well as for the footage of drilling completed. The Contractor may then be requested to re-mobilize at a second site selected by the District. No payment for standby time will be made while awaiting a second site.

2) Destruction hereunder also shall include payment for destruction of any remaining or unused portion of the pilot borehole that is not being used for final well completion.

3) Payment for destruction of the borehole, if required and specifically requested by the District as set forth above, shall be made on a unit price per foot and shall be considered full compensation for all time, materials, and equipment required to complete the destruction (see Bidding Sheets).

c) Destruction During or After Installation of Casing

1) Necessity to destroy the cased borehole shall be deemed caused by the actions of the Contractor or the Contractor's negligence. In the event the borehole is destroyed after installation of casing or screen, the Contractor shall at their discretion, pull or leave the installed casing sections in place. In either case, the borehole shall be destroyed in accordance with State law by backfilling the casing and/or borehole with bentonite, cement or other impervious material.

2) No payment shall be made for lost or damaged casings and/or their installation in a well destroyed by reason of any action of the Contractor. The Contractor shall be required to drill a new well as shown on the Plans within 50 feet of the original site.

SUBMITTAL SCHEDULE

Work Phase	Submittal	Technical Specification Section(s)	Submitted Schedule
Casing and Fill Installation	Gradation (sieve) analyses of gravel pack materials.	H-3.j	Approved sieve analysis prior to shipping; up to three (3) sieve analyses of materials delivered on site due prior to start of casing installation.
	Material certification reports and cement weigh tickets, as applicable, for annular seals and upper annular grout seal.	H-3.k	Due upon delivery of materials on-site and prior to seal installation.
Mechanical Development	Daily development summary (depth intervals developed, total hours, gravel settlement/additions, and volume of settlement bailed from well).	H-4.a	Daily reports grouped and submitted weekly.
Chemical Well Development	Daily development summary (depth intervals developed, total hours, gravel settlement/additions, and volume of settlement bailed from well).	H-4.b	Daily reports grouped and submitted weekly.
Pumping Development	Certification (within past six months) of metering devices to be used for development pumping and aquifer pumping tests.	H-4.c	Due 10 days prior to installation of temporary development pump.
	Pump installation summary (type, diameter, capacity, range, intake depth)	H-4.c	Due upon completion of pump installation.
	Daily development summary (hours pumped, surging details, daily static water level, well discharge, pumping water level, specific capacity and sand content).	H-4.d	Daily reports grouped and submitted weekly.
Production Tests	Results of step-drawdown and constant-rate discharge tests.	H-5.a	Due in the field upon completion of testing.
Video Survey	Downhole color video survey.	H-6.a	Two (2) copies of

			survey results (DVD format) due in the field upon completion.
Alignment/ Deviation Tests	Results of alignment and deviation surveys.	H-6.b	Five (5) field copies of survey due upon completion; one (1) final copy and one (1) digital copy of survey due within one (1) week of completion.
Well Disinfection and Capping	Record of chlorine concentration used for disinfection; material certification report for steel plate used to cap the well.	H-6.c	Due within 1 week of completion.
Standby Time	Daily logs summarizing idle resources and written claim for standby time.	H-7.a	Due upon completion of each idle period for which standby time is claimed.
Well Destruction	Final schedule of destruction and materials (if required)	H-7.b	Cement weigh tickets due upon material delivery on-site; destruction summary due within one week of completion.

****END OF SECTION****

SECTION I

VERTICAL TURBINE PUMPS AND MOTORS

I-1 General Requirements

The Contractor shall provide all labor, materials and equipment and perform all operations required to furnish, install and test deep well vertical turbine pumps, complete with motor divers and all other specified accessories, all in conformance with details specified herein and shown on the Drawings. It shall be the responsibility of the Contractor to insure that all pumps, motors, controls and other pumping unit components furnished under this Contract shall be operationally compatible with each other.

I-2 Quality Control

a. **General** – All manufactured items furnished under these Specifications shall be of the sizes, shapes and utilize materials as specified herein. All materials shall be new, free from effects impairing strength, durability and appearance, and shall be of the best commercial quality for the purposes specified and made with structural properties to withstand all stresses and strains to which they are normally will be subjected. Items furnished, unless otherwise specified, shall be standard approved products of recognized manufacturers and fabricated in accordance with the best shop methods. All incidental items and accessories not specified herein, but which are required to fully carry out the specified intent of work, shall be furnished without additional cost. Welding shall be in accordance with the latest revision of the ASME Boiler and Pressure Vessel Code, Section VIII, Unfired Pressure Vessels. All welding shall be performed by certified welders qualified under the standard qualification procedures of the AWS.

b. **Equipment as Listed with Bid Proposal** – Shop Drawings Required – As specified under Section D, all equipment furnished in conformance with the technical provisions of Sections I shall be identical in type and manufacture to that listed by the Contractor with his bid proposal. All equipment and accessories furnished under the categories of pumps and motors, shall be provided solely by one source specializing in the furnishing of that applicable equipment category. In conformance with applicable provisions of Section D, the manufacturer(s) shall submit for review three sets of certified drawings showing the weights, principal dimensions, general construction and materials used for all equipment. Certified shop drawings including itemized bills of materials shall be submitted and reviewed prior to fabrication or shipment of any materials to the Contract work site. The District reserves the right to reject any material or fabricated unit at any time prior to final acceptance of Contract work if, in the opinion of the Engineer,

the materials and workmanship of such work do not conform to any or all requirements of the Specifications.

c. **Instruction Books –** The Contractor shall furnish three complete identical sets of instruction books for pumping units including motor driver and all accessory control instruments. These books shall contain all cuts and illustrations, with parts shown numbered for identification and instructions necessary for operating and maintaining the equipment. All information contained therein shall apply specifically to the equipment furnished and shall not include instructions not applicable. Instruction books shall contain complete laboratory test data and field test date. Delay in supplying revisions, which are necessary to make the instruction books conform to the completed installation, will be cause for delay in acceptance of the equipment.

I-3 General Requirements for Pumps and Motors

a. **General –** Except as otherwise specified under these Specifications, materials, fabrication, inspection and testing of all pumps and motors shall be in conformance with AWWA E101, Part A and the Appendix to said Specifications, all as applicable to oil lubricated line shaft vertical turbine pumps with direct-coupled, vertical, hollow shaft motor drivers. Design and construction of all motors shall be in conformance with NEMA Standard MG-1. All pump and motor equipment provided under this Contract shall be designed for outdoor pumping of good-quality, non-potable irrigation water with neutral pH, low dissolved solids content, low to moderate turbidity and temperatures between 40°F and 90°F. Pump terminology and nomenclature used in these Specifications will be as used and defined in the Hydraulic Institute Standards and in AWWA E101.

b. **Design Requirements – Operating Conditions** – Each vertical pump and motor furnished under these Specifications shall be required to operate continuously with no evidence of cavitation, excessive noise, vibration or damage to impellers, in conformance with the following listed requirements:

(1)	Required operating range of pump total head	425 ft maximum 260 ft minimum
(2)	Required range of pump capacities	5.7 cfs -7.5 cfs
(3)	Required minimum allowable bowl assembly efficiency for all values of bowl assembly head range	75 percent
(4)	Required minimum allowable bowl assembly efficiency at design head and flowrate	82 percent
(5)	Required minimum allowable overall efficiency for any operating condition within the pump total head range	65 percent
(6)	Requirement rated nameplate horsepower of pump motors	350 hp
(7)	Required rated nameplate voltage of pump motors	480 volts – 3 phase
(8)	Required discharge column pipe-inner diameter	12 inches
(9)	Diameter of well casing	20 inches
(10)	Required nominal motor speed	1800 rpm
(11)	Approximate bowl setting	500 feet
(12)	Minimum diameter of pump shaft and pump line shaft	1-15/16 inches
(13)	Nominal diameter of pump line shaft enclosing the tube	3 inches
(14)	Diameter and Weight of Column Pipe	12 inches, 0.330 min. wall thickness, 12.75 O.D., 43.77 lb/ft.

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

- Peak efficiency is not required for pumping units when operating with pump total heads greater than 500 feet; however, in no case at any value within the required operating range of pump total head, shall brake horsepower requirement of the pump exceed the nameplate horsepower rating of the pump motor.

- Motor bearing loading shall be considered to include the total pump line shaft thrust for the design condition specified under I-5(c); provisions for reduced thrust resulting from hydraulic "thrust balancing" of impellers will not be allowed.

- Unless otherwise directed, design of each impeller and design of each impeller bowl shall be identical to insure interchangeability of parts for all pumps.

I-4 Pump Design and Testing

a. **Pump Design –** Pump bowl assemblies shall be of the multi-stage type with totally enclosed impellers for counterclockwise rotation. Bowl assemblies shall be of the type normally provided by the pump manufacturer of use with oil-lubricated type pumps with enclosed line shafts. Pump bowls shall be of cast iron coated with vitreous enamel. Pump impellers shall be of cast bronze. The use of hydraulic balancing rings for hydraulic "thrust balancing" will not be allowed. Bowl bearings either shall be Vesconite. The impeller pump shafts and pump top shafts shall be of stainless steel. Pump line shafting shall be of ground carbon steel in conformance with AISC-1045 with nominal ultimate tensile strength of 100,000 psi, minimum. Line shaft spacer bearings shall be of bronze at five (5) feet spacing minimum. The distance between line shaft joints shall be 20 feet minimum. Discharge column piping shall be of nominal 12-inch diameter and shall weigh 43.77 pounds per linear foot, minimum, in conformance with AWWA E101, Table 2. Each pumping unit shall be provided with an approved suction extension per the Plans.

b. **Pump Lubrication System** – Each pumping unit shall be equipped with an electrically operated lubricating system which shall supply lubricant to the line-shaft bearings. The auto-oiler shall be designed for outdoor operating and shall have a metal oil reservoir with a capacity of not less than ten gallons, complete with tubing, fittings, and ASCO oil shutoff valve, Model 8262. A manual dripper shall also be provided for pre-lubrication of shaft prior to motor startup.

c. **Pump Discharge Heads –** In conformance with details shown on the drawings, for all pumping units, the Contractor shall furnish and install cast iron or fabricated steel discharge heads for surface discharge; cast iron if utilized shall be in conformance with ASTM A48, Class 30. Steel shall be in conformance with ASTM A283, Grade C. Each pump discharge head shall be provided with a right-angle flanged discharge elbow connected to branch piping and a flanged base.

d. **Laboratory Performance Tests for Pumps** – As directed by the District, bowl assemblies for all pumping units shall be successfully subjected to the performance test and to the hydrostatic tests of discharge head and bowl assembly

as specified under AWWA E101, Section A6. Unless otherwise directed, all tests will be witnessed by the District. Test methods, testing equipment and requirements for recording of test readings and results shall be in conformance with the requirements of AWWA E101, Section A6. Each pump bowl assembly shall be operated at bowl assembly heads over the required range of operating head without signs of cavitation or malfunction. Each complete pump bowl assembly shall discharge a minimum of 5.5 cfs against the maximum required bowl assembly head. The bowl assembly efficiency shall be 82 percent, minimum, for any and all values of the bowl assembly head within the required range in order for a pump to successfully pass the laboratory performance test. Pump performance curves shall be submitted to the District for review and approval.

e. **Painting** – Unless otherwise shown or directed, all exposed metal surfaces of pumps and pump lubrication system components shall be finished and coated as recommended by the manufacturer, and as accepted by the District.

I-5 Motor Design and Testing

a. **General Motor Design –** Except as otherwise specified herein, design and construction of motors shall be in conformance with NEMA Standard MG-1. Motors shall be vertical hollow-shaft squirrel cage induction type, similar to NEMA Design B, Inverter Duty, (Per NEMA MG-1 parts 30 and 31) suitable for three (3)-phase, 60-cycle power operation at full load speed of approximately 1,800 rpm, with the locked rotor torque approximately 100 percent and the breakdown torque approximately 200 percent of full load torque. Motors shall have nameplate rating of 350 horsepower with a service factor of 1.15 and must be compatible with the variable frequency drive (VFD) motor control unit. Rated voltage shall be 480 volts. Motors shall be capable of continuous operation at nameplate rated load without exceeding a motor winding temperature rise of 60°C by thermometer (70°C by resistance); this requirement shall be verified by the witness test specified under I-5(e). Motors shall operate continuously at nameplate rated load with a minimum efficiency of 92.5 percent, not including hydraulic thrust losses. Motors shall have a minimum power factor of 85 percent. Motors shall be enclosed in an outdoor weather protected NEMA Type 1 enclosure with internal corrosion proofing and with corrosion resistant screens to prevent the entrance of rodents. In accordance with applicable provisions of NEMA MG-1, each motor shall be balanced after assembly to an overall vibration amplitude of one (1) mil, maximum, when measured at the machine bearing housing. Motors shall be equipped with a non-reversing ratchet. Motors shall be manufactured in the USA by U.S. Motors, General Electric or approved equal.

b. **Service Conditions**

1. **Unusual Environmental Conditions –** Exposure to ambient temperatures in the range of -10°C to 50°C and exposure to direct solar radiation.

2. **Usual Service Conditions –** All other environmental and operating conditions are normal as stipulated in NEMA standard MG-1-14.02.

c. **Bearing Design –** Design of motor thrust bearings shall be such as to continually handle the total pump line shaft thrust developed with a 3-year minimum and 15-year average life (provision of 144 percent of extra-thrust capability for the above design conditions); in addition, motor thrust bearings shall be capable of handling increased momentary thrust equivalent to the total pump line shaft thrust developed under a closed valve or shut-off condition.

d. **Insulation and Thermal Protection Systems** – Each motor shall be furnished with an approved, form-wound, waterproof insulation system utilizing NEMA Class B materials. The insulation system shall be equivalent to General Electric "Custom Polyseal," Westinghouse "Thermalastic Epoxy," U.S. Motors "Everseal," Insulife 1000 system or approved equal.

e. **Required Factory Tests for Motors** – Upon request by the District, one of the motors to be furnished, as selected by the District, shall successfully be subjected to a complete factory test conducted in accordance with the requirements of NEMA MG-1 Part 12 & ANSI/IEEE 114, including the following individual tests:

1. No-load readings of current and speed.

2. Locked-rotor current.

3. High-potential test.

4. Heat run at full load with temperature rise as measured by either the resistance or thermometer method.

5. Efficiency test at ½ load, ¾ load and full load. All tests will be witnessed by the Engineer. Three (3) certified copies of the results of all tests shall be furnished.

f. **Painting –** Unless otherwise shown or directed, all exposed metal surfaces of motor parts shall be finished and coated as recommended by the manufacturer,

and as accepted by the District. Finish coating shall be in accordance with Section L of this Specification.

I-6 Nameplates

a. **Pumps –** Each pump shall be provided with a nameplate of corrosion-resistant metal securely fastened to the unit. Each pump shall have the plate installed at a point diametrically opposite the discharge nozzle. Each nameplate shall show the following data in engraved or stamped legible characters:

1. Name of pump manufacturer
2. Pump serial number
3. Year built
4. Design capacity in c.f.s.
5. Maximum pump total head at design capacity in feet
6. Number of pump stages
7. Overall efficiency at the best efficiency point
8. Type of impeller

b. **Motors –** Each motor shall be provided with a nameplate of corrosion-resistant metal securely fastened to the unit. The nameplates shall be engraved or stamped to show the minimum data listed under NEMA MG-1-10.39.

I-7 Payment

Payment for all labor, materials, and equipment specified under these Specifications, as required to furnish and install complete pumping unit installations will be made at the unit price stated in the Bidding Schedule for the applicable pumping units. Included in each unit price is the cost of furnishing a vertical turbine pump, pump motor, and appurtenances.

****END OF SECTION****

SECTION J

STRUCTURAL STEEL AND MISCELLANEOUS METALS

J-1 General

The Contractor shall provide all labor, materials, and equipment and shall perform all operations required to furnish and install, complete, all structural steel and miscellaneous metals. Painting and protective coatings for ferrous metalwork shall be as specified in Section L.

J-2 Quality Control

a. General

All items required under Section J of the Specifications shall be of the sizes, shapes and materials as indicated on the drawings or specified herein. All materials shall be new, free from defects impairing strength, durability and appearance, shall be of the best commercial quality for the purposes specified and made with structural properties to withstand all stresses and strains to which they normally will be subjected. Items furnished, unless otherwise specified, shall be standard approved products of recognized manufacturers and fabricated in accordance with the best shop methods. All incidental items and accessories not shown on the drawings or specified herein, but which are required to fully carry out the specified intent of work, shall be furnished without additional cost.

b. Shop Drawings and Mill Reports

Shop drawings of all fabricated units shall be submitted to the Engineer for review in accordance with applicable provisions of Section D. Shop drawings shall conform to AISC recommendations and specifications and shall show all holes, etc required for other work. Drawings shall include complete details showing all members and their connections, anchor bolt layouts, schedules for fabrication procedures, and diagrams showing sequence of erection.

Layout drawings for grating shall be submitted showing the direction of span, type and depth of grating, size and shape of grating panels, seat angle details, and details of hold down fasteners. Load and deflection tables shall be submitted for each style and depth of grating used.

Erection layout drawings of metal decking where occurs showing the location of deck sheets, end laps, side laps, types and locations of welds, and details of accessories shall be submitted. An ICBO report for each type of metal deck used shall be submitted. In addition the Contractor shall submit certification furnished

by the deck manufacturer of the yield strength of the steel used for the metal deck. The Contractor shall also submit gage and section properties and diaphragm shear values for the deck supplied using the welding pattern shown on the drawings.

An ICBO report listing the ultimate and allowable load capacity in tension and shear for each size and type of concrete anchor shall be submitted.

No substitution for the indicated anchors shall be considered unless the request for substitution is accompanied by an ICBO report verifying strength and material equivalency, including temperature at which load capacity is reduced to 90 percent of that determined at 75 degrees F.

Testing laboratory certifications for shop and field welders shall be submitted to the Engineer prior to the start of work.

The Engineer reserves the right to reject any material at any time before final acceptance of Contract work, if, in the opinion of the Engineer, the materials and workmanship do not conform to any or all requirements of the Specifications.

J-3 Structural Steel

a. General

The Contractor shall furnish and install all structural steel as shown on the drawings and specified herein.

b. Materials

Unless otherwise specified or shown on the drawings, materials shall be in conformance with the following requirements. All members shall be furnished full length, without splices, unless otherwise indicated or approved by the Engineer.

1. Wide flange shapes shall be ASTM A992 or ASTM A572, Grade 50. All other shapes, plates, and bars shall be ASTM A36, unless noted otherwise.

2. Structural steel pipe shall be ASTM A501 or ASTM A53, Type E or S, Grade B.

3. Structural tubing shall be ASTM A500, Grade B.

4. All structural steel shall be hot dip galvanized after fabrication per ASTM A123, unless otherwise specified.

5. Bolts - Bolts for connections shall be ASTM A325N, unless indicated otherwise indicated. Bolts used to connect dissimilar metals shall be ASTM A193 and A194, Type 316 stainless steel. All carbon steel bolts and nuts and other threaded fasteners shall be hot-dip galvanized per ASTM A153.

   Anchor bolts shall be ASTM A307, Grade A or B, or ASTM A36, hot dip galvanized per ASTM A153.

   Nuts shall be of the same material as the bolts and shall be capable of developing the full strength of the bolts.

   Bolts and nuts shall be installed with washers fabricated from material matching the base material of the bolts, except hardened washers for high strength bolts shall conform to the requirements of the AISC Specification.

   The length of each bolt shall be such that after the joint is made up, the bolt extends through the entire nut, but no more than 1/2-inch beyond the nut.

c. Fabrication and Installation

Structural steel shall be fabricated in accordance with the drawings, AISC Specifications, and as shown on the approved shop drawings. Materials shall be properly marked and match-marked for field assembly. Where finishing is required, assembly shall be completed, including bolting and welding, before the start of finishing operations.

1. Unless otherwise specified or shown on the drawings, all embedded metalwork shall be set accurately in position when concrete is placed and shall be supported rigidly to prevent displacement or undue vibration during or after the placement of concrete. Unless otherwise specified, where structural steel is to be installed in recesses in formed concrete, said recesses shall be made, structural steel installed, and recesses filled with drypack mortar in conformance with applicable provisions of Section F. All anchor bolt assemblies shall be in accordance with details shown on the drawings.

2. All surfaces of structural steel, except galvanized surfaces, shall be painted or coated after installation in accordance with applicable provisions specified elsewhere under Section L. Structural steel with damaged galvanized surfaces either shall be repaired or replaced at the option of the Engineer, and at no additional cost to the District. Repair of galvanized

surfaces shall be effected with Galvanox repair compound, as manufactured by Subox, Inc., Z.R.C. Cold Galvanizing Compound, as manufactured by ZRC Products Company, or approved equal. All damaged and uncoated areas shall be repaired per ASTM A780.

3. Connections – Shop and field connections shall be bolted or welded as shown or specified. All connections shall develop the full strength of the members joined and shall conform to AISC standard connections, unless noted otherwise on the Drawings.

4. Welding shall comply with the requirements of AWS D1.1, latest revision. Shielded metal arc welding method shall be used for welding structural steel. Upon completion of welding, weld splatter, flux, slag, and burrs left by attachments shall be removed. Welds shall be repaired to produce a workman like appearance, with uniform weld contours and dimensions. Unless otherwise shown, all butt and bevel welds shall be complete penetration.

5. Holes for other work shall be provided as necessary or as indicated for securing other work to the structural steel framing, and for the passage of other work through steel framing members. No torch cut holes will be permitted.

d. Product Delivery, Storage, and Handling

Structural members shall be loaded in such a manner that they may be transported and unloaded without being excessively stressed, deformed, or otherwise damaged. Structural steel members and packaged materials shall be protected from corrosion and other deterioration. Material shall be stored in a dry area and shall not be placed in contact with the ground. Contractor shall repair or replace damaged materials as directed.

e. Erection

The Contractor shall comply with the AISC Specifications and Code of Standard Practice and with specified requirements. Structural steel shall be set accurately to the lines and elevations indicated. Members shall be aligned and adjusted to form a complete frame or structure before being permanently fastened. Surfaces which will be in permanent contact shall be cleaned before assembly. Adjustments necessary to allow for discrepancies in elevations and alignments shall be performed.

High strength bolts shall be installed in accordance with the AISC Specification for Structural Joints Using ASTM A325 Bolts. The connections shall be friction type, unless otherwise indicated.

Incorrectly sized or misaligned holes in members shall not be enlarged by burning or by the use of drift pins. Correction of misfits is part of the Work. Gas cutting torches shall not be used in the field for correcting fabrication errors except when approved by the Engineer.

Anchor bolts and other connectors required for securing structural steel or equipment to in-place work, and templates and other devices for presetting bolts and other anchors to accurate locations shall be furnished by the Contractor.

The Contractor shall be responsible for designing, supplying, and installing any temporary bracing required for the safe erection of all structural steel.

f. Setting Bearing and Base Plates

Before placing non-shrink grout under bearing and base plates ,the plates and the concrete or masonry bearing surface shall be cleaned of all bond reducing materials. The concrete or masonry bearing surface shall also be roughened to improve bonding.

Base plates and bearing plates for structural members and equipment shall be set on wedges, leveling nuts, or other adjustable devices. Baseplates shall be grouted prior to loading the structure to assure uniform bearing. Anchor bolts shall be tightened after the supported members have been positioned and plumbed and the grout has attained its indicated strength.

J-4 Miscellaneous Metals

a. General

The Contractor shall furnish and install all miscellaneous metals in conformance with details shown on the drawings and as specified herein.

b. Materials

Unless otherwise specified or shown on the drawings, materials shall be in conformance with the following requirements:

1. Stainless Steel – Unless otherwise indicated, stainless steel metalwork and bolts shall be Type 316 stainless steel.

2. Aluminum – Unless otherwise indicated, aluminum metalwork shall be Alloy 6061-T6. Aluminum in contact with concrete, masonry, wood, dissimilar metals, or porous materials shall have contact surfaces coated in accordance with Section J.

3. Cast Iron – Cast-iron castings and sleeves shall be in conformance with AWWA C100, Class D.

4. Metal Grating - Metal grating shall be of the design, types, and sizes indicated. Bearing bars in each panel shall be banded at the ends with banding bars of the same size as the bearing bars, welded to each bearing bar. All openings in grating that require cutting of more than three bearing bars shall be finished in the same manner as the ends of the grating panels. All pieces of grating shall be fastened in two locations to each support Grating shall be smooth (non-serrated) unless otherwise indicated on the drawings.

   Where grating forms the landing at the top of a stairway, the edge of the grating which forms the top riser shall have an integral non-slip nosing with a width equal to that of the stairway treads.

   Except where otherwise indicated bar grating shall be hot-dip galvanized per ASTM A123 steel with cross bars welded into position.

5. Checkered Plate – Where no material is indicated on the drawings checkered plate shall be A36 steel. Checkered plate shall have a pattern of raised lugs on one face and shall be smooth on the opposite face. Lugs shall be a minimum of one-inch in length and raised a minimum of 0.050-inches above the surface. The lugs shall be located in a pattern in which the lugs are oriented at 90 degrees from the adjacent lugs in two orthogonal directions and the rows of lugs shall be oriented at 45 degrees from the edges of the plates.

6. Grating Stair Treads - Grating stair treads shall be designed to support a live load of 100 psf or a concentrated load at mid-span of 1000 pounds, whichever creates the higher stress. The maximum deflection due to the uniform live load shall not exceed ¼-inch or the span divided by 180, whichever is less. All grating stair treads shall have an integrated non-slip nosing. Grating stair treads shall be hot dip galvanized per ASTM A123.

7. Stair Safety Nosing - Stair safety nosing shall be provided on all concrete stairs and at other locations as indicated. The nosing shall be 3-inch wide, extruded aluminum with cast-in abrasive strips and integral extruded anchors. The color of the nosing shall be selected by the ENGINEER from

the manufacturer's standard colors. The nosing shall be Amstep Products Company, "Amstep 231A"; American Safety Tread Company, "Type 2211" or approved equal.

8. Ladders – Ladders shall be hot dip galvanized after fabrication unless otherwise indicated. Every ladder which does not have an exterior handhold shall be equipped with a pop-up extension. The pop-up extension device shall be of the same material and finish as the ladder with a telescoping tubular section that locks automatically when fully extended. Upward and downward movement shall be controlled by stainless steel spring balancing mechanisms. Units shall be completely assembled with fasteners for securing to the ladder rungs in accordance with manufacturer's instructions.

9. Floor Hatches - Where access hatches are mounted on a floor slab (including top slabs which are not covered with a roofing membrane) or on a concrete curb, the hatch shall be a flush type as indicated herein. Hatches mounted on a roof surface which has a membrane or other roofing material covering it shall be the integral raised curb type.

   Hatches shall be fabricated from Aluminum 6061 T6, unless otherwise indicated. Hatch hardware shall be Type 316 stainless steel. Hatches shall be gutter-type; Bilco Type "J" or "JD" Babcock-Davis type "FT" or "AM" or equal.

   The design live load shall be 300 psf, unless indicated otherwise.

   Hatch opening sizes, number and swing direction of door leaves, and locations, shall be as indicated. Sizes are for the clear opening. Where the number of leaves is not given, openings larger than 42 inches in either direction shall have double-leaf doors. Unless indicated otherwise, hinges shall be located on the longer dimension side. Unless indicated otherwise, ladder hatches shall be a minimum of 30 inches wide by 38 inches long, with the ladder centered on the shorter dimension, and the door hinge opposite the ladder.

   Door leaves shall be a minimum of 1/4-inch thick checkered pattern plate. Channel frames shall be a minimum of 1/4-inch material with an anchor flange around the perimeter. Hatches shall be provided with an automatic hold-open arm with release handle. Hatches shall be designed for easy opening from both inside and outside.

Hatches shall be designed to be water-tight and shall be equipped with a joint gutter and moat-type edge drain. A minimum 1-1/2-inch diameter drain connection shall be provided, located by the manufacturer.

Hatches shall include a recessed hasp for a padlock that is covered by a hinged lid flush with the surface.

10. Metal Decking (where occurs) – All metal deck shall be manufactured from steel conforming to ASTM A611, Grades C, D, or E; or A446, Grades A, B, C, D, E, or F, or equal, having a minimum yield strength of 33,000 psi. The maximum design working stress of the deck shall not exceed 0.6 times the yield strength.

    The structural properties of the deck shall be shown on the drawings. The moment of inertia and section modulus of the deck shall be computed in accordance with the Steel Deck Institute specifications and in accordance with the American Iron and Steel Institute Specification for the Design of Cold-Formed Steel Structural Members.

    All steel deck shall be hot-dip galvanized per ASTM A123 and shall conform to ASTM A 653.

    Decking stored at the job site before erection shall not be in contact with the ground and shall be protected from the weather.

    The metal deck shall have a sheet length that covers a minimum of 3 spans.

    The metal deck shall be formed at the longitudinal edges in such a manner that they will overlap and/or interlock. Where the ends of sheets overlap they shall be die-formed such that the sheet in the next row telescopes and snugly overlaps the sheet laid previously.

    All plates required to connect decking to the supports or to maintain continuity shall be a minimum of 14 gage and shall be galvanized.

    Metal deck sheets shall be positioned on supporting steel framework and adjusted to final position with ends bearing a minimum of 2-inches on supporting members. Units shall be placed end to end, with all ribs aligned over the entire length of the run before being permanently fastened.

    Special care shall be exercised not to damage or overload the deck during installation. The deck shall not be used for storage or as working platforms until permanently secured in position. Construction loads shall

not exceed the deck carrying capacity, as recommended by the manufacturer.

All openings in the deck shall be cut and fitted neatly and shall be reinforced with structural steel members to distribute the load.

Where concrete fill is required on the Drawings, deck shall be installed with closure plates and other accessories as needed to prevent loss of water, cement, and fines during placing and consolidation of the concrete.

Care shall be exercised in the selection of electrodes and an amperage to provide positive welds and to prevent high amperage blow holes. Welds shall be made from the top side of the deck immediately after alignment.

The metal deck shall be welded to all supporting members with 1/2-inch effective diameter puddle welds spaced at 12-inches on center at members parallel to the ribs and at every rib valley at members perpendicular to the ribs, unless otherwise shown on the Drawings. Welding washers shall be used when welding steel deck of less than 0.028-inch thickness. Welding washers shall not be used when welding steel deck of 0.028-inches or greater.

Side laps shall be welded with 1 1/2 inch long top seam welds, spaced at 12-inches on center unless indicated otherwise.

All welds shall be free of sharp points or edges. All welds shall be cleaned immediately by chipping or wire brushing and shall be coated with a zinc dust type primer paint.

Welding shall conform to the applicable requirements of AISC "Light Gauge Steel Design." Welders shall be AWS certified.

11. Drilled Anchors – Drilled anchors and reinforcing bars shall be installed in strict accordance with the manufacturer’s instructions. Holes shall be roughened with a brush on a power drill, cleaned and dried. Drilled anchors shall not be installed until concrete has reached the required 28-day compressive strength. Adhesive anchors shall not be loaded until the adhesive has reached its indicated strength in accordance with the manufacturer’s instructions. Material for drilled anchors shall be as shown on the drawings.

12. Adhesive Anchors - Unless otherwise indicated all drilled concrete or masonry anchors if indicated or permitted by the Engineer shall be epoxy adhesive anchors. Epoxy adhesive anchors shall not be permitted in areas

where the concrete temperature is in excess of 100 degrees F or higher than the limiting temperature recommended by the manufacturer. Epoxy anchors shall not be used where the anchors are subject to vibration or fire. Embedment depth shall be as shown on the drawings or as recommended by the manufacturer for the loads to be supported. Adhesive anchors shall be Hilti HIT-RE 500-SD adhesive anchors (ICC-ESR No. 2322) as manufactured by Hilti, Inc. or approved equal.

13. Expansion Anchors – Expansion anchors if indicated or permitted shall be hot-dip galvanized steel or stainless steel expansion anchors. Diameter and embedment shall be as indicated on the drawings.

14. Handrail – All handrail shall be fabricated from structural steel pipe unless otherwise indicated. All exposed welds in handrail shall be ground smooth and flush. All handrails shall be welded and hot dip galvanized after fabrication.

J-5 Payment

No separate payment will be made for structural steel and miscellaneous metal work. All costs therefore shall be included in the lump sum price bid in the Schedule of Pay Items for the item of work requiring structural steel and miscellaneous metal work.

END OF SECTION

SECTION K
ELECTRICAL WORK

K-1 General Provisions

a. Related Documents

Drawings and the general provision of this Contract, including General Conditions, Special Conditions, Concrete and Vertical Turbine Pumps and Motors, apply to this Section.

b. Summary of Work

The scope of this Section includes electrical work at three (3) Well sites (MC1, MC2, and B1).

At each site, perform the following:

Furnish and install all required equipment, transformer pad, meter panel with concrete pad, conduit and wiring for incoming electrical service from the Pacific Gas and Electric Company (PG&E) service point to the motor control unit at each new well site (wells MC1, MC2, and B1). Equipment and installation shall be in accordance with PG&E requirements.

Furnish and install one (1) meter panel, one (1) Yaskawa IQU1000 Nema 3R Matrix Variable Frequency Drive (for 350 horsepower well pump), and one (1) future instrumentation and monitoring panel with concrete pad as hereinafter specified and shown on the Drawings at each new well site (MC1, MC2, and B1).

Furnish and install all conduit, including trenching and backfill. Furnish and install all wiring.

Make field connections and terminations to motors, motor control equipment, and other electrical devices as shown on the Drawings.

Furnish and install materials and incidentals required to complete the electrical work hereinafter specified, and shown on the Drawings. Typical materials and incidentals shall include, but not be limited to, compression connectors for cables, junction and terminal boxes, terminal lugs and control wires required to interconnect vendor supplied equipment with other equipment hereinafter specified and shown on the Drawings. It is the intent of these Specifications that the electrical system shall be suitable in every way for the service required. All material and all work which may reasonably implied as being incidental to the work specified in this Section shall be furnished and installed at no extra cost.

c. **Codes, Inspection and Fees**

All materials and methods shall be in accordance with the latest edition of the
National Electrical Code and all applicable national, local and state

codes.

d. **Interpretation of Drawings**

The Drawings are not intended to show exact locations of conduit runs. The Contractor shall coordinate conduit runs with other trades to avoid interference. The Contractor shall locate conduit entry into the meter panel and the motor starter enclosure.

All connections to equipment shall be made as shown, specified, and directed and in accordance with the approved vendor shop and setting drawings, regardless of the number of conductors shown on the Electrical Drawings.

The Drawings show approximate equipment locations and footprints, which are provided for bid purposes. Verify actual equipment dimension and locations with the District prior to commencement of this work.

e. **Coordination with other Work**

Completely coordinate the work hereinafter specified with the work of other trades and vendors.

f. **Shop Drawings**

Shop drawings shall be submitted for approval of all materials, equipment, apparatus, and other items as required by the District.

