



CONTRACT DOCUMENTS

EAST CONTRA COSTA IRRIGATION DISTRICT Substation Upgrade

**SUBSTATION UPGRADE
BIDDING AND CONTRACT DOCUMENTS
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INFORMATION FOR BIDDERS

Bids will be received by the East Contra Costa Irrigation District (herein called the "DISTRICT"), at the office of the DISTRICT until 12 Noon on January 5, 2021 at said office, publicly opened and read aloud.

The major work consists furnishing all necessary labor, equipment and materials required for electrical equipment, electrical systems and related work associated with a DISTRICT Substation which provides power to their irrigation water pumping plants in accordance with these Contract Documents.

The installation to be modified under this contract, ECCID Substation, supplies power to all of the Districts pump stations which supply water to the irrigation system and therefore is critical to its operation. The time that the irrigation system can be out of service is fixed. Therefore, the Contractor shall take the schedule outlined below as the maximum construction period that will be allowed.

CONSTRUCTION SCHEDULE

Begin Civil Work Construction-----	2/1/2021
Complete Civil Work Deadline -----	3/1/2021
Begin Electrical Work -----	11/1/2021
Complete Electrical Work Deadline-----	12/1/2021

A date and time will be scheduled by the DISTRICT for a site visit and work through by bidders interested in the project.

Each BID must be submitted in a sealed envelope, addressed to the DISTRICT at 1711 Sellers Avenue, Brentwood, CA 94513. Each BID must be accompanied with a BID guarantee. Each sealed envelope containing a BID must be plainly marked on the outside as "Bid for Substation Upgrade", and the envelope should bear on the outside, the name of the BIDDER, their address, and their contractor's license number. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the DISTRICT.

All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or type written, and the BID form must be fully completed when submitted. Only one copy of the BID form is required.

The DISTRICT may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn prior to the above-scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the DISTRICT and the BIDDER.

BIDDERS must satisfy themselves as to the accuracy of the estimated quantities in the Bid Schedule by review of the DRAWINGS and SPECIFICATIONS including ADDENDA. After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or the nature of the work to be done. The CONTRACT DOCUMENTS contain the provisions required for the PROJECT. Information obtained from an officer, agent, or employee of the DISTRICT or any person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve them from fulfilling any of the conditions of the Contract.

A Performance Bond and a Payment Bond, each in the amount of 100 percent of the CONTRACT PRICE, with a corporate surety named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570, will be required for the faithful performance of the Contract. An admitted surety insurer holding a certificate of authority to transact surety insurance in California issued by the Insurance Commissioner must issue the Payment Bond.

Attorneys-in-fact who sign Payment Bonds and Performance Bonds must file with each bond a certified and effective dated copy of their power of attorney.

The party to whom the Contract is awarded will be required to obtain the Performance Bond and Payment Bond within ten (10) calendar days from the date when the NOTICE OF AWARD is delivered to the BIDDER. The necessary Bond forms shall accompany the NOTICE OF AWARD.

The DISTRICT, within 15 days of receipt of acceptable Performance Bond and Payment Bond, shall issue a NOTICE TO PROCEED for the said WORK. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period, the time may be extended by mutual agreement between the DISTRICT and CONTRACTOR.

The DISTRICT may take such investigations as it deems necessary to determine the ability of the BIDDER to perform the WORK, and the BIDDER shall furnish to the DISTRICT all such information and data for this purpose as the DISTRICT may request. The DISTRICT reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the DISTRICT that such BIDDER is properly qualified to carry out the obligations of the Contract and to complete the WORK contemplated therein.

The DISTRICT, in making its determination of the successful qualified bidder, will give consideration to the following criteria:

1. Construction schedule and final commission date;
2. Cost for all items of work, and;
3. Any other factor deemed to be in the best interest of the DISTRICT.

The Technical Specifications and Information for Bidders must be referenced and

attached to the Bid Form.

Prices quoted shall include all applicable charges, fees and sales tax. A Construction Schedule of sufficient detail shall also be provided and attached to the Bid Form. The schedule shall show the Contractors planned sequence of operations and dates for commencement of salient features of the work.

All materials under this solicitation must be built and/or provided in accordance with the Successful Bidder's submitted bid meeting the Technical Specifications and shall also have a warranty in compliance with the Technical Specifications. The date of the beginning of the warranty period will be the date of acceptance by the DISTRICT.

Payment for the work performed under the Contract required under this solicitation will be made at the unit prices set forth in the Bid Form. The Successful Bidder may submit a request for progress payments monthly as the work proceeds. The DISTRICT prior to payment must approve each progress payment request. The DISTRICT will make payment on approved requests within thirty (30) days following receipt of the approved request for payment.

Completion of WORK shall be no later than the dates shown on the following construction schedule provided there are no District approved delays:

1. Completion of all civil, structural and underground work by Per Schedule, including:
 - a. foundations,
 - b. fencing,
 - c. ground mat extensions and modifications
 - d. underground conduit
 - e. crushed rock surface
 - f. new transformer installation

2. Completion of equipment installation by Per Schedule including:
 - a. existing structure modifications,
 - b. underground high voltage cable,
 - c. terminations installation,
 - d. control panel including wiring.

3. Completion of testing Per Schedule

Inspection of the work to certify fulfillment of Technical Specifications shall be the Successful Bidder's responsibility. Construction observation will be performed by the DISTRICT.

The Successful Bidder shall maintain insurance as described below and submitted insurance certificates the DISTRICT. The NOTICE TO PROCEED will not be issued until proof of insurance is provided to the DISTRICT.

- a) To the fullest extent permitted by law, Contractor will defend, indemnify and hold

harmless the East Contra Costa Irrigation District, its directors, officers, employees, or authorized volunteers from all claims and demands of all persons arising out of the performance of the work or the furnishing of materials; including but not limited to, claims by the Contractor or Contractor's employees for damages to persons or property except for the sole negligence or willful misconduct or active negligence of the East Contra Costa Irrigation District, its directors, officers, employees, or authorized volunteers.

b) Contractor certifies that he/she is aware of the provisions of Section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and he/she will comply with such provisions before commencing the performance of the work of this agreement. Contractor and sub-contractors will keep workers' compensation insurance for their employees in effect during all work covered by this agreement.

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

d) If any of the required coverages expire during the term of this agreement, the Contractor shall deliver the renewal certificate(s) including the general liability insured endorsement to the East Contra Costa Irrigation District at least ten (10) days prior to the expiration date.

BID FORM

Bids will be received, in writing, on company letterhead up to the 12 Noon on January 5 2021, Sellers Avenue, Brentwood Ave., California, 94513, in the following format:

Mr. Aaron Trott
East Contra Costa Irrigation District
1711 Sellers Avenue
Brentwood, California, 94513.

Dear Mr. Trott:

The undersigned agrees to perform electrical work in strict conformity with the Technical Specifications, Information for Bidders, and Construction Schedule attached hereto, at the unit prices listed and date shown on the attached Bidding Schedule.

The undersigned has checked carefully all of the prices quoted and understands that the East Contra Costa Irrigation District will not be responsible for any errors or omissions on the part of the undersigned in making up this Bidding Schedule.

All items are complete and bid price includes sales tax, other applicable taxes and fees.

Contractor's name, address, telephone number:

Signed by _____
(Signature)

Name _____
(Type or Print)

Title: _____

Date Signed: _____

Enclosures

EAST CONTRA COSTA IRRIGATION DISTRICT
SUBSTATION UPGRADE

BID SCHEDULE

Bid package Posted -----12/18/2020
 Bidders Notified----- 12/18/2020
 Bid Opening----- 1/5/2021 @ 12PM
 Board Award of Contract----- 1/12/2021
 Notice of Award----- 1/13/2021*
 *Pending receipt of performance bonds)

CONTRACTOR'S BID PRICE

(Price to include all applicable charges, fees and sales tax)

Item No.	Item Description	Qty.	Lump Sum Amount
1	All Civil Materials and Labor. Civil work to include underground electrical grounding and conduit	LS	
2	All Electrical Materials and Labor except for Underground Work in specified in Item 1	LS	
3	Installation of District furnished Control Panel including all wiring from existing and new equipment to Panel	LS	
4	Testing per Section 26 08 01	LS	

TOTAL FOR ALL ITEMS_____

TOTAL FOR ALL ITEMS: *(Price in words)*_____

Bidders Name:

Bidders Address:

Telephone No:

Fax No:

Signature:

Title:

NOTICE OF AWARD

To: _____

PROJECT Description: Perform work for East Contra Costa Irrigation District – Substation Upgraded

The DISTRICT has considered the BID submitted by you for the above described WORK dated _____.

You are hereby notified that your BID has been accepted for unit prices set forth in the BID Schedule totaling _____

You are hereby required by the Information for Bidders to furnish the required Contractor's Performance Bond and Payment Bond within ten (10) calendar days from the date of this Notice to you.

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

Dated this _____ day of _____ 2020

East Contra Costa Irrigation District

By _____

Title: General Manager

ACCEPTANCE OF NOTICE
Receipt of the above NOTICE OF AWARD
Is hereby acknowledged.

By _____

This the _____ day of _____,
19 ____.

By _____

Title _____

CHANGE ORDER

Purchase Order No. _____

Change Order No. _____ **P.O. Date:** _____

Date:

NAME OF PROJECT: _____

DISTRICT: **East Contra Costa Irrigation District**

CONTRACTOR: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

Scope of Modification:

Specifications:

Drawings:

Justification:

Change to CONTRACT PRICE: \$

Original CONTRACT PRICE: \$

Current CONTRACT PRICE adjusted by previous CHANGE ORDER: \$

The CONTRACT PRICE due to this CHANGE ORDER will be increased by: \$

The new CONTRACT PRICE including this CHANGE ORDER will be: \$

Change to CONTRACT TIME:

The CONTRACT TIME will be increased by ___ calendar days.

The date of completion for all WORK will be _____.

Recommended By: _____

Ordered By: _____

Accepted By: _____

Approved By: _____

GENERAL AND SPECIAL PROVISIONS
SECTION 1: DEFINITIONS AND TERMS

1.01 GENERAL

Unless the context otherwise requires, wherever in the specifications and other contract documents the following abbreviations and terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as provided in this Section One.

1.02 ABBREVIATIONS

AISC	American Institute of Steel Construction.
ASIS	American Iron and Steel Institute.
ANSI	American National Standards Institute.
API	American Petroleum Institute.
ASME	American Society of Mechanical Engineers.
ASTM	American Society for Testing and Materials.
AWG	American Wire Gage.
AWPA	American Wood-Preservers' Association.
AWS	American Welding Society.
AWWA	American Water Works Association.
EIA	Electronic Industries Association.
IEEE	Institute of Electrical and Electronics Engineers.
NEMA	National Electrical Manufacturers Association.
UL	Underwriters' Laboratories Inc.

1.03 ACCEPTANCE

The formal written acceptance by the Manager of the District of the entire contract which has been completed in all respects in accordance with the drawings and specifications and any modifications thereof previously approved.

1.04 BIDDER

Any individual, firm, partnership, corporation, or combination thereof, submitting a bid for the work contemplated, acting directly or through a duly authorized representative.

1.05 CONTRACT

The written agreement covering the performance of the work and the furnishing of labor, materials, tools and equipment in the construction of the work. The contract shall include the notice to contractors, Bid, drawings, specifications, special provisions and contract bonds and all supplemental agreements amending or extending the work contemplated and which may be required to complete the work in a substantial and acceptable manner. Supplemental agreements are written agreements covering alterations, amendments or extensions to the contract and include contract change orders.

1.06 CONTRACTOR

The person or persons, firm, partnership, corporation, or combination thereof, private or municipal, who have entered into a contract with the East Contra Costa Irrigation District as party or parties of the second part or their legal representatives.

1.07 DAYS

Unless otherwise designated, days as used in the specifications will be understood to mean calendar days.

1.08 DISTRICT

The East Contra Costa Irrigation District of the State of California, as created by law.

1.09 MANAGER/ENGINEER

The General Manager/Engineer of the East Contra Costa Irrigation District as created by law acting either directly or through properly authorized agents, the agents acting within the scope of the particular duties delegated to them.

1.10 LUMP SUM AND FIXED COSTS

Any necessary labor, material and equipment costs directly expended on the item or items under consideration which remain constant regardless of the quantity of the work done.

1.11 LEGAL HOLIDAYS

Those days designated as State holidays in the Government Code.

1.12 LIQUIDATED DAMAGES

The amount prescribed in the specifications to be paid to the District or to be deducted from any payments due or to become due the Contractor for each day's delay in completing the whole or any specified portion of the work beyond the time allowed in the specifications.

1.13 DRAWINGS

The official project drawings, working drawings and supplemental drawings, or reproductions thereof, approved by the Engineer, which show the location, character, dimensions and details of the work to be performed. These documents are to be considered as a part of the Drawings.

1.14 BID

The offer of the bidder for the work when made out and submitted on the prescribed Bid form, properly signed and guaranteed.

1.15 BID FORM

The approved form upon which the East Contra Costa Irrigation District requires formal bids be prepared and submitted for the work.

1.16 BID GUARANTY

The cash, cashier's check, certified check or bidder's bond accompanying the bid submitted by the bidder, as a guaranty that the bidder will enter into a contract with the East Contra Costa Irrigation District for the performance of the work if the contract is awarded to the bidder.

SECTION 2: BID REQUIREMENTS AND CONDITIONS

2.01 CONTENTS OF BID FORMS

Prospective bidders will be furnished with bid forms which will refer to the special provisions and project drawings for the work to be done and will include a schedule of items for which bid prices are asked, showing the approximate estimate of the various quantities and kinds of work to be performed or materials to be furnished.

2.02 APPROXIMATE ESTIMATE

The quantities given in the bid documents are approximate only, being given as a basis for the comparison of bids. The District does not, expressly or by implication, agree that the actual amount of work will correspond therewith, and reserves the right to increase or decrease the amount of any class or portion of the work, or to omit portions of the work, as may be deemed necessary or advisable by the Engineer.

2.03 EXAMINATION OF DRAWINGS, SPECIFICATIONS, CONTRACT, AND SITE OF WORK

The bidder shall examine carefully the site of the work contemplated, the drawings and specifications, and the bid and contract forms therefor. The submission of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality and scope of work to be performed, the quantities of materials to be furnished and as to the requirements of the bid, drawings, specifications and the contract.

Where there has been prior construction by the District or other public agencies within the project limits, records of the prior construction that are currently in the possession of the District and which have been used by, or are known to, the designers and administrators of the project will be made available for inspection by bidders or Contractors, upon written request, subject to the conditions hereinafter set forth. The records may include, but are not limited to, as-built drawings, project reports and other data assembled in connection with the investigation, design, construction and maintenance of the prior projects.

Inspection of the project records may be made at the office of the District. The project records are not a part of the contract and are available solely for the convenience of the bidder or Contractor. It is expressly understood and agreed that the District assumes no responsibility whatsoever in respect to the sufficiency or accuracy of the records thus made, the records thereof, or of project records, or of the interpretations set forth therein or made by the District in its use thereof and there is no warranty or guaranty, either express or implied, that the conditions indicated by the records are representative of those existing in or throughout those areas, or any part thereof, or that unlooked-for developments may not occur, or that materials other than, or in proportions different from those indicated, may not be encountered.

The availability or use of information described in this Section is not to be construed in any way as a waiver of the provisions of the first paragraph in this Section and a bidder or Contractor is cautioned to make any independent investigation and examination as they deem necessary to be satisfied as to conditions to be encountered in the performance of the work.

No information derived from the inspection of the records thereof made by the District or from the Engineer, or the Engineer's assistants, will in any way relieve the bidder or Contractor from any risk or from properly fulfilling the terms of the contract.

2.04 BID FORMS

The District will furnish to each bidder a standard bid form, which, when filled out and executed may be submitted as that bidder's bid. Bids not presented on forms so furnished, and copies or facsimiles of the bidder's completed and executed proposal forms submitted as a bid will be rejected.

The bid form is bound together with the contract in a document entitled "Bid and Contract." The bid shall set forth the item prices and totals, in clearly legible figures, in the respective spaces provided, and shall be signed by the bidder, who shall fill out all blanks in the bid form as therein required.

The bid shall be submitted as directed in the "Notice to Contractors" under sealed cover plainly marked as a bid, and identifying the project to which the bid relates and the date of the bid opening therefor. Bids which are not properly marked may be disregarded.

All bidding documents shall be obtained from the East Contra Costa Irrigation District 1711 Sellers Avenue, Brentwood, CA 94513.

2.05 REJECTION OF BIDS

Bids may be rejected if they have been transferred to another bidder, or if they show any alteration of form, additions not called for, conditional bids, incomplete bids, erasures, or irregularities of any kind.

When bids are signed by an agent, other than the officer or officers of a corporation authorized to sign contracts on its behalf or a member of a partnership, a "Power of Attorney" must be included in the completed bid document or on file with the District prior to bid opening otherwise, the proposal may be rejected as irregular and unauthorized.

2.06 BID GUARANTY

All bids shall be presented under sealed cover and accompanied by one of the following forms of bidder's security:

Cash, a cashier's check, a certified check, or a bidder's bond executed by an admitted surety insurer, made payable to the East Contra Costa Irrigation District.

The security shall be in an amount equal to at least 10 percent of the amount bid. A bid will not be considered unless one of the forms of bidder's security is enclosed with it.

The bidder's bond shall conform to the bond form provided by the District for the project and shall be properly filled out and executed. The bidder's bond form included in bidding documents may be used.

2.07 WITHDRAWAL OF BID

Any bid may be withdrawn at any time prior to the date and time fixed for the opening of bids only by written request for the withdrawal of the bid filed at the location at which the bid was received by the District. The request shall be executed by the bidder or the bidder's duly

authorized representative. The withdrawal of a bid does not prejudice the right of the bidder to file a new bid. Whether or not bids are opened exactly at the time fixed for opening bids, a bid will not be received after that time, nor may any bid be withdrawn after the time fixed for the opening of bids.

2.08 PUBLIC OPENING OF PROPOSALS

Proposals will be opened and read publicly at the time and place indicated in the "Notice to Contractors." Bidders or their authorized agents are invited to be present.

2.09 RELIEF OF BIDDERS

Attention is directed to the provisions of Public Contract Code Sections 5100 to 5107, inclusive, concerning relief of bidders and in particular to the requirement therein, that if the bidder claims a mistake was made in the bid presented, the bidder shall give the District written notice within 5 days after the opening of the bids of the alleged mistake, specifying in the notice in detail how the mistake occurred.

2.10 DISQUALIFICATION OF BIDDERS

More than one bid from an individual, firm, partnership, corporation, or combination thereof under the same or different names will not be considered. Reasonable grounds for believing that any individual, firm, partnership, corporation or combination thereof is interested in more than one proposal for the work contemplated may cause the rejection of all proposals in which that individual, firm, partnership, corporation or combination thereof is interested. If there is reason for believing that collusion exists among the bidders any or all proposals may be rejected. Proposals in which the prices obviously are unbalanced may be rejected.

2.11 PREVIOUS DISQUALIFICATION, REMOVAL OR OTHER PREVENTION OF BIDDING

Pursuant to Section 10162 of the Public Contract Code the bidder shall complete, under penalty of perjury, the questionnaire in the Proposal relating to previous disqualification, removal or other prevention of bidding of the bidder, or officers or employees of the bidder because of violation of law or a safety regulation.

A bid may be rejected on the basis of a bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, having been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state or local project because of a violation of law or a safety regulation.

2.13 MATERIAL GUARANTY

The successful bidder may be required to furnish a written guaranty covering certain items of work for varying periods of time from the date of acceptance of the contract. The guaranty shall be signed and delivered to the Engineer before acceptance of the contract. Upon completion of the contract the amounts of the bonds required in Section 3, "Contract Bonds," may be reduced to conform to the total amount of the contract bid prices for the items of work to be guaranteed, and this amount shall continue in full force and effect for the duration of the guaranty period.

SECTION 3: AWARD AND EXECUTION OF CONTRACT

3.01 AWARD OF CONTRACT

The right is reserved to reject any and all proposals.

The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed. The award, if made, will be made within 30 days after the opening of the proposals. This period will be subject to extension for such further period as may be agreed upon in writing between the District and the bidder concerned.

3.02 CONTRACT BONDS

The successful bidder shall furnish the 2 bonds required by the State Contract Act. One bond shall secure the payment of the claims of laborers, mechanics or materialmen employed on the work under the contract, and the other bond shall guarantee the faithful performance of the contract. The bond forms will be furnished to the successful bidder by the District.

Except as otherwise provided in Section 3248 of the Civil Code the payment bond shall be in a sum equal to the contract price and the performance bond shall be in a sum equal to at least one-half of the contract price.

All alterations, extensions of time, extra and additional work, and other changes authorized by these specifications or any part of the contract may be made without securing the consent of the surety or sureties on the contract bonds.

3.03 EXECUTION OF CONTRACT

The contract shall be signed by the successful bidder and returned, together with the contract bonds, within 8 days, not including Saturdays, Sundays and legal holidays, after the bidder has received the contract for execution.

3.04 FAILURE TO EXECUTE CONTRACT

Failure of the lowest responsible bidder, the second lowest responsible bidder, or the third lowest responsible bidder to execute the contract and file acceptable bonds as provided herein within 8 days, not including Saturdays, Sundays and legal holidays, after that bidder has received the contract for execution shall be just cause for the forfeiture of the proposal guaranty. The successful bidder may file with the District a written notice, signed by the bidder or the bidder's authorized representative, specifying that the bidder will refuse to execute the contract if it is presented. The filing of this notice shall have the same force and effect as the failure of the bidder to execute the contract and furnish acceptable bonds within the time hereinbefore prescribed.

3.05 RETURN OF PROPOSAL GUARANTIES

The proposal guaranties accompanying the proposals of the first, second and third lowest responsible bidders will be retained until the contract has been finally executed, after which those proposal guaranties, except bidders' bonds and any guaranties which have been forfeited, will be returned to the respective bidders whose proposals they accompany. The proposal guaranties, other than bidder's bonds, submitted by all other unsuccessful bidders will be

returned upon determination, by the District, of the first, second and third lowest responsible bidders.

SECTION 4: SCOPE OF WORK

4.01 INTENT OF DRAWINGS AND SPECIFICATIONS

The intent of the drawings and specifications is to prescribe the details for the construction and completion of the work which the Contractor undertakes to perform in accordance with the terms of the contract. Where the drawings or specifications describe portions of the work in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used. Unless otherwise specified, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals, and do all the work involved in executing the contract in a satisfactory and workmanlike manner.

4.02 FINAL CLEANING UP

Before final inspection of the work, the Contractor shall clean the sites and all ground occupied by the Contractor in connection with the work of all rubbish, excess materials, falsework, temporary structures and equipment. All parts of the work shall be left in a neat and presentable condition. Full compensation for final cleaning up will be considered as included in the prices paid for the various contract items of work and no separate payment will be made therefor.

4.03 CHANGES

The District reserves the right to make such alterations, deviations, additions to or deletions from the drawings and specifications, including the right to increase or decrease the quantity of any item or portion of the work or to delete any item or portion of the work, as may be deemed by the Engineer to be necessary or advisable and to require such extra work as may be determined by the Engineer to be required for the proper completion or construction of the whole work contemplated.

Those changes will be set forth in a contract change order which will specify, in addition to the work to be done in connection with the change made, adjustment of contract time, if any, and the basis of compensation for that work. A contract change order will not become effective until approved by the Engineer.

Upon receipt of an approved contract change order, the Contractor shall proceed with the ordered work. If ordered in writing by the Engineer, the Contractor shall proceed with the work so ordered prior to actual receipt of an approved contract change order therefor. In those cases, the Engineer will, as soon as practicable, issue an approved contract change order for the ordered work. When the compensation for an item of work is subject to adjustment under the provisions of this Section, the Contractor shall, upon request, furnish the Engineer with adequate detailed cost data for that item of work.

4.03A Procedure and Protest

A contract change order approved by the Engineer may be issued to the Contractor at any time. Should the Contractor disagree with any terms or conditions set forth in an approved contract change order not executed by the Contractor, the Contractor shall submit a written protest to the Engineer within 15 days after the receipt of the approved contract change order. The protest

shall state the points of disagreement, and, if possible, the contract specification references, quantities and costs involved. If a written protest is not submitted, payment will be made as set forth in the approved contract change order, and that payment shall constitute full compensation for all work included therein or required thereby. Unprotested approved contract change orders will be considered as executed contract change orders.