Shop drawings shall be submitted for the following equipment:

- Meter panel
- Yaskawa IQU1000 Nema 3R Matrix Variable Frequency Drive (for 350 horsepower pump)
- TVSS, 120/240v panel (if separate from control enclosure)

- Future instrumentation and monitoring panel.
- Conduit, wire, boxes, and miscellaneous electrical equipment

Shop drawings shall include the following for the motor control enclosure:

- Outline dimensions, including available space for conduits, cable terminations, bus terminations, and cable supports
- Engineering data, including voltage, current, and short circuit ratings
- Interconnection wiring diagrams
- Written descriptions, explaining ladder diagrams, control operation, and system operation
- Complete list of special tools required for the operation and maintenance of the unit

Prior to submittal by the Contractor, all shop drawings shall be checked for accuracy and Contract requirements. Shop drawings shall bear the date checked and shall be accompanied by a statement that the shop drawings have been examined for conformity to Specifications and Drawings. This statement shall also list all discrepancies with the Specifications and Drawings. Shop drawings not so checked and noted shall be returned.

The District's check shall be only for conformance with the design concept of the project and compliance with the Specifications and Drawings. The responsibility of, or the necessity of, furnishing materials and workmanship required by the specifications and Drawings which may not be indicated on the shop drawings is included under the work of this Section.

The responsibility for all dimensions to be confirmed and correlated at the job site and for coordination of this work with the work of all other trades is also included under the work of this Section.

Submit complete material lists for all materials, equipment, apparatus, and fixtures proposed for the work specified herein. Such lists shall state manufacturer, type, brand name, size, and quantity of each item or class of material.

Catalog cuts, bulletins, brochures, or photocopies of applicable pages thereof shall be submitted for mass-produced, non-custom manufactured material.

Recommended installation and anchoring methods and procedures for the 480- volt motor control enclosure and meter panel as printed by the equipment manufacturer.

g. **Quality Assurance**

All equipment and materials shall be new, shall be listed by UL, and shall bear the UL label where UL requirements apply. All equipment and materials shall be the products of experienced and reputable manufacturers in the industry. Similar items in the work shall be products of the same manufacturer in order to achieve standardization of appearance, operation, maintenance, spare parts and manufacturer's services. All equipment and materials shall be of industrial grade standard of construction.

All materials and equipment shall be installed in accordance with printed recommendations of the manufacturer. All installation work as specified herein shall be accomplished by qualified, experienced personnel working under continuous, competent supervision. The completed installation shall display competent work, reflecting adherence to prevailing industrial standards and methods.

Provide adequate means for fully protecting all finished parts of the materials and equipment against damage resulting from any cause during the progress of the work.

Replace or refinish all damaged materials or equipment, including faceplates of panes and switchboard sections, at no expense to the District.

The materials used in all systems shall be new, unused and as hereinafter specified. All materials where not specified shall be of the very best of their respective kinds. Samples of materials or manufacturer's Specifications shall be submitted for approval as required by the District. Materials and equipment used shall be Underwriters Laboratories, Inc. listed unless otherwise approved by the Engineer.

h. **Tests**

Test the functional operation of all systems and repair or replace all defective work.

i. **Electric Utility Requirements**

Power for each of the well sites will be arranged by the District and provided by PG&E. Electrical service shall be as shown on the Drawings. The

Contractor shall verify with the District the exact location of each service point.

K-2 Raceway, Fittings, and Boxes

a. Raceway and Conduit

Rigid Steel Conduit: Steel conduit shall be mild steel, hot-dipped galvanized inside and outside after threading, and shall conform to ANSI C80.1 rigid steel conduit, zinc coated and UL-6 listed. Provide conduit as manufactured by the Allied Tube and Conduit Corporation, Triangle Pipe and Tube Company, Wheatland Tube Company or approved equal.

Rigid Non-metallic Conduit: Non-metallic conduit shall be Schedule 40, sunlight resilient, high impact polyvinyl chloride (PVC), UL listed for concrete for concrete encasement of direct burial. Provide conduit as manufactured by Carlon, Triangle Pipe and Tube Company, Inc., or approved equal.

Conduit Spacers: Pre-manufactured conduit spacers shall be used in all concrete duct banks, and shall be of polyvinyl chloride (PVC) type, specifically designed for use with non-metallic duct. Spacers shall be Carlon Snap-Loc, or approved equal.

Liquid-tight Flexible Metal Conduit: Liquid-tight, flexible metal conduit shall be Sealtite, Type UA, in accordance with UL-360 – Steel Conduits, Liquid-tight, Flexible as manufactured by the Anaconda Sealtite, Electri-flex Liquatite, or approved equal.

b. Fittings

Fittings used with flexible conduit shall be of the screw-in type as manufactured by the Thomas and Betts Company, Crouse-Hinds Company, or approved equal.

Fittings used with rigid steel conduit shall be hot dipped galvanized inside and out after threading, and shall conform to ANSI C80.1. Provide fittings as manufactured by the Youngstown Sheet and Tube Company, Allied Tube and Conduit Corporation, or approved equal.

Fittings for rigid non-metallic conduit shall be Schedule 40, high impact polyvinyl chloride (PVC), UL listed, and rated for use with 90-degree C conductors. Fittings shall be manufactured by Carlon, Condux, or approved equal.

Combination expansion-deflection fittings shall be Type XD as manufactured by the Crouse-Hinds Company or approved equal.

Conduit hubs shall be as manufactured by Myers Electric Products, Inc., Raco Division, Appleton Electric Company, or approved equal.

c. **Boxes**

Terminal boxes, junction boxes, pull boxes etc., shall be steel unless otherwise shown on the Drawings. Boxes shall be galvanized and have continuously welded seams. Welds shall be ground smooth and galvanized. Box bodies shall be flanged and shall not have holes or knockouts. Box bodies shall not be less than 14-gauge metal and covers shall not be less than 12-gauge metal. Covers shall be gasketed and fastened with stainless steel screws. Boxes shall be as manufactured by Hoffman, Rohn, Hammond or approved equal. NEMA-4 boxes shall be 316 stainless steel.

Cast iron boxes and fittings shall be galvanized with cast galvanized covers and corrosion-proof screws as manufactured by the Crouse-Hinds Company, Appleton Electric Company, or approved equal.

Conduit Wall Seals: Conduit wall seals shall be fire retardant, Type WSK as manufactured by the O.Z. Electrical Manufacturing Company, Type PR-851-FRK as manufactured by Semco, or approved equal.

d. **Installation**

Exposed conduit shall be rigid steel (RGS) or liquid tight flexible metal conduit unless otherwise shown on the Drawings. The conduit shall not approach closer than 6 inches to any object operating above the rated temperature of the insulation of the conductor within the conduit. Conduit shall be spaced at least 3/8-inch from surfaces.

All underground conduit shall be rigid non-metallic polyvinyl chloride (PVC), encased in concrete and spaced per dimensions shown on the Contract Drawings with conduit spacers. Concrete shall be rated 3000 psi. Where underground conduits transition from concrete duct bank to earth, use PVC coated rigid steel elbows and fittings. Joints shall be taped.

Secure conduit racks to concrete surfaces by means of 2-unit expansion anchors. Individual conduit supports shall be similar anchors with die-cast, rustproof alloy expansion shields.

Welding, brazing, or otherwise heating the conduit is not

permitted.

Install cast junction or pull boxes, where required for ease of pulling or to meet code, even though not shown on the Drawings. Where two or more conduit runs of different systems use the same pull box, separate the conductors by means of suitable barriers.

Except as otherwise shown on the Drawings, terminate conduits at junction boxes, motor terminal boxes, or panels with proper fittings. Effectively ground metallic conduit. Terminate conduits feeding freestanding panels, motor starters, and switchgear from below, in clear wiring space. Terminate conduit end with a groundhog bushing.

Take precautions to prevent the lodging of dirt, concrete trash in conduit, fittings, or boxes during the course of installation.

Pull a cleaning mandrel, correctly dimension for each size of conduit, through buried underground conduit. Blow-out with compressed air just prior to pulling in conductors or cables.

e. **Backfill of Utility Trenches**

Utility trenches shall be backfilled to 95 percent relative compaction per ASTM D698. Alternatively, utility trenches can be backfilled with 1.5 or 2.0 sack slurry over the conduits.

f. **Identification Tape**

Continuous lengths of underground warning tapes shall be installed 18 inches below grade and parallel to duct-banks. Tape shall be 6 inches wide polyethylene film imprinted “CAUTION – ELECTRIC UTILITIES BELOW.” Tape shall be as manufactured by **Brady,** or approved equal.

K-3 Wires and Cables

a. **Applications**

Single conductor wire for control, indication and metering shall be Type THWN No. 14 AWG, stranded.

Wire for process instrumentation shall be shielded pairs or shielded triads, No. 16 AWG, stranded, or as noted on the Drawings.

Except for control and signal leads, no conductor smaller than No. 12 AWG

shall be used.

b. **Materials** – All wires and cables shall be of annealed, 98 percent conductivity, soft drawn copper conductors.

All conductors No. 8 AWG and larger shall be stranded.

Cables for circuits operating at 600V and below shall be type THWN, nylon jacketed with flame-retardant insulation, as manufactured by the Rome Cable Corporation, The Okonite Company, Southwire Company or approved equal.

c. **Submittals –** Manufacturer's catalog data for proposed wire and cable shall be submitted for approval. Data shall include wire size, type of insulation, ampacity temperature rating.

d. **Wire and Cable Installation**

Exercise care in pulling cables into conduit so as to avoid kinking, undue stress on the cables, distorting, compressing, or otherwise degrading cable insulation. Use only UL listed pulling compound. Complete and protect the raceway installation from the weather before pulling cable into it.

Splices are not permitted in motor power and control circuits. Run conductors from point-to-point and from termination to termination in continuous lengths.

Install a green equipment grounding conductor for each power and control circuit in the same raceway.

Install detectable warning tape 12 inches above buried conduit duct runs

e. **Wire and Cable Terminating Devices**

Termination of power conductors No. 8 AWG and larger may be made without terminals; directly in box-type lugs where such lugs are a part of the electrical equipment or device as manufactured, and providing that the lugs are of adequate capacity and rating.

All terminals and connectors shall Burndy Hi Lug, Thomas and Belts Sta-Kon or approved equal and be installed with properly sized compression tools recommended by the manufacturer.

Tag power and control circuit conductors at each end in the motor control enclosure, terminal boxes, and field devices with legible, permanently coded

wire marking sleeve showing the complete wire designation.

K-4 480 Volt Motor Control Enclosure

a. **Summary of Work –** Electrical work to be performed under this Contract includes, but is not limited to the following:

Furnish, install, and field test outdoor 480-volt motor control enclosures, each containing:

One (1) 480 volt main circuit breaker
One (1) transient voltage surge suppressor
One (1) 480 volt NEMA Variable Frequency Drive (VFD) motor control unit
Miscellaneous relays, control systems, monitoring and safety systems, indicating lights, switches, circuit breakers, emergency kill, time clock, convenience lighting and convenience outlet.

Each motor control enclosure shall be assembled as a unit in a NEMA 3R enclosure. Each full-voltage combination motor starter shall consist of a motor circuit protector, NEMA sized starter, and ambient compensated thermal overload relay.

b. **Standards and Codes** – Motor control enclosures covered by these specifications shall be designed, tested, assembled, and installed in accordance with the latest applicable standards of ANSI, IEEE, NEMA, and California Codes. Motor control centers shall conform to the standards for NEMA Class II, type B assemblies. Components and assemblies shall comply with NEMA ICS 2.

c. **Quality Assurance –** Manufacturer's Qualifications: Firms regularly engaged in the manufacture of bussed 480 volt motor control enclosures of the type and size required, whose products have been in satisfactory use in similar service for not less than five (5) years.

The equipment shall be completely factory-built, assembled, wired, and tested. All of the equipment and components shall be of new construction. Used or rebuilt equipment is not acceptable.

d. **Shop Testing** – Each motor control enclosure and its components shall be given manufacturer's seismic and standard electrical and mechanical production tests and inspections. These tests shall be conducted in

conformance with the requirements of IEEE, NEMA, UL, and ANSI Standards. The results of the tests shall verify that each complete motor control enclosure and its components comply with all seismic and performance requirements specified.

As a minimum, the motor control enclosure shall be subjected to the following tests:

1. Seismic test of the entire motor control center line-up.

2. Electrical and mechanical operation tests to assure proper functioning of components and the interchangeability of all identical components and plug-in modules.

3. The motor control enclosure shall be given factory standard inspection and tests which call include, but not limited to, electrical continuity check, dielectric tests for each circuit, and inspection for power functioning of all components, including control, protective, monitoring, metering, and alarm devices.

e. **Delivery, Storage, and Handling** – Motor control enclosure and components shall be properly packaged in factory-fabricated type containers, employing manufacturer's recommended shipping splits.

f. **Warranty –** All equipment furnished and installed under this Section shall be guaranteed against defects of workmanship, materials, and proper installation for a period of one (1) year minimum or manufacturer's warranty (whichever is greater) from the date of acceptance. All such equipment or parts proven defective or unsuitable, shall be replaced by the Contractor at no cost to the Owner.

g. **Submittals**

1. Shop Drawings: The following shall be submitted:

Manufacturer's catalog data and descriptive

literature.

Outline drawings of complete motor control enclosure showing dimensions, weights, and panel arrangement by section

Certified factory test reports.

Complete master wiring diagrams and elementary/control schematics. This shall include complete terminal point diagrams for internal and external equipment connections. It is imperative that these drawings be clear and carefully prepared to facilitate interconnections with the other equipment. Standard preprinted sheets or drawings marked to indicate applicability to this contract will not be accepted.

Complete component data including control power transformers, relays, fuses, contactors, overcurrent trip devices, and indicating lights and any other panel mounted devices.

Exceptions to these Specifications clearly noted with the reason for each exception.

Manufacturer's statement accepting one (1) year warranty responsibility. Three line diagram.

2. Final Drawings: Three copies of the following final Drawings shall be submitted:

(1) Outline drawings.

(2) Section elevations showing devices and nameplates.

(3) Complete wiring diagrams, including one line and three line diagrams.

3. O&M Manuals: Three (3) paper copies of operation and maintenance manuals and one (1) electronic copy shall be furnished for all equipment and components.

h. **Products –** The outdoor motor control enclosures described in this specification shall be 480-volt class suitable for operation on a three-phase, 60-Hz system. The system operating voltage and number of wires shall be as indicated. Main disconnect device shall be as indicated. Device shall be capable of being padlocked in the off position.

The motor starters shall be capable of operating any standard or premium **inverter-duty** NEMA Design B squirrel cage motor with a 1.15 service factor, and rated for 350 horsepower.

Subject to compliance with all of the requirements set forth in this specification, the 480-volt motor control enclosure shall be complete for 350HP pumping units. For each pumping unit, it is expected that the electrical motor control panel to be used will be Vaskawa iQ pump U1000 ("Matrix") VFD panel with a

600 amp 100% duty cycle breaker or approved equivalent.

Additional motor control enclosure components shall be furnished and installed as follows:

Transient Voltage Surge Suppressor (TVSS) – A transient Voltage Surge Suppressor shall be installed between the main breaker and the motor control unit and shall be compatible with the said motor control unit. TVSS shall be listed in accordance with UL 1449. TVSS shall be solid-sate type and shall operate bi- directionally. Surge capacity shall be minimum of 130,000 amperes/phase with a voltage suppression rating of 1,200 volts L-G for a 480-volt system.

Elapsed Time Meter – An elapsed time meter shall be provided which is capable of recording the total time in hours that the pump is operating. The elapsed time meter shall be mounted so the face is visible outside of the cabinet. The elapsed time meter shall be Yokogawa Type 240311ACAB, 480-volt, or approved equivalent.

Time Switch – An electronic time switch shall be furnished and installed on the motor control center to allow programming of the stop and start times of the pump. The time switch shall be Intermatic Model No. ET171CT, 120-volt, or approved equivalent. Time switch will operate off of Auto circuit and will not operate in Hand circuit position.

Position Switch – A key-operated "Hand-Off-Auto" 3 position switch with time clock operation in Auto position and time clock bypass in Hand position.

High Pressure Kill Switch – Mercoid model DAW-7000 high pressure kill switch wired for both hand and auto operation.

Emergency Kill Switch – An emergency kill push button switch on the front of the panel.

120 volt Transformer and Convenience Outlets – A 5 KVA, 120/240 volt transformer with a minimum of 5 – 20 amp breakers (not fused): one for security lighting/camera, two dual convenience outlets (one inside the panel and one outside the panel – each on their own circuit), and two spare circuits. [May be installed in a separate enclosure.]

Convenience Outlets – Ground Fault Interrupter (GFI) Duplex Receptacles. Receptacles shall be rated at 20 amps and comply with UL 943, Class A. Provide Leviton 6398-HGI, 3M GFI-2701 or approved equal.

Convenience Lighting – On/Off Switchable LED convenience lighting for both

interior and exterior of the panel.

Security Lighting – LED security lighting with motion detector as shown on the Plans.

i. **Tools and Spare Parts –** Furnish one (1) complete set of Manufacturer recommended special tools and spare parts for each motor control enclosure. As a minimum, furnish the following:

One (1) box of pilot light lamps.

Two (2) each of each size of 120-volt breakers.

Spare parts shall be plainly tagged and marked for identification and re- ordering.

Any other manufacturer recommended items.

j. **Installation –** The Manufacturer, through the Contractor, shall examine all areas and conditions under which the motor control enclosures are to be installed. The Manufacturer shall notify the Contractor in writing of conditions detrimental to the proper completion of the work. No work shall proceed until all unsatisfactory conditions have been corrected in a manner acceptable to the Contractor.

If there are any difficulties in installation or operation of the equipment due to the Manufacturer's design or fabrication, additional services shall be provided at no cost or expense to the Owner.

A concrete pad shall be furnished for the 480-volt meter panels, motor control enclosures and instrumentation and control enclosure as shown on the Drawings. Anchor bolts, of a quantity and size as recommended by the manufacturer, shall be installed in the pad for anchoring of meter panel and motor control equipment.

Meter panel and motor control enclosure anchoring methods shall meet the seismic requirements of the project location.

Anchoring methods and leveling criteria specified in the printed recommendations of the motor control center manufacturer are part of the work of this Contract.

Where wiring connectors are not supplied by the manufacturer, the Contractor shall furnish the connector required to complete internal wiring terminations.

Each 480-volt motor control enclosure shall be set level and plumb on its pad. The Contractor shall furnish all shims necessary to meet these requirements. After a motor control enclosure has been installed, the Contractor shall touch up any painted surfaces that were scratched or otherwise marred during shipping, storage, or installation.

k. **Meter Panel –** The Contractor shall furnish and install a meter panel for connection to incoming electrical power from PG&E. The meter panel shall be suitable for 480-volt, 600-amp service for the 350hp wells with a 4-wire meter can and current transformer (CT) bracket, and shall meet all requirements of the PG&E. The meter panel shall be mounted as shown on the drawings.

K-5 Payment

Payment for all labor, materials, and equipment specified in Section K, as required to complete all electrical work, will be made at the unit price stated in the Proposal Bidding Schedule for "Electrical work at well sites". The unit price shall include the cost of all associated earthwork, concrete work and metalwork.

**** END OF SECTION ****

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SECTION L – PAINTING AND COATING

L-1 General

The Contractor shall provide all labor, materials and equipment and perform all operations required to paint or protectively coat and line ferrous metalwork, pipe and other surfaces which have not been specified in other sections of these Specifications.

L-2 Quality Control

a. **General –** Unless otherwise specified, the Contractor shall clean and paint or protectively coat the surfaces of all ferrous metalwork installed above-ground in conformance with the schedule below. Surfaces of items to be completely embedded in concrete, galvanized, stainless steel surfaces and nonferrous surfaces, including aluminum and bronze surfaces, shall not be painted. Regardless of the method of cleaning specified in this Section, surfaces of all metalwork shall be cleaned of oil, grease, dust, dirt, rust, loose mill scale and other foreign substances by approved means prior to painting or coating; where specified, power tool cleaning or sandblasting shall be performed. Damaged areas of shop painted surfaces shall be cleaned and repainted to match existing at the Contractor's expense. No paint or coating shall be shop or field applied in inclement weather or when the ambient temperature is below 45 F. Materials which have been painted shall be handled with care and protected as necessary to preserve the painted surfaces in good condition. Items or surfaces not to be painted but which are adjacent to surfaces to be painted shall be protected against contamination and damage during cleaning and painting operations.

b. **Submittals –** In accordance with the applicable requirements of the General and Special Conditions, the Contractor shall submit to the Engineer for approval a list of the manufacturer and type of all paints to be used for the work. Should samples be required for testing the suitability of any paint, the Contractor shall supply any such samples including such manufacturer's certifications as are required.

L-3 Materials

a. **General –** The paint shall conform to the quality standards specified herein for the various types. Paint colors shall be selected by the District Representative from standard color charts supplied by the paint manufacturer. The color of the first coat of paint shall be white or other approved color providing discernible contrast with finish coat. Primer and finish coat systems shall be by the same manufacturer and be of compatible/companion systems and be applied per manufacturer recommendations.

b. **High Build Epoxy –** PPG Amercoat 395FD, 3M Scotchkote 323, Devoe Bar-Rust 233H, Sherwin-Williams Tank Clad HS B62-80, PPG AQUAPON LT NSF 95-172, Carboline Carboguard 891, or approved equal.

c. **Fusion Epoxy –**3M Scotchkote 134 or approved equal.

d. **Polyurethane –** PPG Pitthane 95-812, Sherwin-Williams Sher-Cryl B66-300, ICI Devoe Devflex 659, Carboline 3359 or 3359DTM or approved equal.

e. **Primer –** PPG 97-145 Pitt-Guard, Sherwin-Williams Zinc Clad II Plus Primer, ICI Devoe Inorganic Zinc 304V, Carboline Carbozinc 11HS, or approved equal.

f. **Repair Patches –** Repair of any damage shall follow the manufacturer's recommendations of the damaged coating and be subject to the Engineer's approval for all coating types. Where a patch material is not recommended or allowed, the damaged coating shall be removed and re-applied at the Contractor's expense, unless otherwise approved.

L-4 Surface Preparation

Surface preparation shall be in accordance with the methods herein and as indicated in the Schedule for Painting and Protective Coatings. Power tool cleaning, commercial blast cleaning, and near-white blast cleaning shall be in accordance with Specifications SSPC-SP4, SSPC-SP6, and SSPC-SP10, respectively, as published by the Steel Structures Painting Council.

L-5 Schedule for Painting and Protective Coatings

Item	Paint or Coating System for Exposed Surfaces
1. All shade cover components, security bars and related components, bollards, ladders and ladder rungs, safety cable, all nuts, bolts, washers and fasteners including anchor bolts. All other items specified to be galvanized in these specifications or on the Plans.	All surfaces shall be hot-dip galvanized. No repair patchwork with cold galvanizing will be allowed. Damage to any galvanized finish will require re-application of hot-dip galvanizing.

Item	Paint or Coating System for Exposed Surfaces
2. All metalwork, well cages, electrical panels, light poles, operating platforms, including structural steel, grating, checkered plate, handrails, minor steel pipe, all other field fabricated structural work and miscellaneous metal work including pipe supports, flange supports, pipe tie down straps and marker posts, unless galvanizing or other protective coating is specified or shown on the Plans.	Solvent cleaning of dirt and scum followed by SSPC-SP6, commercial sandblasting to remove all loose rust, mill scale and other foreign substances followed by one shop coat of zinc primer to 3.0 mil thickness, one field coat of zinc primer to 2.0 mil thickness, and two finish coats of polyurethane to a minimum thickness of 5.0 mils (minimum dry film thickness of total paint system–10.0 mils).
3. All discharge piping.	Shop fusion bonded epoxy lined and coated in accordance with AWWA C213 or liquid epoxy lined and coated conforming to AWWA C210, minimum dry film thickness of 20 mils both inside and outside. All application and curing shall conform to manufacturer's specifications. All above ground piping shall then be painted with two spray coats of polyurethane to 5.0 mil thickness (minimum dry film thickness of total paint system–25.0 mils). All below ground piping shall be wrapped with 50% overlap using 10 mil. Polyken 900 (polyethylene) pipe tape or approved equivalent. (20 mil. overall thickness)

Item	Paint or Coating System for Exposed Surfaces
4. All aboveground cast iron and steel valves, fittings and castings, not including brass.	Solvent cleaning of dirt and scum followed by SSPC-SP6, commercial sandblasting to remove all loose rust, mill scale and other foreign substances followed by one shop coat of zinc primer to 3.0 mil thickness, one field coat of zinc primer to 2.0 mil thickness, and two finish coats of polyurethane to a minimum thickness of 5.0 mils (minimum dry film thickness of total paint system–10.0 mils) If factory coated to the satisfaction of the District Representative, no primer coat is necessary and two finish coats of polyurethane to a minimum thickness of 5.0 mils shall be applied after proper preparation of factory coating.

L-6 Application

All paint shall be applied in a workman like manner, in accordance with the most recent written Product Data Sheet from Paint Manufacturer, by conventional or airless spray wherever possible. The applications shall leave no sags, brush marks, pinholes, overspray or other defects. Drying time between coats shall adhere to the coating manufacturer's recommendation with conditions of temperature, humidity and ventilation taken into account. Cleaning and painting shall be scheduled so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces. Area shall be masked and protected to prevent overspray while applying coating. Wherever required, imperfections and holes in surfaces to be coated shall be cleaned and filled in an approved manner.

Paint shall not be applied to wet or damp surfaces.

L-7 Inspection

All coatings and coating applications are inspectable items. Any deviations from these specifications not explicitly approved by the District Representative are subject to rejection. Rejected coatings must be corrected per the manufacturer’s recommendations, or removed and re-applied where there are no recommendations, at the Contractor’s expense.

L-8 Payment

No separate payment will be made for work or materials involved in cleaning and painting or providing protective coatings for metalwork as specified herein. The cost of all such work and materials shall be included in the applicable lump sum price stated in the Proposal Bidding Schedule for the item of work requiring painting or coating.

**** END OF SECTION ****

COUNTY OF KERN - STATE OF CALIFORNIA

ROSEDALE - RIO BRAVO WATER STORAGE DISTRICT
McCASLIN / BOWLING WELL PLANS

BASIS OF BEARINGS AND VERTICAL DATUM

THE BASIS OF BEARINGS AND VERTICAL DATUM FOR THIS SURVEY IS DEFINED BY THE GEODETIC COORDINATES AND ELEVATIONS SHOWN ON THE TOPOGRAPHIC SURVEY DATED NOVEMBER 20, 2009, OF THE GOOSE LAKE SLOUGH FACILITY FOR THE ROSEDALE–RIO BRAVO WATER STORAGE DISTRICT.
THIS SURVEY WAS MADE UTILIZING THE CALIFORNIA STATE PLANE COORDINATE SYSTEM PER THE NATIONAL GEODETIC SURVEY'S NORTH AMERICAN DATUM OF 1983, 1992 ADJUSTMENT, ZONE V. THE FOLLOWING TWO POSITIONS PER SAID GOOSE LAKE SLOUGH FACILITY SURVEY WERE USED FOR THIS SURVEY:

A: K.C.W.A. BENCHMARK NO. CVC 12–4.75 BTM.
LOCATED ON THE SOUTHEAST SIDE OF THE BRIDGE CROSSING OF THE CROSS VALLEY CANAL, APPROXIMATELY 8,946.1 FEET SOUTH OF THE CENTERLINE OF STOCKDALE HIGHWAY AND APPROXIMATELY 10,676.6 FEET WEST OF THE CENTERLINE OF ENOS LANE.
N.= 2314186.293
E.= 6177525.876
ELEV.= 315.60

B. K.C.S.C.M. 18" DEEP FOR THE WEST 1/4 CORNER, SECTION 32, 29/26
LOCATED AT THE INTERSECTION OF GREELEY ROAD AND JOHNSON ROAD (BOTH UNPAVED).
N.= 2320122.625
E.= 6198926.511
ELEV.= 334.74

BENCH MARK – McCASLIN

TOP OF POST AT GOOSE LAKE CANAL WEIR NO. 6–0–503
AT NORTHEAST CORNER OF WEIR
1.1 MILES WEST OF ENOS LANE.
NEAR SE CORNER OF McCASLIN PROJECT SITE.

ELEVATION = 321.43 (U.S.G.S. DATUM)

BENCH MARK – BOWLING

TOP OF NE POST AT GOOSE LAKE CANAL WEIR
AT NORTHEAST CORNER OF WEIR
APPROX. 950 FEET SSW OF SUPERIOR WELL #5
NEAR SE CORNER OF PROJECT SITE.

ELEVATION = 334.93 (U.S.G.S. DATUM)

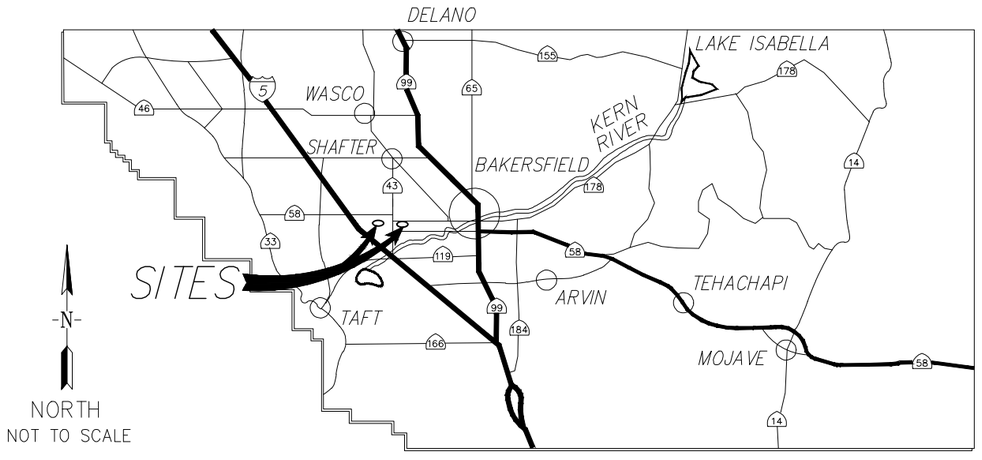
WATER DISTRICT

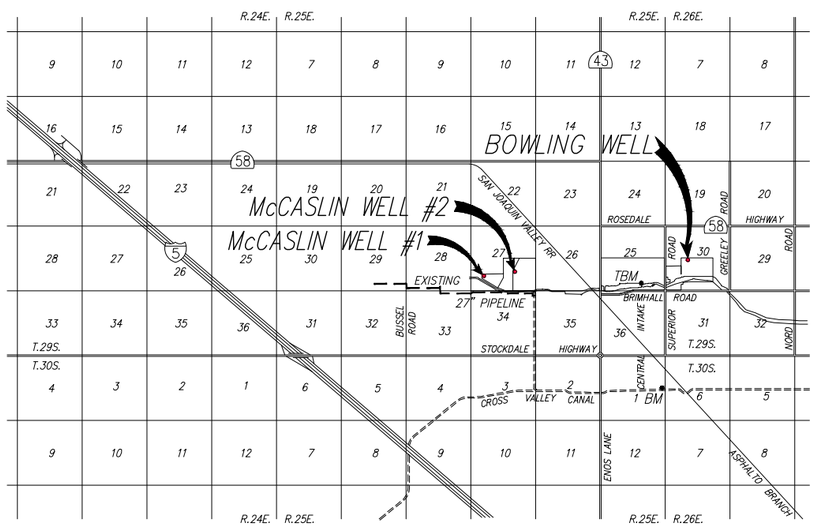
ROSEDALE RIO BRAVO WATER STORAGE DISTRICT
849 ALLEN ROAD
P.O. BOX 20820
BAKERSFIELD, CA. 93390
(661) 589–6045

ENGINEER

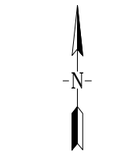
ZEIDERS CONSULTING
1655 GREELEY ROAD
BAKERSFIELD, CA. 93314

INDEX TO SHEETS





VICINITY MAP



ENGINEER:
William W Zeiders 06-28-23
WILLIAM W. ZEIDERS R.C.E. 40031 DATE
EXP. 12/31/2023

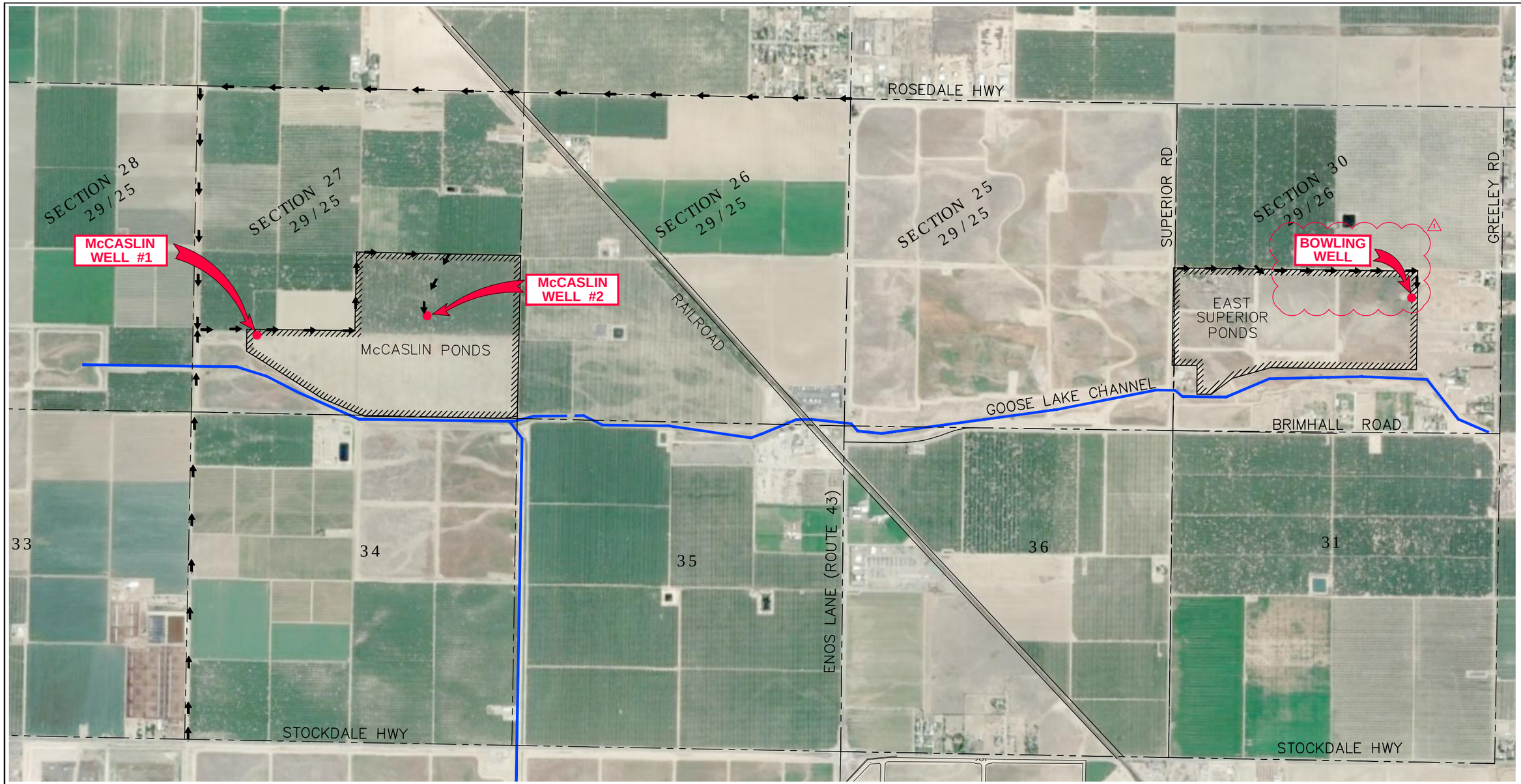
REV.	DATE	DESCRIPTION
1	07/21/2023	BOWLING WELL RELOCATED