Where the protest concerning an approved contract change order relates to compensation, the compensation payable for all work specified or required by that contract change order to which the protest relates will be determined as provided in this Section. The Contractor shall keep full and complete records of the cost of that work and shall permit the Engineer to have access thereto as may be necessary to assist in the determination of the compensation payable for that work.

Where the protest concerning an approved contract change order relates to the adjustment of contract time for the completion of the work, the time to be allowed therefor will be determined as provided in Section 8, "Liquidated Damages."

Proposed contract change orders may be presented to the Contractor for consideration prior to approval by the Engineer. If the Contractor signifies acceptance of the terms and conditions of the proposed contract change order by executing the document and if the change order is approved by the Engineer and issued to the Contractor, payment in accordance with the provisions as to compensation therein set forth shall constitute full compensation for all work included therein or required thereby. A contract change order executed by the Contractor and approved by the Engineer is an executed contract change order as that term is used in this Section. An approved contract change order shall supersede a proposed, but unapproved, contract change order covering the same work.

The Engineer may provide for an adjustment of compensation as to a contract item of work included in a contract change order if that item of work is eligible for an adjustment of compensation thereunder.

4.03B Increased or Decreased Quantities

Increases or decreases in the quantity of a contract item of work will be determined by comparing the total bid item quantity of that item with the change in the quantity.

If the total pay quantity of any item of work required under the contract varies by 25 percent or less, payment will be made for the quantity of work of the item performed at the contract unit price.

If the total pay quantity of any item of work required under the contract varies more than 25 percent, the work in excess of 125 percent of the estimate will be paid for by adjusting the contract unit price, or at the option of the Engineer, payment for the work involved in the excess will be made on the basis of force account as provided in Section 9.

4.03C Decreases of More Than 25 Percent

Should the total pay quantity of any item of work required under the contract be less than 75 percent of the Engineer's Estimate therefor, an adjustment in compensation pursuant to this Section will not be made unless the Contractor so requests in writing. If the Contractor so requests, the quantity of the item performed, unless covered by an executed contract change order specifying the compensation payable therefor, will be paid for by adjusting the contract unit price as hereinafter provided, or at the option of the Engineer, payment for the quantity of the work of the item performed will be made on the basis of force account as provided in Section 9 provided however, that in no case shall the payment for that work be less than that which would be made at the contract unit price.

The adjustment of the contract unit price will be the difference between the contract unit price and the actual unit cost, which will be determined as hereinafter provided, of the total pay quantity of the item, including fixed costs. The actual unit cost will be determined by the Engineer in the same manner as if the work were to be paid for on a force account basis as provided in Section 9; or the adjustment will be as agreed to by the Contractor and the Engineer.

The payment for the total pay quantity of the item of work will in no case exceed the payment which would be made for the performance of 75 percent of the Engineer's Estimate of the quantity for the item at the original contract unit price.

4.03D Eliminated Items

Should any contract item of the work be eliminated in its entirety, in the absence of an executed contract change order covering the elimination, payment will be made to the Contractor for actual costs incurred in connection with the eliminated contract item if incurred prior to the date of notification in writing by the Engineer of the elimination.

If acceptable material is ordered by the Contractor for the eliminated item prior to the date of notification of the elimination by the Engineer, and if orders for that material cannot be canceled, the material will be paid for at the actual cost to the Contractor. In this case, the material paid for shall become the property of the District, and the actual cost of any further handling will be paid for. If the material is returnable to the vendor and if the Engineer so directs, the material shall be returned and the Contractor will be paid for the actual cost of charges made by the vendor for returning the material. The actual cost of handling returned material will be paid for.

The actual costs or charges to be paid by the District to the Contractor as provided in this Section will be computed in the same manner as if the work were to be paid for on a force account basis as provided in Section.

4.03E Changes in Character of Work

If an ordered change in the drawings or specifications materially changes the character of the work of a contract item from that on which the Contractor based the bid price, and if the change increases or decreases the actual unit cost of the changed item as compared to the actual or estimated actual unit cost of performing the work of that item in accordance with the drawings and specifications originally applicable thereto, in the absence of an executed contract change order specifying the compensation payable, an adjustment in compensation therefor will be made in accordance with the following.

The basis of the adjustment in compensation will be the difference between the actual unit cost to perform the work of that item or portion thereof involved in the change as originally planned and the actual unit cost of performing the work of the item or portion thereof involved in the change, as changed. Actual unit costs will be determined by the Engineer in the same manner as if the work were to be paid for on a force account basis as provided in Section 9; or the adjustment will be as agreed to by the Contractor and the Engineer. The adjustment will apply only to the portion of the work of the item actually changed in character. At the option of the Engineer, the work of the item or portion of item which is changed in character will be paid for by force account as provided in Section 9.

If the compensation for an item of work is adjusted under this Section, the costs recognized in determining that adjustment shall be excluded from consideration in making an adjustment for that item of work under the provisions in this Section "Increased or Decreased Quantities."

Failure of the Engineer to recognize a change in character of the work at the time the approved contract change order is issued shall in no wise be construed as relieving the Contractor of the duty and responsibility of filing a written protest within the 15 day limit as provided in this Section "Procedure and Protest."

4.03F Extra Work

New and unforeseen work will be classed as extra work when determined by the Engineer that the work is not covered by any of the various items for which there is a bid price or by combinations of those items. In the event portions of this work are determined by the Engineer to be covered by some of the various items for which there is a bid price or combinations of those items, the remaining portion of the work will be classed as extra work. Extra work also includes work specifically designated as extra work in the Drawings or specifications.

The Contractor shall do the extra work and furnish labor, material and equipment therefor upon receipt of an approved contract change order or other written order of the Engineer, and in the absence of an approved contract change order or other written order of the Engineer the Contractor shall not be entitled to payment for the extra work.

Payment for extra work required to be performed pursuant to the provisions in this Section 4-1.03D, in the absence of an executed contract change order, will be made by force account as provided in Section 9; or as agreed to by the Contractor and the Engineer.

SECTION 5: CONTROL OF WORK

5.01 AUTHORITY OF ENGINEER

The Engineer shall decide all questions which may arise as to the quality or acceptability of materials furnished and work performed and as to the manner of performance and rate of progress of the work; all questions which may arise as to the interpretation of the drawings and specifications; all questions as to the acceptable fulfillment of the contract on the part of the Contractor; and all questions as to compensation. The Engineer's decision shall be final, and the Engineer shall have authority to enforce and make effective those decisions and orders which the Contractor fails to carry out promptly.

5.02 DRAWINGS AND WORKING DRAWINGS

The contract drawings furnished consist of general drawings and show such details as are necessary to give a comprehensive idea of the construction contemplated. All authorized alterations affecting the requirements and information given on the contract drawings shall be in writing.

The contract drawings shall be supplemented by such working drawings prepared by the Contractor as are necessary to adequately control the work. No change shall be made by the Contractor in any working drawing after it has been approved by the Engineer.

Working drawings for any part of the permanent work shall include, but not be limited to shop details, installation drawings, equipment lists, catalog cuts and any other information specifically required elsewhere in the specifications.

Working drawings shall be subject to approval insofar as the details affect the character of the finished work and for compliance with design requirements.

Working drawings shall be approved by the Engineer before any work involving the drawings is performed. It is expressly understood that approval of the Contractor's working drawings shall not relieve the Contractor of any responsibility under the contract for the successful completion of the work in conformity with the requirements of the contract drawings and specifications. Approval of working drawings shall not operate to waive any of the requirements of the contract drawings and specifications or relieve the Contractor of any obligation thereunder, and defective work, materials and equipment may be rejected notwithstanding the approval.

Full compensation for furnishing all working drawings shall be considered as included in the prices paid for the contract items of work to which the drawings relate and no additional compensation will be allowed therefor.

5.03 CONFORMITY WITH CONTRACT DOCUMENTS AND ALLOWABLE DEVIATIONS

Work and materials shall conform to the lines, grades, typical cross sections, dimensions and material requirements, including tolerances, shown on the Drawings or indicated in the specifications. The Engineer shall be the sole judge as to whether the work or materials deviate from the contract drawings and specifications, and the Engineer's decision as to any allowable deviations therefrom shall be final.

5.04 COORDINATION AND INTERPRETATION OF DRAWINGS, STANDARD SPECIFICATIONS, AND SPECIAL PROVISIONS

These specifications, the drawings, special provisions, contract change orders and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary, and to describe and provide for a complete work.

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in these specifications, the special provisions or the drawings, the Contractor shall apply to the Engineer for such further explanations as may be necessary and shall conform to them as part of the contract. In the event of any doubt or question arising respecting the true meaning of these specifications, the special provisions or the drawings, reference shall be made to the Engineer, whose decision thereon shall be final.

In the event of any discrepancy between any drawing and the figures written thereon, the figures shall be taken as correct. Detail drawings shall prevail over general drawings.

5.05 ORDER OF WORK

When required by the special provisions or drawings, the Contractor shall follow the sequence of operations as set forth therein.

Full compensation for conforming to those requirements will be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

5.06 SUPERINTENDENCE

The Contractor shall designate in writing before starting work, an authorized representative who shall have the authority to represent and act for the Contractor.

When the Contractor is comprised of 2 or more persons, firms, partnerships or corporations functioning on a joint venture basis, the Contractor shall designate in writing before starting work, the name of one authorized representative who shall have the authority to represent and act for the Contractor.

The authorized representative shall be present at the site of the work at all times while work is actually in progress on the contract. When work is not in progress and during periods when work is suspended, arrangements acceptable to the Engineer shall be made for any emergency work which may be required.

Whenever the Contractor or the Contractor's authorized representative is not present on any particular part of the work where it may be desired to give direction, orders will be given by the Engineer, which shall be received and obeyed by the superintendent or foreman who may have charge of the particular work in reference to which the orders are given.

Any order given by the Engineer, not otherwise required by the specifications to be in writing, will on request of the Contractor, be given or confirmed by the Engineer in writing.

5.07 INSPECTION

The Engineer shall, at all times, have safe access to the work during its construction, and shall be furnished with every reasonable facility for ascertaining that the materials and the workmanship are in accordance with the requirements and intentions of these specifications, the special provisions and the Drawings. All work done and all materials furnished shall be subject to the Engineer's inspection.

The inspection of the work or materials shall not relieve the Contractor of any of the Contractor's obligations to fulfill the contract as prescribed. Work and materials not meeting the requirements shall be made good, and unsuitable work or materials may be rejected, notwithstanding that the work or materials have been previously inspected by the Engineer or that payment therefor has been included in a progress estimate.

5.08 REMOVAL OF REJECTED AND UNAUTHORIZED WORK

All work which has been rejected shall be remedied, or removed and replaced by the Contractor in an acceptable manner, and no compensation will be allowed to the Contractor for the removal, replacement or remedial work.

Any work done beyond the lines and grades shown on the drawings or established by the Engineer, or any extra work done without written authority will be considered as unauthorized work and will not be paid for. Upon order of the Engineer unauthorized work shall be remedied, removed or replaced at the Contractor's expense.

Upon failure of the Contractor to comply promptly with any order of the Engineer made under this Section 5, the District may cause rejected or unauthorized work to be remedied, removed or replaced, and to deduct the costs from any moneys due or to become due the Contractor.

5.09 EQUIPMENT

Only equipment suitable to produce the quality of work and materials required will be permitted to operate on the project.

The Contractor shall provide adequate and suitable equipment to meet the above requirements, and when ordered by the Engineer shall remove unsuitable equipment from the work.

The Contractor shall identify each piece of equipment, other than hand tools, by means of an identifying number plainly stenciled or stamped on the equipment at a conspicuous location, and shall furnish to the Engineer a list giving the description of each piece of equipment and its identifying number. In addition, the make and model number shall be plainly stamped or stenciled in a conspicuous place on the unit.

5.10 DIFFERING SITE CONDITIONS

During the progress of the work, if physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as

inherent in the work provided for in the contract, are encountered at the site, the party discovering those conditions shall promptly notify the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed.

Upon written notification, the Engineer will investigate the conditions, and if the Engineer determines that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding loss of anticipated profits, will be made and the contract modified in writing accordingly. The Engineer will notify the Contractor of the Engineer's determination whether or not an adjustment of the contract is warranted.

No contract adjustment which results in a benefit to the Contractor will be allowed unless the Contractor has provided the required written notice.

No contract adjustment will be allowed under the provisions specified in this section for any effects caused on unchanged work.

Any contract adjustment warranted due to differing site conditions will be made in conformance with the provisions in Section 4, "Changes," except as otherwise provided.

5.11 CHARACTER OF WORKERS

If any subcontractor or person employed by the Contractor shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, they shall be discharged immediately on the request of the Engineer, and that person shall not again be employed on the work.

5.12 FINAL INSPECTION

When the work has been completed, the Engineer will make the final inspection.

5.13 COST REDUCTION INCENTIVE

The Contractor may submit to the Engineer, in writing, proposals for modifying the drawings, specifications or other requirements of the contract for the sole purpose of reducing the total cost of construction. The cost reduction proposal shall not impair, in any manner, the essential functions or characteristics of the project, including but not limited to service life, economy of operation, ease of maintenance, desired appearance, or design and safety standards.

Cost reduction proposals shall contain the following information:

1. A description of both the existing contract requirements for performing the work and the proposed changes.
2. An itemization of the contract requirements that must be changed if the proposal is adopted.
3. A detailed estimate of the cost of performing the work under the existing contract and under the proposed change. The estimates of cost shall be determined in the same manner as if the work were to be paid for on a force account basis as provided in Section 9, "Force Account Payment."
4. A statement of the time within which the Engineer must make a decision thereon.

5. The contract items of work affected by the proposed changes, including any quantity variation attributable thereto.

The provisions of this Section 5-1.14 shall not be construed to require the Engineer to consider any cost reduction proposal which may be submitted hereunder; proposed changes in basic design will not be considered as an acceptable cost reduction proposal; and the District will not be liable to the Contractor for failure to accept or act upon any cost reduction proposal submitted pursuant to this section nor for any delays to the work attributable to any cost reduction proposal.

The Contractor shall continue to perform the work in accordance with the requirements of the contract until an executed change order, incorporating the cost reduction proposal has been issued. If an executed change order has not been issued by the date upon which the Contractor's cost reduction proposal specifies that a decision thereon should be made, or such other date as the Contractor may subsequently have specified in writing, the cost reduction proposal shall be deemed rejected.

The Engineer shall be the sole judge of the acceptability of a cost reduction proposal and of the estimated net savings in construction costs from the adoption of all or any part of the proposal. In determining the estimated net savings, the right is reserved to disregard the contract bid prices if in the judgment of the Engineer, those prices do not represent a fair measure of the value of work to be performed or to be deleted.

The District reserves the right where it deems such action appropriate, to require the Contractor to share in the District's costs of investigating a cost reduction proposal submitted by the Contractor as a condition of considering the proposal. Where this condition is imposed, the Contractor shall indicate acceptance thereof in writing, and that acceptance shall constitute full authority for the District to deduct amounts payable to the District from any moneys due or that may become due to the Contractor under the contract.

If the Contractor's cost reduction proposal is accepted in whole or in part the acceptance will be by a contract change order, which shall specifically state that it is executed pursuant to this Section 5. The change order shall incorporate the changes in the drawings and specifications which are necessary to permit the cost reduction proposal or that part of it as has been accepted to be put into effect, and shall include any conditions upon which the District's approval thereof is based if the approval of the District is conditional. The change order shall also set forth the estimated net savings in construction costs attributable to the cost reduction proposal effectuated by the change order, and shall further provide that the Contractor be paid 50 percent of that estimated net savings amount. The Contractor's cost of preparing the cost reduction incentive proposal and the District's costs of investigating a cost reduction incentive proposal, including any portion thereof paid by the Contractor, shall be excluded from consideration in determining the estimated net savings in construction costs.

Acceptance of the cost reduction proposal and performance of the work thereunder shall not extend the time of completion of the contract unless specifically provided for in the contract change order authorizing the use of the cost reduction proposal.

The amount specified to be paid to the Contractor in the change order which effectuates a cost reduction proposal shall constitute full compensation to the Contractor for the cost reduction proposal and the performance of the work thereof pursuant to the change order.

SECTION 6: CONTROL OF MATERIALS

6.01 MATERIAL SUPPLY

The Contractor shall furnish all materials required to complete the work, except materials that are designated in the specifications to be furnished by the District.

Only materials conforming to the requirements of the specifications shall be incorporated in the work.

The materials furnished and used shall be new, except as may be provided elsewhere in these specifications, on the drawings or in the special provisions. The materials shall be manufactured, handled and used in a workmanlike manner to ensure completed work in accordance with the drawings and specifications.

Materials to be used in the work will be subject to inspection and tests by the Engineer or the Engineer's designated representative. The Contractor shall furnish without charge such samples as may be required.

6.02 DISTRICT-FURNISHED MATERIALS

Materials which are listed as furnished by the District are shown on the drawings.

District furnished materials damaged from any cause whatsoever shall be replaced by the Contractor at the Contractor's expense. The Contractor shall be liable to the District for the cost of replacing District furnished materials and those costs may be deducted from any moneys due or to become due the Contractor.

6.03 STORAGE OF MATERIALS

Equipment and materials to be incorporated in the work shall be stored in such a manner as to ensure the preservation of their quality and fitness for the work, and to facilitate inspection.

6.04 DEFECTIVE MATERIALS

All materials which the Engineer has determined do not conform to the requirements of the drawings and specifications will be rejected whether in place or not. The rejected materials shall be removed immediately from the site of the work, unless otherwise permitted by the Engineer. No rejected material, the defects of which have been subsequently corrected, shall be used in the work, unless approval in writing has been given by the Engineer. Upon failure of the Contractor to comply promptly with any order of the Engineer made under the provisions in this Section 6, the Engineer shall have authority to cause the removal and replacement of rejected material and to deduct the cost thereof from any moneys due or to become due the Contractor.

6.05 ALTERNATIVE MATERIALS AND EQUIPMENT

Certain materials to be incorporated in the work may be designated under a trade name or the name of a manufacturer and the manufacturer's catalogue information. The use of an alternative which is of equal quality and of the required characteristics for the purpose intended may be permitted, subject to the following requirements:

If the material or equipment is in conformance with an adopted standard by the District, no substitution will be allowed. If not, then the burden of proof as to the quality and suitability of alternatives shall be upon the Contractor, and the Contractor shall furnish all information necessary as required by the Engineer. The Engineer shall be the sole judge as to the quality and suitability of alternative articles or materials, and the Engineer's decision shall be final.

Whenever a substitution of a similar or equivalent material or article, no action relating to the approval of the substitute material will be made until the request for substitution is made in writing by the Contractor accompanied by complete data as to the equality of the material or article proposed. The request shall be made in ample time to permit approval without delaying the work.

SECTION 7: LEGAL RELATIONS AND RESPONSIBILITY

7.01 LAWS TO BE OBSERVED

The Contractor shall keep fully informed of all existing and future State and Federal laws and county and municipal ordinances and regulations which in any manner affect those engaged or employed in the work, or the materials used in the work, or which in any way affect the conduct of the work, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. The Contractor shall at all times observe and comply with, and shall cause all the Contractor's agents and employees to observe and comply with all existing and future laws, ordinances, regulations, orders and decrees of bodies or tribunals having any jurisdiction or authority over the work; and shall protect and indemnify the East Contra Costa Irrigation District, and all officers and employees thereof connected with the work, including but not limited to the Directors, Manager and the Engineer, against any claim or liability arising from or based on the violation of any law, ordinance, regulation, order or decree, whether by the Contractor or the Contractor's employees. If any discrepancy or inconsistency is discovered in the drawings, specifications or contract for the work in relation to any law, ordinance, regulation, order or decree, the Contractor shall forthwith report the same to the Engineer in writing.

7.02 Labor Code Requirements

Attention is directed to the following requirements of the Labor Code:

7.02A Hours of Labor

Eight hours labor constitutes a legal day's work. The Contractor or any subcontractor under the Contractor shall forfeit, as a penalty to the State of California, \$25 for each worker employed in the execution of the contract by the respective Contractor or subcontractor for each calendar day during which that worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the requirements of the Labor Code, and in particular, Section 1810 to Section 1815, thereof, inclusive, except that work performed by employees of Contractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than one and one-half times the basic rate of pay, as provided in Section 1815 thereof.

7.02B Prevailing Wage

The Contractor and any subcontractor under the Contractor shall comply with Labor Code Sections 1774 and 1775. Pursuant to Section 1775, the Contractor and any subcontractor under the Contractor shall forfeit to the District on whose behalf the contract is made or awarded a penalty of not more than fifty dollars (\$50) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of Industrial Relations for the work or craft in which the worker is employed for any work done under the contract by the Contractor or by any subcontractor under the Contractor in violation of the requirements of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. The amount of this forfeiture shall be determined by the Labor Commissioner and shall be based on consideration of the mistake, inadvertence, or neglect of the Contractor or subcontractor in failing to pay the correct rate of prevailing wages, or the previous record of the Contractor or subcontractor in meeting their respective prevailing wage obligations, or the willful failure by the

Contractor or subcontractor to pay the correct rates of prevailing wages. A mistake, inadvertence, or neglect in failing to pay the correct rate of prevailing wages is not excusable if the Contractor or subcontractor had knowledge of the obligations under the Labor Code. In addition to the penalty and pursuant to Labor Code Section 1775, the difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by the Contractor or subcontractor. If a worker employed by a subcontractor on a public works project is not paid the general prevailing per diem wages by the subcontractor, the prime contractor of the project is not liable for the penalties described above unless the prime contractor had knowledge of that failure of the subcontractor to pay the specified prevailing rate of wages to those workers or unless the prime contractor fails to comply with all of the following requirements:

1. The contract executed between the contractor and the subcontractor for the performance of work on the public works project shall include a copy of the requirements in Sections 1771, 1775, 1776, 1777.5, 1813 and 1815 of the Labor Code.
2. The contractor shall monitor the payment of the specified general prevailing rate of per diem wages by the subcontractor to the employees, by periodic review of the certified payroll records of the subcontractor.
3. Upon becoming aware of the subcontractor's failure to pay the specified prevailing rate of wages to the subcontractor's workers, the contractor shall diligently take corrective action to halt or rectify the failure, including, but not limited to, retaining sufficient funds due the subcontractor for work performed on the public works project.
4. Prior to making final payment to the subcontractor for work performed on the public works project, the contractor shall obtain an affidavit signed under penalty of perjury from the subcontractor that the subcontractor has paid the specified general prevailing rate of per diem wages to the subcontractor's employees on the public works project and any amounts due pursuant to Section 1813 of the Labor Code.

Pursuant to Section 1775 of the Labor Code, the Division of Labor Standards Enforcement shall notify the Contractor on a public works project within 15 days of the receipt by the Division of Labor Standards Enforcement of a complaint of the failure of a subcontractor on that public works project to pay workers the general prevailing rate of per diem wages. If the Division of Labor Standards Enforcement determines that employees of a subcontractor were not paid the general prevailing rate of per diem wages and if the District did not retain sufficient money under the contract to pay those employees the balance of wages owed under the general prevailing rate of per diem wages, the contractor shall withhold an amount of moneys due the subcontractor sufficient to pay those employees the general prevailing rate of per diem wages if requested by the Division of Labor Standards Enforcement. The Contractor shall pay any money retained from and owed to a subcontractor upon receipt of notification by the Division of Labor Standards Enforcement that the wage complaint has been resolved. If notice of the resolution of the wage complaint has not been received by the Contractor within 180 days of the filing of a valid notice of completion or acceptance of the public works project, whichever occurs later, the Contractor shall pay all moneys retained from the subcontractor to the District. These moneys shall be retained by the District pending the final decision of an enforcement action.

Pursuant to the requirements in Section 1773 of the Labor Code, the Contractor shall obtain the general prevailing rate of wages (which rate includes employer payments for health and welfare, pension, vacation, travel time and subsistence pay as provided for in Section 1773.8 of the Labor Code, apprenticeship or other training programs authorized by Section 3093 of the Labor Code, and similar purposes) applicable to the work to be done, for straight time, overtime, Saturday, Sunday and holiday work. The holiday wage rate listed shall be applicable to all holidays recognized in the collective bargaining agreement of the particular craft, classification or type of workmen concerned.

The general prevailing wage rates and any applicable changes to these wage rates are available from the California Department of Industrial Relations' Internet Web Site at: <http://www.dir.ca.gov>.