DATE: JULY 21, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

ZEIDERS CONSULTING
1655 GREELEY ROAD
BAKERSFIELD, CA. 93314
(661) 589–8366

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
849 ALLEN ROAD
P.O. BOX 20820
BAKERSFIELD, CA. 93390

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL SITE PLANS
COVER SHEET / INDEX



NORTH
0 800 1600 2400
SCALE:
1"=1600'

LEGEND
- ACCESS ROUTE
- NEW WELL LOCATION
- PROJECT PROPERTY
- SECTION LINE(S)

A/2 LOCATION MAP – SITE ACCESS
MC1, MC2, & B1

REGISTERED PROFESSIONAL ENGINEER
WILLIAM W. ZEIDERS
Lic. No. 40,031
Expires 12/31/23
CIVIL
STATE OF CALIFORNIA

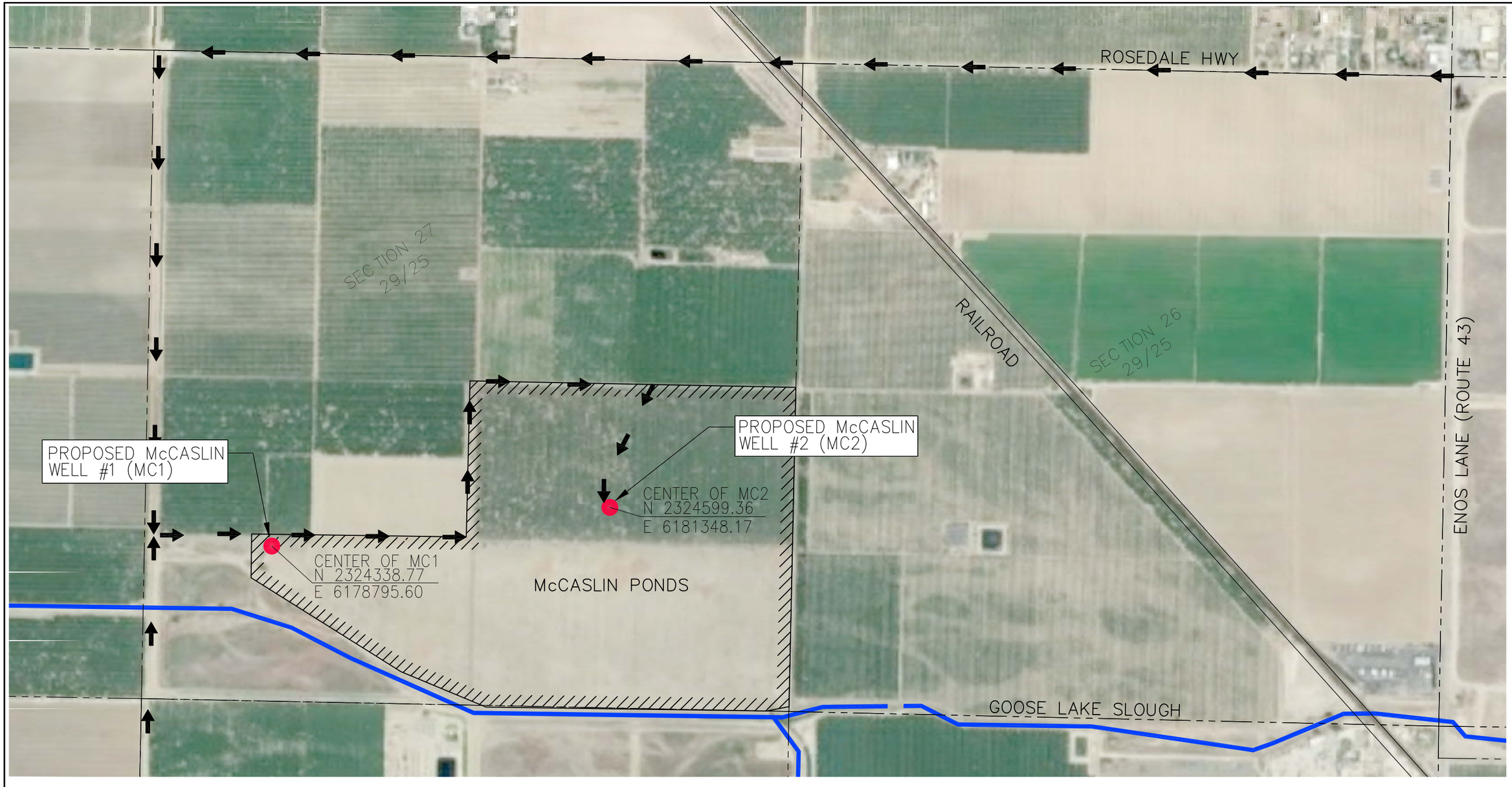
REV.	DATE	DESCRIPTION
1	07/21/2023	BOWLING WELL RELOCATED

DATE: JULY 20, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

ZEIDERS CONSULTING
1655 GREELEY ROAD
BAKERSFIELD, CA. 93314
(661) 589-8366

ROSEDALE-RIO BRAVO
WATER STORAGE DISTRICT
849 ALLEN ROAD
P.O. BOX 20820
BAKERSFIELD, CA. 93390

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL SITE PLANS
OVERALL MAP - INDEX FOR NEW WELLS



NORTH
0 400 800 1200
SCALE:
1"=800'

LEGEND
- ACCESS ROUTE
- NEW WELL LOCATION
- PROJECT PROPERTY
- SECTION LINE(S)

A/3 LOCATION MAP
MC1 AND MC2

NOTE: AERIAL PHOTOGRAPH IS NOT REPRESENTATIVE OF ACTUAL SITE CONDITIONS.

REGISTERED PROFESSIONAL ENGINEER
WILLIAM W. ZEIDERS
Lic. No. 40,031
Expires 12/31/23
CIVIL
STATE OF CALIFORNIA

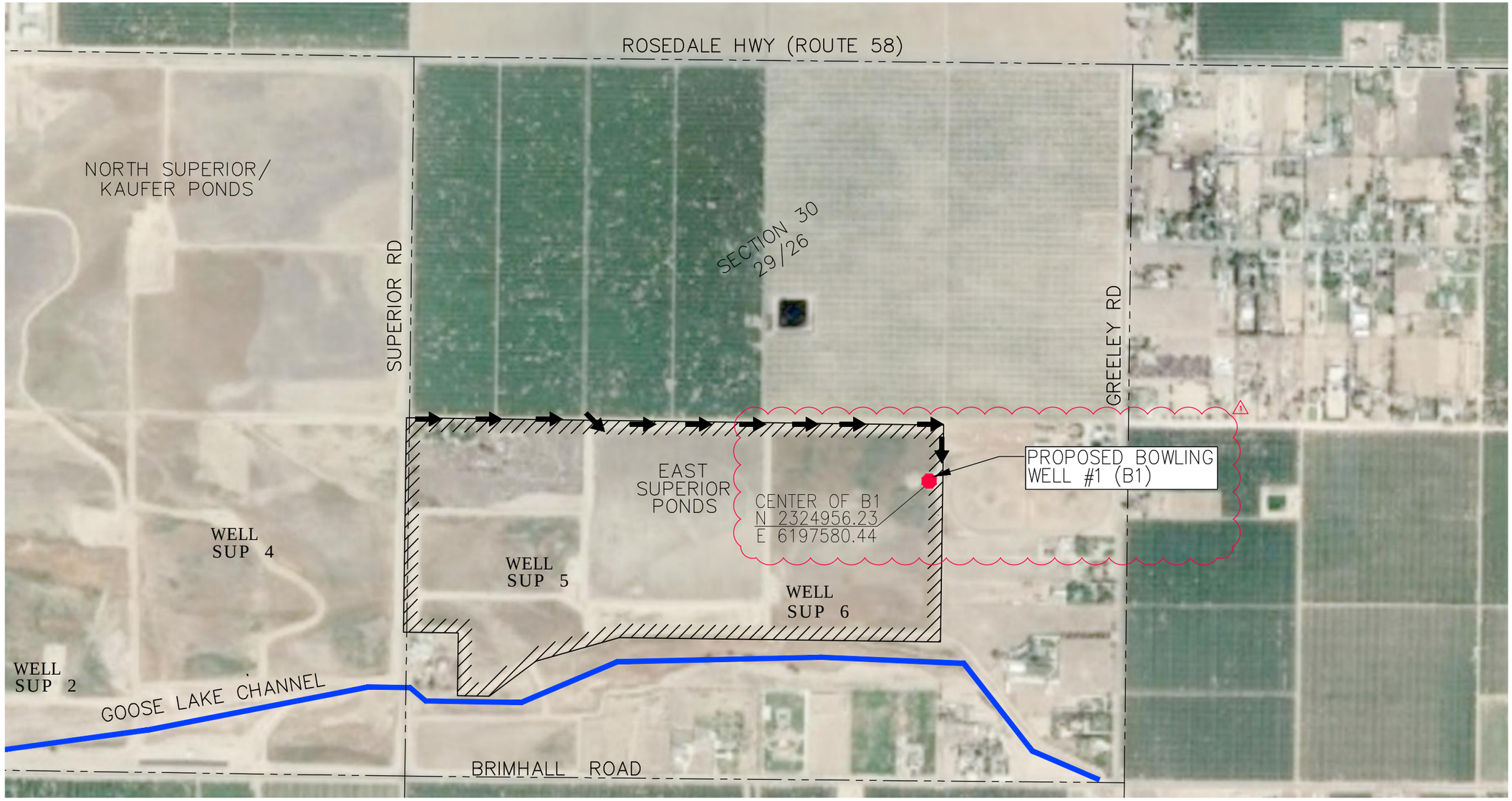
REV. DATE DESCRIPTION

DATE: JUNE 28, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL SITE PLANS
LOCATION MAP - MC1 & MC2

ROSEDALE-RIO BRAVO
WATER STORAGE DISTRICT
849 ALLEN ROAD
P.O. BOX 20820
BAKERSFIELD, CA. 93390

ZEIDERS CONSULTING
1655 GREELEY ROAD
BAKERSFIELD, CA. 93314
(661) 589-8366



-N-

NORTH

0 400 800 1200

SCALE:
1"=800'

LEGEND

- ACCESS ROUTE
- NEW WELL LOCATION
- PROJECT PROPERTY
- SECTION LINE(S)

A/4 LOCATION MAP
BOWLING WELL (B1)

REGISTERED PROFESSIONAL ENGINEER
WILLIAM W. ZEIDERS
Lic. No. 40,031
Expires 12/31/23
CIVIL
STATE OF CALIFORNIA

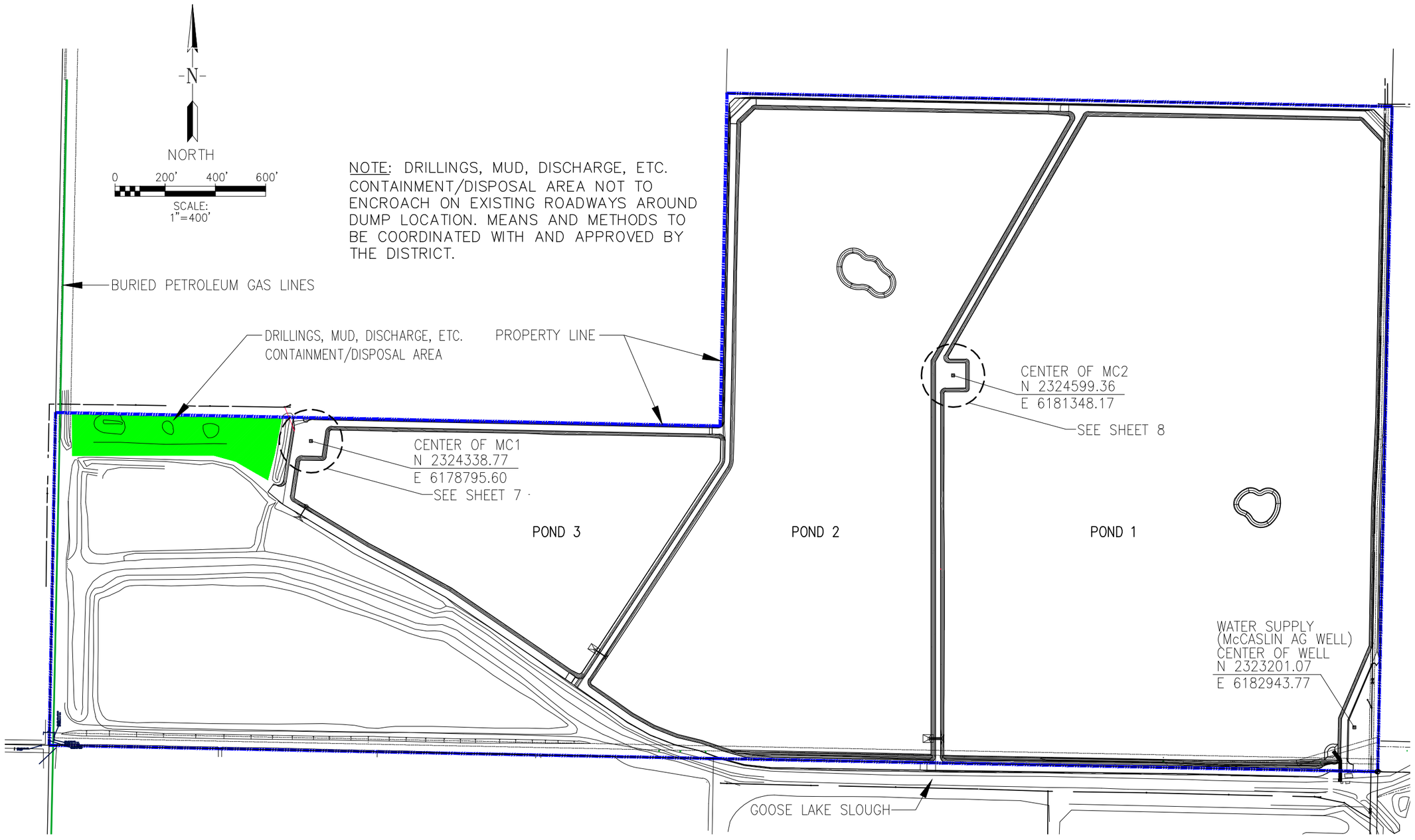
REV.	DATE	DESCRIPTION
1	07/21/2023	BOWLING WELL RELOCATED

DATE: JULY 21, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL SITE PLANS
LOCATION MAP - B1

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
849 ALLEN ROAD
P.O. BOX 20820
BAKERSFIELD, CA. 93390

ZEIDERS CONSULTING
1655 GREELEY ROAD
BAKERSFIELD, CA. 93314
(661) 589-8366



A/5 SITE LOCATION – McCASLIN PONDS
MC1 & MC2

REGISTERED PROFESSIONAL ENGINEER
WILLIAM W. ZEIDERS
Lic. No. 40,031
Expires 12/31/23
CIVIL
STATE OF CALIFORNIA

REV.	DATE	DESCRIPTION
1		

DATE: JUNE 28, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL SITE PLANS
LOCATION MAP - MC1 & MC2

ROSEDALE-RIO BRAVO
WATER STORAGE DISTRICT
849 ALLEN ROAD
P.O. BOX 20820
BAKERSFIELD, CA. 93390

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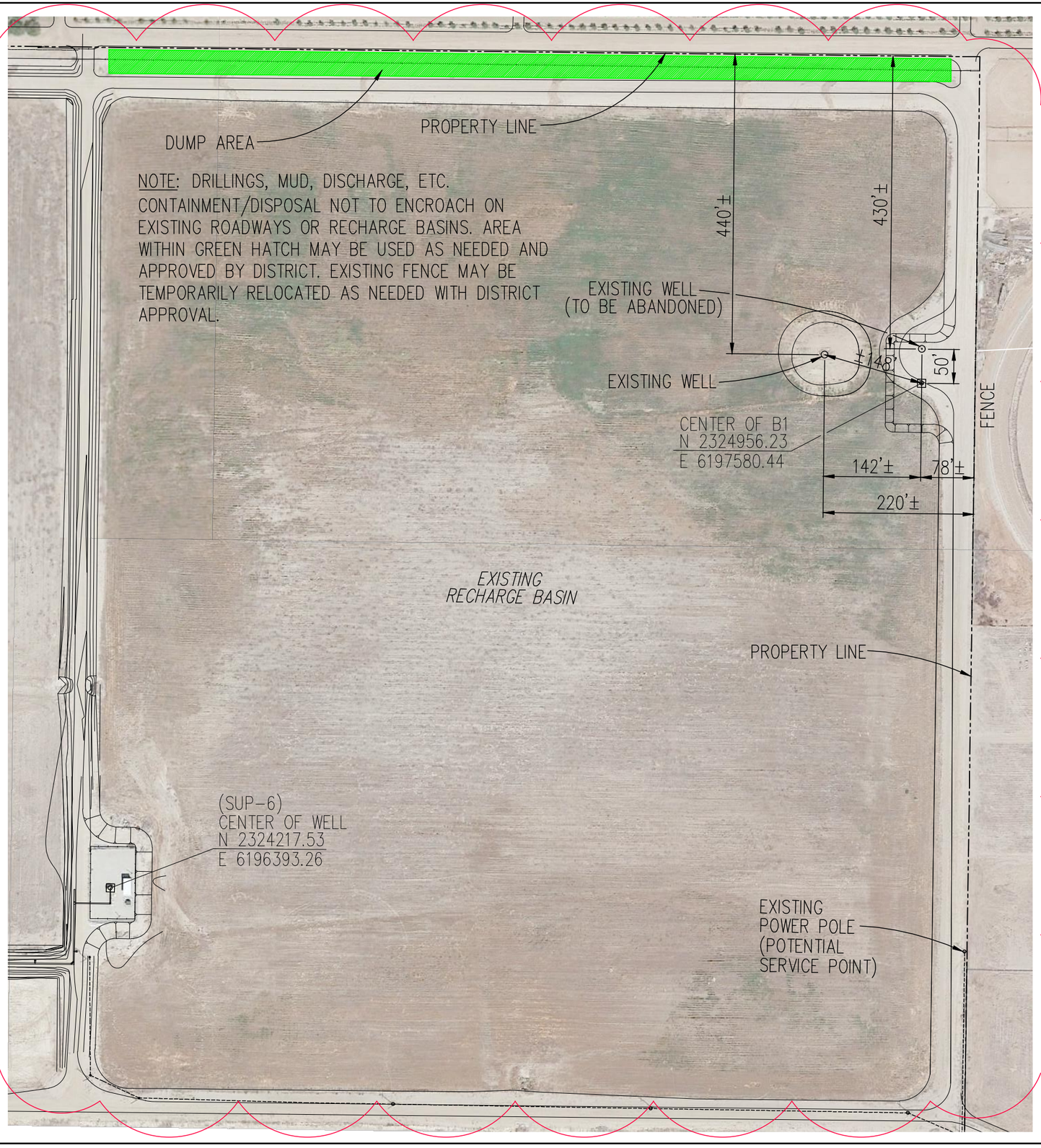

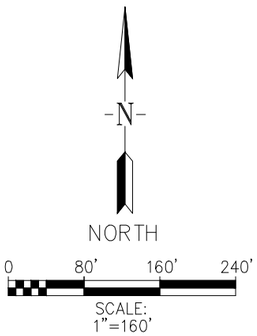

A/6 SITE LOCATION
B1

REV.	DATE	DESCRIPTION
1	07/21/2023	RELOCATED BOWLING WELL

DATE: JULY 20, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL SITE PLANS
BOWLING SITE LOCATION

RRB ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
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CONTINUES TO EXISTING POLE ~84' NORTHWEST OF NEW POLE
(SEE SHEET 34)

PROPERTY LINE

RAMP 8%

NEW POLE

UNDERGROUND PRIMARY CONDUIT

GUY

DAYLIGHT

EXISTING CHANNEL

McCASLIN WELL #1

85'

7'-6"

TRANSFORMER PAD

METER PANEL

VFD CONTROL PANELS

ELECTRICAL CONDUITS (BURIED)

8'-10"

15'

12'x12' CONCRETE WELL PAD

DISCHARGE INTO GROUND

12'

7'

20'

54'

59.65°

5'

12'

9'

10.5'

3'

6'

23'

12" STEEL DISCHARGE ABOVE GROUND

145'

99'

4:1

TOE OF SLOPE

16'

125'

15" PVC PIPELINE (NOT A PART)

60'

79.0'

4:1

16.4'

POND 3

N

NORTH

0 10 20 30

SCALE: 1"=20'

A/7 MC1 SITE DETAIL
POND 3 AT WEST LEVEE

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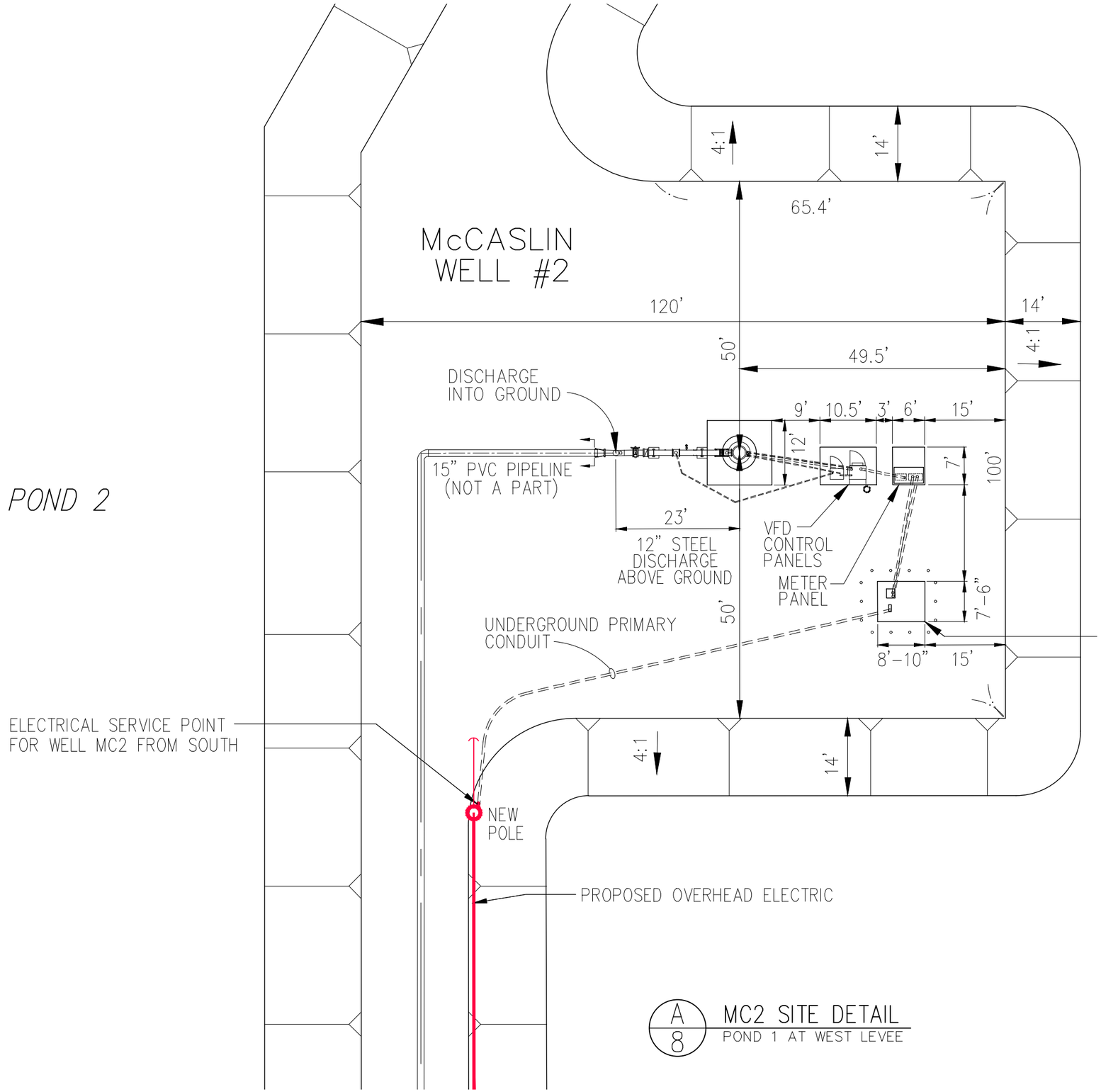
McCASLIN / BOWLING WELL PLANS
WELL SITE LAYOUT
McCASLIN WELL #1 (MC1)



A/8 MC2 SITE DETAIL
POND 1 AT WEST LEVEE

REGISTERED PROFESSIONAL ENGINEER
WILLIAM W. ZEIDERS
Lic. No. 40,031
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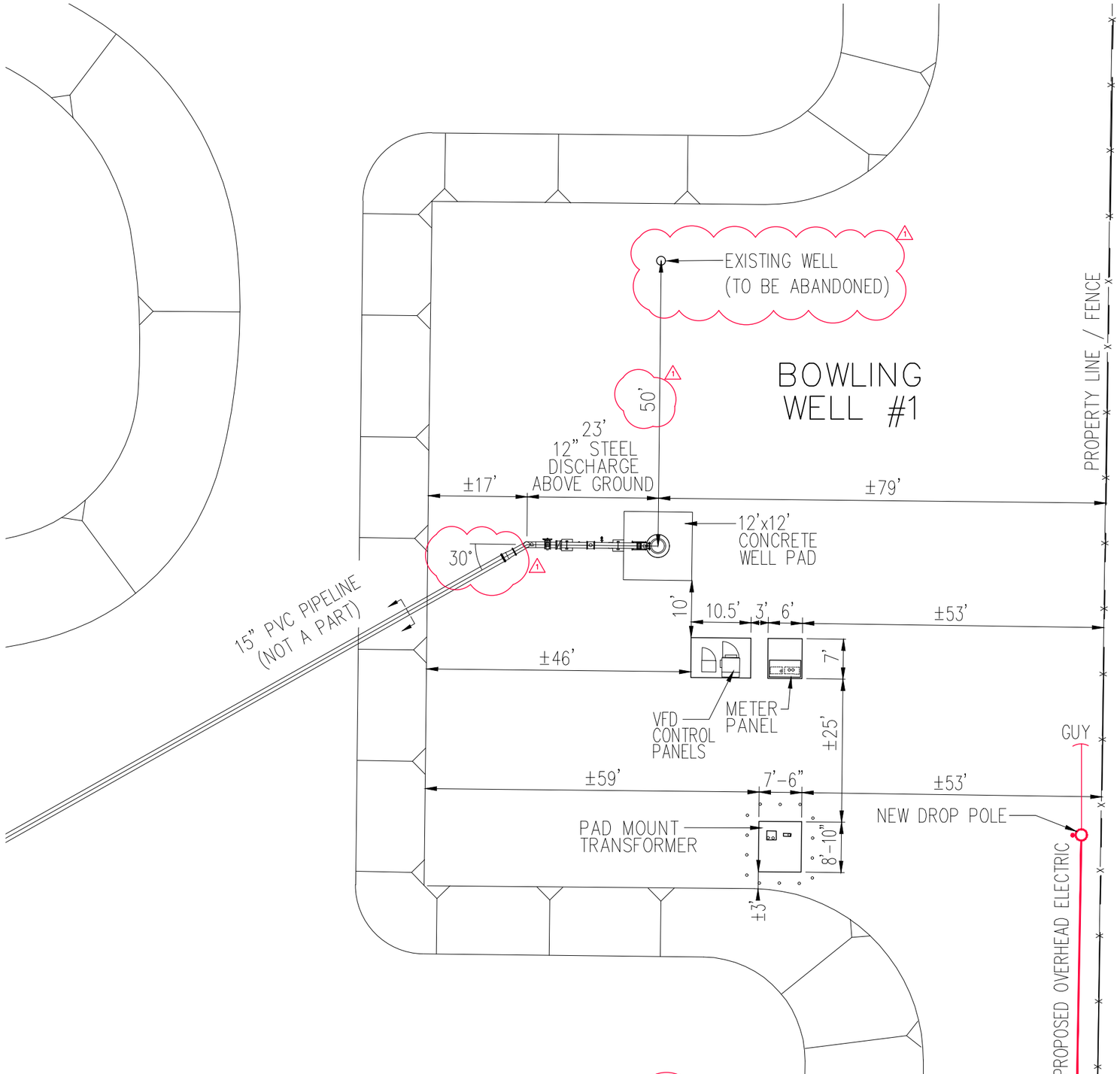
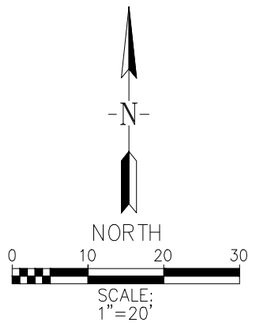
McCASLIN / BOWLING WELL PLANS
WELL SITE LAYOUT
McCASLIN WELL #2 (MC2)



A/9 B1 SITE DETAIL
BOWLING WELL

NOTE: ENTIRE BOWLING WELL LAYOUT WAS RELOCATED. REVISION CLOUDS SHOWN INDICATE CONDITIONS NOT SHOWN IN ORIGINAL PLAN SET.



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9 of 37

R3 ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
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R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL SITE LAYOUT
BOWLING WELL (B1)

REV.	DATE	DESCRIPTION
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DATE: JULY 21, 2023
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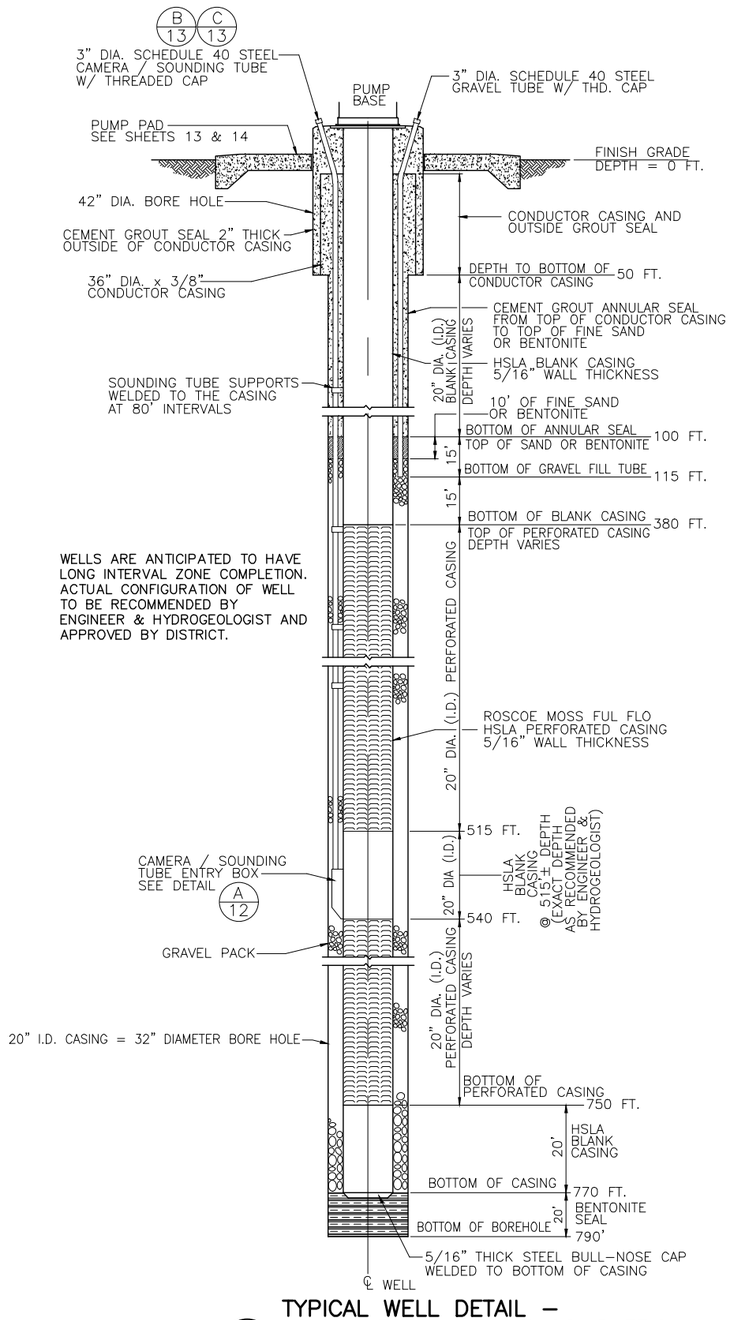
FILE NAME: McCASLIN & BOWLING...

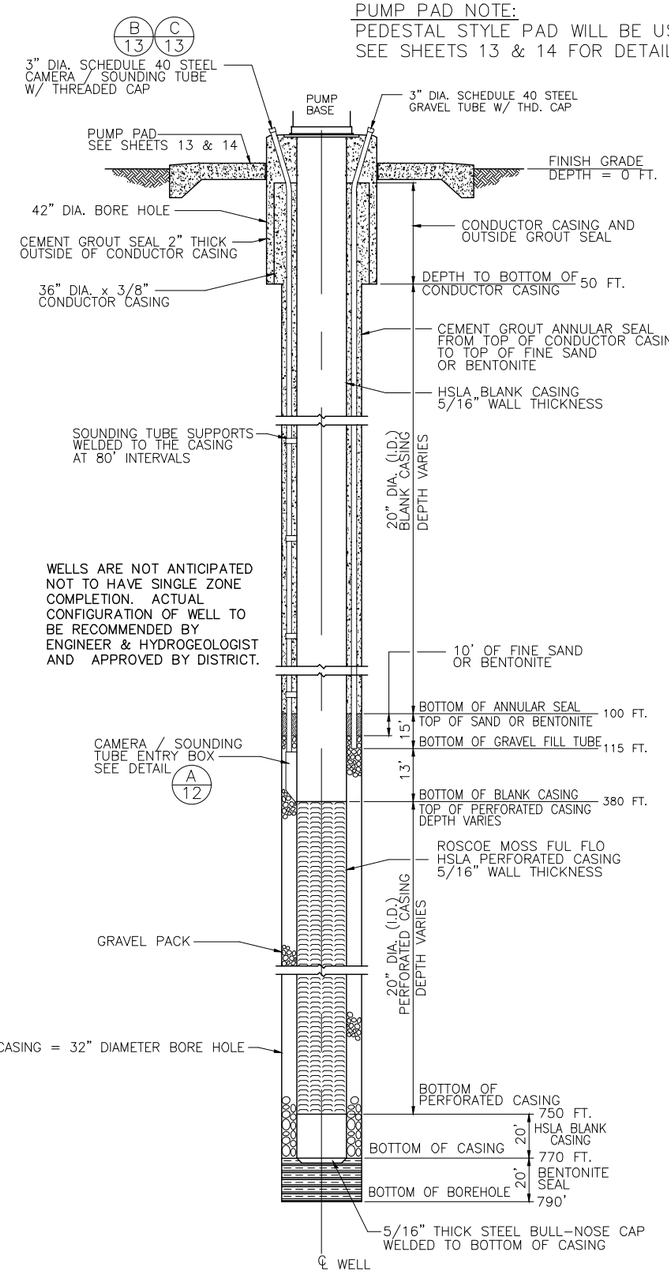
McCASLIN WELLS 1 & 2



WELLS ARE ANTICIPATED TO HAVE LONG INTERVAL ZONE COMPLETION. ACTUAL CONFIGURATION OF WELL TO BE RECOMMENDED BY ENGINEER & HYDROGEOLOGIST AND APPROVED BY DISTRICT.