The wage rates determined by the Director of Industrial Relations refer to expiration dates. Prevailing wage determinations with a single asterisk after the expiration date are in effect on the date of advertisement for bids and are good for the life of the contract. Prevailing wage determinations with double asterisks after the expiration date indicate that the wage rate to be paid for work performed after this date has been determined. If work is to extend past this date, the new rate shall be paid and incorporated in the contract. The Contractor shall contact the Department of Industrial Relations as indicated in the wage rate determinations to obtain predetermined wage changes.

Pursuant to Section 1773.2 of the Labor Code, general prevailing wage rates shall be posted by the Contractor at a prominent place at the site of the work.

Changes in general prevailing wage determinations which conform to Labor Code Section 1773.6 and Title 8 California Code of Regulations Section 16204 shall apply to the project when issued by the Director of Industrial Relations at least 10 days prior to the date of the Notice to Contractors for the project.

The District will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the prevailing wage rate set forth in the contract. The possibility of wage increases is one of the elements to be considered by the Contractor in determining the bid, and will not under any circumstances be considered as the basis of a claim against the District on the contract.

7.02C Travel and Subsistence Payments

Attention is directed to the requirements in Section 1773.8 of the Labor Code. The Contractor shall make travel and subsistence payments to each workman, needed to execute the work, in conformance with the requirements in Labor Code Section 1773.8.

7.02D Payroll Records

Attention is directed to the requirements in Labor Code Section 1776, a portion of which is quoted below. Regulations implementing Labor Code Section 1776 are located in Sections 16016 through 16019 and Sections 16207.10 through 16207.19 of Title 8, California Code of Regulations.

- "(a) Each contractor and subcontractor shall keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:
- (1) The information contained in the payroll record is true and correct.
 - (2) The employer has complied with the requirements of Sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works project.
- "(b) The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the contractor on the following basis:
- (1) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.
 - (2) A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.
 - (3) A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the body awarding the contract, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to paragraph (2), the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the contractor, subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the contractor.
- "(c) The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division.
- "(d) A contractor or subcontractor shall file a certified copy of the records enumerated in subdivision (a) with the entity that requested the records within 10 days after receipt of a written request.
- "(e) Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement shall be marked or obliterated in a manner so as to prevent disclosure of an individual's name, address and social security number. The name and address of the contractor awarded the contract or the subcontractor performing the contract shall not be marked or obliterated.

- "(f) The contractor shall inform the body awarding the contract of the location of the records enumerated under subdivision (a), including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.
- "(g) The contractor or subcontractor shall have 10 days in which to comply subsequent to receipt of a written notice requesting the records enumerated in subdivision (a). In the event that the contractor or subcontractor fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty-five dollars (\$25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section."

The penalties specified in subdivision (g) of Labor Code Section 1776 for noncompliance with the requirements in Section 1776 may be deducted from any moneys due or which may become due to the Contractor.

A copy of all payrolls shall be submitted weekly to the Engineer. Payrolls shall contain the full name, address and social security number of each employee, the employee's correct classification, rate of pay, daily and weekly number of hours worked, itemized deductions made and actual wages paid. They shall also indicate apprentices and ratio of apprentices to journeymen. The employee's address and social security number need only appear on the first payroll on which that name appears. The payroll shall be accompanied by a "Statement of Compliance" signed by the employer or the employer's agent indicating that the payrolls are correct and complete and that the wage rates contained therein are not less than those required by the contract. The Contractor shall be responsible for the submission of copies of payrolls of all subcontractors.

If by the 15th of the month, the Contractor has not submitted satisfactory payrolls for all work performed during the monthly period ending on or before the 1st of that month, the District will retain an amount equal to 10 percent of the estimated value of the work performed (exclusive of Mobilization) during the month from the next monthly estimate, except that this retention shall not exceed \$10,000 nor be less than \$1,000. Retentions for failure to submit satisfactory payrolls shall be additional to all other retentions provided for in the contract. The retention for failure to submit payrolls for any monthly period will be released for payment on the monthly estimate for partial payments next following the date that all the satisfactory payrolls for which the retention was made are submitted.

The Contractor and each subcontractor shall preserve their payroll records for a period of 3 years from the date of completion of the contract.

7.03 Labor Nondiscrimination

Attention is directed to Section 1735 of the Labor Code, which reads 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,

medical 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."

Attention is directed to the following "Nondiscrimination Clause" that is required by Chapter 5 of Division 4 of Title 2, California Code of Regulations.

NONDISCRIMINATION CLAUSE

1. During the performance of this contract, contractor and its subcontractors shall not unlawfully discriminate against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, medical condition, marital status, age (over 40) or sex. Contractors and subcontractors shall ensure that the evaluation and treatment of their employees and applicants for employment are free of such discrimination. Contractors and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Gov. Code, Section 12990 et seq.) and the applicable regulations promulgated thereunder (California Code of Regulations, Title 2, Section 7285.0 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code, Section 12990, set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations are incorporated into this contract by reference and made a part hereof as if set forth in full. Contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.
2. This Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

STANDARD CALIFORNIA NONDISCRIMINATION CONSTRUCTION CONTRACT SPECIFICATIONS (GOV. CODE, SECTION 12990).

These specifications are applicable to all contractors and subcontractors having a construction contract or subcontract of \$5,000, or more.

1. As used in the specifications:
 - a. "Administrator" means Administrator, Office of Compliance Programs, California Department of Fair Employment and Housing, or any person to whom the Administrator delegates authority;
 - b. "Minority" includes:
 - (i) Black (all persons having primary origins in any of the black racial groups of Africa, but not of Hispanic origin);
 - (ii) Hispanic (all persons of primary culture or origin in Mexico, Puerto Rico, Cuba, Central or South America or other Spanish derived culture or origin regardless of race);
 - (iii) Asian / Pacific Islander (all persons having primary origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent or the Pacific Islands); and

- (iv) American Indian / Alaskan Native (all persons having primary origins in any of the original peoples of North America and who maintain culture identification through tribal affiliation or community recognition).
2. Whenever the contractor or any subcontractor subcontracts a portion of the work, it shall physically include in each subcontract of \$5,000 or more the nondiscrimination clause in this contract directly or through incorporation by reference.
 3. The contractor shall implement the specific nondiscrimination standards provided in paragraph 6(a) through (e) of these specifications.
 4. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the contractor's obligations under these specifications, Government Code, Section 12990, or the regulations promulgated pursuant thereto.
 5. In order for the nonworking training hours of apprentices and trainees to be counted, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor or the California Department of Industrial Relations.
 6. The contractor shall take specific actions to implement its nondiscrimination program. The evaluation of the contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The contractor must be able to demonstrate fully its efforts under Steps a. through e. below:
 - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and at all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to each construction project. The contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the contractor's obligations to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
 - b. Provide written notification within seven days to the director of DFEH when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
 - c. Disseminate the Contractor's equal employment opportunity policy by providing notice of the policy to unions and training, recruitment and outreach programs and requesting their cooperation in assisting the Contractor to meet its obligations; and by posting the company policy on bulletin boards accessible to all employees at each location where construction work is performed.
 - d. Ensure all personnel making management and employment decisions regarding hiring, assignment, layoff, termination, conditions of work, training, rates of pay or other employment decisions, including all supervisory personnel, superintendents, general foremen, on-site foremen, etc., are aware of the Contractor's equal

- employment opportunity policy and obligations, and discharge their responsibilities accordingly.
- e. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the equal employment opportunity policy and the Contractor's obligations under these specifications are being carried out.
7. Contractors are encouraged to participate in voluntary associations which assist in fulfilling their equal employment opportunity obligations. The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's.
 8. The Contractor is required to provide equal employment opportunity for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Fair Employment and Housing Act (Gov. Code, Section 12990 et seq.) if a particular group is employed in a substantially disparate manner.
 9. Establishment and implementation of a bona fide affirmative action plan pursuant to Section 8104 (b) of this Chapter shall create a rebuttal presumption that a contractor is in compliance with the requirements of Section 12990 of the Government Code and its implementing regulations.
 10. The Contractor shall not use the nondiscrimination standards to discriminate against any person because of race, color, religion, sex, national origin, ancestry, physical handicap, medical condition, marital status or age over 40.
 11. The Contractor shall not enter into any subcontract with any person or firm decertified from state contracts pursuant to Government Code Section 12990.
 12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and the nondiscrimination clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Government Code Section 12990 and its implementing regulations by the awarding agency. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Government Code Section 12990.
 13. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company equal employment opportunity policy is being carried out, to submit reports relating to the provisions hereof as may be required by OCP and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status, (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week

in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in any easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

NOTE: Authority cited: Sections 12935(a) and 12990(d), Government Code.
References: Section 12990, Government Code.

7.03A Apprentices

Attention is directed to Sections 1777.5, 1777.6 and 1777.7 of the California Labor Code and Title 8, California Code of Regulations Section 200 et seq. To ensure compliance and complete understanding of the law regarding apprentices, and specifically the required ratio thereunder, each contractor or subcontractor should, where some question exists, contact the Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, CA 94102, or one of its branch offices prior to commencement of work on the public works contract. Responsibility for compliance with this section lies with the Contractor.

It is State policy to encourage the employment and training of apprentices on public works contracts as may be permitted under local apprenticeship standards.

7.04 Workers' Compensation

Pursuant to the requirements in Section 1860 of the Labor Code, the Contractor will be required to secure the payment of workers' compensation to the Contractor's employees in conformance with the requirements in Section 3700 of the Labor Code.

Prior to the commencement of work, the Contractor shall sign and file with the Engineer a certification in the following form:

"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."

This certification is included in the contract, and signature and return of the contract as provided in Section 3-1.03, "Execution of Contract," shall constitute signing and filing of the certificate.

7.05 Suits to Recover Penalties and Forfeitures

Attention is directed to Sections 1730 to 1733, inclusive, of the Labor Code concerning suits to recover amounts withheld from payment for failure to comply with requirements of the Labor Code or contract provisions based on those laws.

Those sections provide that a suit on the contract for alleged breach thereof in not making the payment is the exclusive remedy of the Contractor or the Contractor's assignees with reference to amounts withheld for those penalties or forfeitures; and that the suit must be commenced and actual notice thereof received by the awarding authority prior to 90 days after completion of the contract and the formal acceptance of the job.

Submission of a claim under Section 9-1.07B, "Final Payment and Claims," for the amounts withheld from payment for those penalties and forfeitures is not a prerequisite for those suits, and these claims will not be considered.

7.06 Contractor's Licensing Laws

Attention is directed to the provisions of Chapter 9 of Division 3 of the Business and Professions Code concerning the licensing of contractors.

All bidders and contractors shall be licensed in accordance with the laws of this State and any bidder or contractor not so licensed is subject to the penalties imposed by those laws.

Attention is also directed to the requirements in Public Contract Code Section 10164. In all projects where Federal funds are involved, the Contractor shall be properly licensed at the time the contract is awarded.

7.07 Vehicle Code

Pursuant to the authority contained in Vehicle Code Section 591, the District has determined that within those areas that are within the limits of the project and are open to public traffic, the Contractor shall comply with all the requirements set forth in Divisions 11, 12, 13, 14 and 15 of the Vehicle Code.

Attention is directed to the statement in Vehicle Code Section 591 that this section shall not relieve the Contractor or any person from the duty of exercising due care. The Contractor shall take all necessary precautions for safe operation of the Contractor's equipment and the protection of the public from injury and damage from the Contractor's equipment.

7.08 Trench Safety

Attention is directed to the requirements in Section 6705 of the Labor Code concerning trench excavation safety plans.

7.09 Air Pollution Control

The Contractor shall comply with all air pollution control rules, regulations, ordinances and statutes which apply to any work performed pursuant to the contract, including any air pollution control rules, regulations, ordinances and statutes, specified in Section 11017 of the Government Code.

7.10 Water Pollution

The Contractor shall exercise every reasonable precaution to protect streams, lakes, reservoirs, bays, and coastal waters from pollution with fuels, oils, bitumens, calcium chloride and other harmful materials and shall conduct and schedule operations so as to avoid or minimize muddying and silting of streams, lakes, reservoirs, bays and coastal waters.

Water pollution control work is intended to provide prevention, control and abatement of water pollution to streams, waterways and other bodies of water, and shall consist of constructing those facilities specified herein or directed by the Engineer.

The Contractor shall provide temporary water pollution control measures, including but not limited to, dikes, basins, ditches, and applying straw and seed, which become necessary as a result of the Contractor's operations.

Before starting any work on the project, the Contractor shall submit, for acceptance by the Engineer, a program to control water pollution effectively during construction of the project.

The Contractor shall not perform any clearing and grubbing or earthwork on the project, other than that specifically authorized in writing by the Engineer, until the program has been accepted.

If the measures being taken by the Contractor are inadequate to control water pollution effectively, the Engineer may direct the Contractor to revise the operations and the water pollution control program. The directions will be in writing and will specify the items of work for which the Contractor's water pollution control measures are inadequate. No further work shall be performed on those items until the water pollution control measures are adequate and, if also required, a revised water pollution control program has been accepted.

The Engineer will notify the Contractor of the acceptance or rejection of any submitted or revised water pollution control program in not more than 5 working days.

The District will not be liable to the Contractor for failure to accept all or any portion of an originally submitted or revised water pollution control program, nor for any delays to the work due to the Contractor's failure to submit an acceptable water pollution control program.

The Contractor may request the Engineer to waive the requirement for submission of a written program for control of water pollution when the nature of the Contractor's operation is such that erosion is not likely to occur. Waiver of this requirement will not relieve the Contractor from responsibility for compliance with the other provisions of this section. Waiver of the requirement for a written program for control of water pollution will not preclude requiring submittal of a written program at a later time if the Engineer deems it necessary because of the effect of the Contractor's operations.

Nothing in the terms of the contract nor in the provisions in this Section 7 shall relieve the Contractor of the responsibility for compliance with Sections 5650 and 12015 of the Fish and Game Code, or other applicable statutes relating to prevention or abatement of water pollution.

The requirements of this section shall apply to all work performed under the contract.

Compliance with the provisions in this section shall in no way relieve the Contractor from the responsibility to comply with the other provisions of the contract, in particular the responsibility for damage and for preservation of property.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various items of work and no additional compensation will be allowed therefor.

7.11 Use of Pesticides

The Contractor shall comply with all rules and regulations of the Department of Food and Agriculture, the Department of Health, the Department of Industrial Relations and all other agencies which govern the use of pesticides required in the performance of the work on the contract.

Pesticides shall include but shall not be limited to herbicides, insecticides, fungicides, rodenticides, germicides, nematocides, bactericides, inhibitors, fumigants, defoliants, desiccants, soil sterilants and repellents.

Any substance or mixture of substances intended for preventing, repelling, mitigating, or destroying weeds, insects, diseases, rodents, or nematodes and any substance or mixture of substances intended for use as a plant regulator, defoliant or desiccant shall be considered a pesticide.

7.12 Sound Control Requirements

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

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

7.13 Assignment of Antitrust Actions

The Contractor's attention is directed to the following requirements in Public Contract Code 7103.5 and Government Code Sections 4553 and 4554, which shall be applicable to the Contractor and the Contractor's subcontractors:

"In entering into a public works contract or a 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. Sec. 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.

"If an awarding body or public purchasing body receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under this chapter, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the public body any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the public body as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

"Upon demand in writing by the assignor, the assignee shall, within one year from such demand, reassign the cause of action assigned under this part if the assignor has been or may

have been injured by the violation of law for which the cause of action arose and (a) the assignee has not been injured thereby, or (b) the assignee declines to file a court action for the cause of action."

7.14 PAYMENT OF TAXES

The contract prices paid for the work shall include full compensation for all taxes which the Contractor is required to pay, whether imposed by Federal, State or local government, including, without being limited to, Federal excise tax. No tax exemption certificate nor any document designed to exempt the Contractor from payment of any tax will be furnished to the Contractor by the District, as to any tax on labor, services, materials, transportation, or any other items furnished pursuant to the contract.

7.15 PERMITS AND LICENSES

The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work.

The Environmental Quality Act (Public Resources Code, Sections 21000 to 21176, inclusive) may be applicable to permits, licenses and other authorizations which the Contractor must obtain from local agencies in connection with performing the work of the contract. The Contractor shall comply with the provisions of those statutes in obtaining the permits, licenses and other authorizations and they shall be obtained in sufficient time to prevent delays to the work.

In the event that the District has obtained permits, licenses or other authorizations, applicable to the work, in conformance with the requirements in the Environmental Quality Act, the Contractor shall comply with the provisions of those permits, licenses and other authorizations.

7.16 PATENTS

The Contractor shall assume all costs arising from the use of patented materials, equipment, devices or processes used on or incorporated in the work, and agrees to indemnify and save harmless the East Contra Costa Irrigation District, its Directors, Manger and Engineer, and their duly authorized representatives, from all suits at law, or actions of every nature for, or on account of the use of any patented materials, equipment, devices or processes.

7.17 SAFETY AND HEALTH PROVISIONS

The Contractor shall conform to all applicable occupational safety and health standards, rules, regulations and orders established by the State of California.

Working areas utilized by the Contractor to perform work during the hours of darkness, shall be lighted to conform to the minimum illumination intensities established by California Division of Occupational Safety and Health Construction Safety Orders.

Full compensation for conforming to the provisions in this section shall be considered as included in the contract prices paid for the various items of work involved and no separate payment will be made therefor.

7.18 PUBLIC SAFETY

It is the Contractor's responsibility to provide for the safety of the public during construction.

7.19 PRESERVATION OF PROPERTY

Attention is directed to Section 7, "Idemnification and Insurance," and to Section 8, "Utility and Non-Highway Facilities." Due care shall be exercised to avoid injury to existing improvements or facilities, utility facilities, adjacent property, and trees, shrubs and other plants that are not to be removed.

Trees, shrubs and other plants that are not to be removed, and pole lines, fences, signs, markers and monuments, buildings and structures, conduits, pipelines under or above ground, sewer and water lines, all highway facilities and any other improvements or facilities within or adjacent to the project shall be protected from injury or damage, and if ordered by the Engineer, the Contractor shall provide and install suitable safeguards, approved by the Engineer, to protect the objects from injury or damage.

If the objects are injured or damaged by reason of the Contractor's operations, the objects shall be replaced or restored at the Contractor's expense. The facilities shall be replaced or restored to a condition as good as when the Contractor entered upon the work, or as good as required by the specifications accompanying the contract, if any of the objects are a part of the work being performed under the contract. The Engineer may make or cause to be made those temporary repairs that are necessary to restore to service any damaged facility. The cost of the repairs shall be borne by the Contractor and may be deducted from any moneys due or to become due to the Contractor under the contract.

The fact that any underground facility is not shown upon the plans shall not relieve the Contractor of the responsibility. It shall be the Contractor's responsibility, pursuant thereto, to ascertain the location of those underground improvements or facilities which may be subject to damage by reason of the Contractor's operations.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in protecting or repairing property as specified in this Section 7, shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

7.20 INDEMNIFICATION AND INSURANCE

The Contractor's obligations regarding indemnification of the East Contra Costa Irrigation District and the requirements for insurance shall conform to the provisions in Sections 7, "Indemnification," and 7, "Insurance," of this Section 7.

7.20A Indemnification

With the exception that this section shall in no event be construed to require indemnification by the Contractor to a greater extent than permitted by law, the Contractor shall defend, indemnify and save harmless the District, including its officers, Directors, agents (excluding agents who are design professionals), and employees, and each of them (Indemnitees), from any and all claims, demands, causes of action, damages, costs, expenses, actual attorneys' fees, losses or liabilities,

in law or in equity, of every kind and nature whatsoever (Claims), arising out of or in connection with the Contractor's performance of this contract for:

- A. Bodily injury including, but not limited to, bodily injury, sickness or disease, emotional injury or death to persons, including, but not limited to, the public, any employees or agents of the Contractor, District, or any other contractor and;
- B. Damage to property of anyone including loss of use thereof; caused or alleged to be caused in whole or in part by any negligent or otherwise legally actionable act or omission of the Contractor or anyone directly or indirectly employed by the Contractor or anyone for whose acts the Contractor may be liable.

Except as otherwise provided by law, the indemnification provisions above shall apply regardless of the existence or degree of fault of Indemnitees. The Contractor, however, shall not be obligated to indemnify Indemnitees for Claims arising from conduct delineated in Civil Code Section 2782. Further, the Contractor's indemnity obligation shall not extend to Claims to the extent they arise from any defective or substandard condition of the project area which existed at or prior to the time the Contractor commenced work, unless this condition has been changed by the work or the scope of the work requires the Contractor to maintain existing facilities and the claim arises from the Contractor's failure to maintain. The Contractor's indemnity obligation shall extend to Claims arising after the work is completed and accepted only if these Claims are directly related to alleged acts or omissions of the Contractor which occurred during the course of the work. No inspection by the District, its employees or agents shall be deemed a waiver by the District of full compliance with the requirements of this section.

The Contractor's obligation to defend and indemnify shall not be excused because of the Contractor's inability to evaluate liability or because the Contractor evaluates liability and determines that the Contractor is not liable to the claimant. The Contractor will respond within 30 days to the tender of any claim for defense and indemnity by the District, unless this time has been extended by the District. If the Contractor fails to accept or reject a tender of defense and indemnity within 30 days, in addition to any other remedy authorized by law, so much of the money due the Contractor under and by virtue of the contract as shall reasonably be considered necessary by the District, may be retained by the District until disposition has been made of the claim or suit for damages, or until the Contractor accepts or rejects the tender of defense, whichever occurs first.

With respect to third party claims against the Contractor, the Contractor waives any and all rights of any type to express or implied indemnity against the District, its Directors, officers, employees, or agents (excluding agents who are design professionals).

7.20B Insurance

Insurance shall conform to the following requirements:

7.20C Casualty Insurance

The Contractor shall, at the Contractor's expense, procure and maintain insurance on all of its operations with companies acceptable to the District as follows. All insurance shall be kept in full force and effect from the beginning of the work through final acceptance by the District. In

addition, the Contractor shall maintain completed operations coverage with a carrier acceptable to the District through the expiration of the patent deficiency in construction statute of repose set forth in Section 337.1 of the Code of Civil Procedure.

7.20D Workers' Compensation and Employer's Liability Insurance

Workers' Compensation insurance shall be provided as specified in Section 7-1.01A(6), "Workers' Compensation." Employer's Liability Insurance shall be provided in amounts not less than:

- (a) \$1,000,000 for each accident for bodily injury by accident.
- (b) \$1,000,000 policy limit for bodily injury by disease.
- (c) \$1,000,000 for each employee for bodily injury by disease.

7.20E Liability Insurance

The Contractor shall carry General Liability and Umbrella or Excess Liability Insurance covering all operations by or on behalf of the Contractor providing insurance for bodily injury liability, and property damage liability for the limits of liability indicated below and including coverage for:

- (a) premises, operations and mobile equipment.
- (b) products and completed operations.
- (c) broad form property damage (including completed operations).
- (d) explosion, collapse and underground hazards.
- (e) personal injury.
- (f) contractual liability.

7.20E(1) Liability Limits/Additional Insureds

The limits of liability shall be at least:

- (a) \$1,000,000 for each occurrence (combined single limit for bodily injury and property damage).
- (b) \$2,000,000 aggregate for products-completed operations.
- (c) \$2,000,000 general aggregate. This general aggregate limit shall apply separately to the Contractor's work under this Agreement.
- (d) \$5,000,000 umbrella or excess liability. For projects over \$25,000,000 only, an additional \$10,000,000 umbrella or excess liability (for a total of \$15,000,000). Umbrella or excess policy shall include products liability completed operations coverage and may be subject to \$5,000,000 or \$15,000,000 aggregate limits. Further, the umbrella or excess policy shall contain a clause stating that it takes effect (drops down) in the event the primary limits are impaired or exhausted.

The District, including their officers, Directors, agents (excluding agents who are design professionals), and employees, shall be named as additional insureds under the General Liability and Umbrella Liability Policies with respect to liability arising out of or connected with work or

operations performed by or on behalf of the Contractor under this contract. Coverage for such additional insureds shall not extend to liability:

- (1) arising from any defective or substandard condition of the project area which existed at or prior to the time the Contractor commenced work, unless such condition has been changed by the work or the scope of the work requires the Contractor to maintain existing facilities and the claim arises from the Contractor's failure to maintain; or
- (2) for claims occurring after the work is completed and accepted unless these claims are directly related to alleged acts or omissions of the Contractor which occurred during the course of the work; or
- (3) to the extent prohibited by Section 11580.04 of the Insurance Code.