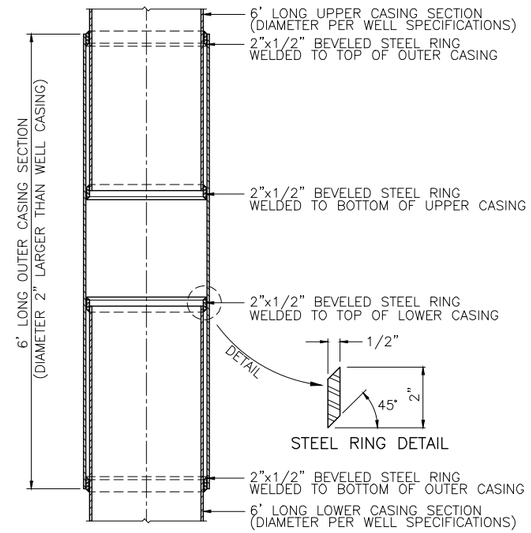
A 10 TYPICAL WELL DETAIL – LONG INTERVAL ZONE COMPLETION
FOR WELLS MC1 & MC2 — NOT TO SCALE

PUMP PAD NOTE:
PEDESTAL STYLE PAD WILL BE USED.
SEE SHEETS 13 & 14 FOR DETAILS.



WELLS ARE NOT ANTICIPATED NOT TO HAVE SINGLE ZONE COMPLETION. ACTUAL CONFIGURATION OF WELL TO BE RECOMMENDED BY ENGINEER & HYDROGEOLOGIST AND APPROVED BY DISTRICT.

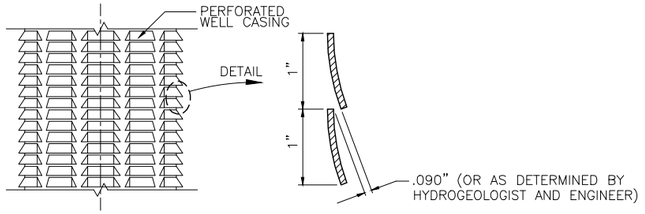
B 10 TYPICAL WELL DETAIL – DEEP COMPLETION
NOT ANTICIPATED — NOT TO SCALE



NOTE:
FABRICATED FROM 3 SECTIONS OF CASING, TWO OF WHICH ARE THE SAME DIAMETER AND WALL THICKNESS AS THE WELL CASING. JOINTS ARE FURNISHED WITH BEVELED STEEL RINGS. ONE RING IS WELDED TO THE BOTTOM OF THE UPPER SECTION AND ONE RING TO THE TOP OF THE LOWER SECTION. THUS, THE JOINTS ARE FREE TO TELESCOPE WITHIN THE OUTER SECTION WHICH IS EQUIPPED WITH RINGS AT EACH END.

LOCATION OF COMPRESSION SECTION TO BE DETERMINED AT TIME OF CASING DESIGN.

D 10 TYPICAL COMPRESSION SECTION DETAIL
NOT ANTICIPATED — NOT TO SCALE



C 10 HORIZ. HSLA FUL FLO LOUVERED SCREEN
ROSCOE MOSS HSLA FUL FLO PERFORATED CASING
NOT TO SCALE

LEGEND

- CEMENT GROUT ANNULAR SEAL
- SRI SUPREME GRAVEL 1/4"x16
- BENTONITE SEAL
- ROSCOE MOSS HSLA CASING FUL FLO .090" PERFORATIONS

NOTE: DETAILS SHOWN ARE FOR BIDDING PURPOSES. ALL FINAL DEPTHS AND WELL DESIGNS SHALL BE DETERMINED BY THE ENGINEER AND HYDRO GEOLOGIST AFTER THE E-LOG IS PERFORMED IN THE PILOT BOREHOLE.

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BAKERSFIELD, CA. 93314
(661) 589-8366

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
849 ALLEN ROAD
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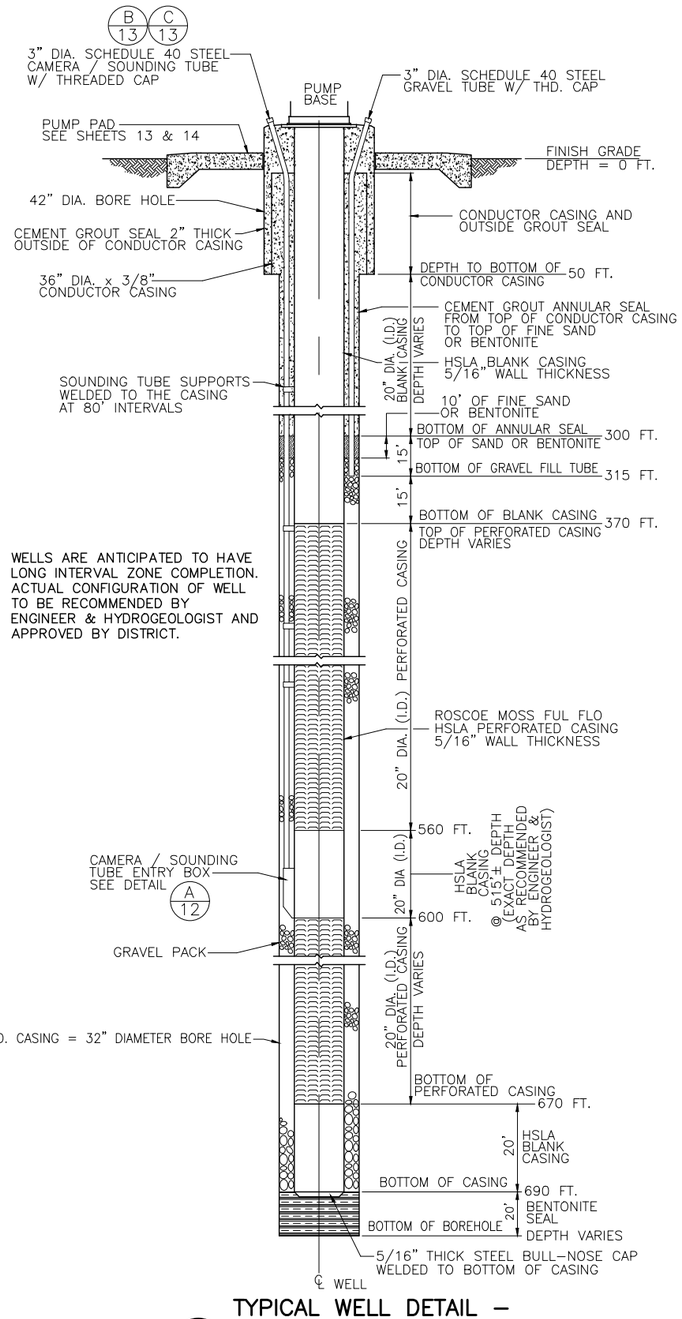
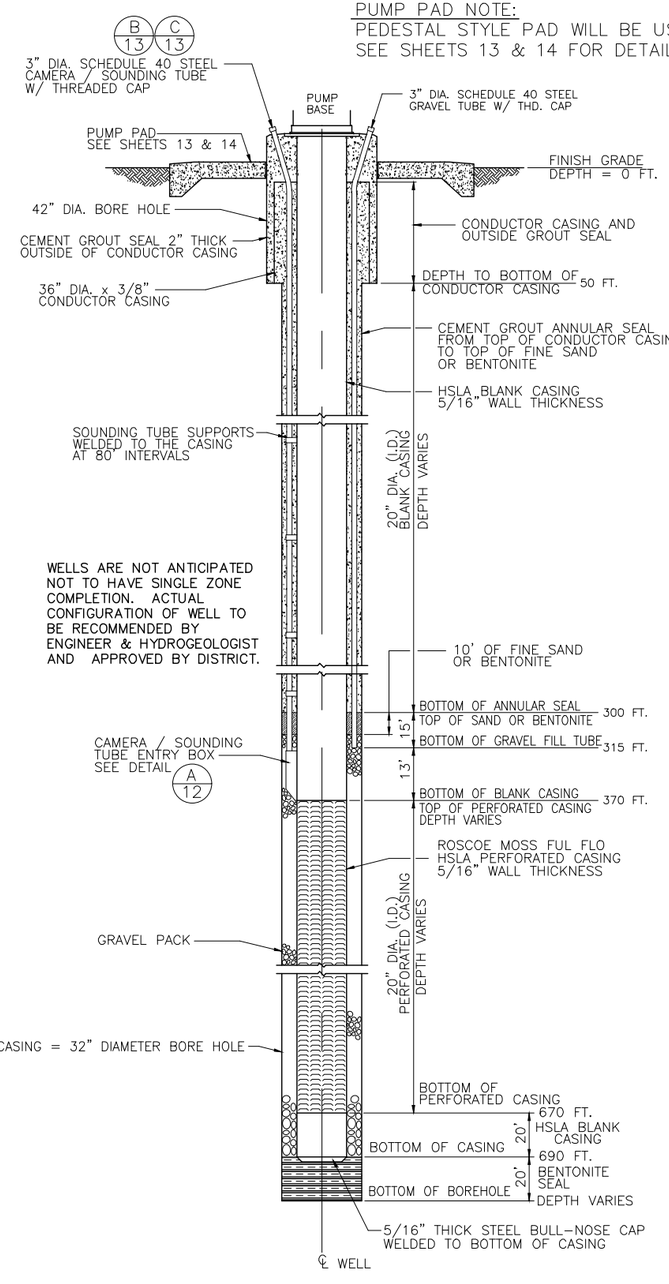
R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL CONSTRUCTION DETAIL
WELLS MC1 & MC2

BOWLING WELL 1

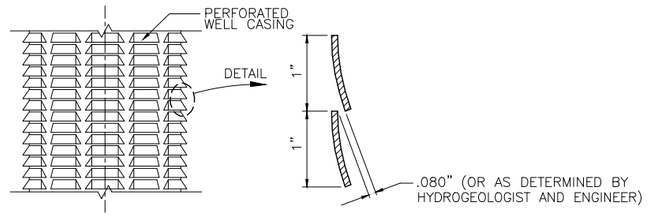


A 11 TYPICAL WELL DETAIL – LONG INTERVAL ZONE COMPLETION
FOR WELL B1 — NOT TO SCALE

PUMP PAD NOTE:
PEDESTAL STYLE PAD WILL BE USED.
SEE SHEETS 13 & 14 FOR DETAILS.



B 11 TYPICAL WELL DETAIL – DEEP COMPLETION
NOT ANTICIPATED — NOT TO SCALE



C 11 HORIZ. HSLA FUL FLO LOUVERED SCREEN
ROSCOE MOSS HSLA FUL FLO PERFORATED CASING
NOT TO SCALE

LEGEND

- CEMENT GROUT ANNULAR SEAL
- SRI SUPREME GRAVEL 1/4"x16
- BENTONITE SEAL
- ROSCOE MOSS HSLA CASING FUL FLO .090" PERFORATIONS

NOTE: DETAILS SHOWN ARE FOR BIDDING PURPOSES. ALL FINAL DEPTHS AND WELL DESIGNS SHALL BE DETERMINED BY THE ENGINEER AND HYDRO GEOLOGIST AFTER THE E-LOG IS PERFORMED IN THE PILOT BOREHOLE.

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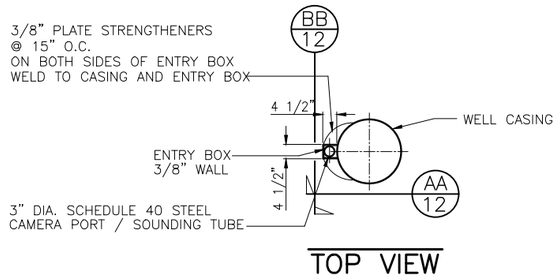
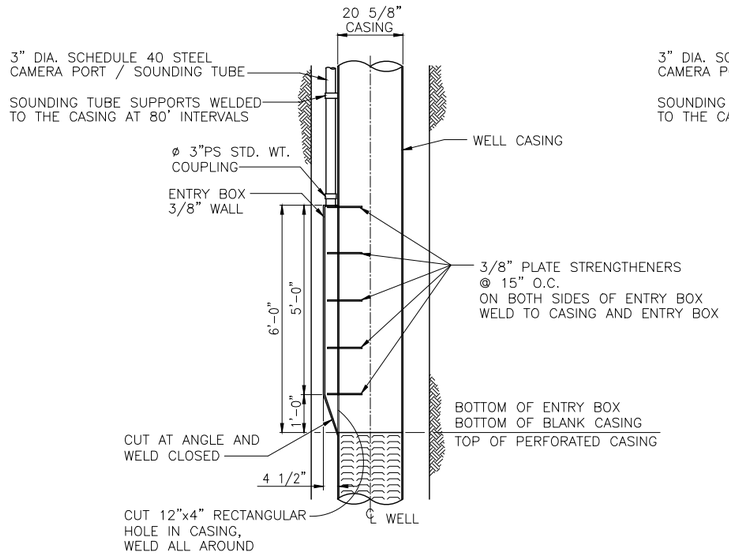
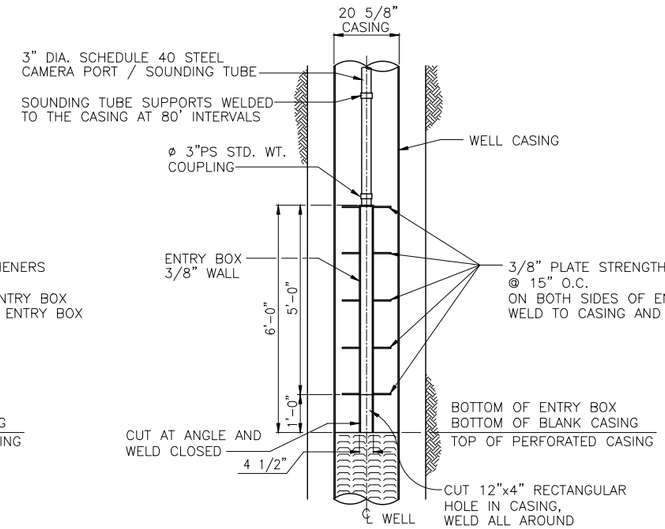
R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL CONSTRUCTION DETAIL
BOWLING WELL (B1)



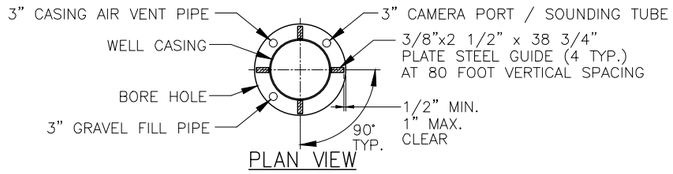
TOP VIEW



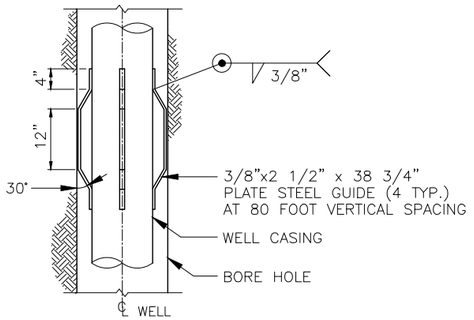
AA 12 SIDE VIEW



BB 12 FRONT VIEW



PLAN VIEW



SIDE VIEW

A 12 CAMERA / SOUNDING TUBE ENTRY BOX DETAIL
CAMERA PORT CONNECTION NOT TO SCALE

B 12 CASING GUIDE DETAIL
NOT TO SCALE

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R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL CONSTRUCTION DETAIL
ALL WELLS

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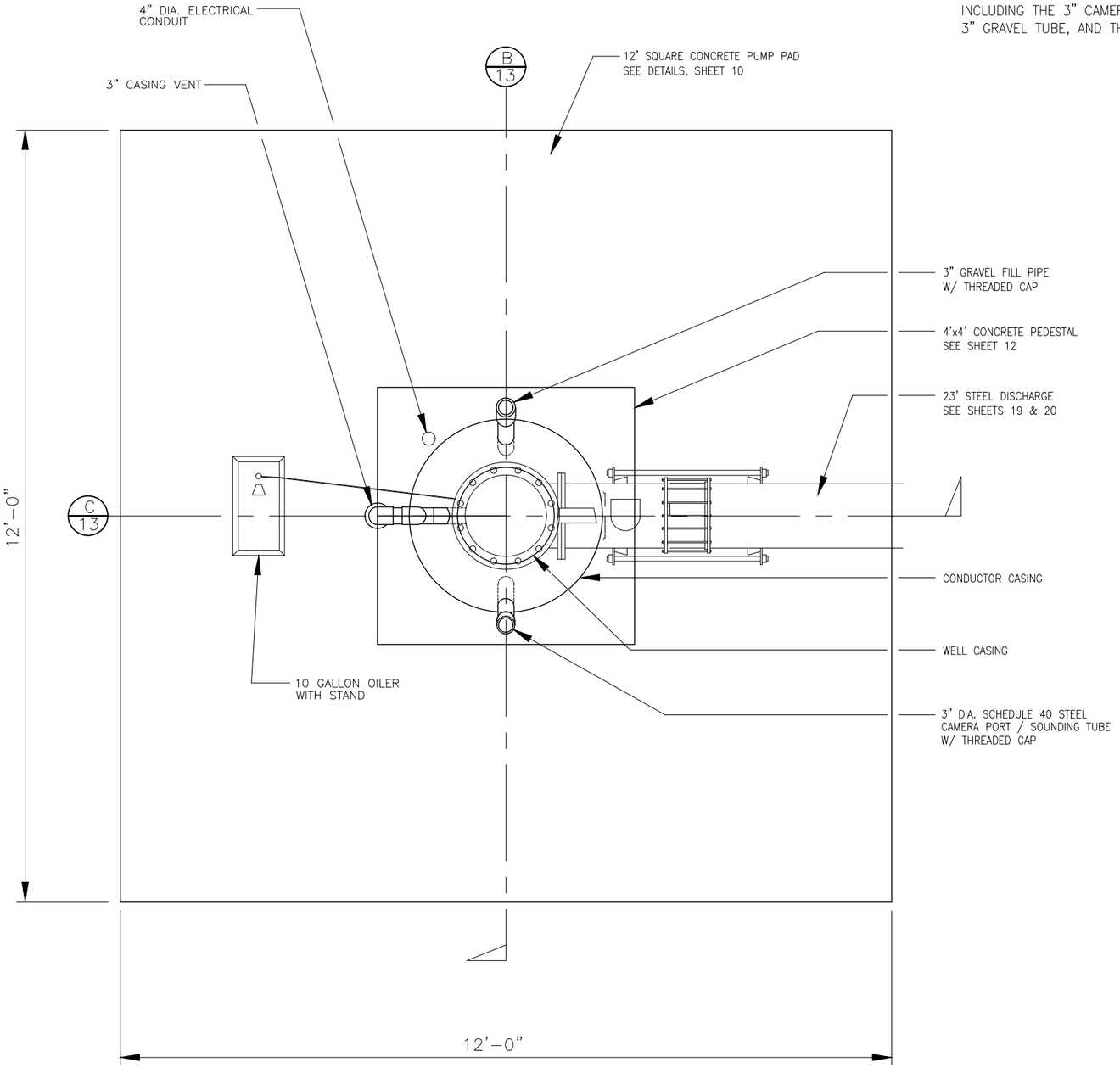
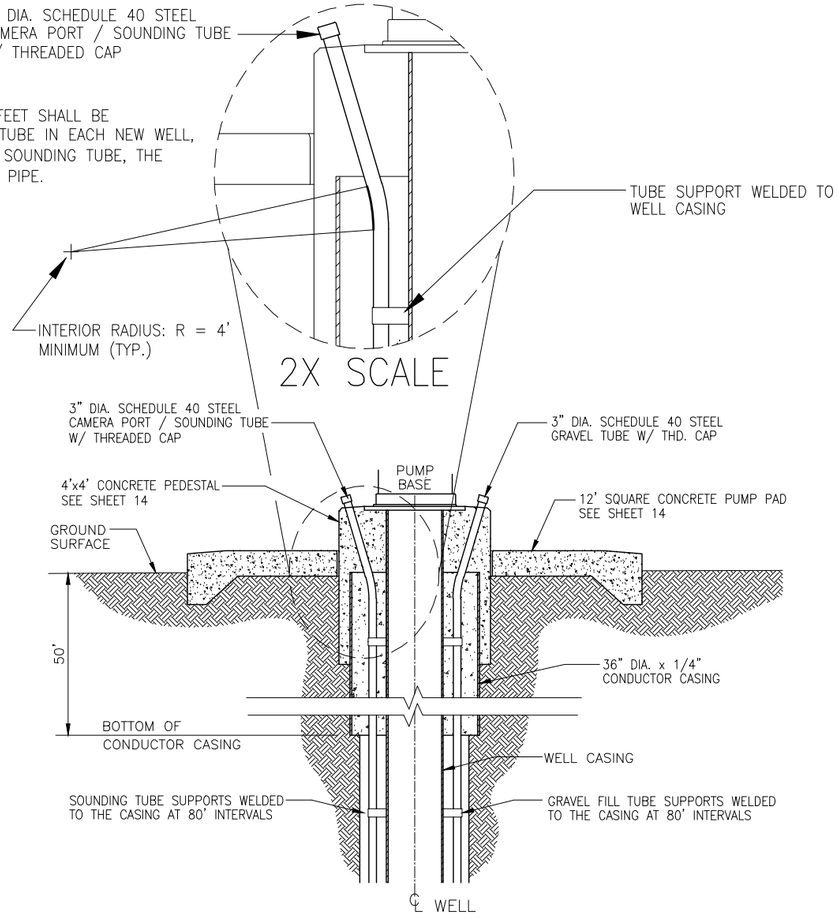


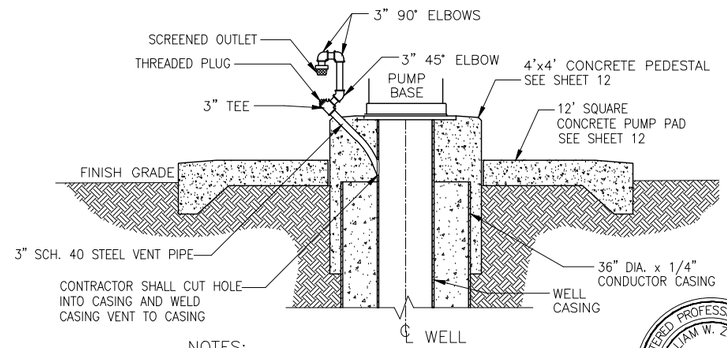
SUBCONTRACTOR SHALL COORDINATE WITH THE ENGINEER FOR THE ORIENTATION OF THE PUMP FOUNDATION AND THE INSTALLATION OF THE ELECTRICAL CONDUIT FOR PUMP.

A/13 PUMP PAD PLAN VIEW
PEDESTAL STYLE SCALE: 1"=2'

NOTE:
A MINIMUM INTERIOR RADIUS OF 4 FEET SHALL BE MAINTAINED FOR ANY BEND IN ANY TUBE IN EACH NEW WELL, INCLUDING THE 3" CAMERA PORT / SOUNDING TUBE, THE 3" GRAVEL TUBE, AND THE 3" VENT PIPE.



B/13 SOUNDING TUBE DETAIL
PEDESTAL STYLE SCALE: 1"=4'



NOTES:
A. SOUNDING TUBE OPENING SHALL BE SCREENED AND SECURED WITH A STAINLESS STEEL CLAMP.
B. 10 GALLON OILER (W/ STAND) AND STEEL DISCHARGE ARE NOT SHOWN ON THIS DETAIL

C/13 CASING VENT DETAIL
PEDESTAL STYLE SCALE: 1"=4'

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McCASLIN / BOWLING WELL PLANS
WELL PAD DETAILS
ALL WELLS

REV.	DATE	DESCRIPTION
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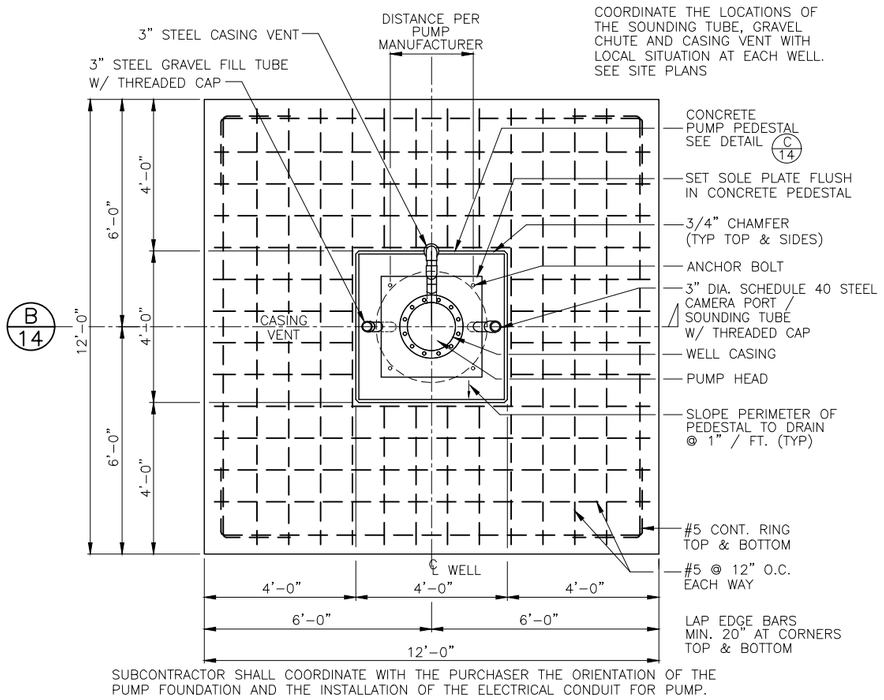
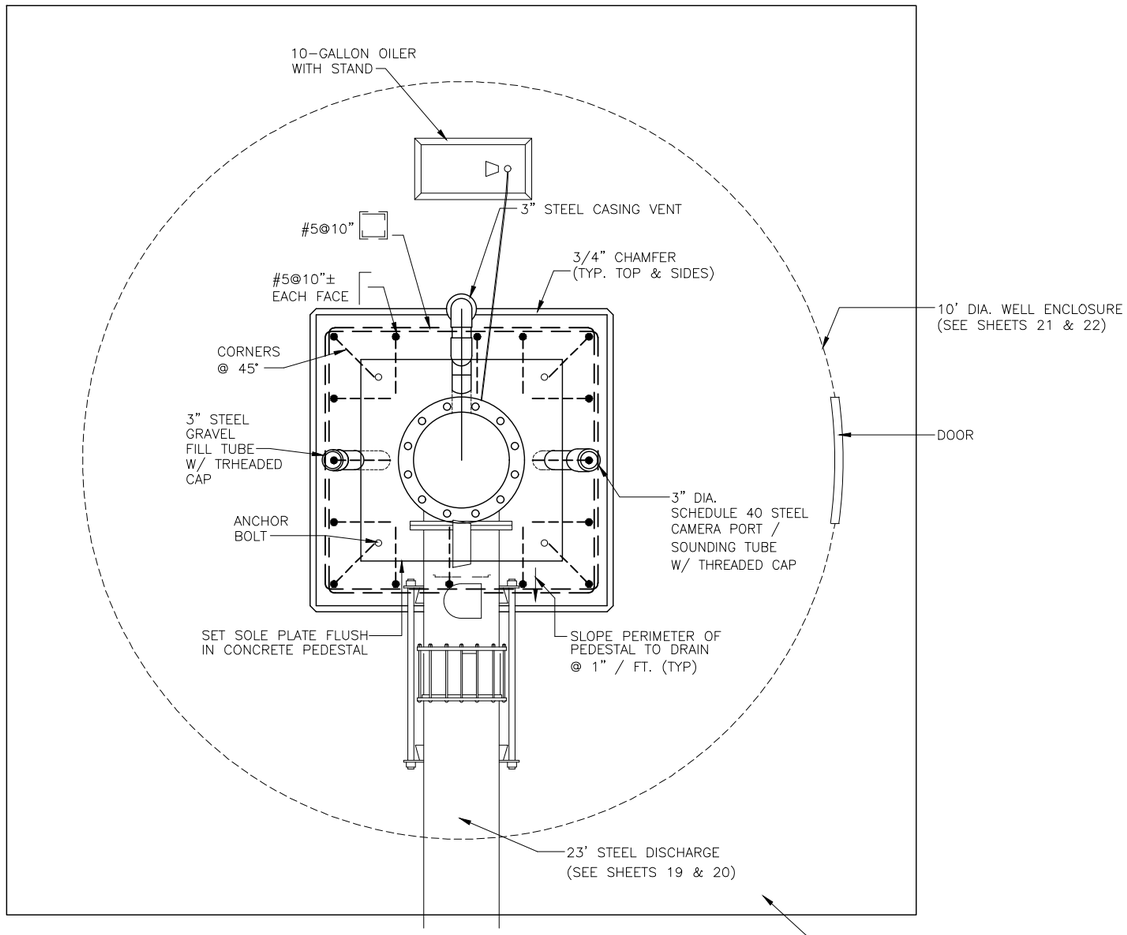


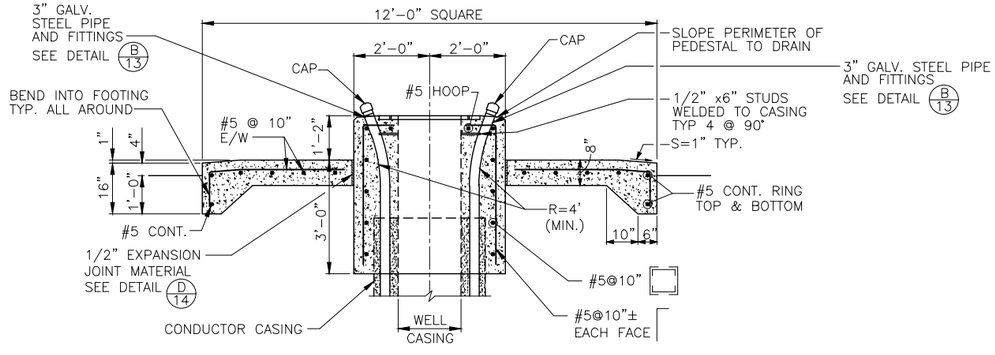
A/14 PUMP PAD AND PEDESTAL REINFORCEMENT PLAN

SCALE: 1"=2'



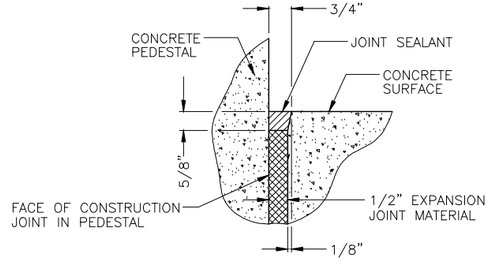
C/14 PEDESTAL REINFORCEMENT DETAIL

SCALE: 1"=1'



B/14 PUMP PAD AND PEDESTAL REINFORCEMENT SECTION

SCALE: 1"=2'



NOTE:

1. PRIME ALL VERTICAL EDGES.
2. CONSTRUCTION JOINTS EXPOSED TO HYDRAULIC BEARING SURFACES SHALL HAVE GROOVE AND SEALANT.

D/14 SEALANT GROOVE CONSTRUCTION JOINTS

NOT TO SCALE

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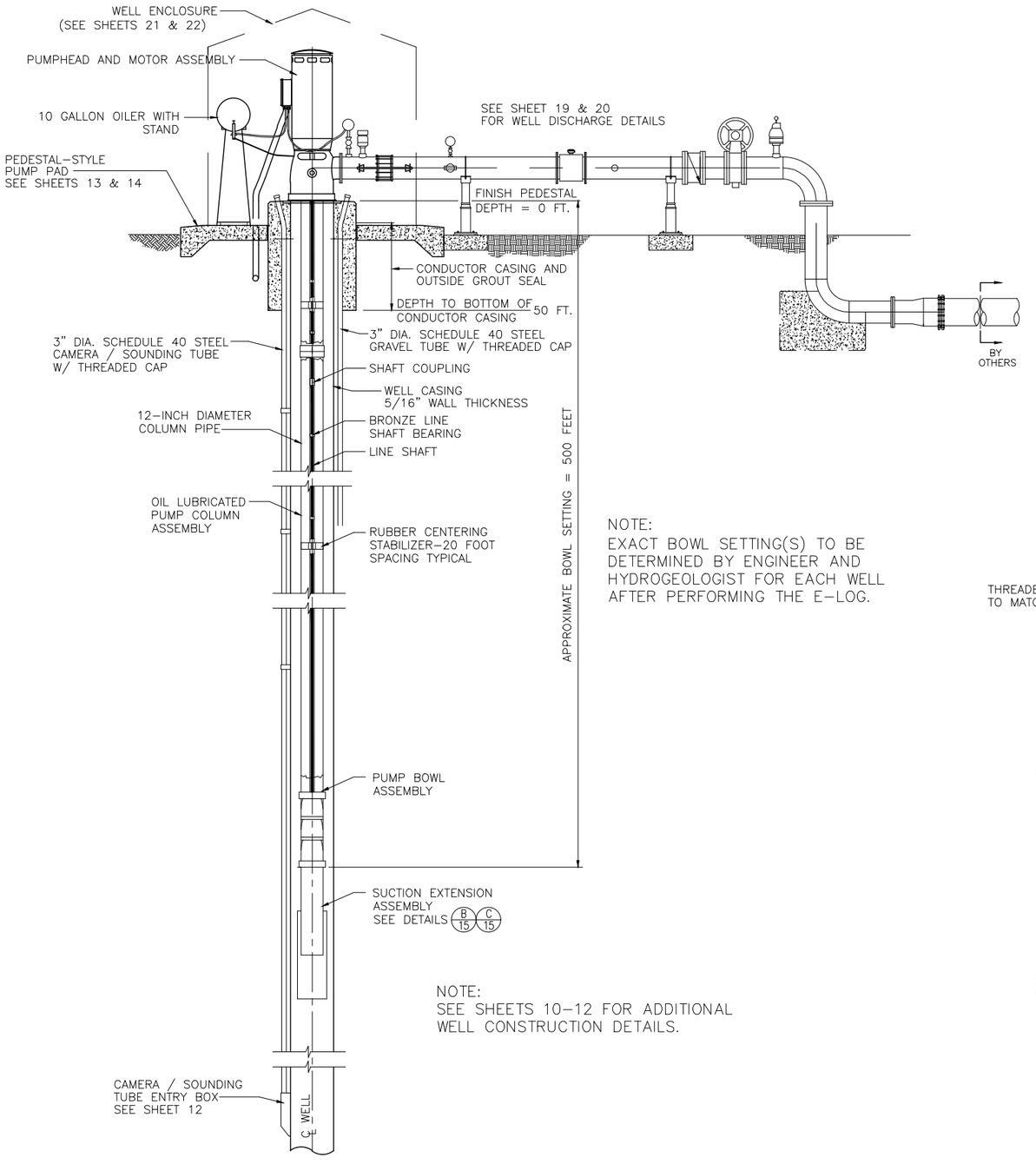
WELL PAD DETAILS
ALL WELLS

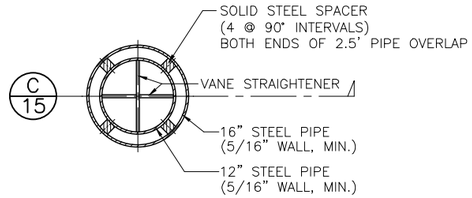


NOTE:
EXACT BOWL SETTING(S) TO BE DETERMINED BY ENGINEER AND HYDROGEOLOGIST FOR EACH WELL AFTER PERFORMING THE E–LOG.