The policy shall stipulate that the insurance afforded the additional insureds shall apply as primary insurance. Any other insurance or self insurance maintained by the District will be excess only and shall not be called upon to contribute with this insurance. Such additional insured coverage shall be provided by a policy provision or by an endorsement providing coverage at least as broad as Additional Insured (Form B) endorsement form CG 2010, as published by the Insurance Services Office (ISO).

7.20E(2) Automobile Liability Insurance

The Contractor shall carry automobile liability insurance, including coverage for all owned, hired and non-owned automobiles. The primary limits of liability shall be not less than \$1,000,000 combined single limit each accident for bodily injury and property damage. The umbrella or excess liability coverage required under Section 7, "Liability Limits/Additional Insureds," shall also apply to automobile liability.

7.20E (3) Policy Forms, Endorsements and Certificates

The Contractor's General Liability Insurance shall be provided under Commercial General Liability policy form No. CG0001 as published by the Insurance Services Office (ISO) or under a policy form at least as broad as policy form No. CG0001.

Evidence of insurance in a form acceptable to the District, including the required "additional insured" endorsements, shall be furnished by the Contractor to the District at or prior to the pre-construction conference. The evidence of insurance shall provide that there will be no cancellation, lapse, or reduction of coverage without thirty (30) days' prior written notice to the District. Certificates of Insurance, as evidence of required insurance, for the General Liability, Auto Liability and Umbrella-Excess Liability policies shall set forth deductible amounts applicable to each policy and all exclusions which are added by endorsement to each policy. The District may expressly allow deductible clauses, which it does not consider excessive, overly broad, or harmful to the interests of the District. Standard ISO form No. CG 0001 or similar exclusions will be allowed provided they are not inconsistent with the requirements of this section. Allowance of any additional exclusions is at the discretion of the District. Regardless of the allowance of exclusions or deductions by the District, the Contractor shall be responsible for any deductible amount and shall warrant that the coverage provided to the District is consistent with the requirements of this section.

7.20E(4) Enforcement

The District may take any steps as are necessary to assure Contractor's compliance with its obligations. Should any insurance policy lapse or be canceled during the contract period the Contractor shall, within thirty (30) days prior to the effective expiration or cancellation date, furnish the District with evidence of renewal or replacement of the policy. Failure to continuously maintain insurance coverage as herein provided is a material breach of contract. In the event the Contractor fails to maintain any insurance coverage required, the District may, but is not required to, maintain this coverage and charge the expense to the Contractor or terminate this Agreement. The required insurance shall be subject to the approval of District, but any acceptance of insurance certificates by the District shall in no way limit or relieve the Contractor of the Contractor's duties and responsibilities under the Contract to indemnify, defend and hold harmless the District, its officers, agents, and employees. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve the Contractor for liability in excess of such coverage, nor shall it preclude the District from taking other actions as is available to it under any other provision of the contract or law. Failure of the District to enforce in a timely manner any of the provisions of this section shall not act as a waiver to enforcement of any of these provisions at a later date.

7.20E(5) Self-Insurance

Self-insurance programs and self-insured retentions in insurance policies are subject to separate annual review and approval by the District of evidence of the Contractor's financial capacity to respond. Additionally, self-insurance programs or retentions must provide the District with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance.

7.20E(6) Miscellaneous

Nothing contained in the Contract is intended to make the public or any member thereof a third party beneficiary of the Insurance or Indemnity provisions of these Standard Specifications, nor is any term, condition or other provision of the Contract intended to establish a standard of care owed to the public or any member thereof.

7.21 Legal Actions Against the District

In the event litigation is brought against the District concerning compliance by the District with State or Federal laws, rules or regulations applicable to the project work, the provisions of this Section 7 shall apply.

- (A) If, pursuant to court order, the District prohibits the Contractor from performing all or any portion of the work, such action will be considered a delay unless the contract is terminated as hereinafter provided.
- (B) If, pursuant to court order (other than an order to show cause) the District is prohibited from requiring the Contractor to perform all or any portion of the work, the District may, if it so elects, eliminate the enjoined work pursuant to Section 4, "Changes," or terminate the contract.
- (C) If the final judgment in the action prohibits the District from requiring the Contractor to perform all or any portion of the work, the District will either eliminate the enjoined work pursuant to Section 4, "Changes," or terminate the contract.

(D) If the contract is to be terminated, the termination and the determination of the total compensation payable to the Contractor shall be governed by the provisions in Section 8, "Termination of Contract."

7.22 DISPOSAL OF MATERIAL OUTSIDE THE PROJECT AREA

If the Contractor elects to dispose of materials at locations other than those where arrangements have been made by the District, or, if material is to be disposed of and the District has not made arrangements for disposal of the material, the Contractor shall make arrangements for disposing of the materials and shall pay all costs involved. Arrangements shall include, but not be limited to, entering into agreements with property owners and obtaining necessary permits, licenses and environmental clearances. Before disposing of any material outside the highway right of way, the Contractor shall furnish to the Engineer satisfactory evidence that the Contractor has entered into agreements with the property owners of the site involved and has obtained the permits, licenses and clearances.

When any material is to be disposed of outside the project area, and the District has not made arrangements for disposal of the material, the Contractor shall first obtain written authorization from the property owner on whose property the disposal is to be made and the Contractor shall file with the Engineer the authorization or a certified copy thereof together with a written release from the property owner absolving the District from any and all responsibility in connection with the disposal of material on the property. Before any material is disposed of on the property, the Contractor shall obtain written permission from the Engineer to dispose of the material at the location designated in the authorization.

Where the District has made arrangements with owners of land in the vicinity of a project for the disposal of materials on an owner's property, the arrangements are made solely for the purpose of providing all bidders an equal opportunity to dispose of the materials on the property. Bidders or Contractors may, upon written request, inspect the documents evidencing the arrangements between property owners and the District. The Contractor may, if the Contractor so elects, exercise any rights that have been obtained, which may be exercised by a Contractor under the arrangements, subject to and upon the conditions hereinafter set forth.

Such arrangements are not a part of the contract and it is expressly understood and agreed that the District assumes no responsibility to the bidder or Contractor whatsoever in respect to the arrangements made with the property owner to dispose of materials thereon and that the Contractor shall assume all risks in connection with the use of the property, the terms upon which the use shall be made, and there is no warranty or guaranty, either express or implied, as to the quantity or types of materials that can be disposed of on the property.

Full compensation for all costs involved in disposing of materials as specified in this Section 7, including all costs of hauling, shall be considered as included in the price paid for the contract item of work involving the materials and no additional compensation will be allowed therefor.

7.23 COOPERATION

Should construction be under way by other forces or by other contractors within or adjacent to the limits of the work specified or should work of any other nature be under way by other forces within or adjacent to those limits, the Contractor shall cooperate with all the other contractors or

other forces to the end that any delay or hindrance to their work will be avoided. The right is reserved to perform other or additional work at or near the site (including material sources) at any time, by the use of other forces.

When 2 or more contractors are employed on related or adjacent work, or obtain materials from the same material source, as provided in Section 6-2.02, "Possible Local Material Sources," or Section 6-2.03, "Mandatory Local Material Sources," each shall conduct their operations in such a manner as not to cause any unnecessary delay or hindrance to the other.

Each contractor shall be responsible to the other for all damage to work, to persons or property caused to the other by their operations, and for loss caused the other due to unnecessary delays or failure to finish the work within the time specified for completion.

7.24 RELIEF FROM MAINTENANCE AND RESPONSIBILITY

Upon the request of the Contractor, the District may relieve the Contractor of the duty of maintaining and protecting certain portions of the work as described below, which have been completed in all respects in accordance with the requirements of the contract and to the satisfaction of the Engineer, and thereafter except with the Contractor's consent, the Contractor will not be required to do further work thereon. In addition, the action by the District will relieve the Contractor of responsibility for injury or damage to those completed portions of the work resulting from use by public or from the action of the elements or from any other cause but not from injury or damage resulting from the Contractor's own operations or from the Contractor's negligence.

However, nothing in this Section 7 providing for relief from maintenance and responsibility will be construed as relieving the Contractor of full responsibility for making good any defective work or materials found at any time before the formal written acceptance of the entire contract by the District.

7.25 CONTRACTOR'S RESPONSIBILITY FOR THE WORK AND MATERIALS

Until the acceptance of the contract, the Contractor shall have the charge and care of the work and of the materials to be used therein (including materials for which the Contractor has received partial payment as provided in Section 9, "Partial Payments," or materials which have been furnished by the District) and shall bear the risk of injury, loss or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work, except as provided in Section 7, "Public Convenience," and, "Relief From Maintenance and Responsibility." The Contractor shall rebuild, repair, restore, and make good all injuries, losses or damages to any portion of the work or the materials occasioned by any cause before its completion and acceptance and shall bear the expense thereof, except as otherwise expressly provided in Section 7, "Damage by Storm, Flood, Tsunami or Earthquake," and except for those injuries, losses, or damages that are directly and proximately caused by acts of the Federal Government or the public enemy. Where necessary to protect the work or materials from damage, the Contractor shall, at the Contractor's expense, provide suitable drainage of the project area and erect those temporary means that are necessary to protect the work or materials from damage. The suspension of the work from any cause whatever shall not relieve the Contractor of the responsibility for the work and materials as herein specified. If

ordered by the Engineer, the Contractor shall, at the Contractor's expense, properly store materials which have been partially paid for by the District or which have been furnished by the District. Storage by the Contractor shall be on behalf of the District and the District shall at all times be entitled to the possession of the materials, and the Contractor shall promptly return the materials to the site of the work when requested. The Contractor shall not dispose of any of the materials so stored except on written authorization from the Engineer.

7.26 DAMAGE BY STORM, FLOOD, TSUNAMI OR EARTHQUAKE

Attention is directed to Section 7, "Contractor's Responsibility for the Work and Materials." In the event damage to the work is caused by a storm, flood, tsunami, earthquake or other natural disaster which constitutes an "Occurrence," as hereinafter defined, the provisions in this Section 7 shall be applicable, and the Contractor may apply in writing to the Engineer for the District to pay or participate in the cost of repairing damage to the work from that cause or, in lieu thereof, and at the sole discretion of the District, terminate the contract and relieve the Contractor of further obligation to perform the work, subject to the following:

- A. Occurrence— "Occurrence" shall include tsunamis, earthquakes in excess of a magnitude of 3.5 on the Richter Scale, and storms, floods and other natural disasters as to which the Governor has proclaimed a state of emergency when the damaged work is located within the territorial limits to which the proclamation is applicable or, which were, in the opinion of the Engineer, of a magnitude at the site of the work sufficient to have caused such a proclamation had they occurred in a populated area or in an area in which such a proclamation was not already in effect.
- B. Application by Contractor— The Contractor's written request for the District to pay or to participate in the cost of rebuilding, repairing, restoring or otherwise remedying the damage to the work caused by the Occurrence shall be submitted to the Engineer before performing any work other than emergency work, including emergency work necessary to provide for passage of public traffic.
- C. Protecting the Work from Damage— Nothing in this section shall be construed to relieve the Contractor of the responsibility to protect the work from damage. The Contractor shall bear the entire cost of repairing damage to the work caused by the Occurrence which the Engineer determines was due to the failure of the Contractor to comply with the requirements of the Plans and Specifications, take reasonable and adequate measures to protect the work or exercise sound engineering and construction practices in the conduct of the work, and those repair costs shall be excluded from consideration under the provisions of this section.
- D. Repair Work— Repair of damaged work under the provisions of this section shall be pursuant to a contract change order issued hereunder and specifying the repair work to be performed on the damaged facility. The repair work shall consist of restoring the in-place construction to the same state of completion to which the work had advanced prior to the Occurrence. Emergency work which the Engineer determines would have been part of the repair work if it had not previously been performed, will be considered to be part of the repair work.

The District reserves the right to make changes in the plans and specifications applicable to the portions of the work to be repaired, and if those changes will increase the cost of repairing the damage over the Engineer's estimate of the cost of repair without the

changes, the Contractor will be paid for the increased costs in accordance with Subsection E and the increased cost amount shall not be considered in determining the cost of repair to be borne by the Contractor under Subsection F.

Nothing in this section shall be construed to relieve the Contractor of full responsibility for the risk of injury, loss or damage to materials not yet incorporated in the work and to materials, tools and equipment used to perform the work, or to relieve the Contractor of responsibility under Section 7, "Idemnification and Insurance." The provisions of this section shall not be applicable to the repair of damage caused by an Occurrence to any portion of the work as to which the Contractor has been granted relief from maintenance and responsibility pursuant to Section 7,

E. Determination of Costs— Unless otherwise agreed between the Engineer and the Contractor, the cost of the work performed pursuant to this Section 7-1.165 will be determined in conformance with the provisions in Section 9, "Force Account Payment," except there shall be no markup allowance pursuant to Section 9, "Work Performed by Contractor," unless the Occurrence that caused the damage was an earthquake. The cost of emergency work, which the Engineer determines would have been part of the repair work if it had not previously been performed, will be determined in the same manner as the authorized repair work. The cost of repairing damaged work which was not in compliance with the requirements of the plans and specifications shall be borne solely by the Contractor, and those costs shall not be considered in determining the cost of repair under this Subsection E.

F. Payment for Repair Work— When the Occurrence that caused the damage was a tsunami or earthquake, the District will pay the cost of repair determined as provided in Subsection E, that exceeds 5 percent of the amount of the Contractor's bid for bid comparison purposes.

When the Occurrence that caused the damage was a storm, flood or other natural disaster, the District will participate in the cost of the repair determined as provided in Subsection E in accordance with the following:

1. On projects for which the amount of the Contractor's bid for bid comparison purposes is \$2,000,000 or less, the District will pay 90 percent of the cost of repair that exceeds 5 percent of the amount of the Contractor's bid for bid comparison purposes.
2. On projects for which the Contractor's bid for bid comparison purposes is greater than \$2,000,000, the District will pay 90 percent of the cost of repair that exceeds \$100,000.

G. Termination of Contract— If the District elects to terminate the contract, the termination and the determination of the total compensation payable to the Contractor shall be governed by the provisions of Section 8-1.11, "Termination of Contract."

7.27 ACCEPTANCE OF CONTRACT

When the Engineer has made the final inspection as provided in Section 5, "Final Inspection," and determines that the contract work has been completed in all respects in accordance with the plans and specifications, the Engineer will recommend that the District formally accept the contract, and immediately upon and after the acceptance by the District, the Contractor will be relieved of the duty of maintaining and protecting the work as a whole, and the Contractor will

not be required to perform any further work thereon; and the Contractor shall be relieved of the responsibility for injury to persons or property or damage to the work which occurs after the formal acceptance by the District.

7.28 PROPERTY RIGHTS IN MATERIALS

Nothing in the contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or soil or after partial payment has been made as provided in Section 9, "Partial Payments," for material delivered on the ground or stored subject to or under the control of the District and unused. All the material shall become the property of the District upon being so attached or affixed or upon payment for materials delivered on the ground or stored subject to or under the control of the District and unused, as provided in Section 9.

7.29 RIGHTS IN LAND AND IMPROVEMENTS

Nothing in these specifications shall be construed as allowing the Contractor to make any arrangements with any person to permit occupancy or use of any land, structure, or building within the limits of the contract for any purpose whatsoever, either with or without compensation, in conflict with any agreement between the District and any owner, former owner, or tenant of the land, structure, or building.

7.30 PERSONAL LIABILITY

Neither the Director, the Engineer nor any other officer or authorized employee of the East Contra Costa Irrigation District, nor any Director, employee of any county, city or District shall be personally responsible for any liability arising under or by virtue of the contract.

7.31 REPAIR OF EQUIPMENT

The work of installing, assembling, repairing or reconditioning, or other work of any nature on machinery, equipment or tools used in or upon the work shall be considered a part of the work to be performed under the contract and any laborers, workers or mechanics working on the machinery, equipment or tools, unless employed by bona fide commercial repair shops, garages, blacksmith shops or machine shops, which have been established and operating on a commercial basis for a period of at least 2 months prior to the award of the contract, shall be subject to all the requirements relating to labor set forth in these specifications and in the special provisions.

7.32 MATERIAL PLANTS

The construction, erection and operation of material production, proportioning or mixing plants from which material is used wholly on the contract or on contracts under the supervision of the District shall be considered a part of the work to be performed under the contract and any laborers, workers or mechanics working on those plants shall be subject to all of the requirements relating to labor set forth in these specifications and in the special provisions.

SECTION 8: PROSECUTION AND PROGRESS

8.01 SUBCONTRACTING

The Contractor shall give personal attention to the fulfillment of the contract and shall keep the work under the Contractor's control.

No subcontractor will be recognized as such, and all persons engaged in the work of construction will be considered as employees of the Contractor and the Contractor will be held responsible for their work, which shall be subject to the provisions of the contract and specifications.

The Contractor shall perform, with the Contractor's own organization, contract work amounting to not less than 50 percent of the original total contract price, except for equipment purchased may be performed by subcontract and the amount of any equipment purchases performed by subcontract may be deducted from the original total contract price before computing the amount of work required to be performed by the Contractor with the Contractor's own organization.

Subcontracts shall include provisions that the contract between the District and the Contractor is part of the subcontract, and that all terms and provisions of the contract are incorporated in the subcontract. Subcontracts shall also contain certification by the subcontractor that the subcontractor is experienced in and qualified to do, and knowledgeable about, the subcontracted work. Copies of subcontracts shall be available to the Engineer upon written request, and shall be provided to the Engineer at the time any litigation against the District concerning the project is filed.

Before work is started on a subcontract, the Contractor shall file with the Engineer a written statement showing the work to be subcontracted, the names of the subcontractors and the description of each portion of the work to be subcontracted.

Pursuant to the provisions of Section 6109 of the Public Contract Code, the Contractor shall not perform work on a public works project with a subcontractor who is ineligible to perform work on the public works project pursuant to Section 1777.1 or 1777.7 of the Labor Code.

When a portion of the work which has been subcontracted by the Contractor is not being prosecuted in a manner satisfactory to the District, the subcontractor shall be removed immediately on the requisition of the Engineer and shall not again be employed on the work.

8.02 ASSIGNMENT

The performance of the contract may not be assigned, except upon the written consent of the District. Consent will not be given to any proposed assignment which would relieve the original Contractor or the Contractor's surety of their responsibilities under the contract nor will the District consent to any assignment of a part of the work under the contract.

The Contractor may assign moneys due or to become due the Contractor under the contract and the assignment will be recognized by the District, if given proper notice thereof, to the extent permitted by law, but any assignment of moneys shall be subject to all proper set-offs in favor of the District and to all deductions provided for in the contract and particularly all money withheld,

whether assigned or not, shall be subject to being used by the District for the completion of the work in the event that the Contractor should be in default therein.

8.03 BEGINNING OF WORK

The Contractor shall begin work within 15 calendar days after receiving notice that the contract has been approved by the District, and shall diligently prosecute the same to completion within the time limit provided in the special provisions.

The Contractor shall notify the Engineer, in writing, of the Contractor's intent to begin work at least 72 hours before work is begun. The notice shall be delivered to the District's office and shall specify the date the Contractor intends to start. If the project has more than one location of work, a separate notice shall be given for each location.

Should the Contractor begin work in advance of receiving notice that the contract has been approved as above provided, any work performed by the Contractor in advance of the date of approval shall be considered as having been done by the Contractor at the Contractor's own risk and as a volunteer unless the contract is approved.

The delivery to the District for execution and approval of the contract properly executed on behalf of the Contractor and surety and the minimum 72 hours advance written notice as required above shall constitute the Contractor's authority to enter upon the site of the work and to begin operations, subject to the Contractor's assumption of the risk of the disapproval of the contract, as above provided, and subject also to the following:

- (1) The Contractor shall, on commencing operations, take all precautions required for public safety and shall observe all the provisions in these specifications.
- (2) In the event of disapproval, the Contractor shall at the Contractor's expense do that work that is necessary to leave the site in a neat condition to the satisfaction of the Engineer. If the work done affects any existing road or highway, the Contractor shall at the Contractor's expense restore it to its former condition, or the equivalent thereof, to the satisfaction of the Engineer.
- (3) All work done according to the contract prior to its approval, will, when the contract is approved, be considered authorized work and will be paid for as provided in the contract.
- (4) The Contractor shall not be entitled to any additional compensation or an extension of time for any delay, hindrance or interference caused by or attributable to commencement of work prior to the date on which the contract was approved by the District, except to the extent the delay, hindrance or interference would have been compensable hereunder had work been commenced on the date of the approval and the progress thereof been the same as that actually made.

8.04 PROGRESS SCHEDULE

The Contractor shall submit to the Engineer a practicable progress schedule within 20 working days of approval of the contract, and within 10 working days of the Engineer's written request at any other time.

The Contractor may furnish the schedule on a form of the Contractor's choice.

The schedule shall show the order in which the Contractor proposes to carry out the work, the dates on which the Contractor will start the several salient features of the work (including procurement of materials, plant, and equipment), and the contemplated dates for completing those salient features.

The progress schedule submitted shall be consistent in all respects with the time and order of work requirements of the contract.

Subsequent to the time that submittal of a progress schedule is required in accordance with these specifications, no progress payments will be made for any work until a satisfactory schedule has been submitted to the Engineer.

8.05 TEMPORARY SUSPENSION OF WORK

The Engineer shall have the authority to suspend the work wholly or in part, for any time period as the Engineer deems necessary, due to unsuitable weather, or to such other conditions considered unfavorable for the suitable prosecution of the work, or for any time period as the Engineer deems necessary due to the failure on the part of the Contractor to carry out orders given, or to perform any provision of the contract. The Contractor shall immediately comply with the written order of the Engineer to suspend the work wholly or in part. The suspended work shall be resumed when conditions are favorable and methods are corrected, as ordered or approved in writing by the Engineer.

In the event that a suspension of work is ordered as provided above, and should that suspension be ordered by reason of the failure of the Contractor to carry out orders or to perform any provision of the contract; or by reason of weather conditions being unsuitable for performing any item or items of work, which work, in the sole opinion of the Engineer, could have been performed prior to the occurrence of the unsuitable weather conditions had the Contractor diligently prosecuted the work when weather conditions were suitable; the Contractor, at the Contractor's expense, shall do all the work necessary to provide a safe, smooth, and unobstructed passageway through construction for use by public traffic during the period of that suspension as provided in Sections 7, "Public Convenience," and 7, "Public Safety," and as specified in the special provisions for the work. In the event that the Contractor fails to perform the work above specified, the District will perform that work and the cost thereof will be deducted from moneys due or to become due the Contractor.

In the event that a suspension of work is ordered by the Engineer due to unsuitable weather conditions, and in the sole opinion of the Engineer, the Contractor has prosecuted the work with energy and diligence prior to the time that operations were suspended, the cost of providing the work will be paid for as extra work as provided in Section 4 or, at the option of the Engineer, that work will be performed by the District at no cost to the Contractor.

If the Engineer orders a suspension of all of the work or a portion of the work which is the current controlling operation or operations, due to unsuitable weather or to other conditions considered unfavorable to the suitable prosecution of the work, the days on which the suspension is in effect shall not be considered working days as defined in Section 8, "Time of Completion." If a portion of work at the time of the suspension is not a current controlling operation or operations, but subsequently does become the current controlling operation or operations, the

determination of working days will be made on the basis of the then current controlling operation or operations.

If a suspension of work is ordered by the Engineer, due to the failure on the part of the Contractor to carry out orders given or to perform any provision of the contract, the days on which the suspension order is in effect shall be considered working days if those days are working days within the meaning of the definition set forth in Section 8, "Time of Completion."

In addition to the requirements specified above, the following shall apply:

If the performance of all or any portion of the work is suspended or delayed by the Engineer in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and the Contractor believes that additional compensation or contract time or additional compensation and contract time is due as a result of that suspension or delay, the Contractor shall submit to the Engineer in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for the adjustment.

Upon receipt, the Engineer will evaluate the Contractor's request. If the Engineer agrees that the cost or time or cost and time required for the performance of the contract has increased as a result of the suspension and the suspension was caused by conditions beyond the control of and not the fault of the Contractor, its suppliers, or subcontractors at any approved tier, and not caused by weather, the Engineer will make an adjustment (excluding profit) and modify the contract in writing accordingly. The Engineer will notify the Contractor of the Engineer's determination whether or not an adjustment of the contract is warranted.

No contract adjustment will be allowed unless the Contractor has submitted the request for adjustment within the time prescribed.

No contract adjustment will be allowed under the provisions specified in this section to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided for or excluded under any term or condition of this contract.

In the event of a suspension of work under any of the conditions set forth in this Section 8, the suspension of work shall not relieve the Contractor of the responsibilities as set forth in Section 7, "Legal Relations and Responsibility."

8.06 TIME OF COMPLETION

The Contractor shall complete all or any designated portion of the work called for under the contract in all parts and requirements within the time set forth in the special provisions.

A working day is defined as any day, except as follows:

- (a) Saturdays, Sundays and legal holidays;
- (b) Days on which the Contractor is prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations, as determined by the Engineer, from proceeding with at least 75 percent of the normal labor and equipment force engaged on that operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations; or

Should the Contractor prepare to begin work at the regular starting time of any day on which inclement weather, or the conditions resulting from the weather, or the condition of the work, prevents the work from beginning at the usual starting time and the crew is dismissed as a result thereof and the Contractor does not proceed with at least 75 percent of the normal labor and equipment force the Contractor will not be charged for a working day whether or not conditions should change thereafter during that day and the major portion of the day could be considered to be suitable for those construction operations.

Determination that a day is a non-working day by reason of inclement weather or conditions resulting immediately therefrom, shall be made by the Engineer. The Contractor will be allowed 15 days from the issuance of the weekly statement of working days in which to file a written protest setting forth in what respects the Contractor differs from the Engineer; otherwise, the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct. The Engineer will furnish the Contractor a weekly statement showing the number of working days charged to the contract for the preceding week, the number of working days of time extensions being considered or approved, the number of working days originally specified for the completion of the contract and the number of working days remaining to complete the contract and the extended date for completion thereof, except when working days are not being charged in conformance with the provisions in Section 8, "Temporary Suspension of Work."

8.07 LIQUIDATED DAMAGES

It is agreed by the parties to the contract that in case all the work called for under the contract in all parts and requirements is not finished or completed within the number of working days as set forth in the special provisions, damage will be sustained by the East Contra Costa Irrigation District, and that it is and will be impracticable and extremely difficult to ascertain and determine the actual damage which the District will sustain in the event of and by reason of the delay; and it is therefore agreed that the Contractor will pay to the East Contra Costa Irrigation District, the sum set forth in the special provisions per day for each and every calendar day's delay in finishing the work in excess of the number of working days prescribed; and the Contractor agrees to pay the liquidated damages herein provided for, and further agrees that the District may deduct the amount thereof from any moneys due or that may become due the Contractor under the contract.

It is further agreed that in case the work called for under the contract is not finished and completed in all parts and requirements within the number of working days specified, the District shall have the right to increase the number of working days or not, as the District may deem best to serve the interest of the District, and if the District decides to increase the number of working days, the District shall further have the right to charge to the Contractor, or the Contractor's heirs, assigns or sureties and to deduct from the final payment for the work all or any part, as the District may deem proper, of the actual cost of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to the contract, and which accrue during the period of the extension, except that cost of final surveys and preparation of final estimate shall not be included in the charges.

The Contractor will be granted an extension of time and will not be assessed with liquidated damages or the cost of engineering and inspection for any portion of the delay in completion of the work beyond the time named in the special provisions for the completion of the work caused

by acts of God or of the public enemy, fire, floods, tsunamis, earthquakes, epidemics, quarantine restrictions, strikes, labor disputes, shortage of materials and freight embargoes, provided that the Contractor shall notify the Engineer in writing of the causes of delay within 15 days from the beginning of that delay. The Engineer shall ascertain the facts and the extent of the delay, and the Engineer's findings thereon shall be final and conclusive.

No extension of time will be granted for a delay caused by a shortage of materials unless the Contractor furnishes to the Engineer documentary proof that the Contractor has made every effort to obtain the materials from all known sources within reasonable reach of the work in a diligent and timely manner, and further proof in the form of supplementary progress schedules, as required in Section 8, "Progress Schedule," that the inability to obtain the materials when originally planned, did in fact cause a delay in final completion of the entire work which could not be compensated for by revising the sequence of the Contractor's operations. The term "shortage of materials," as used in this section, shall apply only to materials, articles, parts or equipment which are standard items and are to be incorporated in the work. The term "shortage of materials," shall not apply to materials, parts, articles or equipment which are processed, made, constructed, fabricated or manufactured to meet the specific requirements of the contract. Only the physical shortage of material will be considered under these provisions as a cause for extension of time. Delays in obtaining materials due to priority in filling orders will not constitute a shortage of materials.

If the Contractor is delayed in completion of the work by reason of changes made under Section 4, "Changes," or by failure of the District by any act of the Engineer or of the District, not contemplated by the contract, an extension of time commensurate with the delay in completion of the work thus caused will be granted, and the Contractor shall be relieved from any claim for liquidated damages, or engineering and inspection charges or other penalties for the period covered by that extension of time; provided that the Contractor shall notify the Engineer in writing of the causes of delay within 15 days from the beginning of the delay. The Engineer shall ascertain the facts and the extent of the delay, and the Engineer's findings thereon shall be final and conclusive.

The Contractor shall have no claim for damage or compensation for any delay or hindrance.

It is the intention of the above provisions that the Contractor shall not be relieved of liability for liquidated damages or engineering and inspection charges for any period of delay in completion of the work in excess of that expressly provided for in this Section 8.

8.08 TERMINATION OF CONTROL

Failure to supply an adequate working force, or material of proper quality, or failure to comply with Section 10262 of the State Contract Act, or in any other respect to prosecute the work with the diligence and force specified by the contract, is grounds for termination of the Contractor's control over the work and for taking over the work by the District as provided in the State Contract Act.

If the Contractor's control of the work is terminated or the Contractor abandons the work and the contract work is completed in conformance with the provisions in Section 10255 of the State Contract Act, any dispute concerning the amount to be paid by the District to the Contractor or

the Contractor's surety or to be paid to the District by the Contractor or the Contractor's surety, under the provisions in Section 10258 of the State Contract Act, shall be subject to arbitration in conformance with the provisions in Section 9, "Arbitration." The surety shall be bound by the arbitration award and is entitled to participate in the arbitration proceedings.

8.09 RIGHT OF WAY DELAYS

If, through the failure of the District to ready the project site, the Contractor sustains loss which could not have been avoided by the judicious handling of forces, equipment and plant, there shall be paid to the Contractor that amount that the Engineer may find to be a fair and reasonable compensation for that part of the Contractor's actual loss, that, in the opinion of the Engineer, was unavoidable, determined as follows:

Compensation for idle time of equipment will be determined in the same manner as determinations are made for equipment used in the performance of extra work paid for on a force account basis, as provided in Section 9, "Equipment Rental," with the following exceptions:

- (1) The time for which the compensation will be paid will be the actual normal working time during which the delay condition exists, but in no case will exceed 8 hours in any one day.
- (2) The days for which compensation will be paid will be the calendar days, excluding Saturdays, Sundays and legal holidays, during the existence of the delay, except that when rental of equipment is paid for under the provisions in Section 9, "Equipment not on the Work".

Actual loss shall be understood to include no items of expense other than idle time of equipment and necessary payments for idle time of workers, cost of extra moving of equipment and cost of longer hauls. Compensation for idle time of equipment will be determined as provided in this Section 8 and compensation for idle time of workers will be determined as provided in Section 9, "Labor," and no markup will be added in either case for overhead and profit. The cost of extra moving of equipment will be paid for as extra work as provided in Section 4.

8.10 UTILITY AND NON-HIGHWAY FACILITIES

Attention is directed to Section 7, "Preservation of Property," and Section 7, "Indemnification and Insurance." The Contractor shall protect from damage utility and other facilities that are to remain in place, be installed, relocated or otherwise rearranged.

It is anticipated that some or all of the utility and other facilities, both above ground and below ground, that are required to be rearranged (as used herein, rearrangement includes installation, relocation, alteration or removal) as a part of the improvement will be rearranged in advance of construction operations. Where it is not anticipated that the rearrangement will be performed prior to construction, or where the rearrangement must be coordinated with the Contractor's construction operations, the existing facilities that are to be rearranged will be indicated on the plans or in the special provisions. Where a rearrangement is indicated on the plans or in the special provisions, the Contractor will have no liability for the costs of performing the work involved in the rearrangement.

The right is reserved to the District and the owner's facilities, or their authorized agents, to enter upon the project site for the purpose of making those changes that are necessary for the rearrangement of their facilities or for making necessary connections or repairs to their properties. The Contractor shall cooperate with forces engaged in this work and shall conduct operations in such a manner as to avoid any unnecessary delay or hindrance to the work being performed by the other forces. Wherever necessary, the work of the Contractor shall be coordinated with the rearrangement of utility or other facilities, and the Contractor shall make arrangements with the owner of those facilities for the coordination of the work.

Attention is directed to the possible existence of underground main or trunk line facilities not indicated on the plans or in the special provisions and to the possibility that underground main or trunk lines may be in a location different from that which is indicated on the plans or in the special provisions. The Contractor shall ascertain the exact location of underground main or trunk lines whose presence is indicated on the plans or in the special provisions, the location of their service laterals or other appurtenances, and of existing service lateral or appurtenances of any other underground facilities which can be inferred from the presence of visible facilities such as buildings, meters and junction boxes prior to doing work that may damage any of the facilities or interfere with their service.

If the Contractor cannot locate an underground facility whose presence is indicated on the plans or in the special provisions, the Contractor shall so notify the Engineer in writing. If the facility for which the notice is given is in a substantially different location from that indicated on the plans or in the special provisions, the additional cost of locating the facility will be paid for as extra work as provided in Section 4.

If the Contractor discovers underground main or trunk lines not indicated on the plans or in the special provisions, the Contractor shall immediately give the Engineer and the Utility Company written notification of the existence of those facilities. The main or trunk lines shall be located and protected from damage as directed by the Engineer, and the cost of that work will be paid for as extra work as provided in Section 4. The Contractor shall, if directed by the Engineer, repair any damage which may occur to the main or trunk lines. The cost of that repair work, not due to the failure of the Contractor to exercise reasonable care, will be paid for as extra work as provided in Section 4. Damage due to the Contractor's failure to exercise reasonable care shall be repaired at the Contractor's cost and expense.

Where it is determined by the Engineer that the rearrangement of an underground facility is essential in order to accommodate the improvement and the plans and specifications do not provide that the facility is to be rearranged, the Engineer will provide for the rearrangement of the facility by other forces or the rearrangement shall be performed by the Contractor and will be paid for as extra work as provided in Section 4.

When ordered by the Engineer in writing, the Contractor shall rearrange any utility or other facility necessary to be rearranged as a part of the improvement, and that work will be paid for as extra work as provided in Section 4.

Should the Contractor desire to have any rearrangement made in any utility facility, or other improvement, for the Contractor's convenience in order to facilitate the Contractor's construction

operations, which rearrangement is in addition to, or different from, the rearrangements indicated on the plans or in the special provisions, the Contractor shall make whatever arrangements are necessary with the owners of the utility or other facility for the rearrangement and bear all expenses in connection therewith.

The Contractor shall immediately notify the Engineer of any delays to the Contractor's operations as a direct result of underground main or trunk line facilities which were not indicated on the plans or in the special provisions or were located in a position substantially different from that indicated on the plans or in the special provisions, or as a direct result of utility or other facilities not being rearranged as herein provided (other than delays in connection with rearrangements made to facilitate the Contractor's construction operations or delays due to a strike or labor dispute).

Any delays to the Contractor's operations as a direct result of utility or other facilities not being rearranged as provided in this Section 8, due to a strike or labor dispute, will entitle the Contractor to an extension of time as provided in Section 8, "Liquidated Damages." The Contractor shall be entitled to no other compensation for that delay.

8.11 TERMINATION OF CONTRACT

The contract may be terminated by the District when termination is authorized by Section 7, "Legal Actions Against the District," Section 7, "Damage by Storm, Flood, Tsunami or Earthquake," or by other provisions of the contract which authorize termination. The District also reserves the right to terminate the contract at any time upon a determination by the District that termination of the contract is in the best interest of the District.

If the District elects to terminate the contract, the termination of the contract and the total compensation payable to the Contractor shall be governed by the following:

- (A) The Engineer will issue the Contractor a written notice signed by the Manager, specifying that the contract is to be terminated. Upon receipt of the written notice, the Contractor will be relieved of further responsibility for damage to the work (excluding materials) as specified in Section 7-1.16, "Contractor's Responsibility for the Work and Materials," and, except as otherwise directed in writing by the Engineer, the Contractor shall:
 - (1) Stop all work under the contract except that specifically directed to be completed prior to acceptance.
 - (2) Perform work the Engineer deems necessary to secure the project for termination.
 - (3) Remove equipment from the site of the work.
 - (4) Take action that is necessary to protect materials from damage.
 - (5) Notify all subcontractors and suppliers that the contract is being terminated and that their contracts or orders are not to be further performed unless otherwise authorized in writing by the Engineer.
 - (6) Provide the Engineer with an inventory list of all materials previously produced, purchased or ordered from suppliers for use in the work and not yet used in the work, including its storage location, and such other information as the Engineer may request.

- (7) Dispose of materials not yet used in the work as directed by the Engineer. It shall be the Contractor's responsibility to provide the District with good title to all materials purchased by the District hereunder, including materials for which partial payment has been made as provided in Section 9, "Partial Payments," and with bills of sale or other documents of title for those materials.
- (8) Subject to the prior written approval of the Engineer, settle all outstanding liabilities and all claims arising out of subcontracts or orders for materials terminated hereunder. To the extent directed by the Engineer, the Contractor shall assign to the District all the right, title and interest of the Contractor under subcontracts or orders for materials terminated hereunder.
- (9) Furnish the Engineer with the documentation required to be furnished by the Contractor under the provisions of the contract including, on projects as to which Federal funds are involved, all documentation required under the Federal requirements included in the contract.
- (10) Take other actions directed by the Engineer.

(B) Acceptance of the contract as hereinafter specified shall not relieve the Contractor of responsibility for damage to materials. The Contractor shall continue to be responsible for damage to materials after issuance of the Notice of Termination, except as follows:

- (1) The Contractor's responsibility for damage to materials for which partial payment has been made as provided in Section 9, "Partial Payments," and for materials furnished by the District for use in the work and unused shall terminate when the Engineer certifies that those materials have been stored in the manner and at the locations the Engineer has directed.
- (2) The Contractor's responsibility for damage to materials purchased by the District subsequent to the issuance of the notice that the contract is to be terminated shall terminate when title and delivery of those materials has been taken by the District.

When the Engineer determines that the Contractor has completed the work under the contract directed to be completed prior to termination and such other work as may have been ordered to secure the project for termination, the Engineer will recommend that the District formally accept the contract, and immediately upon and after the acceptance by the District, the Contractor will not be required to perform any further work thereon and shall be relieved of the contractual responsibilities for injury to persons or property which occurs after the formal acceptance of the project by the District.

(C) Termination of the contract shall not relieve the surety of its obligation for any just claims arising out of the work performed.

(D) The total compensation to be paid to the Contractor shall be determined by the Engineer on the basis of the following:

- (1) The reasonable cost to the Contractor, without profit, for all work performed under the contract, including mobilization, demobilization and work done to secure the project for termination. In determining the reasonable cost, deductions will be made for the cost of materials to be retained by the Contractor, amounts realized by the sale of materials, and for other appropriate credits against the cost of the work.

Deductions will also be made, when the contract is terminated under the authority of Section 7, "Damage by Storm, Flood, Tsunami or Earthquake," for the cost of materials damaged by the "occurrence."

When, in the opinion of the Engineer, the cost of a contract item of work is excessively high due to costs incurred to remedy or replace defective or rejected work, the reasonable cost to be allowed will be the estimated reasonable cost of performing that work in compliance with the requirements of the plans and specifications and the excessive actual cost shall be disallowed.

- (2) A reasonable allowance for profit on the cost of the work performed as determined under Subsection (1), provided the Contractor establishes to the satisfaction of the Engineer that it is reasonably probable that the Contractor would have made a profit had the contract been completed and provided further, that the profit allowed shall in no event exceed 4 percent of the cost.
- (3) The reasonable cost to the Contractor of handling material returned to the vendor, delivered to the District or otherwise disposed of as directed by the Engineer.
- (4) A reasonable allowance for the Contractor's administrative costs in determining the amount payable due to termination of the contract.

All records of the Contractor and the Contractor's subcontractors, necessary to determine compensation in conformance with the provisions in this Section 8, shall be open to inspection or audit by representatives of the District at all times after issuance of the notice that the contract is to be terminated and for a period of 3 years, thereafter, and those records shall be retained for that period.

After acceptance of the work by the District, the Engineer may make payments on the basis of interim estimates pending issuance of the Final Estimate in conformance with the provisions in Section 9, "Final Payment and Claims," when, in the Engineer's opinion, the amount thus paid, together with all amounts previously paid or allowed, will not result in total compensation in excess of that to which the Contractor will be entitled. All payments, including payment upon the Final Estimate shall be subject to deduction for prior payments and amounts, if any, to be kept or retained under the provisions of the contract.

SECTION 9: MEASUREMENT AND PAYMENT

9.01 MEASUREMENT OF QUANTITIES

All work to be paid for at a contract price per unit of measurement will be measured by the Engineer in accordance with the International System of Units (SI) {United States Standard Measures.

Weighing, measuring and metering devices used to measure the quantity of materials used in the work shall be suitable for the purpose intended and shall conform to the tolerances and specifications as outlined in Title 4, Chapter 9 of the California Code of Regulations, the provisions of the California Business and Professions Code, Division 5, and these specifications. Devices not Type-approved by the Division of Measurement Standards shall be Type-approved in conformance with the requirements in California Test 109.

Weighing, measuring or metering devices used to determine the quantity of materials to be paid for will be considered to be "commercial devices" and shall be sealed by the Division of Measurement Standards or its authorized representative as often as the Engineer may deem necessary.

When material is to be measured and paid for on a volume basis and it is impractical to determine the volume by the specified method of measurement, or when requested by the Contractor in writing and approved by the Engineer in writing, the material will be weighed in accordance with the requirements specified for mass measurement and the mass will be converted to volume measurement for payment purposes. Factors for conversion from mass measurement to volume measurement will be determined by the Engineer and shall be agreed to by the Contractor before that method of measurement of pay quantities will be adopted.

9.02 FINAL PAY ITEMS

The final pay quantity of each bid item will be based on the quantity installed.

If a portion of a final pay item is eliminated, the final pay quantity will be revised in the amount represented by the eliminated portion of the item of work.

9.02A SCOPE OF PAYMENT

The Contractor shall accept the compensation provided in the contract as full payment for furnishing all labor, materials, tools, equipment, and incidentals necessary to the completed work and for performing all work contemplated and embraced under the contract; also for loss or damage arising from the nature of the work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the acceptance by the District and for all risks of every description connected with the prosecution of the work, also for all expenses incurred in consequence of the suspension or discontinuance of the work as provided in the contract; and for completing the work according to the plans and specifications. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of any obligation to make good any defective work or material.

No compensation will be made in any case for loss of anticipated profits.

9.03 FORCE ACCOUNT PAYMENT

□ When extra work is to be paid for on a force account basis, the labor, materials and equipment used in the performance of that work shall be subject to the approval of the Engineer and compensation will be determined as follows:

9.03A Work Performed by Contractor

The Contractor will be paid the direct costs for labor, materials and equipment used in performing the work determined as hereinafter provided in Sections 9, "Labor," 9, "Materials," and 9, "Equipment Rental," except where agreement has been reached to pay in conformance with the provisions in Section 9, "Work Performed by Special Forces or Other Special Services."

To the total of the direct costs computed as provided in Sections 9, "Labor," 9, "Materials," and 9, "Equipment Rental," there will be added a markup of 33 percent to the cost of labor, 15 percent to the cost of materials and 15 percent to the equipment rental.

The above markups shall constitute full compensation for all overhead costs which shall be deemed to include all items of expense not specifically designated as cost or equipment rental in Sections 9, "Labor," 9, "Materials," and 9, "Equipment Rental." The total payment made as provided above shall be deemed to be the actual cost of the work and shall constitute full compensation therefor.

When extra work to be paid for on a force account basis is performed by a subcontractor, approved in conformance with the provisions in Section 8, "Subcontracting," an additional markup of 5 percent will be added to the total cost of that extra work including all markups specified in this Section 9. The additional 5 percent markup shall reimburse the Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the extra work by a subcontractor.

9.03A(1) Labor

The Contractor will be paid the cost of labor for the workers (including foremen when authorized by the Engineer), used in the actual and direct performance of the work. The cost of labor, whether the employer is the Contractor, subcontractor or other forces, will be the sum of the following:

9.03A(1a) Actual Wages

The actual wages paid shall include any employer payments to or on behalf of the workers for health and welfare, pension, vacation and similar purposes.

9.03A(1b) Labor Surcharge

To the actual wages, as defined in Section 9, will be added a labor surcharge set forth in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the work is accomplished and which is a part of the contract. The labor surcharge shall constitute full compensation for all payments imposed by State and Federal laws and for all other payments made to, or on behalf of, the workers, other than actual wages as defined in Section 9 and subsistence and travel allowance as specified in Section 9.

9.03A(1c) Subsistence and Travel Allowance

The actual subsistence and travel allowance paid to the workers.

9.03A(2) Materials

The District reserves the right to furnish any materials it deems advisable, and the Contractor shall have no claims for costs and markup on those materials.

Only materials furnished by the Contractor and necessarily used in the performance of the work will be paid for. The cost of those materials will be the cost to the purchaser, whether Contractor, subcontractor or other forces, from the supplier thereof, except as the following are applicable:

9.03A(2a)

If a cash or trade discount by the actual supplier is offered or available to the purchaser, it shall be credited to the District notwithstanding the fact that the discount may not have been taken.

9.03A(2b)

If materials are procured by the purchaser by any method which is not a direct purchase from and a direct billing by the actual supplier to the purchaser, the cost of those materials shall be deemed to be the price paid to the actual supplier as determined by the Engineer plus the actual costs, if any, incurred in the handling of the materials.

9.03A(2c)

If the materials are obtained from a supply or source owned wholly or in part by the purchaser, the cost of those materials shall not exceed the price paid by the purchaser for similar materials furnished from that source on contract items or the current wholesale price for those materials delivered to the jobsite, whichever price is lower.

9.03A(2d)

If the cost of the materials is, in the opinion of the Engineer, excessive, then the cost of the material shall be deemed to be the lowest current wholesale price at which the materials were available in the quantities concerned delivered to the jobsite, less any discounts as provided in Section 9.

9.03A(2e)

If the Contractor does not furnish satisfactory evidence of the cost of the materials from the actual supplier thereof within 60 days after the date of delivery of the material or within 15 days after acceptance of the contract, whichever occurs first, the District reserves the right to establish the cost of the materials at the lowest current wholesale prices at which the materials were available in the quantities concerned delivered to the location of the work, less any discounts as provided in Section 9.

9.03A(3) Equipment Rental

The Contractor will be paid for the use of equipment at the rental rates listed at a local equipment agency, other than Contractor owned, the Contractor will be paid at the hourly rate shown on the rental agency invoice or agreement for the time used on force account work as provided in

Section 9, "Equipment on the Work." If a minimum equipment rental amount is required by the local equipment rental agency, the actual amount charged will be paid to the Contractor.

If it is deemed necessary by the Engineer to use equipment for which a rental rate has not been established and not available at local Rental Agencies. A suitable rental rate for that equipment will be established by the Engineer. The Contractor may furnish any cost data which might assist the Engineer in the establishment of the rental rate.

The rental rates paid as above provided 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.

Operators of rented equipment will be paid for as provided in Section 9, "Labor."

All equipment shall, in the opinion of the Engineer, be in good working condition and suitable for the purpose for which the equipment is to be used.

Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

Individual pieces of equipment or tools having a replacement value of \$500 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor.

Rental time will not be allowed while equipment is inoperative due to breakdowns.

9.03A(3a) Equipment on the Work

The rental time to be paid for equipment on the work shall be the time the equipment is in operation on the extra work being performed, and in addition, shall include the time required to move the equipment to the location of the extra work and return the equipment to the original location or to another location requiring no more time than that required to return the equipment to its original location, except that moving time will not be paid for if the equipment is used at the site of the extra work on other than the extra work. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made if the equipment is used at the site of the extra work on other than the extra work.

The following shall be used in computing the rental time of equipment on the work:

- (1) When hourly rates are listed, less than 30 minutes of operation shall be considered to be 0.5-hour of operation.
- (2) When daily rates are listed, less than 4 hours of operation shall be considered to be 0.5-day of operation.