NOTE:
SEE SHEETS 10–12 FOR ADDITIONAL WELL CONSTRUCTION DETAILS.

A/15 TYPICAL PUMPING EQUIPMENT DETAIL

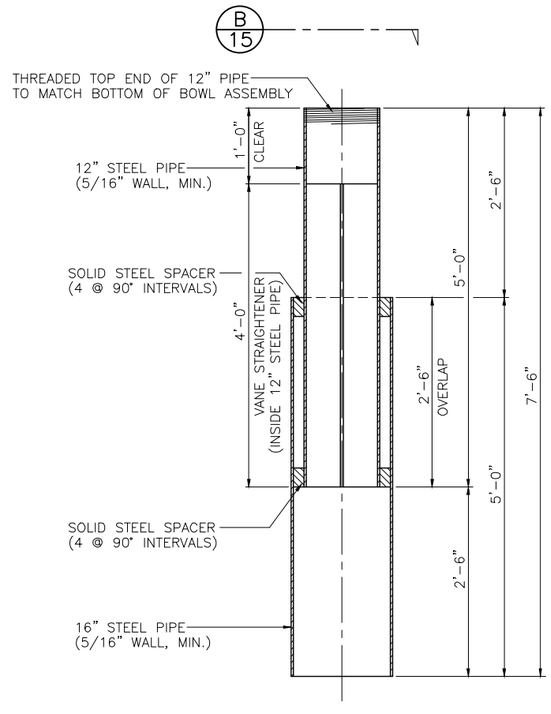
NOT TO SCALE



B/15 TYPICAL SUCTION EXTENSION DETAIL

TOP VIEW

NOT TO SCALE



C/15 TYPICAL SUCTION EXTENSION DETAIL

SECTION

NOT TO SCALE

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WILLIAM W. ZEIDERS
Lic. No. 40,031
Expires 12/31/23
CIVIL
STATE OF CALIFORNIA

REV. | DATE | DESCRIPTION

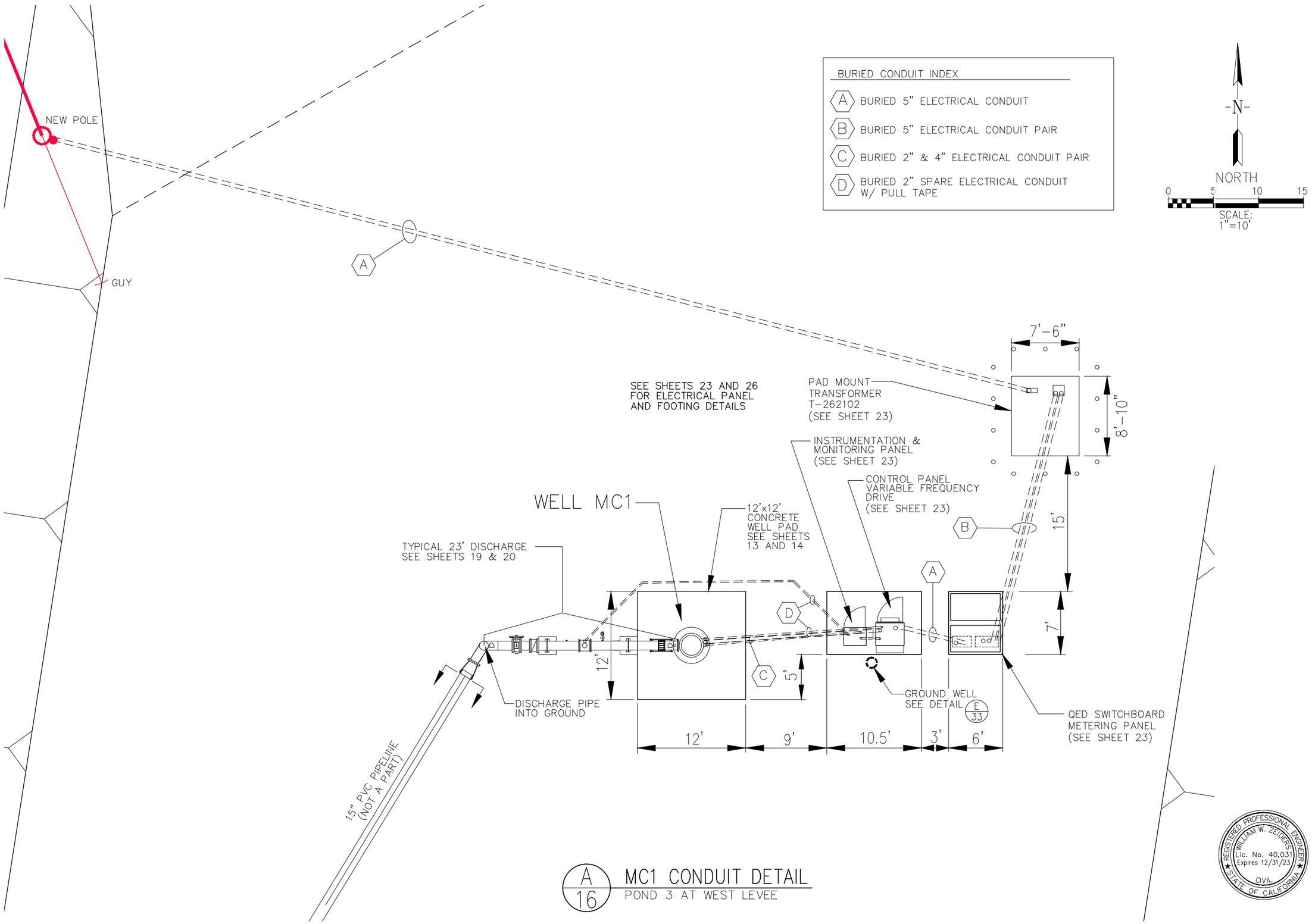
DATE: JUNE 28, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL PUMPING EQUIPMENT DETAILS
ALL WELLS

ROSEDALE–RIO BRAVO WATER STORAGE DISTRICT
849 ALLEN ROAD
P.O. BOX 20820
BAKERSFIELD, CA. 93390

ZEIDERS CONSULTING
1655 CREELEY ROAD
BAKERSFIELD, CA. 93314
(661) 589–8366

BURIED CONDUIT INDEX	
A	BURIED 5" ELECTRICAL CONDUIT
B	BURIED 5" ELECTRICAL CONDUIT PAIR
C	BURIED 2" & 4" ELECTRICAL CONDUIT PAIR
D	BURIED 2" SPARE ELECTRICAL CONDUIT W/ PULL TAPE



NORTH

0 5 10 15

SCALE: 1"=10'

A / 16 MC1 CONDUIT DETAIL
POND 3 AT WEST LEVEE

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REV.	DATE	DESCRIPTION
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R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
CONDUIT DETAIL
McCASLIN WELL #1 (MC1)

SEE SHEETS 24 AND 26
FOR ELECTRICAL PANEL
AND FOOTING DETAILS

WELL MC2

12'x12'
CONCRETE
WELL PAD
SEE SHEETS 13 & 14

DISCHARGE
INTO GROUND

15" PVC PIPELINE
(NOT A PART)

9' 10.5' 3' 6'

12'

7'

QED SWITCHBOARD
METERING PANEL
(SEE SHEET 24)

INSTRUMENTATION &
MONITORING PANEL
(SEE SHEET 24)

CONTROL PANEL
VARIABLE FREQUENCY
DRIVE
(SEE SHEET 24)

GROUND WELL
SEE DETAIL E/33

23'
12" STEEL DISCHARGE
ABOVE GROUND

PAD MOUNT
TRANSFORMER
T-262102
(SEE SHEET 26)

7'-6"

8'-10"

BURIED CONDUIT INDEX

- (A) BURIED 5" ELECTRICAL CONDUIT
- (B) BURIED 5" ELECTRICAL CONDUIT PAIR
- (C) BURIED 2" & 4" ELECTRICAL CONDUIT PAIR
- (D) BURIED 2" SPARE ELECTRICAL CONDUIT W/ PULL TAPE

GUY

NEW POLE

ELECTRICAL SERVICE POINT
FOR WELL MC2 FROM SOUTH

A/17 MC2 CONDUIT DETAIL
POND 1 AT WEST LEVEE

-N-
NORTH
0 5 10 15
SCALE:
1"=10'

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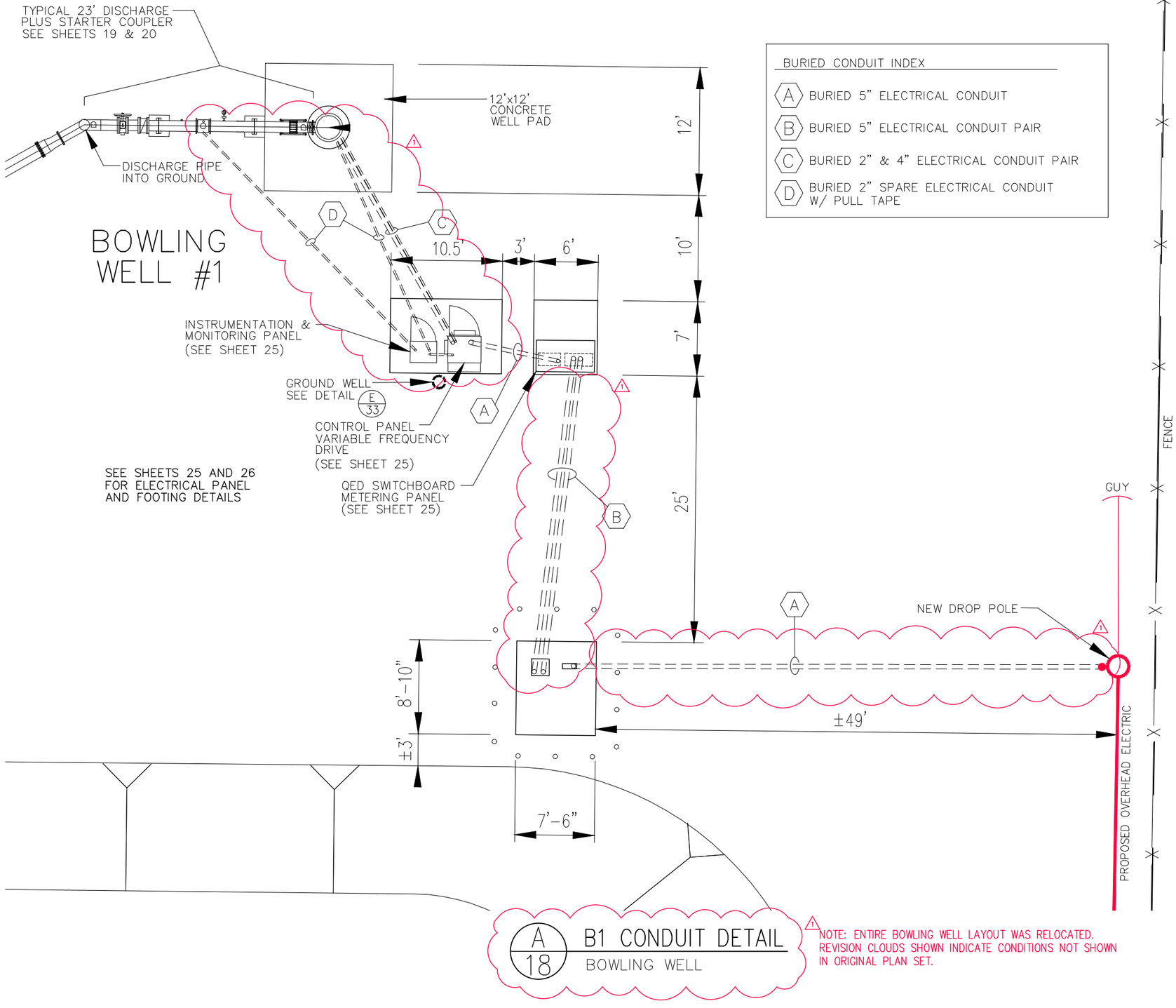
R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
CONDUIT DETAIL
McCASLIN WELL #2 (MC2)

REV.	DATE	DESCRIPTION
1		

DATE: JUNE 28, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...



BURIED CONDUIT INDEX

- (A) BURIED 5" ELECTRICAL CONDUIT
- (B) BURIED 5" ELECTRICAL CONDUIT PAIR
- (C) BURIED 2" & 4" ELECTRICAL CONDUIT PAIR
- (D) BURIED 2" SPARE ELECTRICAL CONDUIT W/ PULL TAPE

-N-
NORTH
0 5 10 15
SCALE: 1"=10'

A 18 B1 CONDUIT DETAIL
BOWLING WELL

1 NOTE: ENTIRE BOWLING WELL LAYOUT WAS RELOCATED. REVISION CLOUDS SHOWN INDICATE CONDITIONS NOT SHOWN IN ORIGINAL PLAN SET.

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REV.	DATE	DESCRIPTION
1	07/21/2023	RELOCATED BOWLING WELL

DATE: JULY 21, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
CONDUIT DETAIL
BOWLING WELL (B1)

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
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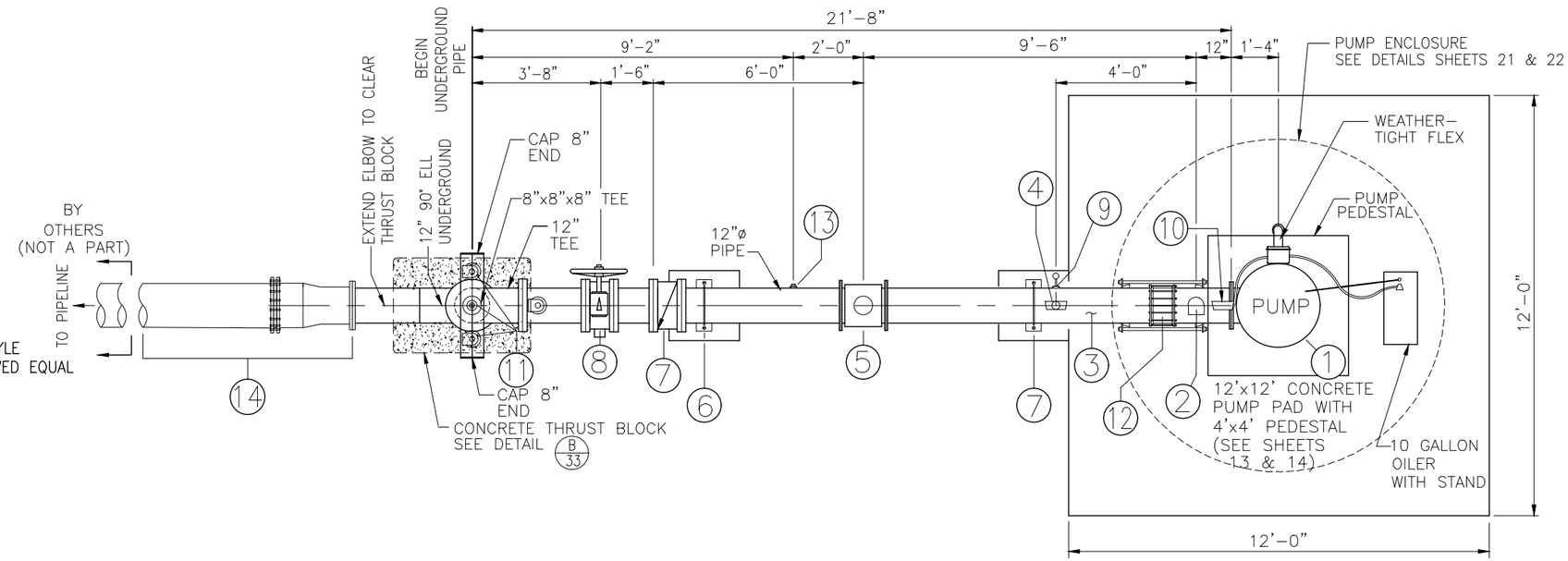
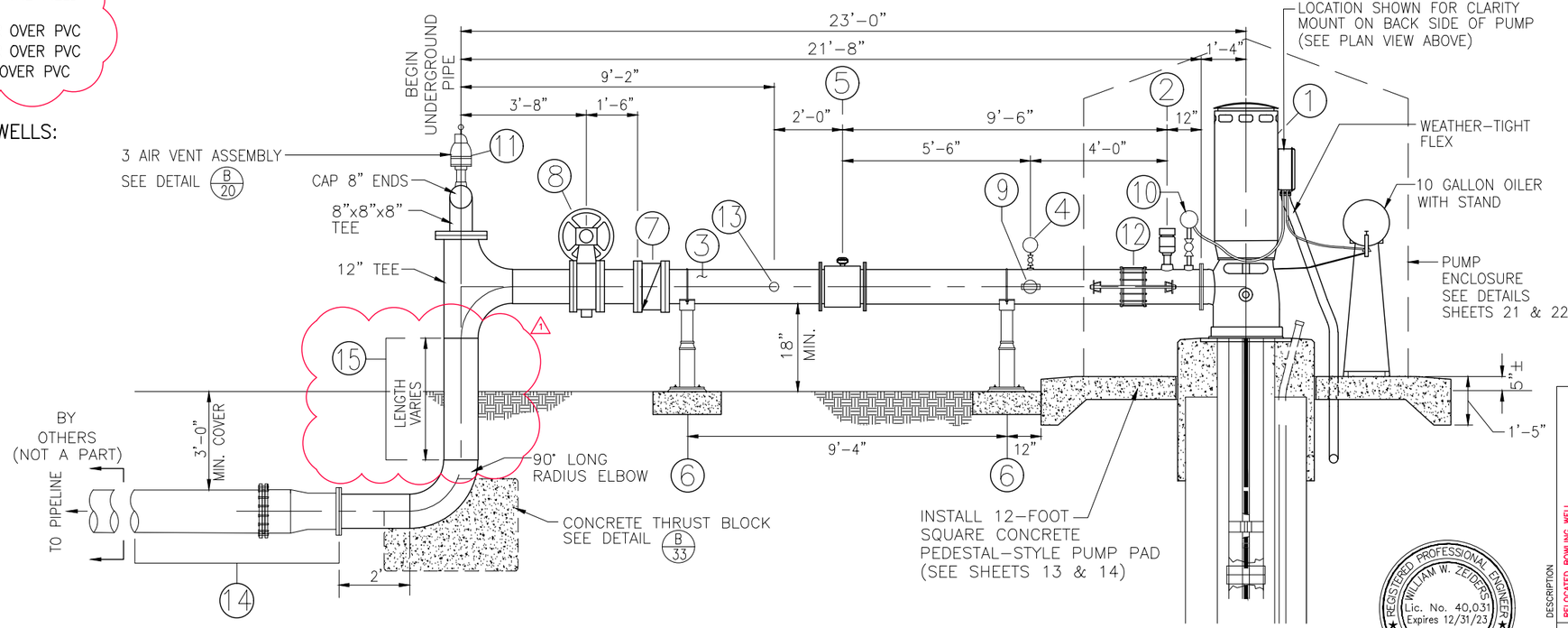
SCOPE OF WORK

1. PUMPHEAD AND MOTOR ASSEMBLY
2. 3" WATERMAN AV–150 AIR VENT
3. 12" DISCHARGE PIPE
4. PRESSURE GAUGE – 3" OIL FILLED, TO 100 PSI
5. 12" FLOWMETER – 12" SEAMETRICS IN–LINE MAG METER (READS IN CFS AND TOTALIZES IN ACRE–FEET – 0 TO 8 CFS) **NOTE: REQUIRES ALTERNATING CURRENT. UNIT SHALL HAVE 4–20 mA AND PULSE OUTPUT. UNITS WITHOUT BOTH OUTPUTS ARE UNACCEPTABLE.**
6. (2) ADJUSTABLE SADDLE TYPE SUPPORT (SEE DETAIL A/20)
7. 12" WAFER CHECK VALVE – FRESNO VALVE SERIES 3700, WATERMAN PC–150 OR APPROVED EQUAL
8. 12" BUTTERFLY VALVE – GRAYLINE 8400 SERIES BFV WAFER STYLE VALVE W/ WORM GEAR OPERATOR AND HAND WHEEL OR APPROVED EQUAL
9. 1" BALL VALVE (MOUNTED ON SIDE OF 12" PIPE)
10. HIGH PRESSURE KILL (SHUT–OFF) SWITCH (OFF @ 80 PSI) MERCOID DAW–7000 OR APPROVED EQUAL
11. (3) VENT ASSEMBLY – 4" WATERMAN CR101 (SEE DETAIL B/20)
12. 12" DRESSER TYPE COUPLING (CONSTRAINED) DRESSER STYLE 253 OR APPROVED EQUAL
13. 1" THREADED COLLAR W/ PLUG (FOR RATING WELL)
14. 12" X 15" STEEL–TO–PVC STARTER COUPLER WITH 1 JOINT OF 15" PIP PVC CL100. PROTECT END OF PIPE IN PLACE BEFORE BACKFILL. 12" SIDE (STEEL); 150 POUND FLANGE PER THE SPECIFICATIONS 15" SIDE (PVC); COMPRESSION STYLE COUPLER.
15. ALL LENGTHS PER WELL AS SHOWN AND VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION:
    MC1: SHALL DEVELOP A MINIMUM 3' OF COVER OVER PVC
    MC2: SHALL DEVELOP A MINIMUM 3' OF COVER OVER PVC
    B1: SHALL DEVELOP A MINIMUM 6' OF COVER OVER PVC

NOTE:
THIS DETAIL APPLIES TO THE FOLLOWING WELLS: MC1, MC2, AND B1



A/19 TYPICAL WELL DISCHARGE PLAN
WELLS MC1, MC2, AND B1 NOT TO SCALE



B/19 TYPICAL WELL DISCHARGE PROFILE
WELLS MC1, MC2, & B1 NOT TO SCALE

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REV.	DATE	DESCRIPTION
1	07/21/2023	RELOCATED BOWLING WELL

DATE: JULY 21, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

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McCASLIN / BOWLING WELL PLANS
TYPICAL DISCHARGE DETAILS
ALL WELLS

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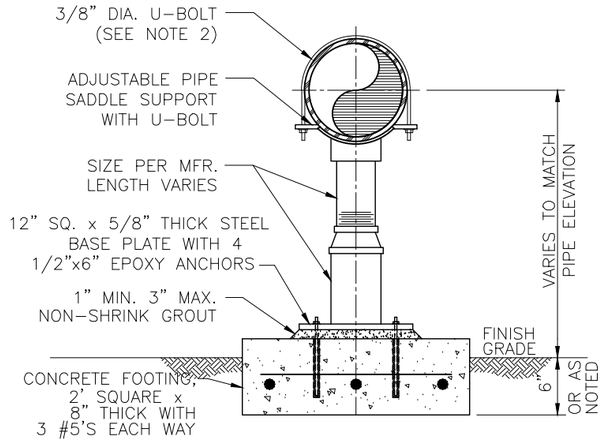
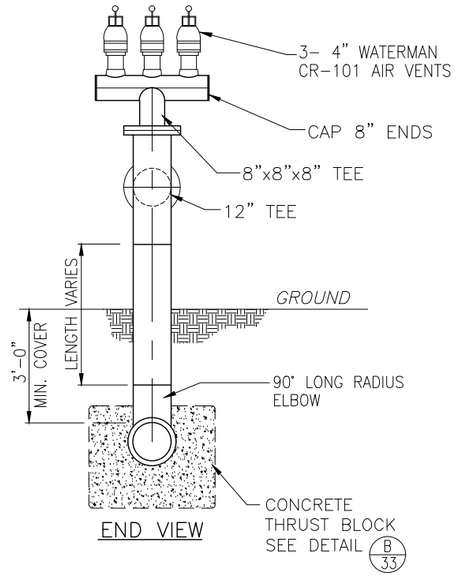


NOTE:

1. ADJUSTABLE PIPE SUPPORT, GRINNELL FIGURE 265, B-LINE B3093/3089 OR EQUAL WITH A PIPE STANCHION AND U-BOLT, GRINNELL FIGURE 259, B-LINE B3090 OR EQUAL. ALL SUPPORTS EXCEPT SST SHALL BE COATED OR PAINTED PER SPECIFICATIONS.
2. U-BOLTS SHALL HAVE 1/4-INCH CLEARANCE BETWEEN PIPE AND U-BOLT TO ALLOW MOVEMENT WHEN SUPPORTING EXPANSION JOINTS.
3. PROVIDE 1/8 INCH TEFLON PAD BETWEEN PIPE AND SADDLE.

A / 20 ADJUSTABLE PIPE SUPPORT AT WELL DISCHARGE — NOT TO SCALE



B / 20 TYPICAL WELL DISCHARGE (END) — NOT TO SCALE

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R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
TYPICAL DISCHARGE DETAILS
ALL WELLS

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REV.	DATE	DESCRIPTION
1		

DATE: JUNE 28, 2023
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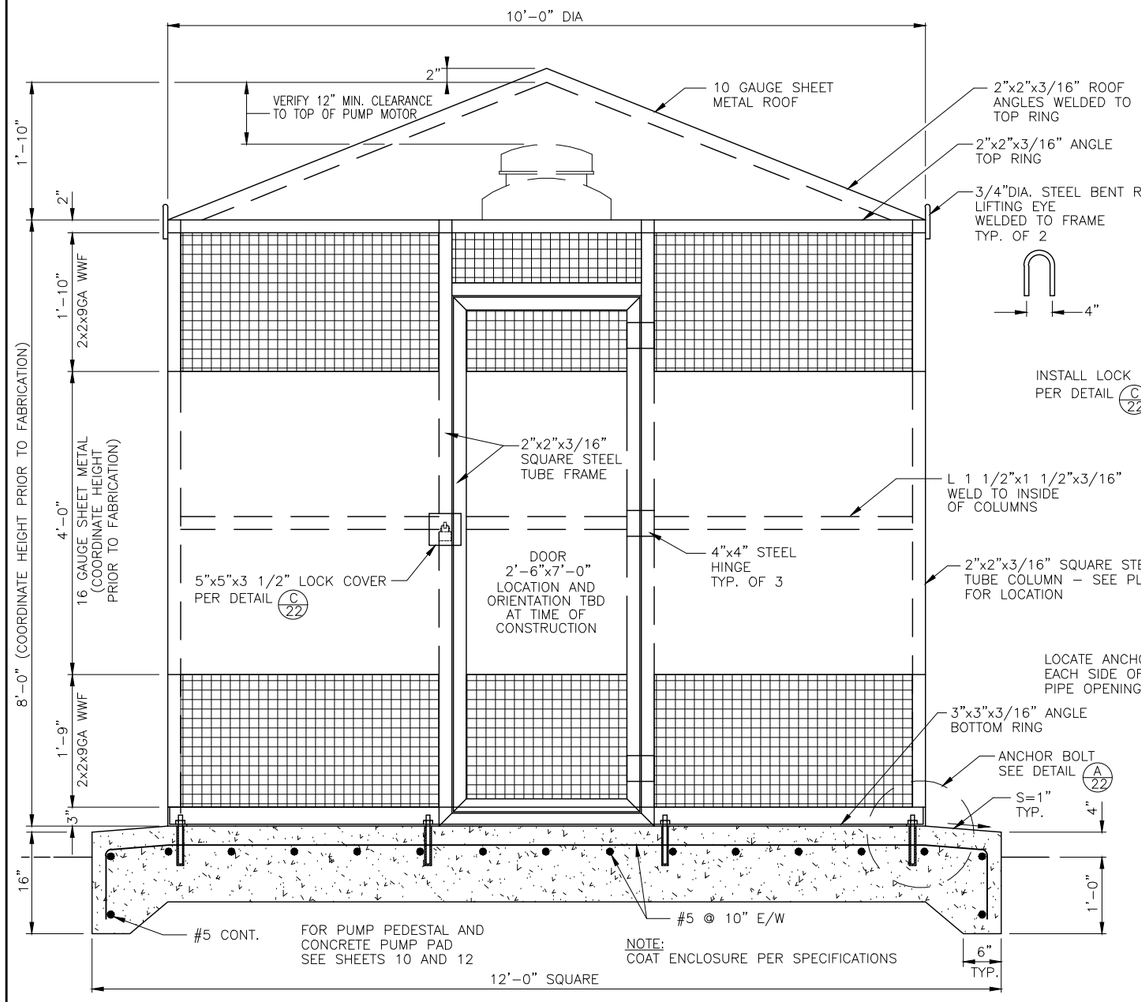
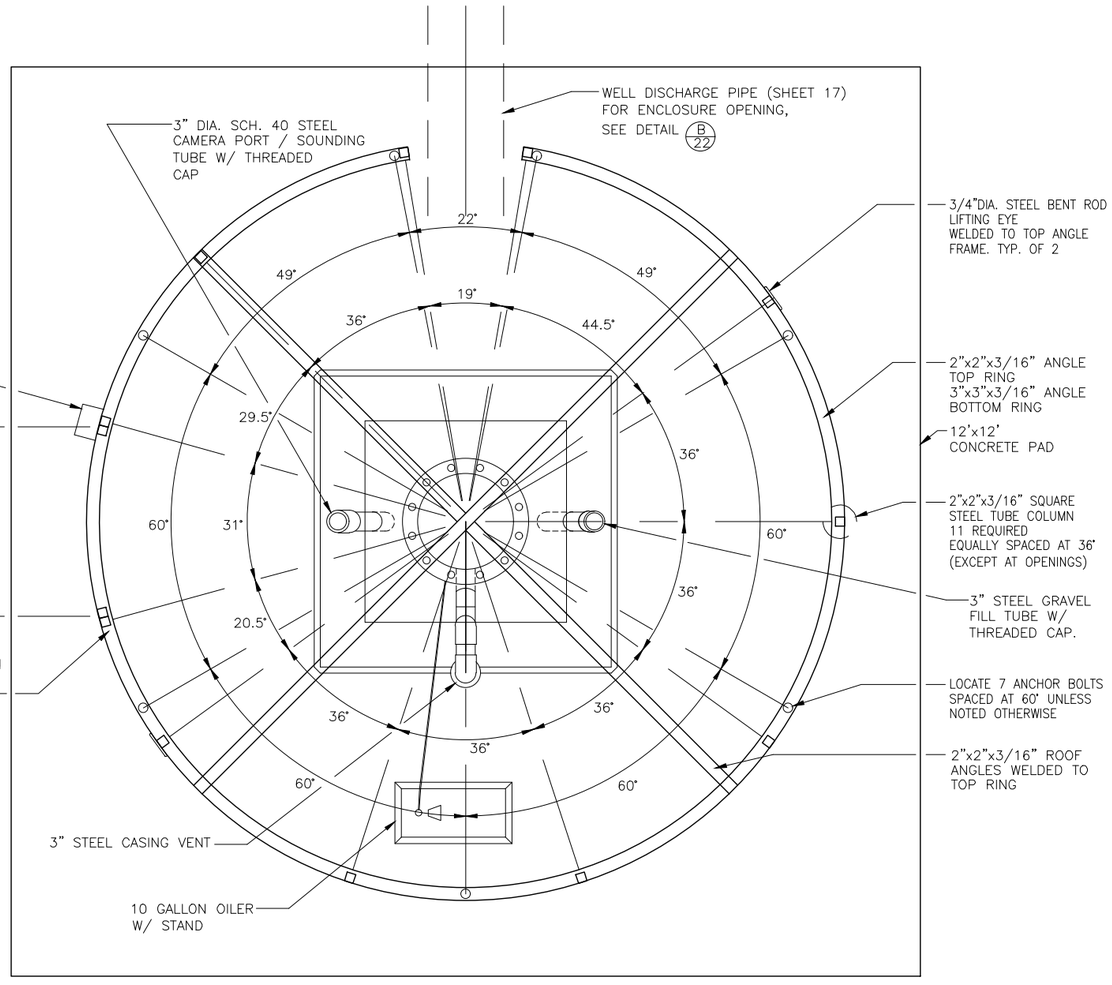
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...



A 21 WELL ENCLOSURE PLAN
SIDE VIEW SCALE: 1" = 2'-0"



B 21 WELL ENCLOSURE PLAN
TOP VIEW SCALE: 1" = 2'-0"

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R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
WELL ENCLOSURE DETAILS
ALL WELLS

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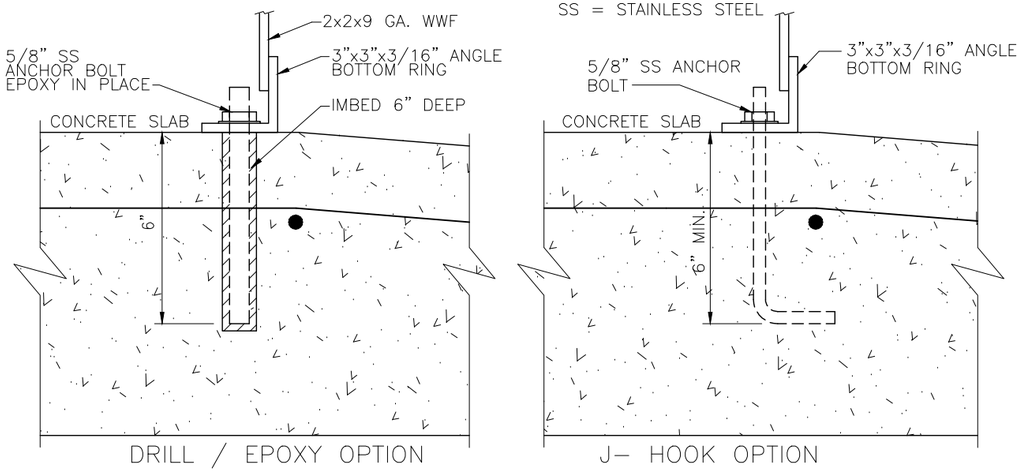
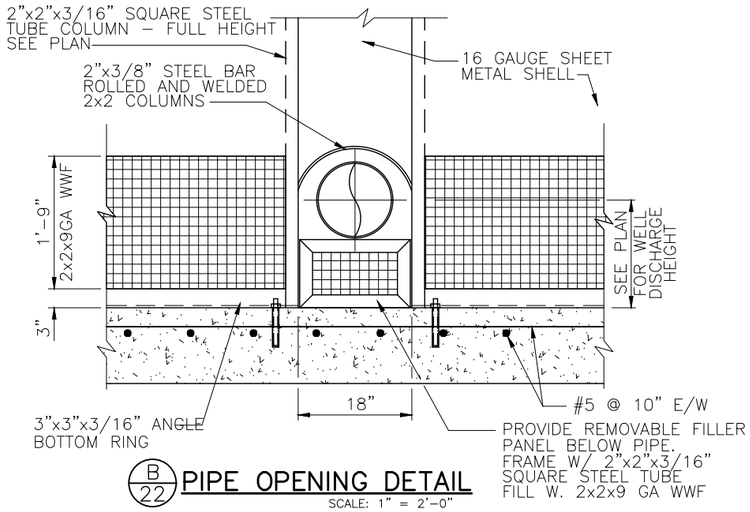
FILE NAME: McCASLIN & BOWLING...