9.03A(3b) Equipment not on the Work

For the use of equipment moved in on the work and used exclusively for extra work paid for on a force account basis, the Contractor will be paid the actual rental rates as evidenced by invoices

from the rental company. or determined as provided in Section 9 and for the cost of transporting the equipment to the location of the work and its return to its original location, all in accordance with the following provisions:

- (1) The original location of the equipment to be hauled to the location of the work shall be agreed to by the Engineer in advance.
- (2) The District will pay the costs of loading and unloading the equipment.
- (3) The cost of transporting equipment in low bed trailers shall not exceed the hourly rates charged by established haulers.
- (4) The rental period shall begin at the time the equipment is unloaded at the site of the extra work, shall include each day that the equipment is at the site of the extra work, excluding Saturdays, Sundays and legal holidays unless the equipment is used to perform the extra work on those days, and shall terminate at the end of the day on which the Engineer directs the Contractor to discontinue the use of the equipment. The rental time to be paid per day will be in accordance with the following:

Hours Equipment is in Operation	Hours to be Paid
0	4
0.5	4.25
1	4.5
1.5	4.75
2	5
2.5	5.25
3	5.5
3.5	5.75
4	6
4.5	6.25
5	6.5
5.5	6.75
6	7
6.5	7.25
7	7.5
7.5	7.75
8	8
Over 8	hours in operation

The hours to be paid for equipment which is operated less than 8 hours due to breakdowns, shall not exceed 8 less the number of hours the equipment is inoperative due to breakdowns.

When hourly rates are listed, less than 30 minutes of operation shall be considered to be 0.5-hour of operation.

When daily rates are listed, payment for 0.5-day will be made if the equipment is not used. If the equipment is used, payment will be made for one day.

The minimum rental time to be paid for the entire rental period on an hourly basis shall not be less than 8 hours or if on a daily basis shall not be less than one day.

- (5) Should the Contractor desire the return of the equipment to a location other than its original location, the District will pay the cost of transportation in accordance with the above provisions, provided the payment shall not exceed the cost of moving the equipment to the work.
- (6) Payment for transporting, and loading and unloading equipment, as above provided, will not be made if the equipment is used on the work in any other way than upon extra work paid for on a force account basis.

When extra work, other than work specifically designated as extra work in the plans and specifications, is to be paid for on a force account basis and the Engineer determines that the extra work requires the Contractor to move on to the work equipment which could not reasonably have been expected to be needed in the performance of the contract, the Engineer may authorize payment for the use of the equipment at equipment rental rates in excess of those listed as applicable for the use of that equipment subject to the following additional conditions:

- (1) The Engineer shall specifically approve the necessity for the use of particular equipment on that work,
- (2) The Contractor shall establish to the satisfaction of the Engineer that the equipment cannot be obtained from the Contractor's normal equipment source or sources and those of the Contractor's subcontractors,
- (3) The Contractor shall establish to the satisfaction of the Engineer that the proposed equipment rental rate for the equipment from the proposed source is reasonable and appropriate for the expected period of use.
- (4) The Engineer shall approve the equipment source and the equipment rental rate to be paid by the District before the Contractor begins work involving the use of that equipment.

9.03A(3c) Owner-Operated Equipment

When owner-operated equipment is used to perform extra work to be paid for on a force account basis, the Contractor will be paid for the equipment and operator, as follows:

Payment for the equipment will be made in conformance with the provisions in Section 9, "Equipment Rental."

Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the Contractor to other workers operating similar equipment already on the project or, in the absence of other workers operating similar equipment, at the rates for that labor established by collective bargaining agreements for the type of workers and location of the work, whether or not the owner-operator is actually covered by an agreement. A labor surcharge will be added to the cost of labor described herein, in conformance with the provisions in Section 9, "Labor Surcharge."

To the direct cost of equipment rental and labor, computed as provided herein, will be added the markups for equipment rental and labor as provided in Section 9, "Work Performed by Contractor."

9.03B Work Performed by Special Forces or Other Special Services

When the Engineer and the Contractor, by agreement, determine that a special service or an item of extra work cannot be performed by the forces of the Contractor or those of any of the Contractor's subcontractors, that service or extra work item may be performed by a specialist. Invoices for the service or item of extra work on the basis of the current market price thereof may be accepted without complete itemization of labor, material and equipment rental costs when it is impracticable and not in accordance with the established practice of the special service industry to provide a complete itemization.

In those instances wherein a Contractor is required to perform extra work necessitating a fabrication or machining process in a fabrication or machine shop facility away from the jobsite, the charges for that portion of the extra work performed in the facility may, by agreement, be accepted as a specialist billing.

To the specialist invoice price, less a credit to the District for any cash or trade discount offered or available, whether or not the discount may have been taken, will be added 15 percent in lieu of the percentages provided in Section 9, "Work Performed by Contractor."

9.03C Records

The Contractor shall maintain records in such a manner as to provide a clear distinction between the direct costs of extra work paid for on a force account basis and the costs of other operations.

From the above records, the Contractor shall furnish the Engineer completed daily extra work reports, either on forms furnished by the District or on computerized facsimiles of the District's forms acceptable to the Engineer, for each day's extra work to be paid for on a force account basis. The daily extra work reports shall itemize the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the Contractor, subcontractor or other forces, except for charges described in Section 9, "Work Performed by Special Forces or Other Special Services." The daily extra work reports shall provide names or identifications and classifications of workers, the hourly rate of pay and hours worked, and also the size, type and identification number of equipment, and hours operated.

Material charges shall be substantiated by valid copies of vendor's invoices. The invoices shall be submitted with the daily extra work reports, or if not available, the invoices shall be submitted with subsequent daily extra work reports. Should the vendor's invoices not be submitted within 60 days after the date of delivery of the material or within 15 days after the acceptance of the contract, whichever occurs first, the District reserves the right to establish the cost of the materials at the lowest current wholesale prices at which those materials were available in the quantities concerned delivered to the location of work less any discounts as provided in Section 9.

Daily extra work reports shall be signed by the Contractor or the Contractor's authorized representative.

The Engineer will compare the Engineer's records with the completed daily extra work reports furnished by the Contractor and make any necessary adjustments. When these daily extra work reports are agreed upon and signed by both parties, the reports shall become the basis of payment

for the work performed, but shall not preclude subsequent adjustment based on a later audit by the District.

The Contractor's cost records pertaining to work paid for on a force account basis shall be open to inspection or audit by representatives of the District, during the life of the contract and for a period of not less than 3 years after the date of acceptance thereof, and the Contractor shall retain those records for that period. Where payment for materials or labor is based on the cost thereof to forces other than the Contractor, the Contractor shall make every reasonable effort to ensure that the cost records of those other forces will be open to inspection and audit by representatives of the District on the same terms and conditions as the cost records of the Contractor. If an audit is to be commenced more than 60 days after the acceptance date of the contract, the Contractor will be given a reasonable notice of the time when the audit is to begin.

9.03D Payment

Payment as provided in Sections 9, "Work Performed by Contractor," and 9, "Work Performed by Special Forces or Other Special Services," shall constitute full compensation to the Contractor for performance of work paid for on a force account basis and no additional compensation will be allowed therefor. The payment will be made in conformance with the provisions in Section 9, "Partial Payments."

9.04 NOTICE OF POTENTIAL CLAIM

The Contractor shall not be entitled to the payment of any additional compensation for any act, or failure to act, by the Engineer, including failure or refusal to issue a change order, or for the happening of any event, thing, occurrence or other cause, unless the Contractor shall have given the Engineer due written notice of potential claim as hereinafter specified. Compliance with this Section 9 shall not be a prerequisite as to matters within the scope of the protest provisions in Section 4, "Changes," or Section 8, "Time of Completion," or the notice provisions in Section 5, "Differing Site Conditions," or Section 8, "Liquidated Damages," or Section 8, "Utility and Other Facilities," nor to any claim which is based on differences in measurements or errors of computation as to contract quantities.

The written notice of potential claim shall be submitted to the Engineer prior to the time that the Contractor performs the work giving rise to the potential claim for additional compensation, if based on an act or failure to act by the Engineer, or in all other cases within 15 days after the happening of the event, thing, occurrence or other cause, giving rise to the potential claim.

The written notice of potential claim shall be submitted and shall be certified with reference to the California False Claims Act, Government Code Sections 12650 - 12655. The notice shall set forth the reasons for which the Contractor believes additional compensation will or may be due and the nature of the costs involved. Unless the amount of the potential claim has been stated in the written notice, the Contractor shall, within 15 days of submitting the notice, furnish an estimate of the cost of the affected work and impacts, if any, on project completion. The estimate of costs may be changed or updated by the Contractor when conditions have changed. When the affected work is completed, the Contractor shall submit substantiation of the Contractor's actual costs. Failure to do so shall be sufficient cause for denial of any claim subsequently filed on the basis of the notice of potential claim.

It is the intention of this Section 9 that differences between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that the matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that the Contractor shall have no right to additional compensation for any claim that may be based on any act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was filed.

Should the Contractor, in connection with or subsequent to the assertion of a potential claim, request inspection and copying of documents or records in the possession of the District that pertain to the potential claim, the Contractor's records of the project, as deemed by the District to be pertinent to the potential claim, shall be made available to the District for inspection and copying.

9.05 STOP NOTICES

The District may at its option and at any time retain out of any amounts due the Contractor, sums sufficient to cover claims, filed pursuant to Section 3179 et seq. of the Civil Code.

9.06 PARTIAL PAYMENTS

The Engineer, once in each month, shall make an estimate in writing of the total amount of work done and acceptable materials furnished, provided the acceptable materials are furnished and delivered by the Contractor and not used or are furnished and stored for use on the contract, if the storage is within the State of California and the Contractor furnishes evidence satisfactory to the Engineer that the materials are stored subject to or under the control of the District, to the time of the estimate, and the value thereof. The estimate shall also include any amounts payable for mobilization. Daily extra work reports furnished by the Contractor less than 5 calendar days, not including Saturdays, Sundays and legal holidays, prior to the preparation of the monthly progress estimate shall not be eligible for payment until the following month's estimate.

The amount of any material to be considered in making an estimate will in no case exceed the amount thereof which has been reported by the Contractor to the Engineer on forms properly filled out and executed, including accompanying documentation as therein required, less the amount of the material incorporated in the work to the time of the estimate. Only materials to be incorporated in the work will be considered. The estimated value of the material established by the Engineer will in no case exceed the contract price for the item of work for which the material is furnished.

The District shall retain 10 percent of the estimated value of the work done and 10 percent of the value of materials so estimated to have been furnished and delivered and unused or furnished and stored as aforesaid as part security for the fulfillment of the contract by the Contractor, except that at any time after 20 percent of the work has been completed, if the Engineer finds that satisfactory progress is being made, the District may reduce the total amount being retained from payment pursuant to the above requirements to 5 percent of the total estimated value of the work and materials and may also reduce the amount retained from any of the remaining partial payments to 5 percent of the estimated value of the work and materials. In addition, on any partial payment made after 95 percent of the work has been completed, the District may reduce the amount withheld from payment pursuant to the requirements of this Section 9, to such lesser

amount as the District determines is adequate security for the fulfillment of the balance of the work and other requirements of the contract, but in no event will that amount be reduced to less than 125 percent of the estimated value of the work yet to be completed as determined by the Engineer. The reduction will only be made upon the written request of the Contractor and shall be approved in writing by the surety on the Performance Bond and by the surety on the Payment Bond. The approval of the surety shall be submitted to the District; the signature of the person executing the approval for the surety shall be properly acknowledged and the power of attorney authorizing the person to give that consent must either accompany the document or be on file with the District.

The District shall pay monthly to the Contractor, while carrying on the work, the balance not retained, as aforesaid, after deducting therefrom all previous payments and all sums to be kept or retained under the provisions of the contract. No monthly estimate or payment shall be required to be made when, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the contract.

No monthly estimate or payment shall be construed to be an acceptance of any defective work or improper materials.

Attention is directed to the prohibitions and penalties pertaining to unlicensed contractors as provided in Business and Professions Code Sections 7028.15(a) and 7031.

9.07 PAYMENT OF WITHHELD FUNDS

Attention is directed to Section 9, "Partial Payments," and in particular to the retention provisions of that section.

Upon the Contractor's request, pursuant to Public Contract Code Section 10263, the District will make payment of funds withheld from progress payments to ensure performance of the contract if the Contractor deposits in escrow with the State Treasurer, or with a bank acceptable to the District, securities equivalent to the amount withheld. The Contractor shall be beneficial owner of any securities substituted for moneys withheld and shall receive any interest thereon. Upon satisfactory completion of the contract, the securities shall be returned to the Contractor.

Alternatively, upon the Contractor's request, the District will make payment of retentions earned directly to the escrow agent. The Contractor may direct the investment of the payments into securities, and the Contractor shall receive the interest earned on the investments upon the same terms provided for securities deposited by the Contractor. Upon satisfactory completion of the contract, the Contractor shall receive from the escrow agent all securities, interest and payments received by the escrow agent from the District, pursuant to the terms in Section 10263 of the Public Contract Code.

Alternatively, and subject to the approval of the District, the payment of retentions earned may be deposited directly with a person licensed under Division 6 (commencing with Section 17000) of the Financial Code as the escrow agent. Upon written request of an escrow agent that has not been approved by the District under subdivision (c) of Section 10263 of the Public Contract Code, the District will provide written notice to that escrow agent within 10 business days of receipt of the request indicating the reason or reasons for not approving that escrow agent. The

payments will be deposited in a trust account with a Federally chartered bank or savings association within 24 hours of receipt by the escrow agent. The Contractor shall not place any retentions with the escrow agent in excess of the coverage provided to that escrow agent pursuant to subdivision (b) of Section 17314 of the Financial Code. In all respects not inconsistent with subdivision (c) of Section 10263 of the Public Contract Code, the remaining provisions of Section 10263 of the Public Contract Code shall apply to escrow agents acting pursuant to subdivision (c) of Section 10263 of the Public Contract Code.

Securities eligible for investment shall include those listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest-bearing demand deposit accounts, standby letters of credit or any other security mutually agreed to by the Contractor and the District.

The escrow agreement used pursuant to this Section 9 shall be substantially similar to the "Escrow Agreement for Security Deposits In Lieu of Retention" in Section 10263 of the Public Contract Code, deemed as incorporated herein by reference.

The Contractor shall obtain the written consent of the surety to the agreement.

9.08 PAYMENT AFTER ACCEPTANCE

After the work has been accepted by the District, as provided in Section 7, "Acceptance of Contract," payments will be made to the Contractor subject to the provisions in this Section 9.

9.08A Payment Prior to Proposed Final Estimate

After acceptance of the work by the District, the Engineer will make an estimate of the total amount of work done under the contract and the District will make a final monthly payment pending issuance of the proposed final estimate. The District will pay the balance thereon found to be due after deduction of all previous payments, all amounts to be kept or retained under the provisions of the contract and those further amounts that the Engineer determines to be necessary pending issuance of the proposed final estimate and payment thereon.

9.08B Final Payment and Claims

After acceptance by the District, the Engineer will make a proposed final estimate in writing of the total amount payable to the Contractor, including therein an itemization of the total amount, segregated as to contract item quantities, extra work and any other basis for payment, and shall also show therein all deductions made or to be made for prior payments and amounts to be kept or retained under the provisions of the contract. All prior estimates and payments shall be subject to correction in the proposed final estimate. The Contractor shall submit written approval of the proposed final estimate or a written statement of all claims arising under or by virtue of the contract so that the Engineer receives the written approval or statement of claims no later than close of business of the thirtieth day after receiving the proposed final estimate. If the thirtieth day falls on a Saturday, Sunday or legal holiday, then receipt of the written approval or statement of claims by the Engineer shall not be later than close of business of the next business day. No claim will be considered that was not included in the written statement of claims, nor will any claim be allowed as to which a notice or protest is required under the provisions in Sections 4, "Changes," 8, "Time of Completion," 8, "Liquidated Damages," 5, "Differing Site

Conditions," 8, "Utility and Other Facilities," and 9, "Notice of Potential Claim," unless the Contractor has complied with the notice or protest requirements in those sections.

On the Contractor's approval, or if the Contractor files no claim within the specified period of 30 days, the Engineer will issue a final estimate in writing in accordance with the proposed final estimate submitted to the Contractor, and within 30 days thereafter the District will pay the entire sum so found to be due. That final estimate and payment thereon shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections 9, "Records," and 9, "Clerical Errors."

If the Contractor within the specified period of 30 days files claims, the Engineer will issue a semifinal estimate in accordance with the proposed final estimate submitted to the Contractor and within 30 days thereafter the District will pay the sum so found to be due. The semifinal estimate and payment thereon shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except insofar as affected by the claims filed within the time and in the manner required hereunder and except as otherwise provided in Sections 9, "Records," and 9, "Clerical Errors." Claims filed by the Contractor shall be in sufficient detail to enable the Engineer to ascertain the basis and amount of those claims. If additional information or details are required by the Engineer to determine the basis and amount of the claims, the Contractor shall furnish additional information or details so that the additional information or details are received by the Engineer no later than the fifteenth day after receipt of the written request from the Engineer. If the fifteenth day falls on a Saturday, Sunday or legal holiday, then receipt of the information or details by the Engineer shall not be later than close of business of the next business day. Failure to submit the information and details to the Engineer within the time specified will be sufficient cause for denying the claim.

The Contractor shall keep full and complete records of the costs and additional time incurred for any work for which a claim for additional compensation is made. The Engineer or any designated claim investigator or auditor shall have access to those records and any other records as may be required by the Engineer to determine the facts or contentions involved in the claims. Failure to permit access to those records shall be sufficient cause for denying the claims.

Claims submitted by the Contractor shall be accompanied by a notarized certificate containing the following language:

Under the penalty of law for perjury or falsification and with specific reference to the California False Claims Act, Government Code Section 12650 et. seq., the undersigned,

(name)

(title) of

(company)

hereby certifies that the claim for the additional compensation and time, if any, made herein for the work on this contract is a true statement of the actual costs incurred and time sought, and is fully documented and supported under the contract between parties.

Date
d _____

/s/ _____

Subscribed and sworn _____ day
before me this _____

of _____ .

(Notary Public)
My Commission
Expires _____

Failure to submit the notarized certificate will be sufficient cause for denying the claim.

Any claim for overhead type expenses or costs, in addition to being certified as stated above, shall be supported by an audit report of an independent Certified Public Accountant. Any claim for overhead shall also be subject to audit by the District at its discretion.

Any costs or expenses incurred by the District in reviewing or auditing any claims that are not supported by the Contractor's cost accounting or other records shall be deemed to be damages incurred by the District within the meaning of the California False Claims Act.

The District will make the final determination of any claims which remain in dispute after completion of claim review by the Engineer. A board or person designated by the District will review those claims and make a written recommendation thereon to the District. The Contractor may meet with the review board or person to make a presentation in support of those claims.

Upon final determination of the claims, the Engineer will then make and issue the Engineer's final estimate in writing and within 30 days thereafter the District will pay the entire sum, if any, found due thereon. That final estimate shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections 9, "Records," and 9, "Clerical Errors."

9.09 ADJUSTMENT OF OVERHEAD COSTS

When the final estimate of the contract cost of the work, including extra work, is made and the total of the final estimate is less than 90 percent of the total bid price for performing the contract work, as submitted by the Contractor in the bid Bid, an adjustment in the final payment to the Contractor to cover overhead costs will be made as set forth below. No adjustment for overhead costs will be made when the total of the final estimate is 90 percent or more of the total bid price for performing the contract work.

Additional payment to the Contractor to cover overhead costs as above provided shall be 10 percent of the difference between a computed amount representing 90 percent of the estimated cost of the work as submitted by the Contractor in the bid Bid and the final estimate of cost of the work, including extra work.

The provisions of this Section 9.09 shall not apply to contracts which have been terminated pursuant to Sections 7, "Legal Actions Against the District," 7, "Damage by Storm, Flood, Tsunami or Earthquake," 8, "Termination of Contract," or other provisions for terminating the contract.

9.10 CLERICAL ERRORS

Notwithstanding the provisions in Section 9, "Payment After Acceptance," for a period of 3 years after acceptance of the work, all estimates and payments made pursuant to Section 9, including the final estimate and payment, shall be subject to correction and adjustment for clerical errors in the calculations involved in the determination of quantities and payments. The Contractor and the District agree to pay to the other any sum due under the provisions of this Section 9, provided, however, if the total sum to be paid is less than \$200, no payment shall be made.

9.11 ARBITRATION

Article 7.1, (Sections 10240-10240.13, inclusive) of Chapter 1, Division 2 of the Public Contract Code provides for the resolution of contract claims by arbitration.

Claims (demands for monetary compensation or damages) arising under or related to performance of the contract shall be resolved by arbitration unless the District and the Contractor agree in writing, after the claim has arisen, to waive arbitration and to have the claim litigated in a court of competent jurisdiction. Arbitration shall be pursuant to Public Contract Code Sections 10240-10240.13, inclusive, and applicable regulations (see Subchapter 3 [Sections 301-382, inclusive] of Chapter 2 of Title 1 of the California Code of Regulations). The arbitration decision shall be decided under and in accordance with the law of this State, supported by substantial evidence and, in writing, contain the basis for the decision, findings of fact and conclusions of law.

Arbitration shall be initiated by a Complaint in Arbitration made in compliance with the requirements of those regulations. A Complaint in Arbitration by the Contractor shall be made not later than 90 days after the date of service in person or by mail on the Contractor of the final written decision by the District on the claim.

SECTION 03 30 00

CONCRETE

- 3.1 GENERAL. The Contractor shall furnish all work and materials, including cement, sand and coarse aggregate, water, admixtures, curing compound, reinforcement, form work and other materials that may form an integral part of the concrete construction.
- 3.2 CONCRETE MATERIALS.
- A. CEMENT. All cement shall be Portland Cement, Type II, and shall conform to ASTM Designation C-150. The cement shall be free of lumps and properly aged.
- B. AGGREGATES. Fine and coarse aggregates shall conform to the requirements of ASTM C-33. The maximum nominal size of coarse aggregate shall be 1 inch.
- C. WATER. Water shall be clean and free from oils, acids, salts, or other injurious substances.
- D. AIR ENTRAINING AGENT. The Contractor may use an air-entraining agent conforming to the requirements of ASTM Designation C-260 in all concrete. The amount of air entraining agent, if used, shall be such as will affect the entrainment of four to six percent (4%-6%) of air, by volume of the concrete at the time of discharge from the mixer.
- 3.3 PROPORTIONING.
- The Contractor shall furnish concrete which will develop a minimum compressive strength of three thousand pounds per square inch (3,000 psi), unless noted otherwise on the drawings, and shall conform to the basic requirements set forth in these Specifications. The net water-cement ratio of the concrete (exclusive of water within or absorbed by the aggregates) shall not exceed 0.52 by weight. A minimum of five and one-half (5½) sacks of cement to each cubic yard of concrete shall be used. The slump shall not exceed three inches (3") for slabs that are horizontal or nearly horizontal and four inches (4") for all other work. The Engineer reserves the right to alter the required slump whenever, in his judgment, the quality of the work will improve. Slump test, air entrainment test, and test cylinders will be made by the Engineer and such tests shall conform to the latest ASTM procedures.

3.4 MIXING. Mixing may be performed at the site of work or by transit-mix methods. Transit-mixed concrete shall conform to the Standard Specifications for ready-mixed concrete, ASTM Designation C-94. The total volume of materials mixed per batch shall not exceed the rated capacity of the mixer as determined by the standard requirements of the Associated General Contractors of America. If a batch mixer is used, the concrete ingredients shall be mixed for not less than one and one-half (1½) minutes after all the ingredients, except for the full amount of water, are in the mixer. The mixing shall be increased if the charging and mixing operations fail to produce a concrete in which the ingredients are consistent and uniform throughout. Water shall be added prior to, during, and following the mixer-charging operation. Excessive overmixing, requiring additional water to preserve the concrete consistency, will not be permitted. Any mixer that at any time produces unsatisfactory results shall be repaired or replaced.

3.5 HANDLING AND PLACING.

A. GENERAL. In preparation for the placing of concrete, all water, sawdust, chips, and other construction debris and extraneous matter shall be removed from the interior of the forms. 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, and the Contractor will not be allowed to commence work on any such part unless the inspected and approved materials on hand are sufficient to complete the part without interruption in the placing of the concrete. The concrete shall be placed as nearly as possible to its final position by means that avoid segregation of the materials and displacement of the reinforcement. Concrete shall not be permitted to fall from a height greater than six feet (6') without the use of adjustable length pipes or "elephant trunks."