LEGEND:

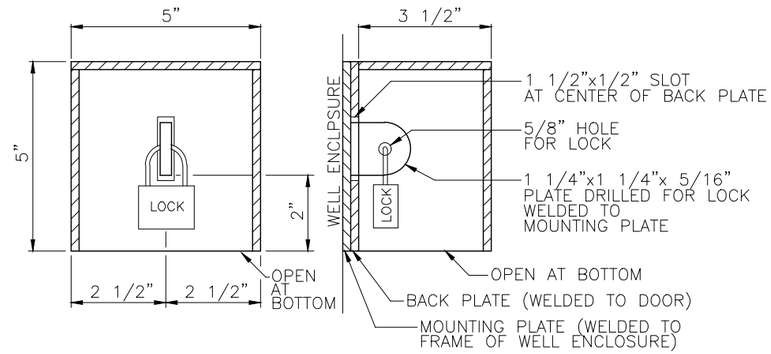
WWF = WELDED WIRE FABRIC
SS = STAINLESS STEEL



A/22 ANCHOR BOLT DETAIL
SCALE: 5" = 2'–0"



B/22 PIPE OPENING DETAIL
SCALE: 1" = 2'–0"



NOTE: TO BE CONSTRUCTED OF 5/16" STEEL

C/22 LOCK COVER DETAIL
NOT TO SCALE

NOTE:

1. GRIND SMOOTH ALL WELDS AND EDGES OF SHEET METAL. PROVIDE 1/8 INCH RADIUS AT CORNERS OF SHEET METAL.
2. STRUCTURAL STEEL ENCLOSURE SHALL BE ASSEMBLED IN THE SHOP TO THE GREATEST EXTENT POSSIBLE TO MINIMIZE FIELD ASSEMBLY. CONTRACTOR SHALL SUBMIT ERECTION DRAWINGS CLEARLY NOTING COMPONENTS TO BE ASSEMBLED IN THE FIELD. SHOW FIELD WELDING AND SPLICE LOCATIONS. REPAIR DAMAGED METAL.
3. MODIFICATIONS DUE TO IMPROPERLY SET J–HOOK ANCHORS ARE NOT ALLOWED. IF A J–HOOK IS IMPROPERLY SET IN THE ENGINEER'S OPINION, IT SHALL BE ABANDONED AND REPLACED WITH AN EPOXY ANCHOR AT THE CONTRACTOR'S EXPENSE.

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WELL ENCLOSURE DETAILS
ALL WELLS

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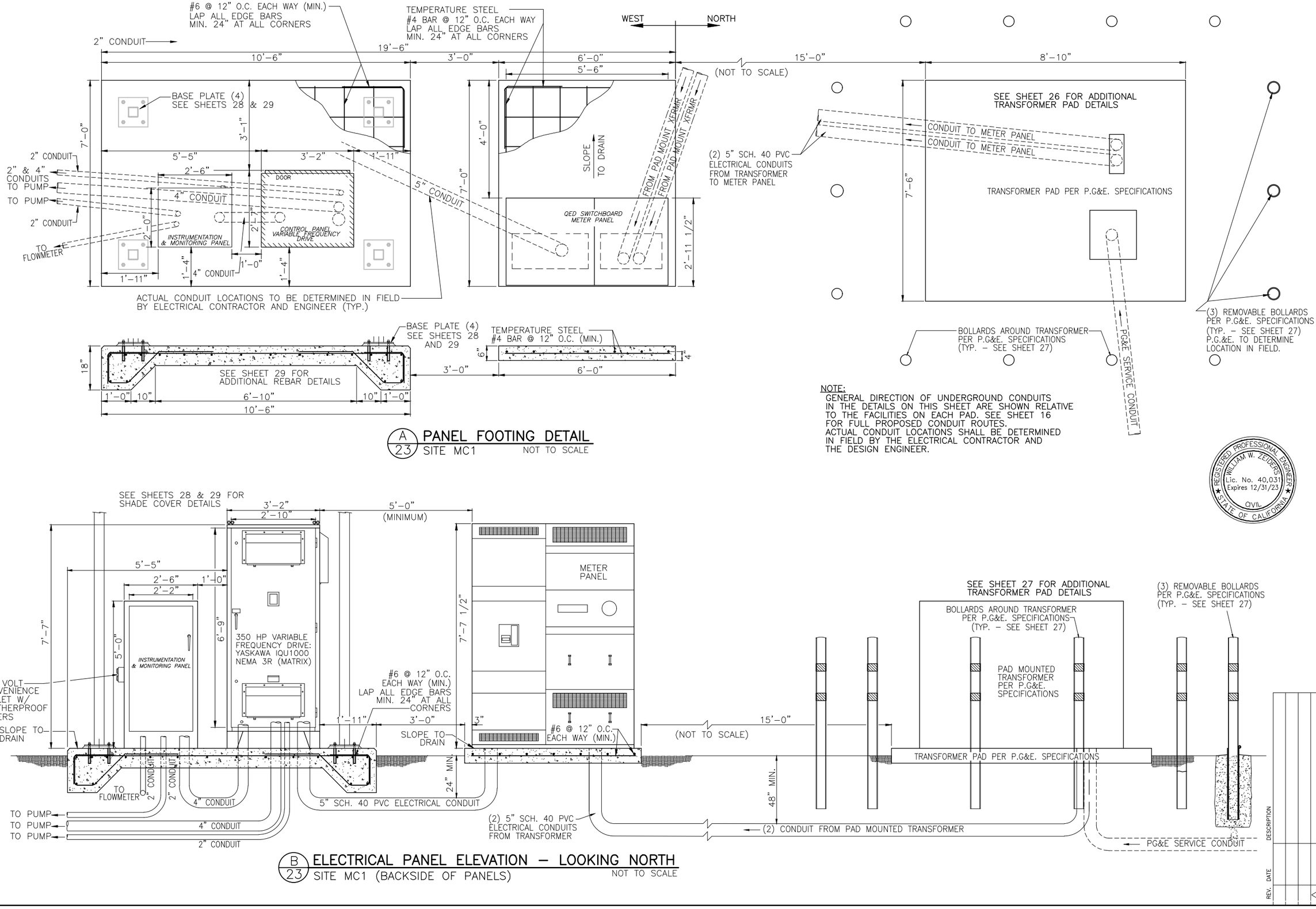

A/23 PANEL FOOTING DETAIL
SITE MC1 NOT TO SCALE

NOTE:
GENERAL DIRECTION OF UNDERGROUND CONDUITS IN THE DETAILS ON THIS SHEET ARE SHOWN RELATIVE TO THE FACILITIES ON EACH PAD. SEE SHEET 16 FOR FULL PROPOSED CONDUIT ROUTES. ACTUAL CONDUIT LOCATIONS SHALL BE DETERMINED IN FIELD BY THE ELECTRICAL CONTRACTOR AND THE DESIGN ENGINEER.

B/23 ELECTRICAL PANEL ELEVATION – LOOKING NORTH
SITE MC1 (BACKSIDE OF PANELS) NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
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McCASLIN / BOWLING WELL PLANS
ELECTRICAL PANEL & FOOTING DETAILS
McCASLIN WELL 1 (MC1)

REV.	DATE	DESCRIPTION
1		

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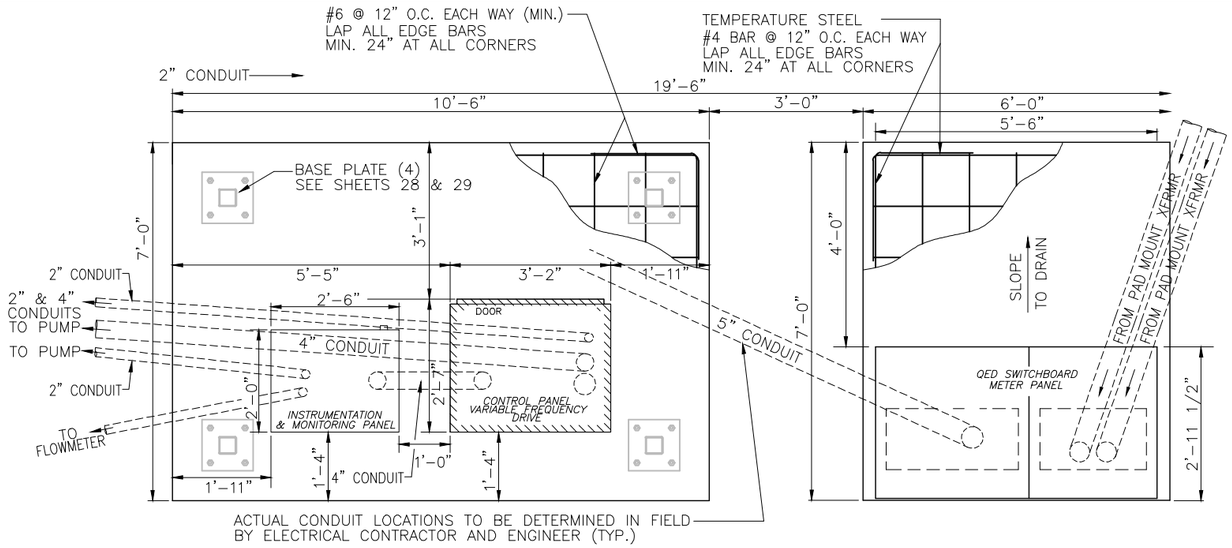
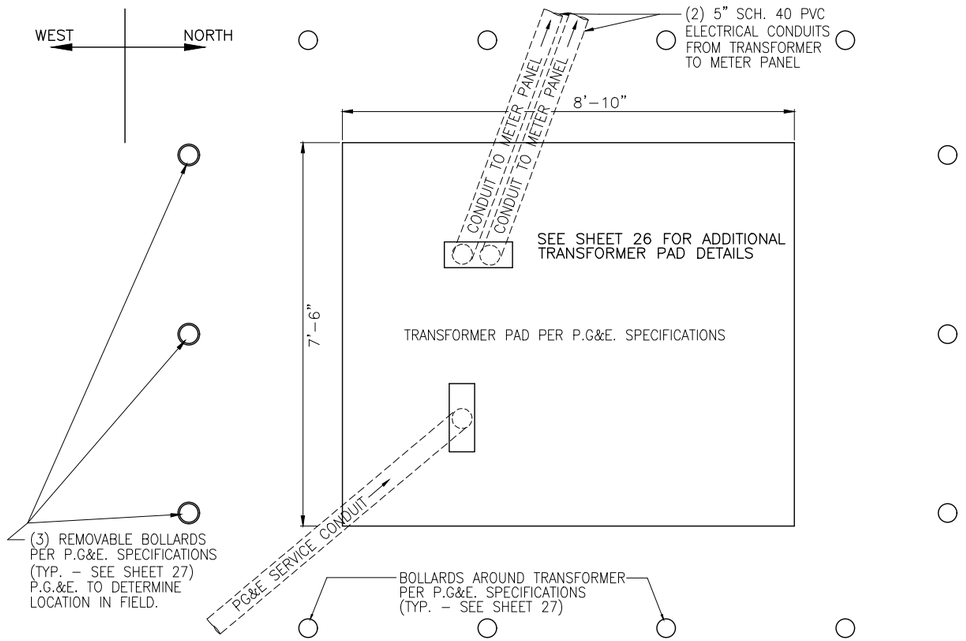
FILE NAME: McCASLIN & BOWLING...



A/24 **PANEL FOOTING DETAIL**
SITE MC2 NOT TO SCALE



NOTE:
GENERAL DIRECTION OF UNDERGROUND CONDUITS IN THE DETAILS ON THIS SHEET ARE SHOWN RELATIVE TO THE FACILITIES ON EACH PAD. SEE SHEET 17 FOR FULL PROPOSED CONDUIT ROUTES. ACTUAL CONDUIT LOCATIONS SHALL BE DETERMINED IN FIELD BY THE ELECTRICAL CONTRACTOR AND THE DESIGN ENGINEER.

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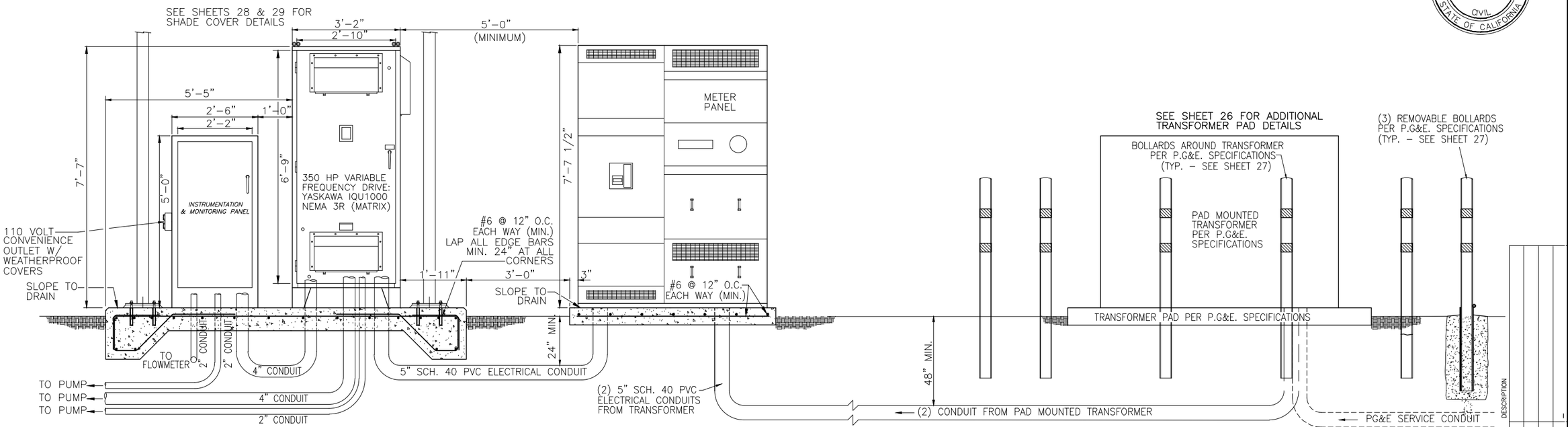

B/24 **ELECTRICAL PANEL ELEVATION – LOOKING NORTH**
SITE MC2 (BACKSIDE OF PANELS) NOT TO SCALE

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McCASLIN / BOWLING WELL PLANS
ELECTRICAL PANEL & FOOTING DETAILS
McCASLIN WELL 2 (MC2)

REV.	DATE	DESCRIPTION
1		

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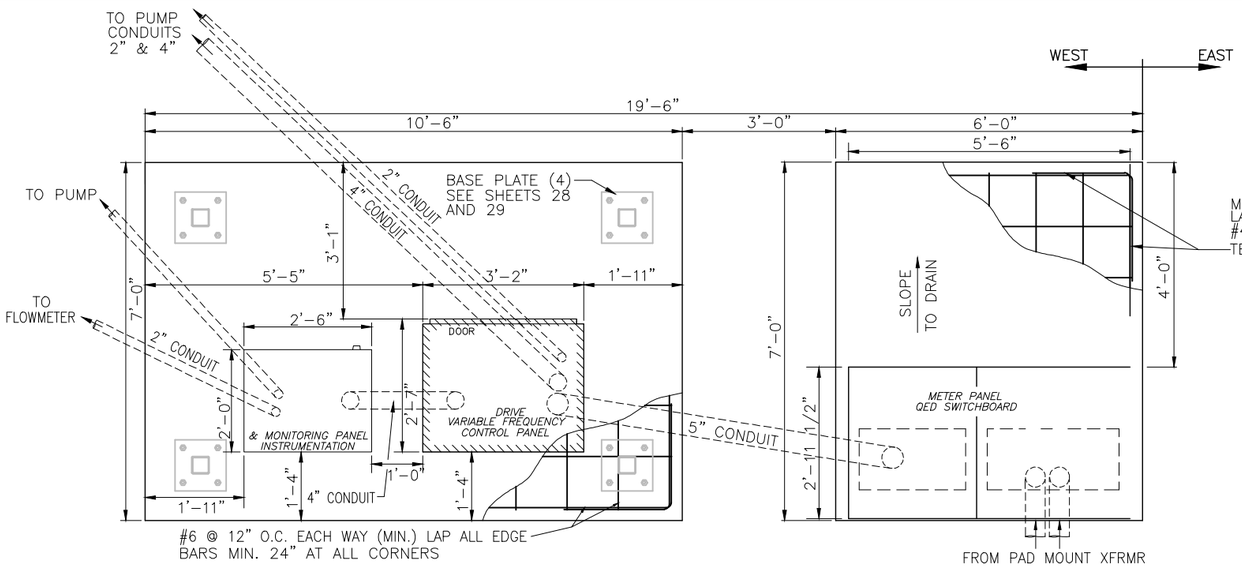
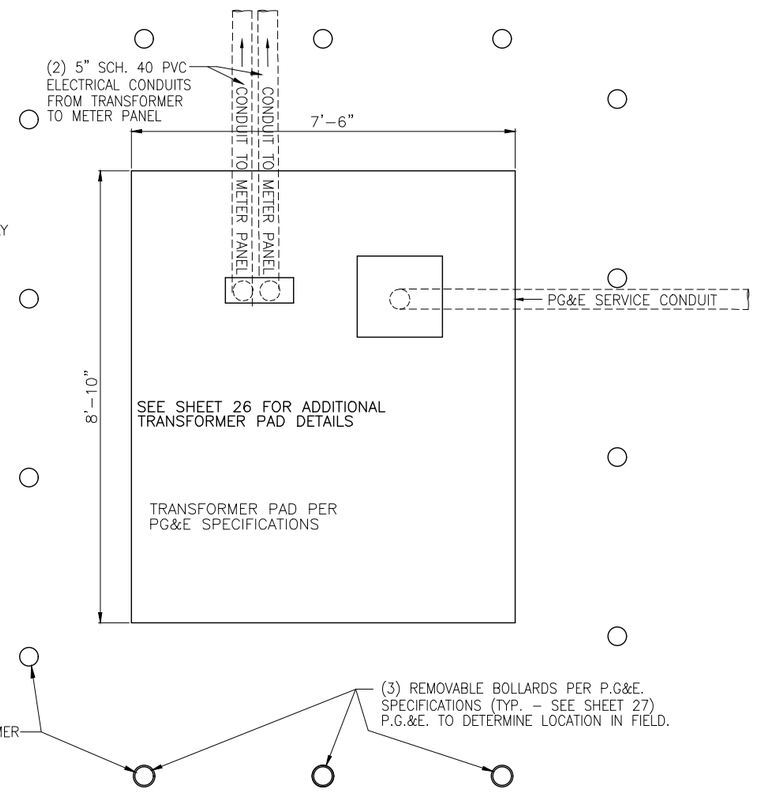
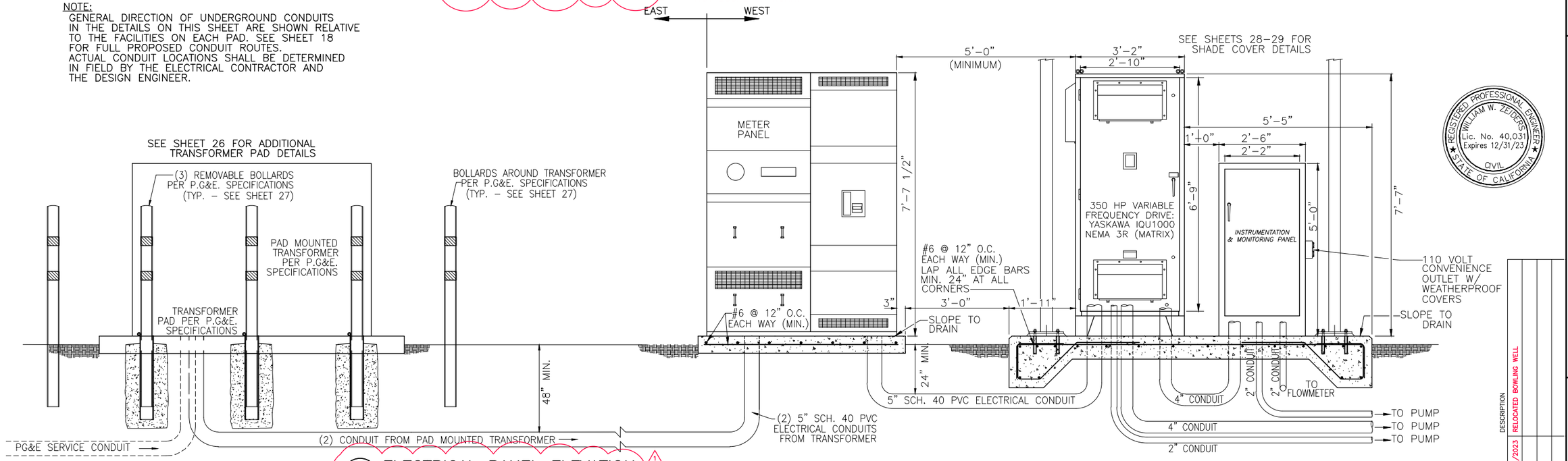


A/25 PANEL FOOTING DETAIL
SITE B1 NOT TO SCALE

1 NOTE: ENTIRE BOWLING WELL LAYOUT WAS RELOCATED. LOCATION AND ORIENTATION OF PANELS CHANGED, BUT NOT SCOPE OF WORK.



NOTE:
GENERAL DIRECTION OF UNDERGROUND CONDUITS IN THE DETAILS ON THIS SHEET ARE SHOWN RELATIVE TO THE FACILITIES ON EACH PAD. SEE SHEET 18 FOR FULL PROPOSED CONDUIT ROUTES. ACTUAL CONDUIT LOCATIONS SHALL BE DETERMINED IN FIELD BY THE ELECTRICAL CONTRACTOR AND THE DESIGN ENGINEER.



B/25 ELECTRICAL PANEL ELEVATION
SITE B1 NOT TO SCALE

1 NOTE: ENTIRE BOWLING WELL LAYOUT WAS RELOCATED. LOCATION AND ORIENTATION OF PANELS CHANGED, BUT NOT SCOPE OF WORK.

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CIVIL
STATE OF CALIFORNIA

REV.	DATE	DESCRIPTION
1	07/21/2023	RELOCATED BOWLING WELL

DATE: JULY 21, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

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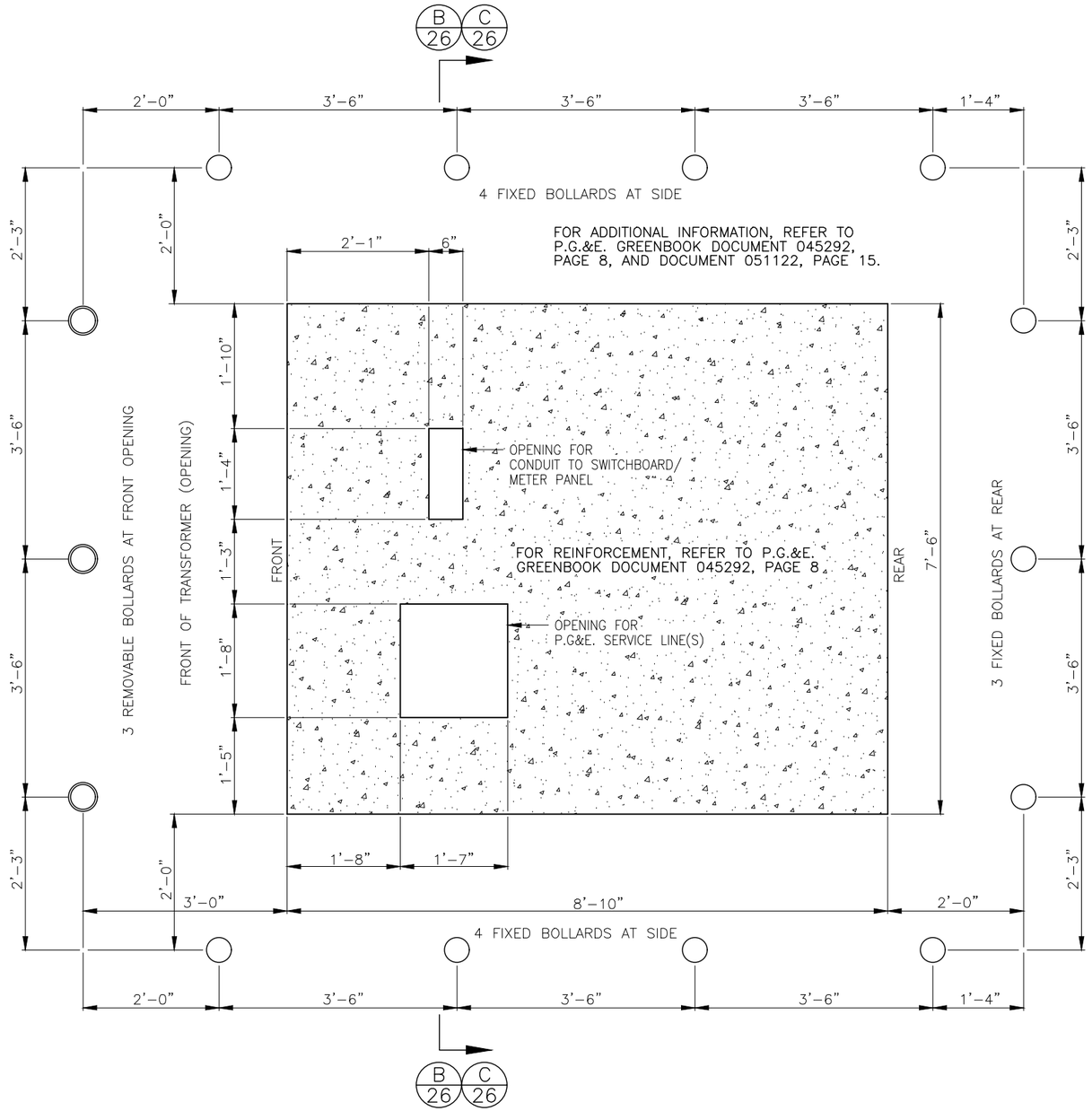
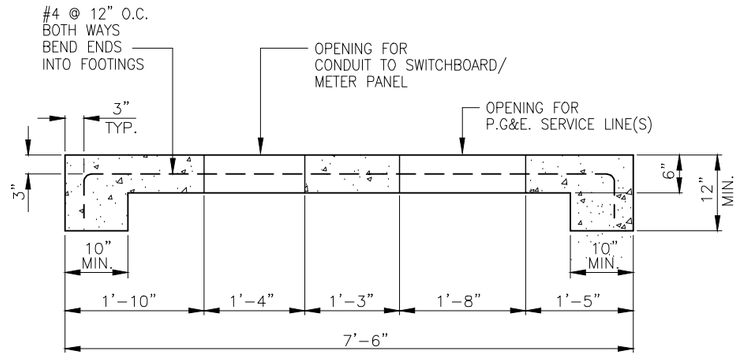
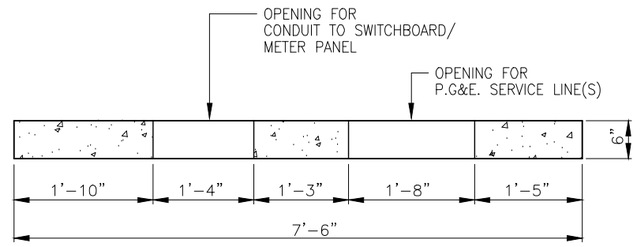
McCASLIN / BOWLING WELL PLANS
ELECTRICAL PANEL & FOOTING DETAILS
BOWLING WELL (B1)



A/26 **CONCRETE PAD LAYOUT FOR GROUND MOUNTED TRANSFORMER**
PER P.G.&E. SPECIFICATIONS
SCALE: 1"=2'



B/26 **CONCRETE PAD LAYOUT FOR GROUND MOUNTED TRANSFORMER**
POURED IN PLACE PAD PER P.G.&E. SPECIFICATIONS
SCALE: 1"=2'



C/26 **CONCRETE PAD LAYOUT FOR GROUND MOUNTED TRANSFORMER**
PRECAST PAD PER P.G.&E. SPECIFICATIONS
SCALE: 1"=2'

FOR ADDITIONAL INFORMATION, REFER TO P.G.&E. GREENBOOK DOCUMENT 045292, PAGE 8, AND DOCUMENT 051122, PAGE 15.

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FILE NAME: McCASLIN & BOWLING...

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McCASLIN / BOWLING WELL PLANS
PAD MOUNT TRANSFORMER DETAILS
ALL WELLS

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Clearances and Location Requirements for Enclosures, Pads, and Underground Equipment

17. Placement of Metal Barrier Posts and Details

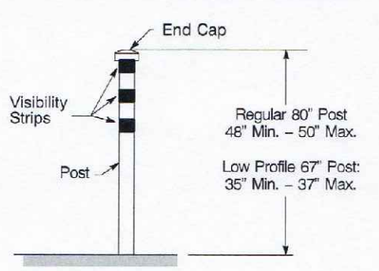
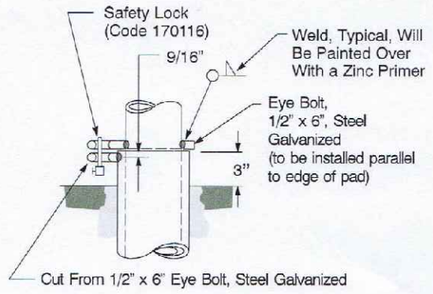


Figure 24
Steel Barrier Post
(see Table 4)



Detail A
(see Figure 26)

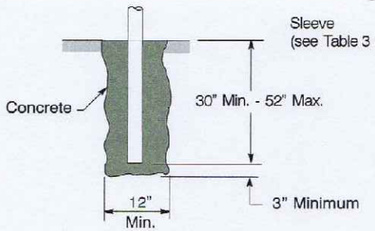


Figure 25
Footing for Fixed Steel Post Detail
(see Table 4)

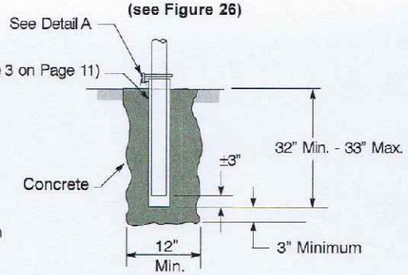


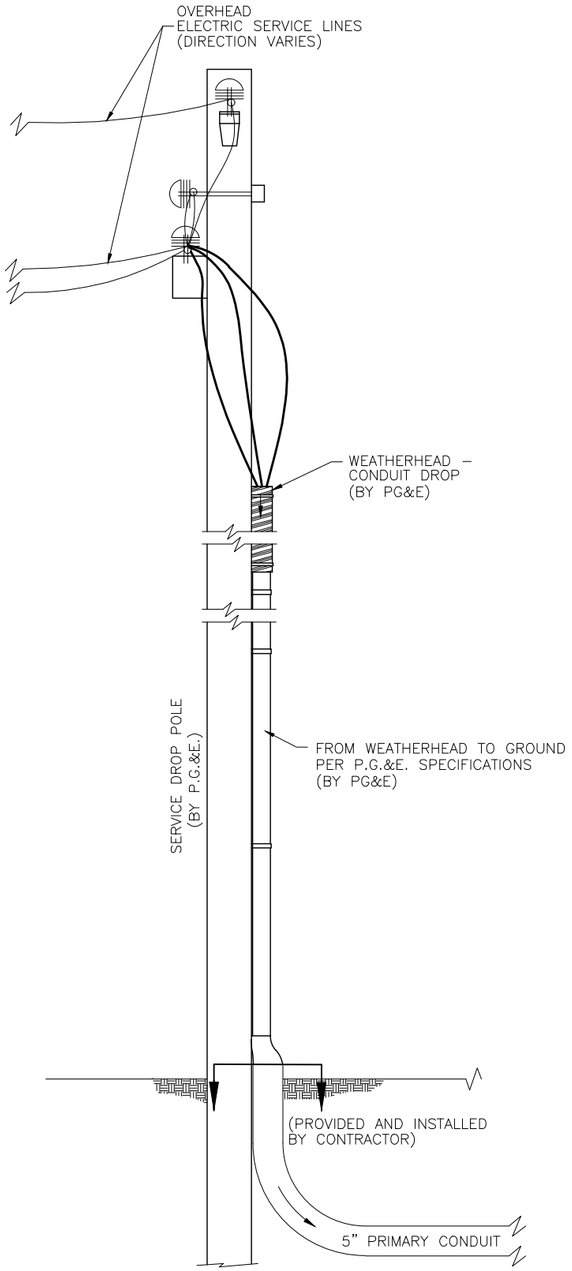
Figure 26
Footing for Removable Steel Post Detail
(see Table 4)

Table 4 Description and Codes for Steel Barrier Posts [1]

Description	Length (inches)	Code	Doc
Galvanized Fixed Post, 4", Steel Pipe, Standard, Schedule 40	80	155107	–
	67 [2]	155108	–
Removable Post, 4", Galvanized Steel Pipe, Standard, Schedule 40 With 5" Galvanized Steel Pipe Sleeve, 36" Long, Standard, Schedule 40	80	155105	–
	67 [2]	155106	–
Replacement 4" Removable Barrier Post Galvanized Steel Pipe With Cap Less Sleeve and Eye Bolt	67	150265	–
	80	150266	–
End Cap, 4", Galvanized Malleable Iron, May Be Screwed	–	021882	–
Strip, Visibility Reflective Yellow Adhesive Sheet, 2" X 12", Pacific Utilities #PEM212F, Almetek #DL-RY2X12-A	–	013163	022168
Safety Lock	–	170116	–

1 Posts fabricated from 20-foot lengths of galvanized steel pipe, Code 011794.
2 67" post length is for single-phase transformer.

A/27 PG&E BARRIER POST DETAIL



B/27 ELECTRICAL DROP POLE DETAIL

NOT TO SCALE

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McCASLIN / BOWLING WELL PLANS
PG&E DETAILS
ALL WELLS

REV.	DATE	DESCRIPTION
1		

DATE: JUNE 28, 2023
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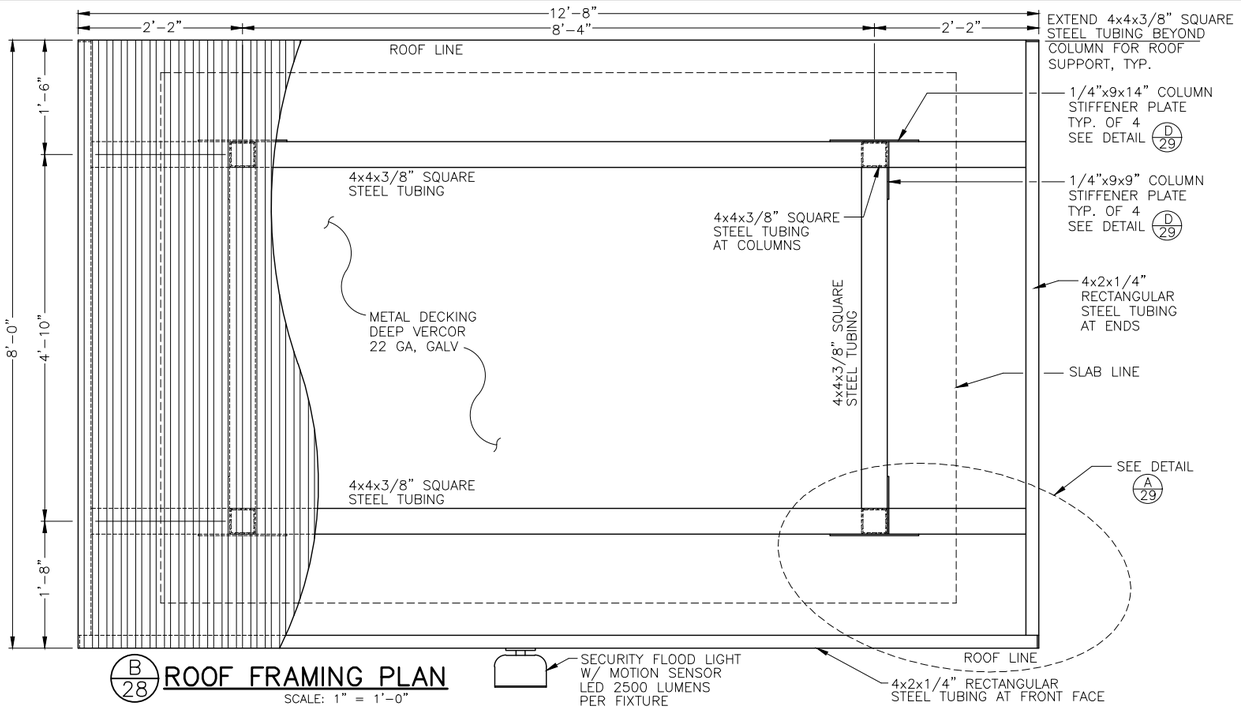
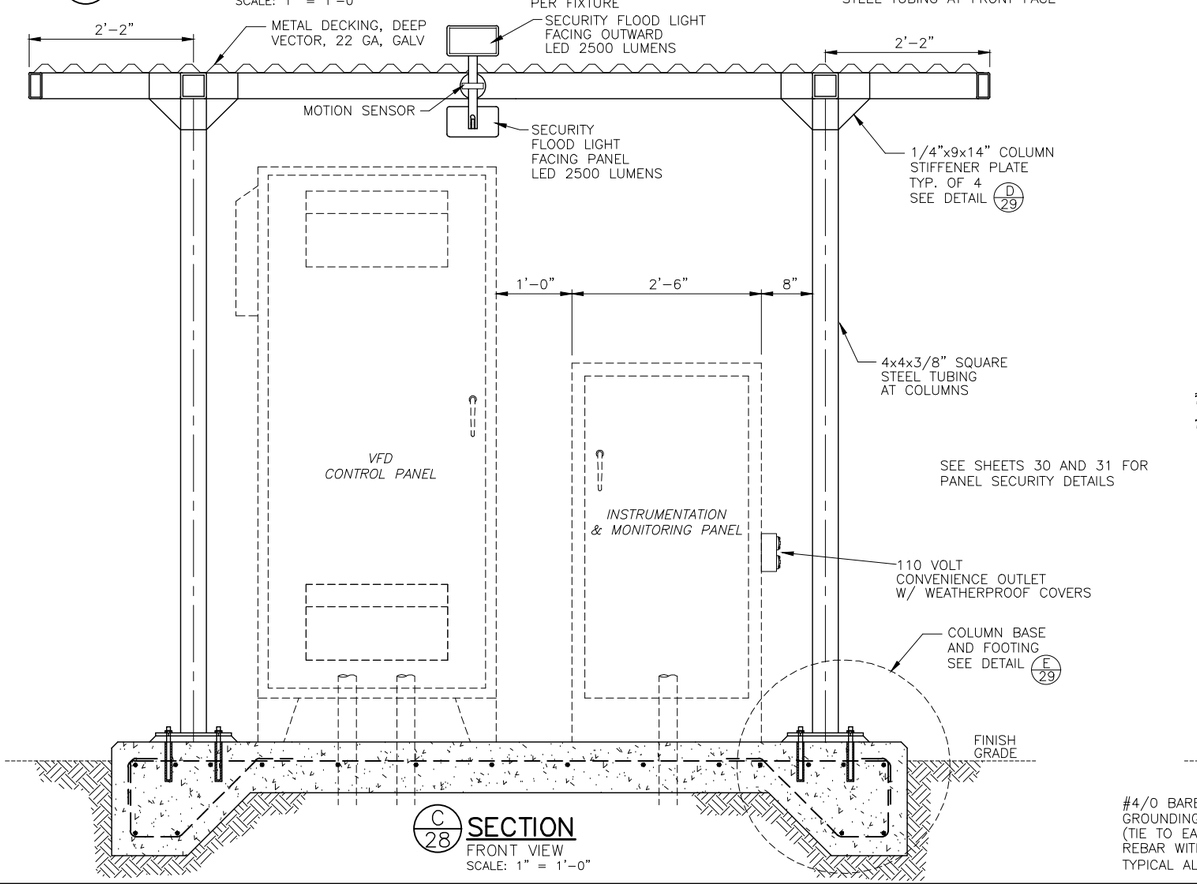
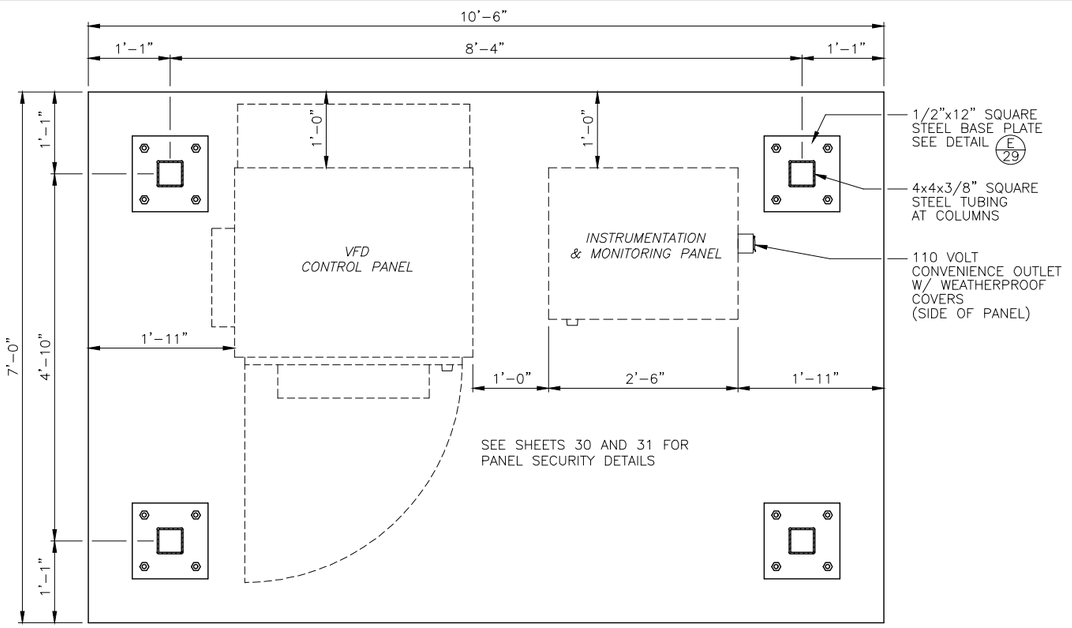
FILE NAME: McCASLIN & BOWLING...



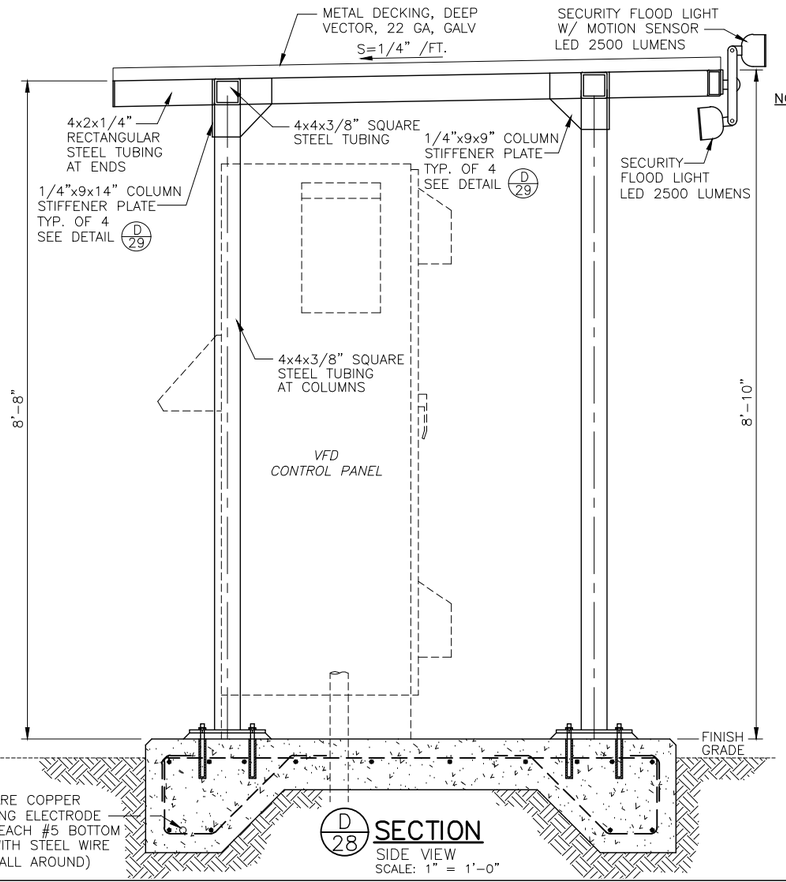
B/28 ROOF FRAMING PLAN
SCALE: 1" = 1'-0"



C/28 SECTION
FRONT VIEW
SCALE: 1" = 1'-0"



A/28 COLUMN & BASE PLATE LAYOUT
SCALE: 1" = 1'-0"



D/28 SECTION
SIDE VIEW
SCALE: 1" = 1'-0"

NOTES:

1. SECURITY FLOOD LIGHTS SHALL HAVE MOTION DETECTOR OPERATION.

2. GRIND SMOOTH ALL WELDS AND EDGES OF SHEET METAL. PROVIDE 1/8 INCH RADIUS AT CORNERS OF SHEET METAL.

3. STRUCTURAL STEEL FRAMEWORK SHALL BE ASSEMBLED IN THE SHOP TO THE GREATEST EXTENT POSSIBLE TO MINIMIZE FIELD ASSEMBLY. CONTRACTOR SHALL SUBMIT ERECTION DRAWINGS CLEARLY NOTING COMPONENTS TO BE ASSEMBLED IN THE FIELD. SHOW FIELD WELDING AND SPLICE LOCATIONS. REPAIR DAMAGED METAL.

4. SHADE COVER FRAMEWORK AND ROOF DECKING SHALL BE GALVANIZED.

5. SHADE STRUCTURE MAY NEED TO BE INCREASED IN SIZE TO ACCOMODATE PANELS.

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McCASLIN / BOWLING WELL PLANS
SHADE STRUCTURE DETAILS
ALL WELLS

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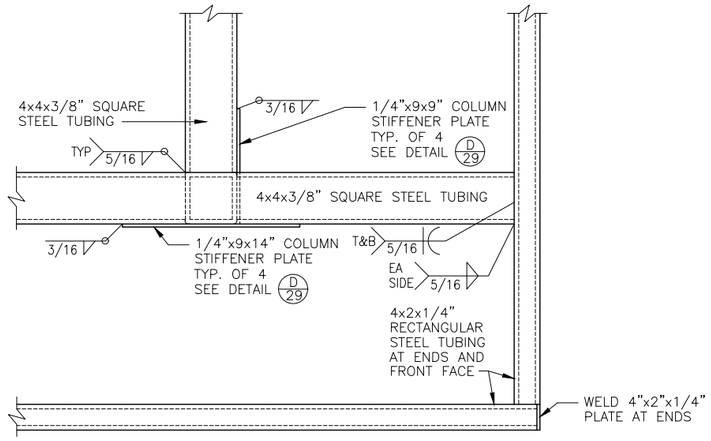
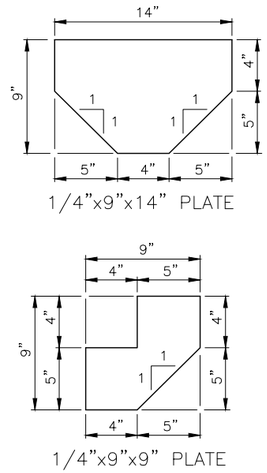
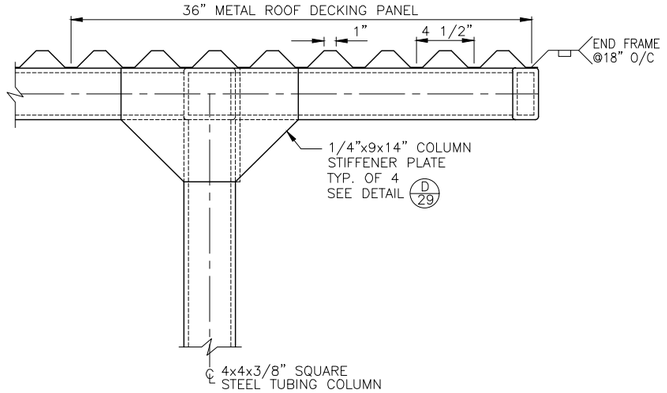


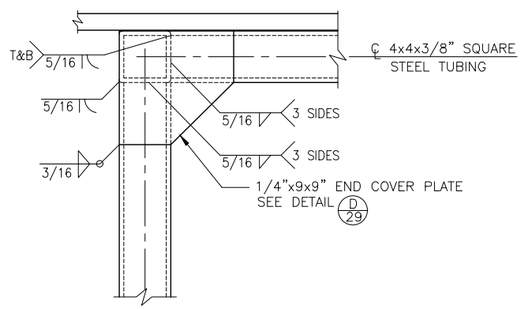
A/29 ROOF FRAMING DETAIL
SCALE: 1" = 1'-0"



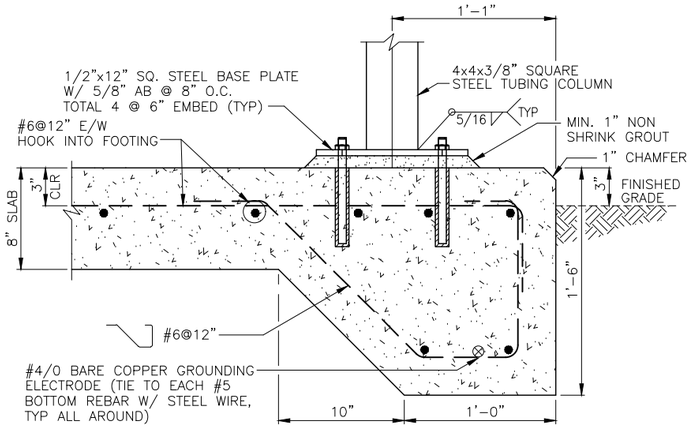
D/29 TYPICAL STIFFENER PLATE
SCALE: 1" = 1'-0"



B/29 METAL ROOF DECKING
SCALE: 1" = 1'-0"



C/29 COLUMN END ELEVATION
SCALE: 1" = 1'-0"



E/29 TYPICAL COLUMN BASE AND FOOTING
SCALE: 1" = 1'-0"

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FILE NAME: McCASLIN & BOWLING...

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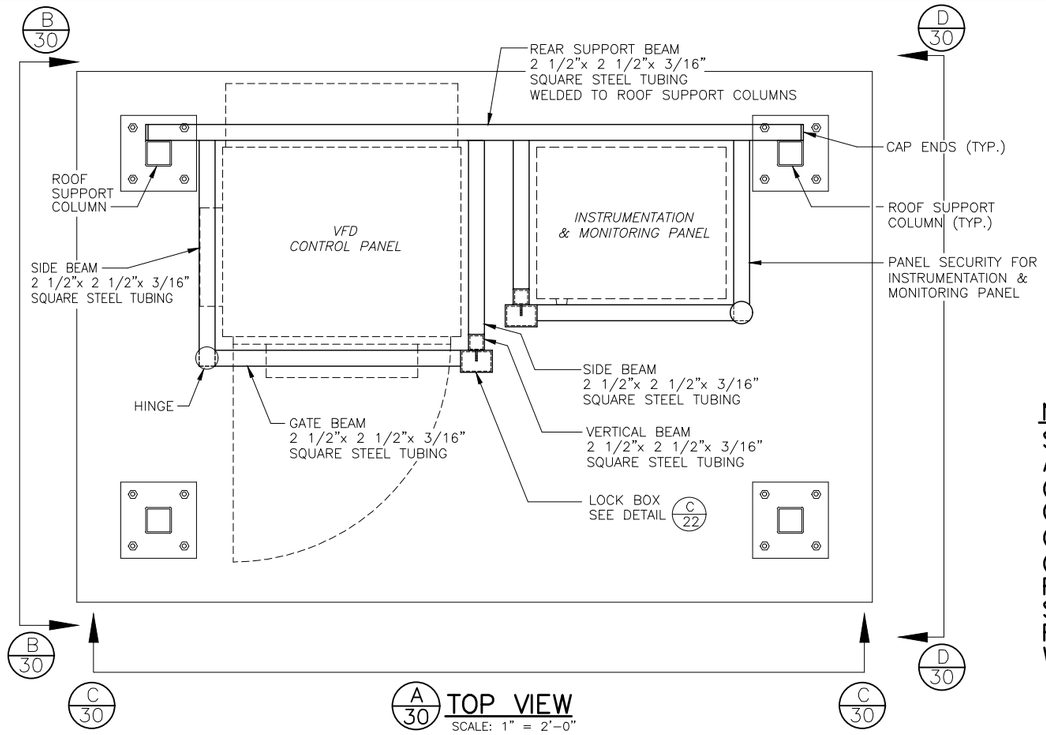
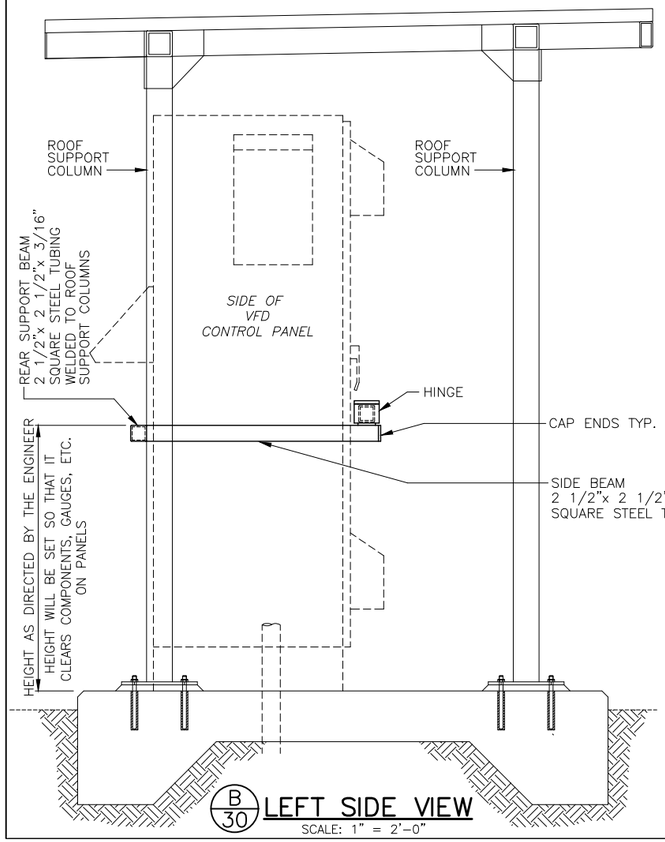
SHADE STRUCTURE DETAILS
ALL WELLS



A 30 **TOP VIEW**
SCALE: 1" = 2'-0"

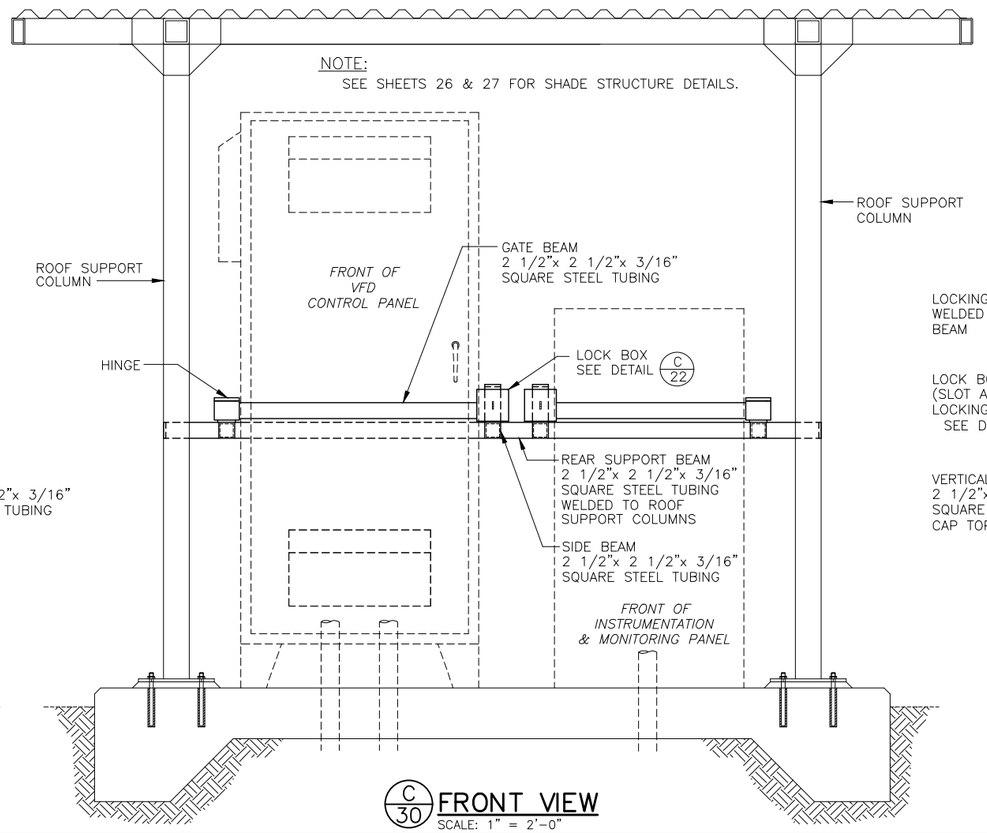
PANEL SECURITY DETAILS:
TYPICAL OF METER PANEL, CONTROL PANEL, AND INSTRUMENTATION & MONITORING PANEL.

NOTE:
SECURITY BARS MAY NEED TO BE ADJUSTED TO ACCOMMODATE ACTUAL PANEL DIMENSIONS AND CONFIGURATIONS (TYP.). SHOULD ANY ALTERATIONS OCCUR AFTER HOT-DIP GALVANIZING THAT DAMAGE OR REMOVE THE GALVANIZED FINISH (I.E. WELDING, CUTTING, GRINDING, ETC.), SAID PIECES WILL BE REQUIRED TO BE HOT-DIP GALVANIZED AGAIN. STAINLESS STEEL IS AN ACCEPTABLE ALTERNATIVE FOR SECURITY BARS FOR FIELD FABRICATION WITHOUT HOT-DIP GALVANIZING.

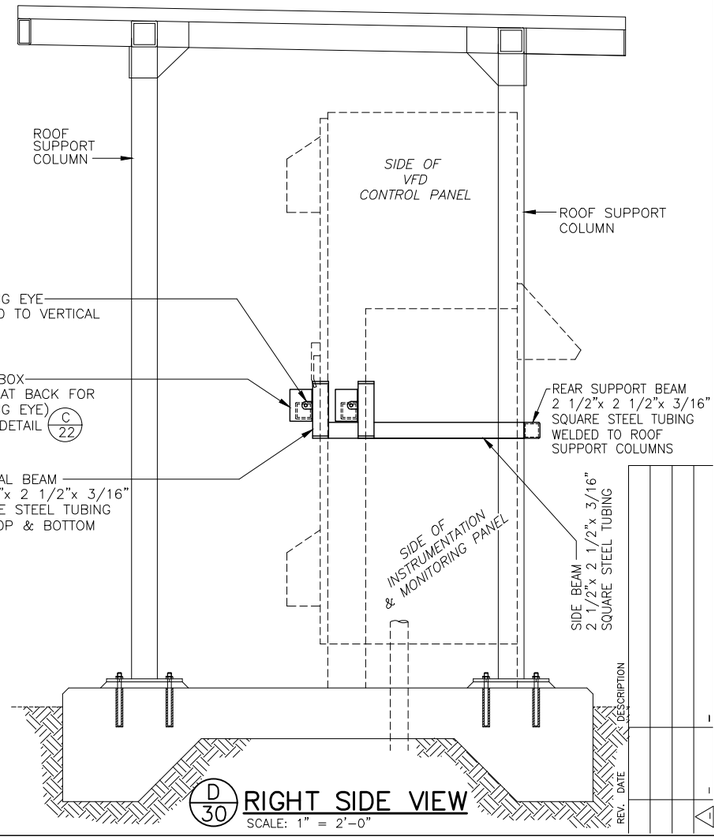


B 30 **LEFT SIDE VIEW**
SCALE: 1" = 2'-0"

NOTE:
SEE SHEETS 26 & 27 FOR SHADE STRUCTURE DETAILS.



C 30 **FRONT VIEW**
SCALE: 1" = 2'-0"



D 30 **RIGHT SIDE VIEW**
SCALE: 1" = 2'-0"

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McCASLIN / BOWLING WELL PLANS
SECURITY STRUCTURE DETAILS
ALL WELLS

REV.	DATE	DESCRIPTION
1		

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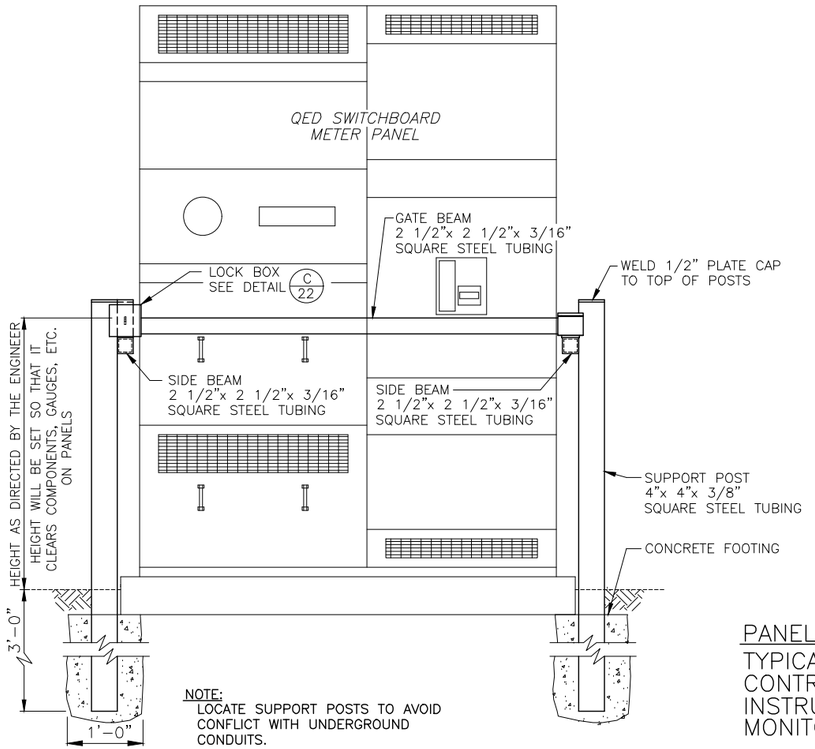
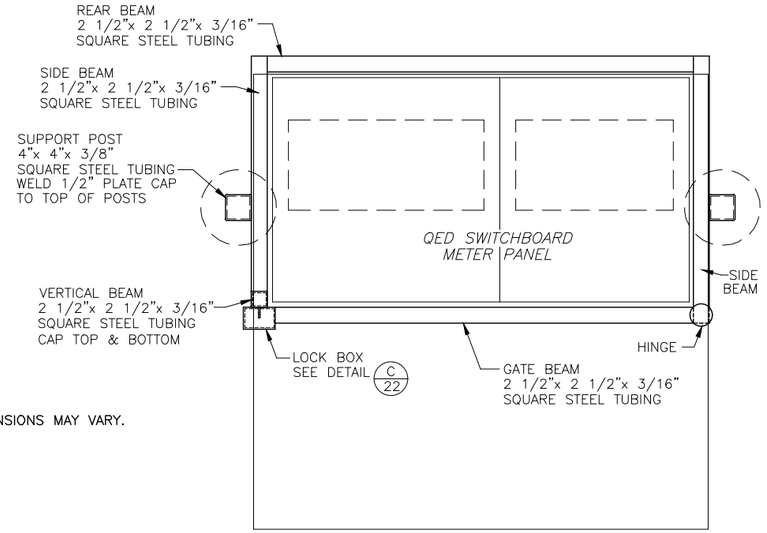


NOTE:
LOCATE SUPPORT POSTS TO AVOID CONFLICT WITH UNDERGROUND CONDUITS.

E/31 FRONT VIEW
METER PANEL
SCALE: 1" = 2'-0"

NOTE:
SECURITY BAR DIMENSIONS MAY VARY.



PANEL SECURITY DETAILS:
TYPICAL OF METER PANEL, CONTROL PANEL, AND INSTRUMENTATION & MONITORING PANEL.

F/31 TOP VIEW
METER PANEL
SCALE: 1" = 2'-0"

NOTE:
SECURITY BARS MAY NEED TO BE ADJUSTED TO ACCOMMODATE ACTUAL PANEL DIMENSIONS AND CONFIGURATIONS (TYP.). SHOULD ANY ALTERATIONS OCCUR AFTER HOT-DIP GALVANIZING THAT DAMAGE OR REMOVE THE GALVANIZED FINISH (I.E. WELDING, CUTTING, GRINDING, ETC.), SAID PIECES WILL BE REQUIRED TO BE HOT-DIP GALVANIZED AGAIN. STAINLESS STEEL IS AN ACCEPTABLE ALTERNATIVE FOR SECURITY BARS FOR FIELD FABRICATION WITHOUT HOT-DIP GALVANIZING.