B. COMPACTION. Concrete, during and immediately after placing, shall be thoroughly compacted. The compaction shall be done with mechanical vibrators capable of transmitting vibration to the concrete at frequencies of not less than four thousand (4,000) cycles per minute. The location, manner and duration of the application of the vibrators shall be such as to secure maximum consolidation of the concrete. The vibrators shall not be attached to or held against the forms or the reinforcing steel.

C JOINTS. Construction joints placed in concrete structures to facilitate construction must be approved by the Engineer. Bond is required at all construction joints. The surface of all joints shall be clean and damp when covered with fresh concrete or mortar. Cleaning shall consist of removal of all laitance, loose or defective concrete, coatings, sand, and other foreign material from the surface of the joint and exposed reinforcing steel. Mortar for bonding of joints shall be the same as that in the concrete with the coarse aggregate omitted. The mortar bond shall be approximately one-half inch ($\frac{1}{2}$ ") thick and worked into the joint surface.

D TEMPERATURE LIMITS. 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 72 hours of curing. 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 predicted 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.

3.6 FINISHING. All horizontal surfaces on structures will have a light broom finish, unless noted otherwise.

3.7 FORMS. Forms shall conform to the shape, line, grade and dimensions of structures as shown on the Drawings. 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. Molding 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 Drawings. 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 used for form ties shall be so arranged that when the forms are removed, no metal shall be within one inch (1") 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 during the construction period. Forms shall be removed in such a manner as to prevent injury to the concrete. Immediately after the forms are removed, all defects in the concrete, including the rod holes, rock pockets, and other unconsolidated areas shall be repaired by the dry pack method, and the total exposed area coated with clear sealing compound. Wood forms shall be of sound lumber, free from loose knots or other defects, and of such quality that when treated or coated, there will be no chemical deterioration or discoloration of the formed concrete surface. All form lumber shall be surfaced lumber in narrow and uniform widths closely matched, except that plywood of adequate stiffness shall be used on all surfaces exposed to air or water. Lumber reused in forms shall be cleaned, repaired and plugged. All nails shall be withdrawn from lumber prior to reuse. Before the concrete is placed, the forms shall be coated with a non-staining commercial form oil.

3.8 CURING. Reinforced concrete shall be cured by membrane curing. Membrane curing shall be by application of a clear sealing compound conforming to ASTM C-309. Sealing compound shall be applied to the concrete surfaces by spraying in one coat to provide a continuous, uniform membrane over all areas.

3.9 TOLERANCES. Variations from level, grade, alignment, or plumb for any portion of a structure shall not exceed one-eighth inch (1/8") within thirty feet (30') unless a more restrictive tolerance is shown on the Drawings.

3.10 REINFORCEMENT.

A. MATERIALS. Reinforcing steel shall conform to ASTM Designation A-615 Grade 60 for deformed and plain billet steel bars for concrete reinforcement.

B. PLACING REINFORCEMENT. Before the reinforcing bars are placed, the surfaces of the bars and the surfaces of any metal supports for reinforcing bars shall be cleaned of heavy flaky rust, loose mill scale, dirt, grease, or other foreign substances. Heavy, flaky rust that can be removed by rubbing with burlap or equivalent treatment is considered objectionable. After being placed, the reinforcing bars shall be maintained in a clean condition until they are completely

embedded in the concrete. Reinforcing bars shall be accurately placed and secured in position so that they will not be displaced during the placing of the concrete, and special care shall be exercised to prevent any disturbance of the reinforcing bars in concrete that has already been placed.

3.11 MEASUREMENT AND PAYMENT. The quantity of concrete will be measured to the neat lines shown on the Drawings. Payment will be made at the Lump Sum Price bid per cubic yard in the schedule for reinforced concrete. The Lump Sum Price shall include furnishing and placing all concrete, base rock, materials, reinforcement, excavation, and backfill. All labor and materials for which there is no item in the Bid Schedule shall be included in the Lump Sum Price bid therefore for reinforced concrete.

3.12 EXISTING CANAL LINING.

A GENERAL. At the Contractor's option, the existing concrete canal lining shall either be protected in place or removed and replaced to facilitate construction of the new transformer foundation. If the existing lining is to be protected in place, it shall not be undercut by the excavation for the transformer foundation. Soil under the lining shall be supported and stabilized with temporary shoring if needed. Any soil that sloughs into the excavation shall be immediately replaced and compacted by hand tamping. If the Contractor elects to remove and replace the lining, or the lining is not removed and is damaged during construction, it shall be saw cut and removed at least 2-feet beyond the horizontal excavation limits or any visible cracking or damage resulting from the construction activities. The vertical limit of lining replacement shall be at the toe of the slope. The saw cut edges of the existing lining shall be thoroughly cleaned and a bonding agent applied. The soil under the saw cut edges shall be undercut approximately 4-inches beyond the edge such that the new concrete will flow under the existing lining. The thickness of the replacement lining shall match that of the existing lining, but it shall not be less than 3-inches. The concrete used for lining replacement shall be in accordance with the requirements of the transformer foundation. Replacement of the canal lining shall be completed within the time specified for the transformer foundation construction.

B PAYMENT. No separate payment will be made for protecting in place or removing and replacing the existing canal lining. The costs thereof shall be included in the Lump Sum Price Bid.

PROJECT SCOPE, BASIC MATERIALS AND METHODS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

- A. The CONTRACTOR shall assemble and install District purchased equipment in the District's existing substation. Installation includes all work, systems, products and materials required as shown in these specifications, on the drawings and for a complete operating system.
- B. The Contractor shall provide all supporting parts of the equipment supplied by the District. The provisions of this Section apply to all sections in Division 26, except as indicated otherwise. The Contract Documents consist of drawings (plans) and these specifications.
- C. The drawings and specifications are complimentary and when shown only in one document it applies to all documents. Specifications prevail in case of differences between the two documents.
- D. The Contractor shall be responsible for transporting and installing District furnished transformer, supporting parts and control panel. Equipment may be delivered near job site or delivered to District equipment yard. Contractor shall furnish crane and trucking equipment to load, transport and unload the District furnished equipment from District equipment yard to job site and placement within the substation. All materials and equipment not supplied by the District shall be supplied by the Contractor. Supporting materials, brackets and equipment shall be supplied by the Contractor. In general, the District supplied equipment is as follows:
 - 1. One three phase 2500/2800kVA, 69kV-20760/11986kV, Power Transformer. See attached Manufacturer's Drawings.
 - 2. One combination control/RTU panel to replace existing panel. See attached Control Panel reference drawings.
- E. All Labor and materials shall be provided by the Contractor except for the following which will be provided by the District.
 - 1. PLC programming
 - 2. Radio programming
 - 3. Incorporation into the District SCADA system
- F. Discussions prior to the issuance of these documents concerning substitutions and alternative methods by any party which are not included in these specifications either by reference or by revision are not a part of the work and will not be a basis for consideration and or modification of that herein stated. All substitutions of equipment and materials for that specified or shown shall have written approval of the Engineer.
- G. The electrical site drawings are schematic in form and the electrical schematic drawings are representative of the equipment and materials to be furnished and installed. Drawings illustrate approximate locations, dimensions and layout of equipment. The Contractor shall

obtain information from the District, Civil documents, actual installed equipment and materials and equipment manufacturer's submittals to determine final dimensions and location of the equipment and materials. Equipment and materials shall not be installed without review by the Engineer.

- H. Dimensions of equipment shown on the drawings are representative and may not be accurate for the approved equipment. Contractor shall furnish and install modifications required to equipment locations and mounting including concrete pads. Location of equipment is subject to final project layout. The District will provide manufacturer's information and documents on the EQUIPMENT SUPPLIED by the District. The Electrical Contractor shall coordinate all work with General Contractor. All modifications to equipment and its location shall be submitted for Engineer's review.
- I. Some Civil and Structural features have been deleted from the electrical drawings for clarity purposes. Use Civil and Structural drawings for physical dimensions, definition and quantities of materials and labor. Where physical discrepancies exist between Civil and Electrical drawings, Civil drawings shall take precedence.
- J. Conduit routing is shown diagrammatically. Contractor shall furnish and install all materials and labor consistent with field conditions to provide a complete and operating electrical system. Materials and conduit installation from transformer to 69kV and 25kV shall be in accordance with the serving utility standards. All other conduit shall be as specified in the contract documents.
- K. This installation includes equipment, devices and materials that may require assistance of the manufacturer in its installation and operation. The transformer will be delivered in a configuration consistent with transporting requirements. The contractor is responsible for:
 - 1. Accurate placement of the transformer in its final location
 - 2. Assembly of the various parts
 - 3. Employing either directly or through its sub-contractor, manufacturer's assistance during installation and start-up as may be necessary for the project's successful operation as determined by the Owner at the completion of the services.
- L. Substitutions of equipment and materials for that specified shall not be made without expressed approval of the Engineer. Such submission and review must occur prior to the purchase.
- M. The WORK of this Section is required for operation of existing electrically-driven equipment. The CONTRACTOR's attention is directed to the requirement for proper coordination of the WORK of this Section with the existing equipment.
- N. Concrete, excavation, backfill, and steel reinforcement required for support, installation, or construction of the WORK of the various sections of Division 26 is included as a part of the WORK including underground conduit, pull boxes, vaults, and equipment.
- O. Equipment, apparatus, bus and devices installed within enclosures shall be securely anchored in place and be capable of withstanding seismic forces per the 2016 California Building Code.
- P. Programmable Logic Controller and Operator Interface Programming

1. Configuration and Programming of the PLC and OI is by Application Programmer, an Owner Representative, (not in contract).

1.2 REFERENCE STANDARDS

- A. Work installed or material used must comply with latest rules of the following codes:

CEC	California Code of Regulations (CCR) Title 24, Part 3, California Electrical Code
ESO	California Code of Regulations (CCR) Title 8, Chapter 4, Subchapter 5 Electrical Safety Orders
GO128	Public Utilities Commission, State of California, Construction of Underground Electric Supply and Communication Systems
GO95	Public Utilities Commission, State of California, Construction of Overhead Electric Line Construction
CBC	California Building Code, 2009 Edition
NFPA 70 (NEC)	National Electrical Code, 2017 Edition

- B. Installation of electrical equipment and materials shall comply with OSHA Safety and Health Standards (29 CFR 1910 and 29 CFR 1926, as applicable), state building standards, and applicable local codes and regulations.
- C. Where the requirements of the specifications conflict with IEEE, UL, NEMA, NFPA, ICEA, ANSI, NETA, ASTM or other applicable standards, the more stringent requirements shall govern.
- D. Electrical equipment shall be listed by and shall bear the label of Underwriters' Laboratories, Inc. (UL) or an independent testing laboratory acceptable to the local code enforcement agency having jurisdiction

1.3 SIGNAGE AND MARKINGS

- A. Identification: Provide danger, caution, and warning signs and equipment identification markings in accordance with applicable federal and state OSHA and NEC requirements.
- B. Local Disconnect Switches
 1. Each local disconnect switch for equipment shall be legibly marked to indicate its purpose unless the purpose is indicated by the location and arrangement.
- C. Warning Signs
 1. Six hundred volts nominal, or less: Entrances to guarded locations that contain live parts shall be marked with conspicuous signs prohibiting unqualified persons to enter.

2. Greater than 600 volts: Buildings, rooms, and/or transformer enclosures containing exposed live parts or exposed conductors operating at greater than 600 volts nominal shall be lockable. Permanent and conspicuous warning signs shall be provided reading as follows: DANGER – HIGH VOLTAGE – KEEP OUT.
 3. Indoor electrical installations that are open to unqualified persons and containing metal – enclosed switchgear, unit substations, transformers, and other similar associated equipment over 600 volts nominal shall be marked with appropriate caution signs.
 4. Outside branch circuits and feeders over 600 volts: Warning signs shall be posted in plain view where unauthorized persons might come in contact with live parts – WARNING – HIGH VOLTAGE – KEEP CLEAR.
- D. Isolating Switches: Isolating switches not interlocked with an approved circuit - interrupting device shall be provided with a sign warning against opening them under load.

1.4 PUBLIC UTILITIES REQUIREMENTS

- A. The CONTRACTOR shall contact the East Contra Costa Irrigation District for coordination of modifications to the existing substation.
- B. Electrical service shall be as indicated.
- C. The CONTRACTOR shall verify and provide service conduits, fittings, grounding devices, and service wires required.

1.5 PERMITS AND INSPECTION

- A. Permits shall be obtained and inspection fees shall be paid by the Contractor.

1.6 SUBMITTALS

- A. The Contractor shall submit for review all equipment and materials specified in 26 00 00 Sections and as shown on the Contract Drawings. The Contractor shall furnish all labor and materials required to produce submittals that meet the contract requirements.
 1. Requirements described herein are specific to electrical submittals and are secondary to those described in other general specifications sections. Any additional requirements described here that are beyond those described in other sections shall be provided as described. Conflicts shall be resolved by giving priority to general specifications.
 2. The Contractor shall ensure that the equipment suppliers provide the submittal documentation required in this section. Submittals shall be neat, orderly, complete (without un-needed parsing), and indexed.
 3. Electronic submittals shall be assembled in accordance with the specifications for hard copy submittals with table of contents, bookmarks, tabs, subtabs, etc. utilizing the electronic bookmarks feature available in the PDF assembler.
 4. Electronic (PDF) submittals must follow all applicable requirements for hard copy submittals including indexing, item selection indication, bookmarks, etc.

5. The Contractor shall coordinate submittals with the work so that project will not be delayed. This coordination shall include scheduling the different categories of submittals, so that one will not be delayed for lack of coordination with another. Time extensions will not be allowed due to failure to properly schedule submittals.
6. No material or equipment shall be delivered to the job site until the submittal for such items has been reviewed by the Engineer and marked "No Exceptions Taken" or "Make Corrections Noted".
7. The equipment specifications have been prepared on the basis of the equipment first named in the Specifications. The Contractor shall note that the second named equipment, if given, is considered acceptable and equal equipment, but in some cases additional design, options, or modifications may be required to meet Specifications or functional installation.
8. Exceptions to the Specifications or Drawings or equipment or procedures submitted as "equal" to specified equipment shall be clearly identified in a letter at the front of the submittal. Submittal data for "equal" equipment or procedures shall contain sufficient details so a proper evaluation may be made by the Engineer. The Contractor is responsible for verifying proper application/operation of substituted equipment.
9. The opinion of the Engineer will be the final determination whether a substitution request meets the design intent.
10. Deviations from the Contract documents shall not be incorporated into the work without prior written approval of the Engineer. A "Change Order" directive from the Engineer is required prior to incorporating any deviation from the Contract documents that has costs associated. The cost differential associated with this change order must be negotiated with the Engineer to amend the Contract to reflect the costs or savings.
11. Interconnection Diagrams will be prepared by the District between the substation and the control building for devices and equipment that require field wiring. The contract Interconnection Diagrams will be prepared using the information shown on the Contractor's submittals. Interconnection Diagrams will show the termination of both ends of each known wire to be installed along with the wire designation. The Interconnection Diagrams will be prepared after all submittals have been approved.

The Contractor shall correct or add any connections, designations and information needed to produce as-built diagrams. The marked-up Interconnection Diagrams shall be submitted for Engineer's review after completion of the testing. The wire and terminal designations shown on the Interconnection Drawings shall be placed on each wire at each termination and on each terminal of the terminal blocks.

B. Submittal Procedures

1. Identify all submittals by submittal number on letter of transmittal. Submittals shall be numbered consecutively and resubmittals shall have a letter suffix. For example:
 - a. 1st submittal: 1
 - b. 1st resubmittal: 1A
 - c. 2nd resubmittal: 1B, etc.

2. The reviewed submittals will be annotated "No Exceptions Taken", "Make Corrections Noted", "Amend and Resubmit", or "Rejected-Resubmit". The following actions shall then be taken by the Contractor:
 - a. "No Exceptions Taken" - The Contractor may proceed with the work covered in this submittal. No resubmission is necessary.
 - b. "Make Corrections Noted" - The Contractor may proceed with the work covered in this submittal incorporating the changes noted. However, the Contractor shall revise the submittal in accord with the changes noted and resubmit six (6) copies of drawings, bill of materials, and catalog data denoting changes within 14 calendar days when requested by the Engineer for record keeping purposes.
 - c. "Amend and Resubmit" - The Contractor shall not proceed with the work covered in this submittal. The Contractor shall revise and correct the submittal in accordance with the comments and resubmit six (6) copies within 14 calendar days for approval.
 - d. "Rejected – Resubmit" - The Contractor shall not proceed with the work covered in this submittal. The submittal did not address the work scope as defined by the submittal's title or the previous submittal comments have not been addressed in full. The Contractor shall revise and correct the submittal in accordance with the specifications, and resubmit six (6) copies within calendar 14 days for approval.
- C. Resubmittals shall address all comments by the Engineer. A submittal response letter shall be submitted that addresses each comment by the Engineer with a standardized response of "revised" or with a written explanation. Partial re-submittals (that do not address all comments) may be returned without review at the discretion of the Engineer.
- D. The Contractor shall be responsible for the Engineer's review cost for each resubmittal in excess of the second resubmittal. These costs will be back-charged to the Contractor and will be deducted from his progress payments.
- E. Electrical Equipment -- Submittal data shall be grouped by equipment type. Each submittal shall be as complete as possible covering the entire project and scope of supply. Drawings or equipment submitted individually that are not on the critical path will not be accepted for individual review. The electrical submittals shall include (as a minimum):
 1. Table of Contents
 2. Comment Letter: The Contractor shall note all deviations from Contract Documents and the reason(s) for the deviation. He may use this forum to inform the Engineer of important information related to the project. RFIs must be submitted separately. Re-submittals shall include written responses to every comment provided by the engineer during the previous review.
 3. Bill of Materials: The Contractor shall provide Bill of Material for electrical components formatted as shown below. Generic names or part numbers as defined by a distributor or Integrator are not acceptable. Only the originating manufacturer's name and part number shall be listed. Provide separate bill of materials for each panel, MCC, instrument list, etc.

Bill of Material

Item #	Qty	Tag#	Description	Manufacturer	Part #

4. Shop Drawings:
 - a. Equipment elevations with enclosure details drawn to scale or dimensioned with relative scale.
 - b. Electrical One-line, Elementary, and wiring diagrams
 - c. Wiring diagrams

5. Catalog Data shall include the following: (features and options shall be highlighted, circled, or "arrowed.")
 - a. Instrumentation data summary sheets (by Contractor)
 - b. Manufacturer's technical information brochure
 - c. Physical size and mounting details and illustrations
 - d. Calibration Range
 - e. Input/output signals
 - f. Electric power, air, and/or water supply requirements.
 - g. Options selected and available (Cross out items not included)
 - h. Materials of construction of components

- F. Shop Drawings - Shop drawings shall be furnished for each electrical panel even if one was not shown explicitly on the Drawings. Shop drawings shall be numbered in sequence. Blank drawings or drawings that contain no specific project data will not be accepted for review.

- G. Preparation - All drawings shall be generated with a computer utilizing AutoCAD or similar drafting program. Drawings shall be no smaller than 11" x 17". The lettering shall be legible and no smaller than 0.75 inch in height.

- H. Contractor furnished Drawings – All drawings shall be custom prepared for this project and shall have borders and a title block identifying the project, manufacturer, system or location, drawing number, drawing title, AutoCAD file name, project engineer, date, revisions, and type of drawing. Diagrams shall carry a uniform and coordinated set of wire colors, wire numbers, and terminal block numbers. The shop drawings shall include the following as a minimum:
 1. Electrical one-line diagrams detailing all devices associated with the power distribution system. The following applicable information or data shall be shown on the one- or three- line diagram: location, size and amperage rating of bus; size and amperage rating of wire or cable; breaker ratings, number of poles, and frame sizes; power fail and other protective devices; fuse size and type.

2. Wiring diagrams showing the requirements for each instrument or device connection.
3. Interconnection Diagrams shall be prepared by the District for all physically separate devices and equipment between the substation and the control building that have wiring that is to be installed in the field by the Contractor. The Interconnection Diagrams will be prepared after all submittals have been made and approved. The diagrams will show the termination of both ends of each wire to be installed as shown on the submittals. The diagrams shall be marked-up in red by the Contractor where delivered equipment has different terminal designations. The Interconnection Diagrams shall be updated and kept current during installation. The modified Interconnection Diagrams shall be submitted as as-built drawings.
4. Elementary diagrams shall be provided for all relay logic, programmable logic controls, motor controls, power supplies, and other wiring.
5. Equipment exterior and interior scaled drawings of front, side, elevation, dead front, front panel devices, and back pan components. Show fabrication methods and details; including material of construction, paint color, door latch and lock, and ventilation system. Show shipping split locations and offloading information. Submit base plan showing allowed conduit entrance areas and bolt hole locations.
6. Drawings shall show UL required information as needed to UL label the equipment in accordance with UL procedures for label applied.
7. Submit full size drawing of all nameplates and tags, as specified herein, to be used on project. Submittal to include the following:
 - a. Dimensions of nameplate.
 - b. Exact lettering and font for each nameplate.
 - c. Color of nameplate.
 - d. Color of lettering.
 - e. Materials of construction.
 - f. Method and materials for attachment.
8. Drawing showing location of nameplates on each, panel and enclosure.
- I. Shop Drawings shall be custom prepared. Drawings or data indicating "optional" or "as required" equipment are not acceptable. Options not proposed shall be crossed out or deleted from Shop Drawings.
- J. Materials and Equipment Schedules: The CONTRACTOR shall deliver to the ENGINEER within 30 Days of the commencement date in the Notice to Proceed, a complete list of materials, equipment, apparatus, and fixtures proposed for use. The list shall include type, sizes, names of manufacturers, catalog numbers, and such other information required to identify the items.
- K. Technical Manuals: Complete manufactured prepared information.

L. Drawings of duct banks and concealed below-grade electrical installations. Record drawings shall be prepared and submitted.

M. Seismic Anchor Design Calculations

1. All equipment and electrical materials shall be so installed as to remain in a secure and captive position when subjected to a horizontal force in accordance with the California Building Code for Seismic Zone 4 requirements. A seismic importance factor, corresponding to Essential Facility Occupancy Category, shall be used. Method of securing shall constrain equipment against both vertical and horizontal forces and overturning forces.
2. Calculations shall be submitted, as prepared by a structural engineer registered in the State of California, for earthquake forces on all specified equipment. Calculations shall include wind loading forces for equipment installed outdoors. Describe requirements for anchorage, components, layout, location and size of all bolts, straps, clips or other devices used.

1.7 AREA DESIGNATIONS

A. General

1. Raceway system enclosures shall comply with Section 26 05 33 – Raceway and Boxes for Electrical Systems.
2. Electric WORK specifically indicated in sections within any of the specifications shall comply with the requirements of those sections unless indicated otherwise.
3. Installations in hazardous locations shall conform strictly to the requirements of the Class, Group, and Division indicated.

B. Material Requirements

1. NEMA 4X enclosures shall be 304 or 316 stainless steel. NEMA 4X enclosures shall not be coated.
2. NEMA 1, 3R, and 12 enclosures shall be steel, primed and coated with ANSI 61 light grey paint.

1.8 TESTS

- A. The CONTRACTOR shall be responsible for factory and field tests required by specifications in section 26 08 01 Factory and Field Testing and by the ENGINEER or other authorities having jurisdiction. The CONTRACTOR shall furnish necessary testing equipment and pay costs of tests, including replacement parts and labor, due to damage resulting from damaged equipment or from testing and correction of faulty installation.
- B. Where test reports are indicated, proof of design test reports for mass-produced equipment shall be submitted with the Shop Drawings, and factory performance test reports for custom-manufactured equipment shall be submitted and be approved prior to shipment. Field test reports shall be submitted for review prior to Substantial Completion.
- C. Equipment or material that fails a test shall be removed and replaced or if the ENGINEER approves, may be repaired and retested for compliance. Corrections to equipment or

materials with a factory warranty shall be as recommended by the manufacturer and shall be done in a manner that does not void the warranty.