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REV.	DATE	DESCRIPTION
1		
2		
3		
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SECURITY STRUCTURE DETAILS
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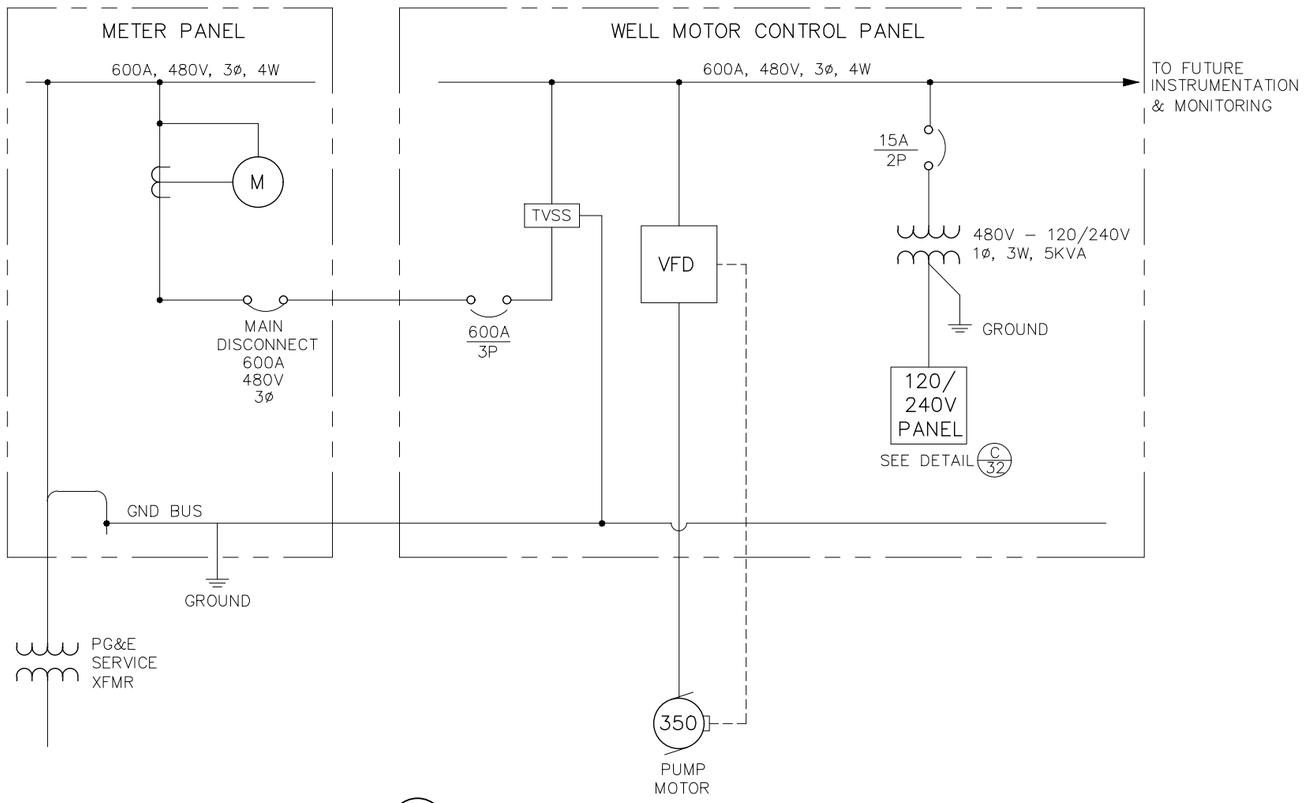
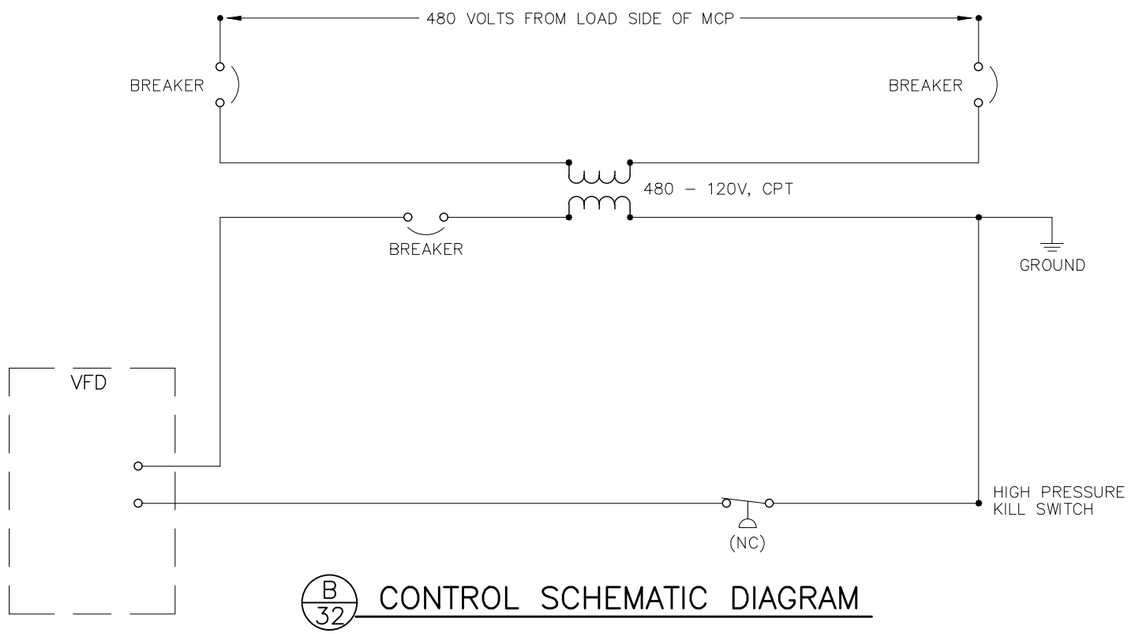
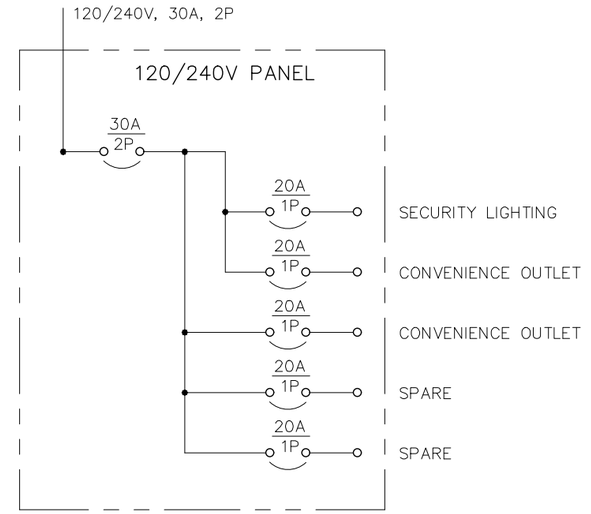


A/32 SINGLE LINE DIAGRAM



B/32 CONTROL SCHEMATIC DIAGRAM



C/32 120/240V PANEL DIAGRAM

ELECTRICAL SYMBOLS	
DEVICE	SYMBOL DESCRIPTION
M	UTILITY METER
	DRY TYPE TRANSFORMER
20A	CIRCUIT BREAKER (AMPERAGE SHOWN ON PLAN)
	DISCONNECT
350	PUMP MOTOR – 350 HORSEPOWER
	GROUND
	CURRENT TRANSFORMER
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TC	TIME CLOCK
HAND / OFF / AUTO	SELECTOR SWITCH
(NC)	HIGH PRESSURE KILL SWITCH (NORMALLY CLOSED)
VFD	VARIABLE FREQUENCY DRIVE

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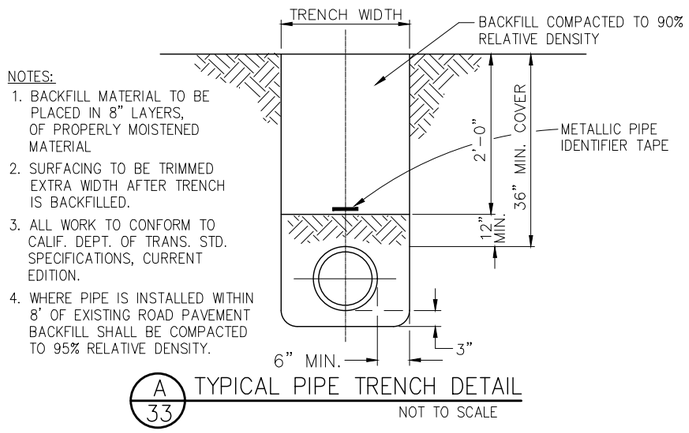
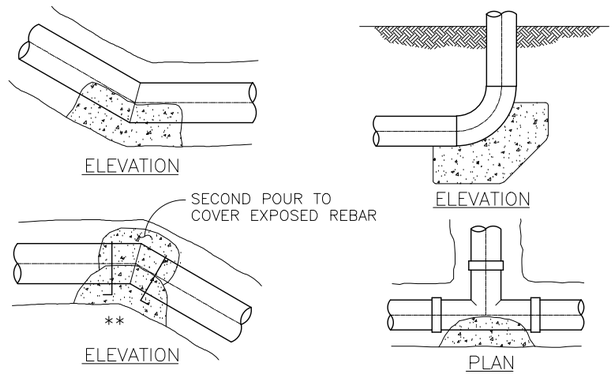
McCASLIN / BOWLING WELL PLANS
ELECTRICAL WIRING DIAGRAMS
ALL WELLS



A/33 TYPICAL PIPE TRENCH DETAIL
NOT TO SCALE



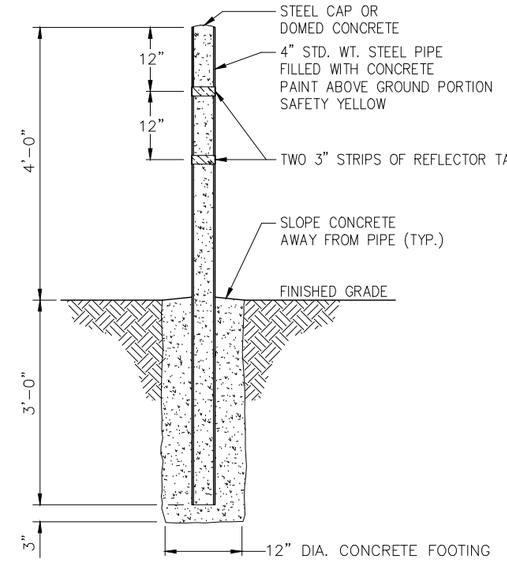
THRUST BLOCK SCHEDULE					
PIPE SIZE	MINIMUM BEARING AREA IN SQUARE FEET *				
	TEE OR PLUG	90° ELL	45° ELL	30° ELL	22½° ELL
12"	3	4	2	1	1
14"	4	5	3	2	2
15"	4	5	3	2	2
18"	5	7	4	3	3
21"	8	10	6	4	4
24"	10	13	7	5	4
27"	13	17	9	6	5
30"	17	22	12	8	7

THRUST BLOCK TABLE

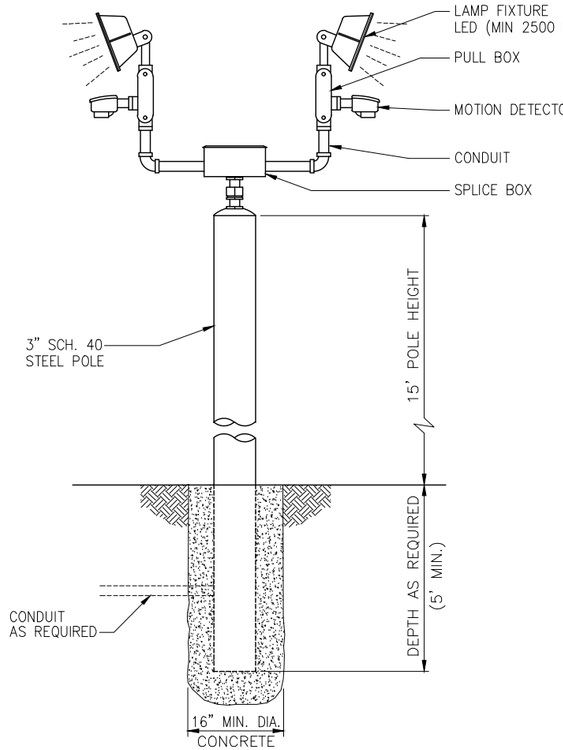
* VALUES BASED ON 20 PSI OF HEAD, 1000 PSF SOIL BEARING CAPACITY – MINIMUM

** WHERE THRUST IS AWAY FROM THRUST BLOCK, INSTALL #4 REBAR REINFORCEMENT TIES AND SECOND POUR AS REQUIRED BY ENGINEER.

B/33 TYPICAL THRUST BLOCK SCHEDULE
NOT TO SCALE

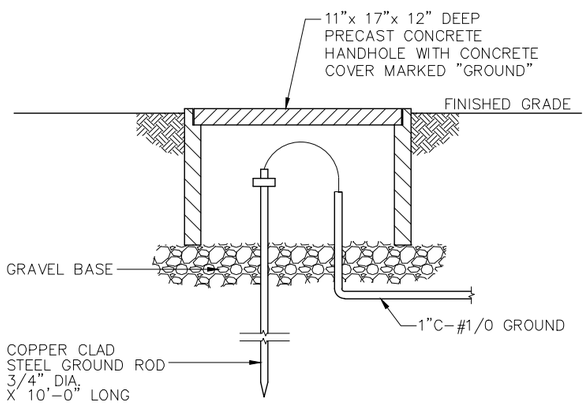


D/33 TYPICAL GUARD POST DETAIL
NOT TO SCALE

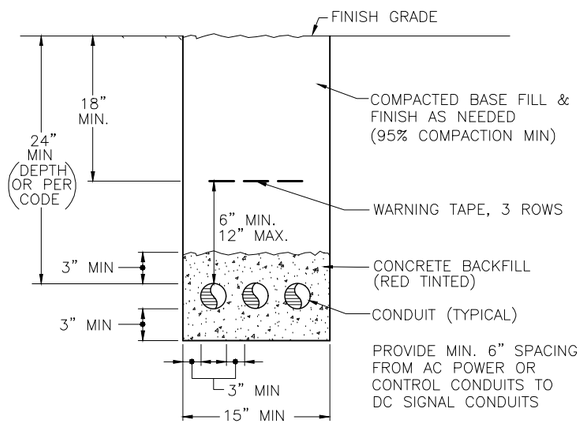


NOTE:
ALL CONDUIT CONNECTIONS, SPLICE BOXES, PULL BOXES, ETC. SHALL BE WEATHERPROOFED

C/33 TYPICAL SECURITY LIGHT DETAIL
ALTERNATE POLE MOUNT
TWO LAMP FIXTURE SHOWN
NOT TO SCALE



E/33 TYPICAL GROUND ROD/ GROUND WELL DETAIL
NOT TO SCALE



F/33 ELECTRICAL CONDUIT TRENCH DETAIL
NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
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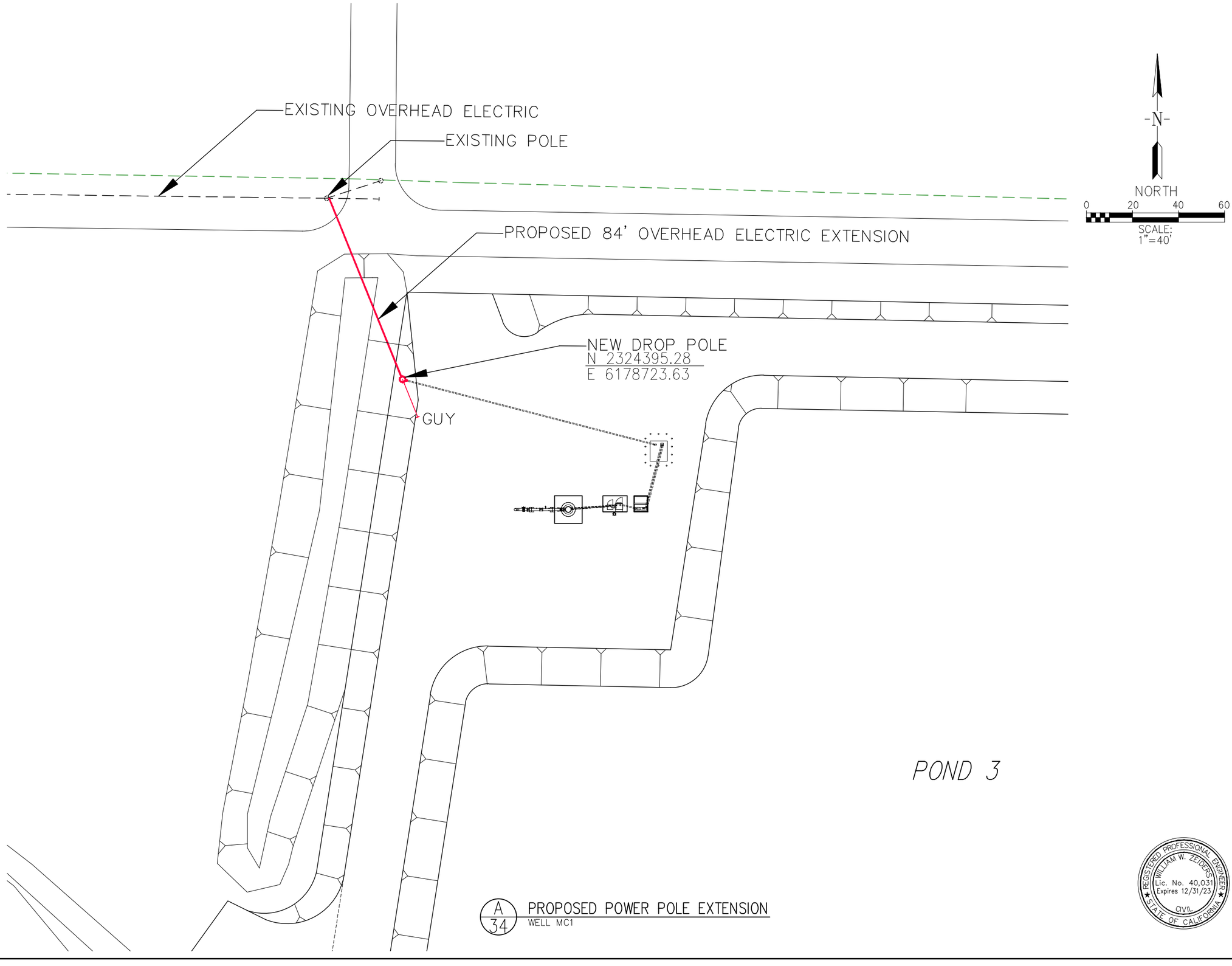
RRB ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
849 ALLEN ROAD
P.O. BOX 20820
BAKERSFIELD, CA. 93390

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
TYPICAL DETAILS
ALL WELLS

REV.	DATE	DESCRIPTION
1		

DATE: JUNE 28, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...



A/34 PROPOSED POWER POLE EXTENSION
WELL MC1

STATE OF CALIFORNIA
REGISTERED PROFESSIONAL ENGINEER
WILLIAM W. ZEIDERS
Lic. No. 40,031
Expires 12/31/23
CIVIL

REV.	DATE	DESCRIPTION
1		

DATE: JUNE 28, 2023
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DRAWN BY: W. FREY
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FILE NAME: McCASLIN & BOWLING...

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
PG&E PROPOSED OVERHEAD ELECTRIC ROUTE
McCASLIN WELL 1 (MC1)

RR3 ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
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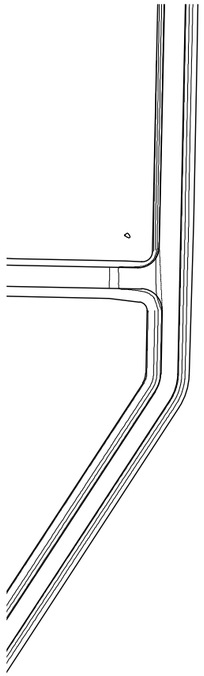
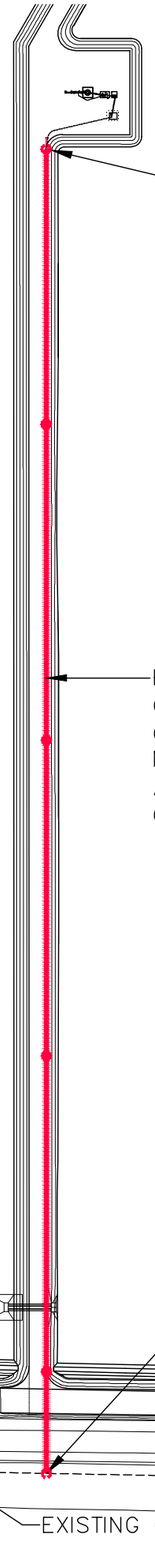


POND 2



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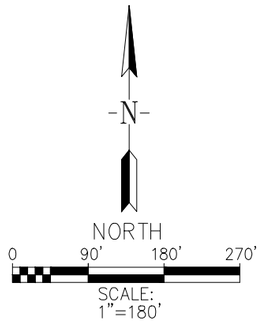
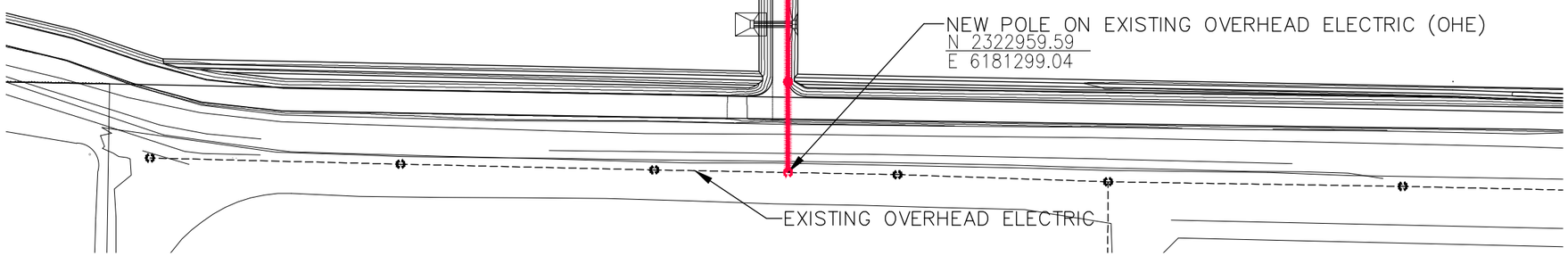


A/33 PROPOSED POWER POLE EXTENSION
WELL MC2



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CIVIL
STATE OF CALIFORNIA

REV.	DATE	DESCRIPTION
1		

DATE: JUNE 28, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
PG&E PROPOSED OVERHEAD ELECTRIC ROUTE
McCASLIN WELL 2 (MC2)

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
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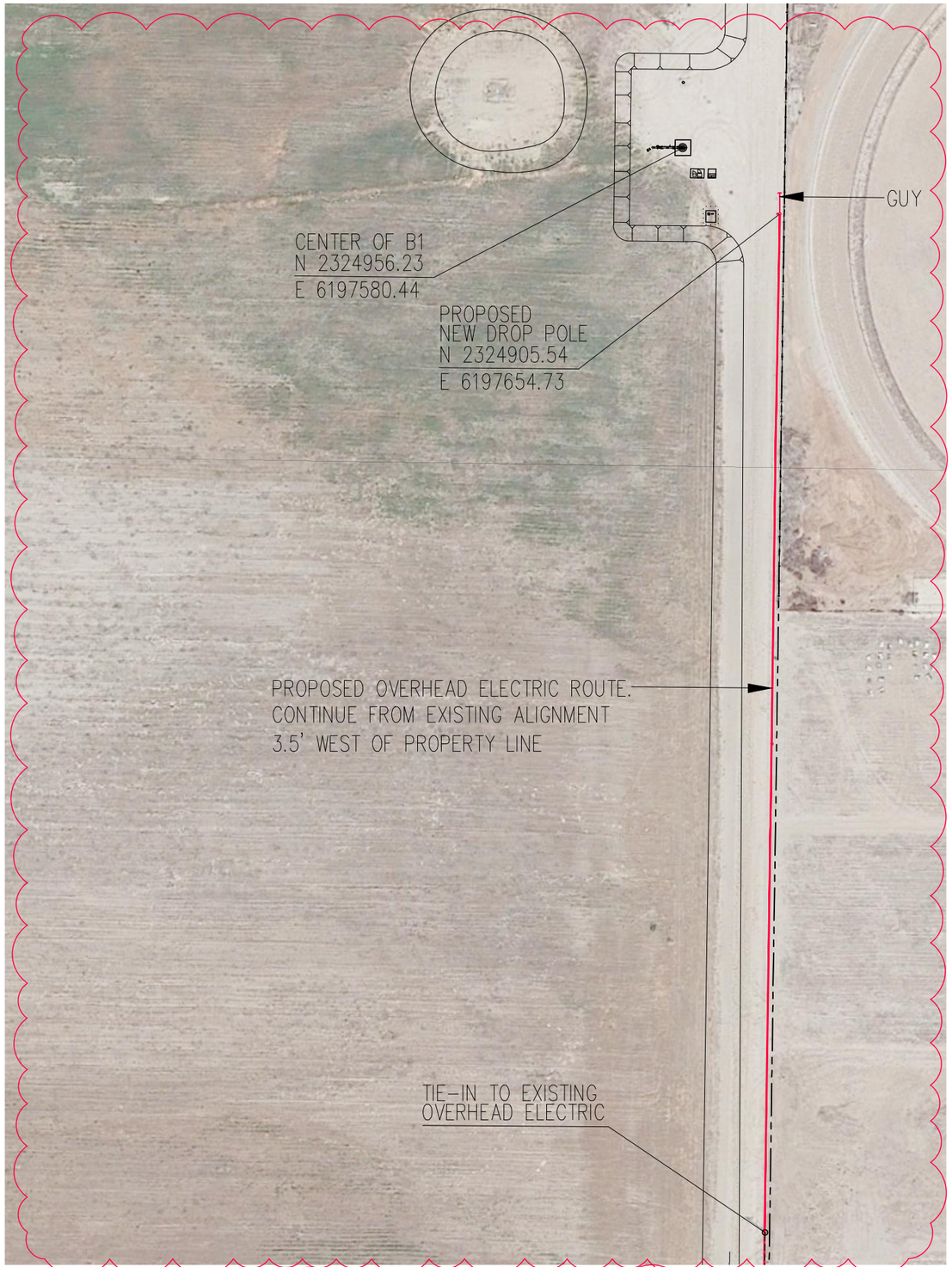
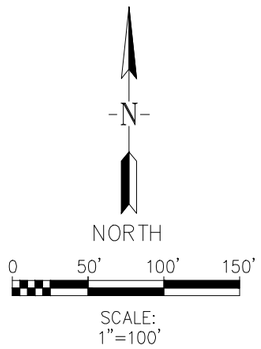


A/36 PROPOSED POWER POLE EXTENSION
WELL B1

1 NOTE: ENTIRE BOWLING WELL LAYOUT WAS RELOCATED.



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RRB ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
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R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
PG&E PROPOSED OVERHEAD ELECTRIC ROUTES
BOWLING WELL (B1)

REGISTERED PROFESSIONAL ENGINEER
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Expires 12/31/23
CIVIL
STATE OF CALIFORNIA

REV.	DATE	DESCRIPTION
1	07/21/2023	RELOCATED BOWLING WELL

DATE: JULY 21, 2023
SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

GENERAL NOTES:

1. EXISTING UTILITIES AND STRUCTURES (UNDERGROUND, SURFACE, OR OVERHEAD) ARE INDICATED ONLY TO THE EXTENT THAT SUCH INFORMATION WAS KNOWN, MADE AVAILABLE TO, OR DISCOVERED BY THE ENGINEER PREPARING THE DRAWINGS. THE LOCATIONS, CONFIGURATIONS, AND ELEVATIONS OF SUBSURFACE UTILITIES ARE APPROXIMATE, AND NOT ALL UTILITIES AND FACILITIES MAY BE INDICATED. OVERHEAD UTILITIES ARE NOT INDICATED IN ELEVATIONS, PROFILE OR SECTION DRAWINGS.

2. SUBCONTRACTOR'S STAGING, PARKING AND MATERIAL STORAGE SHALL BE LIMITED TO THE WORK SITE. PROVIDING ADDITIONAL STORAGE OR PARKING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

3. CALL 811 (UNDERGROUND SERVICE ALERT) BEFORE YOU DIG. CONTRACTOR SHALL VERIFY PRECISE LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STRUCTURES, WHETHER INDICATED ON THE DRAWINGS OR NOT, IN THE FIELD IN ADVANCE OF EXCAVATING, BY CONTACTING ALL UTILITIES AND OTHER AGENCIES, AND BY PROSPECTING, CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL, DEMOLITION, RECONSTRUCTION, AND RECONNECTION OF EXISTING FACILITIES AS REQUIRED TO COMPLETE THE WORK. IF REQUIRED AFTER FIELD VERIFICATION, SUBCONTRACTOR SHALL COORDINATE WITH THE DISTRICT TO DETERMINE ANY NECESSARY MODIFICATIONS TO PROPOSED NEW WORK.

4. BEFORE CONSTRUCTION IS STARTED, SUBCONTRACTOR SHALL COORDINATE WITH THE DISTRICT AND THE OWNER OF EACH UTILITY AND DEFINE THE REQUIREMENTS AND METHODS TO ACCOMMODATE THE PROTECTION, TEMPORARY SUPPORT, ADJUSTMENT, OR RELOCATION OF ANY UTILITIES AFFECTED BY THE PROPOSED WORK.

5. SUBCONTRACTOR SHALL COMPLY WITH ALL GOVERNING AGENCY PERMIT AND CONSTRUCTION REQUIREMENTS, AND SHALL PROVIDE APPROPRIATE MITIGATION MEASURES OR PROTECTION AND RESTORATION AT ALL LOCATIONS AS REQUIRED BY THEIR OPERATIONS AND AS DIRECTED BY THE DISTRICT.

6. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL PROPERTY CORNER MARKERS. PROPERTY CORNER MARKERS DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE RE-ESTABLISHED BY A PROFESSIONAL SURVEYOR LICENSED IN THE STATE OF CALIFORNIA.

7. FOR ALL SITE GRADING, SMOOTH PARABOLIC TRANSITIONS SHALL BE MADE BETWEEN CHANGES IN SLOPE. PARABOLIC ROUNDING SHALL APPLY TO ALL CUT AND FILL SECTIONS.

8. THE SUBCONTRACTOR'S OPERATIONS SHALL CONFORM TO THE RULES AND REGULATIONS OF THE STATE CONSTRUCTION SAFETY ORDERS PERTAINING TO EXCAVATION AND TRENCHING.

9. THE TERM "BY OWNER" OR "BY OTHERS" AS INDICATED IN THE DRAWINGS MEANS THE ITEM IS DESIGNED OR PLANNED TO BE PROVIDED BY OWNER OR OTHERS SEPARATE FROM THIS CONTRACT. THE TERM "FUTURE" AS INDICATED ON THE DRAWINGS REFERS TO THE DISTRICT'S INTERPRETATION OF THE ITEM FOR FUTURE INSTALLATION, BASED ON AVAILABLE INFORMATION.

10. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED BACK TO THE ORIGINAL CONDITION. EXISTING BELOW GROUND AND ABOVE GROUND FACILITIES SHALL BE PROTECTED IN PLACE. CONTRACTOR SHALL RESTORE ANY EXISTING STRUCTURES THAT ARE DISTURBED, DAMAGED, OR REMOVED BY CONSTRUCTION.

11. CONTRACTOR SHALL NOTIFY THE DISTRICT AND THE ENGINEER AT LEAST FIVE WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION WORK.

12. THE LOCATION OF WELLS SHOWN IS APPROXIMATE. THE DISTRICT AND THE ENGINEER SHALL MARK THE LOCATION OF THE WELLS PRIOR TO THE CONTRACTOR COMMENCING WITH THE WORK. ALL WELLS SHALL BE LOCATED TO ADHERE TO THE KERN COUNTY HEALTH DEPARTMENT SETBACK CRITERIA.

13. FOR WORK OCCURRING INSIDE RECHARGE PONDS, THE CONTRACTOR SHALL COORDINATE WITH THE DISTRICT. IF RECHARGE OPERATIONS ARE INITIATED, THE DISTRICT WILL NOTIFY THE CONTRACTOR. IN THE EVENT THAT RECHARGE OPERATIONS ARE INITIATED, THE CONTRACTOR WILL BE REQUIRED TO IMPLEMENT ALL MEASURES TO MINIMIZE DISTURBANCES TO THE DISTRICT OPERATIONS.

14. SPOIL OBTAINED FROM THE DESIGNATED BORROW AREAS SHALL BE TAKEN UNIFORMLY TO THE SAME BOTTOM DEPTH OVER THE ENTIRE BORROW AREA. AFTER SPOIL REMOVAL, AND PRIOR TO LEAVING THE SITE, AT ALL DESIGNATED BORROW AREAS, CONTRACTOR SHALL LOOSEN SOILS IN THE BOTTOM OF PONDS BY RIPPING TO A MINIMUM DEPTH OF 36 INCHES.

SOILS AND FOUNDATIONS:

1. ALL EARTHWORK AND FOUNDATION CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

2. TO FACILITATE SCHEDULING, AT LEAST 48 HOURS ADVANCE NOTICE SHALL BE GIVEN PRIOR TO THE REQUIRED INSPECTIONS.

3. WHERE APPLICABLE, FOUNDATION CONSTRUCTION SHALL NOT BEGIN UNTIL THE SPECIAL INSPECTION HAS BEEN COMPLETED AND NOTIFICATION TO PROCEED HAS BEEN GIVEN.

4. UNLESS OTHERWISE NOTED, BACKFILL SHALL NOT BE PLACED AGAINST WALLS WHICH SUPPORT A CONCRETE SLAB OR WALKWAY UNTIL THE TOP SLAB OR WALKWAY HAS BEEN PLACED IN ITS ENTIRETY AND ALL CONCRETE HAS REACHED ITS DESIGNED STRENGTH.

REINFORCING STEEL:

1. ALL REINFORCING BAR SHALL BE GRADE 60, DEFORMED, AND CONFORM TO ASTM A615. WELDABLE REBAR SHALL CONFORM THE ASTM A706.

2. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 OR A497.

3. DIMENSIONS TO REINFORCING BARS ARE TO BAR CENTERLINES, UNLESS NOTED OTHERWISE. BAR COVER IS CLEAR DISTANCE BETWEEN BAR AND THE CONCRETE SURFACE

4. SPLICING OF REINFORCEMENT FOR WALLS, FOOTINGS AND SLABS SHALL BE MINIMUM 40 DIAMATERS UNLESS OTHERWISE APPROVED BY THE DISTRICT. WHEN BARS OF DIFFERENT SIZE LAP TO EACH OTHER, SPLICE LENGTH FOR THE SMALLER BAR CAN BE USED.

5. UNLESS INDICATED OTHERWISE, ALL DOWELS SHALL HAVE THE SAME SIZE AND SPACING AS THAT OF THE REINFORING STEEL TO WHICH THEY ARE SPLICED AND SHALL HAVE A MINIMUM LAP PER NOTE NO. 4 ABOVE, UNLESS NOTED OTHERWISE.

6. NO WELDING OF REINFORCING BARS SHALL BE PERMITTED, UNLESS APPROVAL IS OBTAINED PRIOR TO CONSTRUCTION AND WELDABLE REBAR IS USED (CONFORMING TO ASTM A706).

STAINLESS STEEL:

1. STAINLESS STEEL BOLTS SHALL CONFORM TO ASTM A193, TYE 316, UNLESS NOTED OTHERWISE

2. STAINLESS STEEL PLATES, BARS AND RODS SHALL CONFORM TO ASTM A240, TYPE 316L.

3. STAINLESS STEEL STRUCTURAL SHAPES AND STUDS SHALL CONFORM TO ASTM A276, TYPE 316L

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STRUCTURAL STEEL:

1. UNLESS OTHERWISE NOTED, STRUCTURAL STEEL SHALL CONFORM TO ASTM A36, ROLLED WIDE FLANGE SHAPES TO ASTM A992 OR ASTM A572; STRUCTURAL PIPES TO ASTM A53, TYPE E OR S, GRADE B OR ASTM A 500, GRADES B OR C, OR ASTM A501; STRUCTURAL TUBING TO ASTM A500, GRADE B OR C. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE TO THE LATEST AISC SPECIFICATIONS PARTS 1 THRU 4 AND THE "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS." ALL STEEL PIPING SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH AWWA C-200 STANDARDS.

2. ALL WELDING SHALL BE DONE BY AWS CERTIFIED WELDERS. ALL WELDING SHALL BE PERFORMED WITH FILLER METAL HAVING A MINIMUM TENSILE STRENGTH OF 70 KSI. WELDING SHALL CONFORM TO THE PROVISIONS OF THE LATEST STRUCTURAL WELDING CODE (AWS D1.1).

3. UNLESS OTHERWISE NOTED, ALL STRUCTURAL STEEL COMPONENTS AND CONNECTIONS SHALL BE PAINTED OR PROTECTIVE COATED IN ACCORDANCE TO THE SPECIFICATIONS.

SOILS AND FOUNDATIONS:

1. ALL EARTHWORK AND FOUNDATION CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

2. TO FACILITATE SCHEDULING, AT LEAST 48 HOURS ADVANCE NOTICE SHALL BE GIVEN PRIOR TO THE REQUIRED INSPECTIONS.

3. WHERE APPLICABLE, FOUNDATION CONSTRUCTION SHALL NOT BEGIN UNTIL THE SPECIAL INSPECTION HAS BEEN COMPLETED AND NOTIFICATION TO PROCEED HAS BEEN GIVEN.

4. UNLESS OTHERWISE NOTED, BACKFILL SHALL NOT BE PLACED AGAINST WALLS WHICH SUPPORT A CONCRETE SLAB OR WALKWAY UNTIL THE TOP SLAB OR WALKWAY HAS BEEN PLACED IN ITS ENTIRETY AND ALL CONCRETE HAS REACHED ITS DESIGNED STRENGTH.

CAST-IN-PLACE CONCRETE:

1. A MINIMUM 28 DAY COMPRESSIVE STRENGTH (f'c) OF 4,000 PSI WAS UTILIZED IN THE DESIGN OF STRUCTURAL, REINFORCED CONCRETE.

2. CEMENT SHALL BE ASTM C150, TYPE II, LOW ALKALI.

3. ALL CONCRETE CONSTRUCTION SHALL CONFORM TO THE 2001 CALIFORNIA BUILDING CODE (CBC) AND THE ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" INCLUDING BAR BENDS AND HOOKS, UNLESS DETAILED OTHERWISE.

4. THE LOCATION OF ALL CONSTRUCTION JOINTS AND OTHER TYPES OF JOINTS, OTHER THAN SPECIFIED OR SHOWN ON THE PLANS, SHALL BE APPROVED PRIOR TO PLACING CONCRETE.

5. ALL OPENINGS, PIPE SLEEVES, CONDUITS, INSERTS AND OTHER EMBEDDED ITEMS SHALL BE IN PLACE BEFORE CONCRETE IS PLACED.

6. ALL EXPOSED EDGES AND CORNERS, UNLESS NOTED OTHERWISE, SHALL BE CHAMFERED 3/4" EXCEPT THE TOP EDGE OF WALLS AND SLABS WHICH ARE TO BE TOOLED.

7. ALL EXISTING CONSTRUCTION JOINTS SHALL BE ROUGHENED TO ¼" AMPLITUDE MINIMUM.

REV.	DATE	DESCRIPTION
1		

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SCALE: AS NOTED
DRAWN BY: W. FREY
CHECKED BY: W. ZEIDERS
FILE NAME: McCASLIN & BOWLING...

R.R.B.W.S.D.
McCASLIN / BOWLING WELL PLANS
NOTES
ALL WELLS

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