1.9 DEMOLITION AND RELATED WORK

- A. The CONTRACTOR shall perform demolition WORK as indicated. The CONTRACTOR is cautioned that demolition WORK may also be indicated on non-electrical Drawings. Coordinate with all trades electrical de-energization, disconnection, and removal, and the overall sequence of construction.
 - 1. A portion of the substation fence shall be removed for expansion of the substation for the new transformer. It shall be replaced with a new fence as shown and shall be grounded to the ground mat.
- B. Electrical requirements associated with removed equipment shall be:
 - 1. Remove dedicated wiring and exposed conduits back to the source.
 - 2. Abandon in place wiring that shares conduits with other equipment wiring, except power wiring. Power wiring shall be removed from the power source to the first pullbox or manhole remote from the panel. The remainder shall be abandoned in place. Power wiring shall be disconnected, tagged and marked at the source of the power.
 - 3. Abandon in place wiring routed through encased conduits. Encased conduits shall be cut flush to the floor and be grouted flush with the floor.
 - 4. Reroute conduit and wiring interrupted by structure modifications and restore functionality of circuit
 - 5. Remove all exposed and surface mounted conduit and wire that will not be used in the new installation.
- C. Where new lighting and receptacles are installed, old lighting, receptacles, switches, wiring, and conduits shall be removed.
- D. Wiring and conduits indicated to be extended shall be terminated in a new junction box with terminal strips. The junction box shall have a NEMA rating in accordance with the area in which it is located and shall be sized as required. Wires and terminals shall be properly identified before disconnection.
- E. Removed materials and equipment not indicated to be returned to the OWNER shall, upon removal, become the CONTRACTOR's property and shall be disposed of off the Site.
- F. Material and equipment indicated to be relocated or reused shall be removed and relocated, and reinstalled with care to prevent damage thereto.
- G. Materials indicated to be returned to the OWNER shall be placed in boxes with the contents clearly marked and be stored at a location determined by the ENGINEER.
- H. Where electrical cabinets/panels are indicated to have components, assemblies, or circuits removed and reconnected, the affected compartments shall have new engraved nameplates worded as indicated and matching the existing, or the panelboard schedule shall be modified to indicate the revised circuits. Pencil or magic marker markings directly on the MCC or panelboard breaker are not permitted.

1.10 CONSTRUCTION SEQUENCING

- A. Site operation after designated construction schedule is critical. Therefore, CONTRACTOR shall carefully examine WORK to be done in, on, or adjacent to existing equipment. WORK shall be scheduled, subject to OWNER's approval, to minimize outage time. The CONTRACTOR shall submit a construction sequence and duration of activities to be performed during designated construction period.
- B. Switching, safety tagging, etc., required for plant shutdown or to isolate existing equipment shall be performed by the OWNER. In no case shall the CONTRACTOR begin any WORK in, on, or adjacent to existing equipment without written authorization by the OWNER.
- C. The CONTRACTOR shall make modifications or alterations to existing electrical facilities required to successfully install and integrate the new electrical equipment as indicated. Modifications to existing equipment, panels, or cabinets shall be made in a professional manner. Coatings shall be repaired to match existing. The costs for modifications to existing electrical facilities that are required for a complete and operating system shall be included in the Bid, and no additional payment for this WORK will be authorized.
- D. Extreme caution shall be exercised in digging trenches to not damage existing underground utilities and ground mat. Costs of repairs of damages caused during construction shall be the CONTRACTOR's responsibility as a part of the WORK.
- E. The CONTRACTOR shall be responsible for identifying available existing circuit breakers in lighting panels for the intended use as required. Costs for this WORK shall be included in the Bid.
- F. The CONTRACTOR shall visit the Site before submitting a Bid to better acquaint itself with the WORK of this Contract. Lack of knowledge will not be accepted as justification for extra compensation to perform the WORK.
 - 1. Installation of Temporary Equipment
 - 2. The CONTRACTOR shall provide electrical power for his construction activities necessary for completion of the work. Costs associated with these temporary installations shall be included in the Bid.
 - 3. Temporary wiring and equipment shall remain the property of the CONTRACTOR unless indicated otherwise.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. Equipment and materials shall be new, shall be listed by UL, and shall bear the UL label where UL requirements apply. 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. Equipment and materials shall be of industrial grade standard of construction.
- B. Where a NEMA enclosure type is indicated in a non-hazardous location, the CONTRACTOR shall utilize that type of enclosure, despite the fact that certain modifications such as cutouts for control devices may negate the NEMA rating.

2.2 MOUNTING HARDWARE

A. Miscellaneous Hardware

1. Nuts, bolts, and washers shall be stainless steel.
2. Threaded rods for trapeze supports shall be continuous threaded galvanized steel, 3/8-inch diameter minimum.
3. Strut for mounting of conduits and equipment shall be galvanized steel for indoor building installations and stainless steel for other installations. Where contact with concrete or dissimilar metals may cause galvanic corrosion, suitable non-metallic insulators shall be utilized to prevent such corrosion. Aluminum strut shall not be utilized. Strut shall be as manufactured by Unistrut, B-Line, or equal.
4. Anchors for attaching equipment to concrete walls, floors, and ceilings shall be as shown, if not shown, shall be stainless steel expansion anchors, such as "Rawl-Bolt," "Rawl-Stud" or "Lok-Bolt" as manufactured by Rawl, similar by Star, or equal. Wood plugs shall not be permitted.

2.3 ELECTRICAL IDENTIFICATION

- A. Nameplates: Nameplates shall be fabricated from white-letter, black-face laminated plastic engraving stock, Formica Type ES-1 or equal. Each shall be fastened securely, using fasteners of brass, cadmium-plated steel, or stainless steel, screwed into inserts or tapped holes as required. Engraved characters shall be block style with no characters smaller than 1/8-inch top to bottom.
- B. Conductor and Equipment Identification: Equipment identification devices shall be either imprinted plastic-coated cloth marking devices such as manufactured by Brady, Thomas & Betts, or equal. Conductor identification shall be heat imprinted heat-shrink plastic tubing.

PART 3 -- EXECUTION

3.1 GENERAL

- A. Incidentals: The CONTRACTOR shall provide materials and incidentals required for a complete and operable system, even if not required explicitly by the Contract Documents. Typical incidentals are terminal lugs not furnished with vendor-supplied equipment, compression connectors for cables, splices, junction and terminal boxes, and control wiring required by vendor-furnished equipment to connect with other equipment indicated in the Contract Documents.
- B. Field Control of Location and Arrangement: The Drawings diagrammatically indicate the desired location and arrangement of outlets, conduit runs, equipment, and other items. Exact locations shall be determined by the CONTRACTOR in the field based on the physical size and arrangement of equipment, finished elevations, and other obstructions. Locations on the Drawings, however, shall be followed as closely as possible.
 1. Where conduit development drawings or "home runs" are indicated, the CONTRACTOR shall route the conduits in accordance with those requirements. Routings shall be exposed or encased as indicated, except that conduit in finished areas shall be concealed unless specifically indicated otherwise. Conduits encased

in a slab shall be sized for conduit OD to not exceed one-third of the slab thickness and be laid out and spaced to not impede concrete flow or be in contact with the reinforcing steel.

2. Conduit and equipment shall be installed in such a manner as to avoid obstructions, to preserve headroom, and keep openings and passageways clear. Lighting fixtures, switches, convenience outlets, and similar items shall be located within finished rooms as indicated. Where the Drawings do not indicate exact locations, such locations will be determined by the ENGINEER. If equipment is installed without instruction and must be moved, it shall be moved without additional cost to the OWNER. Lighting fixture locations shall be adjusted slightly to avoid obstructions and to minimize shadows.
 3. Wherever conduits and wiring for lighting and receptacles are not indicated, it shall be the CONTRACTOR'S responsibility to provide lighting and receptacle-related conduits and wiring as required, based on the actual installed fixture layout and the circuit designations as indicated. Wiring shall be #12 AWG minimum, and conduits shall be 3/4-inch minimum (exposed) and 1-inch minimum (encased). Where circuits are combined in the same raceway, the CONTRACTOR shall derate conductor ampacities in accordance with NEC requirements.
- C. Workmanship: Materials and equipment shall be installed in strict accordance with printed recommendations of the manufacturer. Installation shall be accomplished by workers skilled in the WORK. Installation shall be coordinated in the field with other trades to avoid interferences.
- D. Protection of Equipment and Materials: The CONTRACTOR shall fully protect materials and equipment against damage from any cause. Materials and equipment, both in storage and during construction, shall be covered in such a manner that no finished surfaces will be damaged, marred, or splattered with water, foam, plaster, or paint. Moving parts shall be kept clean and dry. The CONTRACTOR shall replace or refinish damaged materials or equipment, including faceplates of panels and switchboard sections as part of the WORK.
- E. Incoming utility power materials shall be provided in conformance with the District's requirements.

3.2 CORE DRILLING

- A. The CONTRACTOR shall perform required core drilling through concrete walls and decks where sleeves were not provided during construction of the structures. Locations of floor penetrations, as may be required, shall be based on field conditions. Verify exact core drilling locations based on equipment actually furnished as well as exact field placement.

3.3 EQUIPMENT ANCHORING

- A. Floor-supported, wall, or ceiling-hung equipment and conductors shall be anchored in place by methods that will meet seismic requirements in the area where the project is located. Vertically mounted panels that weigh more than 500 pounds or that are within 18-inches of the floor shall be provided with fabricated steel support pedestals. If the supported equipment is a panel or cabinet enclosed within removable side plates, it shall match supported equipment in physical appearance and dimensions.

- B. Steel channel shall be installed to level existing imperfections. The concrete slabs shall be saw cut for installation of channel. Channel shall be grouted in place to finished elevation.
- C. Anchoring methods and leveling criteria in the printed recommendations of the equipment manufacturers are a part of the WORK of this Contract. Such recommendations shall be submitted as Shop Drawings under Paragraph 1.6.
- D. EQUIPMENT IDENTIFICATION
 - 1. General: Equipment and devices shall be identified as follows:
 - 2. Nameplates shall be provided for panelboards, control and instrumentation panels, starters, switches, and pushbutton stations. In addition to nameplates, control devices shall be equipped with standard collar-type legend plates.
 - 3. Control devices within enclosures shall be identified as indicated. Identification shall be similar to the subparagraph above.
 - 4. Toggle switches that control loads out of sight of switches and multi-switch locations of more than 2 switches shall have suitable inscribed finish plates.
 - 5. Equipment names and tag numbers, where indicated on the Drawings, shall be utilized on nameplates.
 - 6. The CONTRACTOR shall furnish printed circuit directories for panelboards; circuit directory shall accurately reflect the outlets connected to each circuit.
 - 7. Termination points on terminal blocks shall be labeled by identifiers on the blocks. Identifiers shall be preprinted by the terminal manufacturer or custom-printed. Hand lettered markers will not be acceptable.

3.4 CLEANING

- A. Before final acceptance, the electrical WORK shall be thoroughly cleaned. Exposed parts shall be thoroughly cleaned of cement, plaster, and other materials. Temporary tags, markers, stickers, etc. shall be removed. Oil and grease spots shall be removed with a non-flammable cleaning solvent. Such surfaces shall be carefully wiped and cracks and corners scraped out. Touch-up paint shall be applied to scratches on panels and cabinets. Electrical cabinets or enclosures shall be vacuum-cleaned.
- B. Debris and refuse from cleaning shall be disposed of off the Site.

END OF SECTION

SECTION 26 05 13

MEDIUM AND HIGH VOLTAGE CABLE

PART 1 -- GENERAL

1.1 REQUIREMENT

- A. This Specification Section covers the furnishing, installing and testing of Medium and High Voltage Power Cable required to complete the electric installation as specified herein and as shown.
- B. Medium and High Voltage Power Cable shall be suitable for use in wet and dry locations exposed, in conduit and underground duct systems.

1.2 REFERENCES

- A. Electrical Specifications, 26 05 00 Basic Electrical Materials and Methods
- B. Electrical Specifications, 26 08 01 Factory and Field Testing

1.3 SUBMITTALS

- A. Descriptive literature for all materials furnished under this section shall be submitted in accordance with Sections 26 05 00 of these specifications.
- B. Submittals for the Cable shall include but shall not be limited to, the following:
 - 1. Manufacturer's product data sheets for all cables, of each type and voltage rating, on which work is to be performed under this contract.
 - 2. Certified test reports prepared by manufacturer.
 - 3. List of installations of the power cable of the type and rating specified prepared by the manufacturer for the purpose of demonstrating successful operating experience.
 - 4. Certification that the manufacturer has been manufacturing power cable of the type and rating specified in his current facility for a minimum of five (5) years.
 - 5. Certification that the cable to be delivered has been manufactured within one year of the shipment date.
 - 6. Qualifications of the cable splicer's to be used on the project. A certificate showing each cable splicer specific applicable experience of making terminations during the immediate past five years.

1.4 QUALITY ASSURANCE

- A. The Medium and High Voltage Cable shall be manufactured and tested under the control of a Quality Assurance program which meets the requirements of Section 10CFR50, Appendix B, of the Federal Register as defined in ANSI N45.2.
- B. The Quality Assurance program shall demonstrate compliance with the above referenced criteria by having passed yearly Quality Audits conducted by outside independent organizations.
- C. The cable shall have a performance record demonstrating a minimum of five (5) years successful operating experience in utility and industrial power cable applications. District may require that adequate service records be submitted to prove competence of cable manufacturer.
- D. The following identifying legend shall be printed on the jacket with contrasting ink repeated at two (2) foot intervals with unmarked surfaces not exceeding six inches.

Manufacturer
Plant #
Conductor Size
Conductor Material
Voltage
Insulation Type
Insulation Thickness
MV105

1.5 DELIVERY, STORAGE AND HANDLING

- A. Cable shall be delivered complete, in manufacturer's original, unopened protective packaging. Packing materials shall be such as to prevent damage to the materials during transportation and handling.
- B. Cable shall be handled in a manner to prevent damage to the coverings and conductor.
- C. Maintain protective coverings until ready for installation.

PART 2 -- PRODUCTS

2.1 REFERENCE STANDARDS

- A. Cable supplied under this contract shall be designed, manufactured, and tested in accordance with the latest version of the following standards.

- 1. American Society Testing Materials (ASTM)

B-609
B-231

- B. Underwriters Laboratory (UL)
 - UL-1072
- C. Insulated Cable Engineers Association (ICEA)
 - S-93-639
 - S-97-682
- D. National Electrical Code (NEC)
 - 501, 502, 503, 506
- E. Institute of Electrical and Electronic Engineers (IEEE)
- F. National Electrical Manufacturer's Association
 - WC-74
- G. California Code of Regulations (CAC)
 - Title 24

2.2 MEDIUM AND HIGH VOLTAGE INSULATED CABLE

- A. The conductor shall be single conductor; Class B stranded copper, extruded semi-conducting ethylene-propylene rubber strand screen, EPR insulation, copper tape shield and overall PVC jacket with a continuous corrugated aluminum sheath
 - 1. 25kV: Okonite Type MV90 135-23-6452 or equal.
 - 2. 69kV: Okonite Type MV90 135-22-3765 or equal
- B. The insulation shall be compounded by the cable manufacturer in its own facility using a closed system to insure maximum cleanliness. All ingredients will be mixed, screened and then treated with the accelerator or cross-linking agent to insure complete blending and uniformity of the final compound.

2.3 PRODUCTION TESTS

- A. Conductors shall meet the electrical resistance requirements of ICEA S-68-516 Section 2.5
- B. Insulation Test - Insulation Resistance test shall be performed in accordance with the requirements of ICEA S-68-516, Part 6.28. Each cable shall have an insulation resistance not less than that corresponding to the insulation resistance constant of at

least 50,000 megohms-1000 ft. at 15.6C

C. High Voltage Test

A high voltage AC and DC test is performed in accordance with Part 6.27 of ICEA S-68-516 at the AC and DC test voltages given in Table II.

2.4 SPLICES AND TERMINATIONS

- A. Medium voltage cable splices and terminations shall be as shown specific to cable specifications. Splices and terminations shall be manufactured by ESNA, General Electric, 3M Company, PLM Products or equivalent. Stress cones either shall be of wrapped construction or preformed rubber cone with semi-conducting inlay for shield termination. Materials, procedures and dimensions shall be only as supplied and specified by the splice kit manufacturer for specific cable size and type used. Terminations for medium voltage cables connected to pad mounted dead-front transformers or termination cabinets shall be elbow connectors. Terminations shall be made by certified cable splicers. Certificates shall be submitted for review.

2.5 CABLE MARKER TAGS

- A. Cable marker tags shall be made of durable polyethylene, non-corrosive, non-conductive, and resists acid, alkali, saltwater and shall be completely reusable. Tags shall consist be attached to the feeder cables and tag marking shall indicate system voltage, cable size and identification. Tags shall be Almetak Industries; Tech Products, Inc. type Fasttags; or equal. Cable is to be color taped to match exiting color-coding.

PART 3 -- PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. The conductor of each phase of three phase circuits shall be equal in length as close as possible.
- B. Do not pull cables into conduits until factory tests of cable have been approved.
- C. Cable shall not be installed in conduit until the entire raceway system has been completed and cleaned. The equipment and methods for the installation of cable shall insure that no cuts or abrasions in the insulation or protective covering or kinks in the conductors occur. Cable installation will be in new duct.
- D. Prior to installing cable, a flexible steel mandrel shall be pulled through the duct followed by a heavy-duty wire brush mandrel. The mandrel shall be sized for the existing conduit to be cleaned. Prior to installing cable in existing duct with existing cable, the existing cable shall be pulled out followed by the cleaning process as described for spare duct.

- E. Cables shall be pulled down grade with the feed in point at point of the highest elevation. Do not exceed cable manufacturer's recommended maximum pulling tension, side wall pressure and bending radius. The Contractor shall use a tension gauge at all times while installing the cable. As a maximum, pulling tension shall be limited to 0.008 lbs per circular mil of conductor, manufacturer's recommendation and 1000 lbs whichever is smaller.
- F. The Contractor shall take all necessary precautions in working in vaults and manholes to protect personnel, equipment, and energized feeders when installing new cables and components. A complete 360 degree loop of cable shall be made in each vault and manhole.
- G. The Contractor shall pull cable into the conduit with sufficient length remaining at the ends to conveniently make connections to all equipment or devices.
- H. Where practicable, the minimum radius to which an insulated conductor shall be bent, whether permanently or temporarily during installation, shall be minimum eighteen times the diameter over the outer covering unless cable manufacturer recommends a larger bending diameter.
- I. Where a lubricant is needed as an aid in pulling wire or cable, a non-conducting lubricant or cable-pulling compound, which is approved by the cable manufacturer and is not injurious to the sheath or insulation shall be used.
- J. Cable shall be continuous, with no splices permitted except as required by reel length and/or maximum tension

3.2 Splicing and Termination of Conductors

- A. Seal all ends of cable unless termination is to be done immediately.
- B. Terminating conductors shall be done in a manner suitable for the voltage and environment of the wire or cable. Materials shall be as specified herein, as shown and shall be made in strict accordance with the manufacturer's recommendations.
- C. Cables shall be marked with a tag at each entry to and exit from vaults, manholes, pullboxes, switchgear, switches or terminations. Tags shall be marked with voltage, cable size and feeder number. Cables shall be taped with existing color-coding scheme.
- D. Every worker assigned to tightening bolted connections on this job shall be required to have either a torque screwdriver or a torque wrench on site in their toolbox. Each crew shall have one of each. All electrical, mechanical and structural threaded connections shall be torqued. Torque connections to the value recommended by the equipment manufacturer. Every bolted connection final torque reading shall be recorded and submitted for review.

3.3 Testing And Preparation for Operation

- A. Testing and preparation for operation shall be performed in accordance with Section 26 08 00 titled **ELECTRICAL TESTING**.

END OF SECTION

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 -- GENERAL

1.1 THE REQUIREMENT

- A. The CONTRACTOR shall provide and install all wire and cable to the new Control Panel furnished by the District, complete and operable, in accordance with the Contract Documents. The wire and cable to be furnished and installed is that between the new power transformer, existing transformer, existing station service transformer, existing recloser and the Control Panel in the control building. All wiring shall be new and shall use the existing underground conduit except for the conduit between the new transformer and the pull box as shown.
- B. Existing control, instrumentation and power wiring is shown on the attached Control Panel Reference Drawings. New wiring shall be as shown on the new transformer Reference Drawings.

1.2 REFERENCES

- A. Electrical Specifications, 26 05 00 Basic Electrical Materials and Methods
- B. Electrical Specifications, 26 08 01 Factory and Field Testing

1.3 CONTRACTOR SUBMITTALS

- A. The CONTRACTOR shall submit Shop Drawings in accordance with Sections 26 05 00 Basic Electrical Materials and Methods.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. Conductors, include grounding conductors, shall be copper. Aluminum conductor wire and cable will not be permitted. Insulation shall bear UL label, the manufacturer's trademark, and identify the type, voltage, and conductor size. Conductors except flexible cords and cables, fixture wires, and conductors that form an integral part of equipment such as motors and controllers shall conform to the requirements of Article 310 of the National Electric Code, latest edition, for current carrying capacity. Flexible cords and cables shall conform to Article 400, and fixture wires shall conform to Article 402. Wiring shall have wire markers at each end.

2.2 LOW VOLTAGE WIRE AND CABLE

- A. Power, Control and Lighting Wire
 - 1. Low voltage conductors shall be used for power, control, lighting and miscellaneous circuits. This Section applies to all wires or conductors used internal for all electrical equipment or external for field wiring. Wire shall be new, plainly marked with UL label, gauge, voltage, type of insulation, and manufacturer's name.
 - a. Conductors shall be copper with a minimum of 98% conductivity.

- b. Class C stranding. Solid conductors may be used for lighting and receptacle circuits.
- c. Wire shall be rated 600 volt (min).
- d. Size all conductors per NEC minimum or as shown on the drawings. All conductors in underground conduit shall have insulation suitable for wet locations.

<u>Type</u>	<u>Sizes</u>	<u>Insulation</u>
Control	No.14 and No.12	THWN
Branch	No.12 to No.10	THHN/THWN
Grounding	All	TW or Bare
Feeders	No.6 and above	THHN/THWN

- 2. Insulation shall be continuously colored and size for the entire conductor length. All insulated grounding conductors shall be green and neutral conductors shall be white. Separately derived system neutral wire insulation shall have distinctive markings.
- 3. Wire shall be properly fused or breaker protected at or below the maximum amperage rating allowed by the NEC.

B. Instrumentation Cable

- 1. Instrumentation cable shall be rated at 600 volts.
- 2. Individual conductors shall be No. 18, or larger, AWG stranded, tinned copper. Insulation shall be color coded polyethylene: black-red for 2 conductor cable and black-red-white for 3 conductor cable.
- 3. Instrumentation cables shall be composed of the individual conductors, an aluminum polyester foil shield, a No. 18 AWG stranded tinned copper drain wire, and a PVC outer jacket with a thickness of 0.048-inches.
- 4. Single pair, No. 16 AWG, twisted, shielded cable shall be Belden Part No. 9342, or equal.
- 5. Single triad, No. 16 AWG, twisted, shielded cable shall be Belden Part No. 1119A, or equal.

2.3 COLOR CODE

- A. All wires #8 and below shall have wire insulation the color specified. Wires #6 and larger may be black with color electrical tape at termination points.
- B. No other colors shall be used without prior approval.

C. Color code - color code of all wire shall conform with the following table:

WIRES COLOR CODE TABLE

Description	Phase/Code Letter	Field wire or tape color	Non-Field Wire Color
480V, 3 Ph	A	Brown	Brown
	B	Orange	Orange
	C	Yellow	Yellow
	Neutral	Gray	Gray
240V or 208V, 3 Ph	A	Black	-
	B	Red (Orange if high leg)	-
	C	Blue	-
240 / 120 V, 1 Ph	L1	Black	Black
	L2	Red	-
24V Positive	24+	Pink	Pink
24V Negative	24-	Black	Black
12V Positive	12+	Pink	Pink/white
12V Negative	12-	Black	Black/white
AC Control		Red	Red (Yellow for foreign circuits)
DC Control		Blue	Blue
Neutral	N	White	White
Ground	G	Green	Green
Shielded Pair	+	Red, Clear, or White	Clear or White
	-	Black	Black

2.4 CABLE TERMINATIONS

- A. Compression connectors shall be Burndy "Hi Lug", Thomas & Betts "Sta-Kon," or equal. Threaded connectors shall be split bolt type of high strength copper alloy. Pressure type, twist-on connectors will not be acceptable.
- B. Pre-insulated fork tongue lugs shall be Thomas & Betts, Burndy, or equal.
- C. General purpose insulating tape shall be Scotch No. 33, Plymouth "Slip-knot", or equal. High temperature tape shall be polyvinyl as manufactured by Plymouth, 3M, or equal.

- D. Every end of every field installed and interior cabinet conductor shall be tagged or labeled with either plastic clip-on markers that are covered and protected by clear heat shrink tubing or permanently machine imprinted heat shrink plastic tubing.

2.5 FUSES AND FUSE HOLDER

- A. Fuses shall not be used in branch or control circuits unless specifically shown in the drawings. Circuit breakers shall be furnished and utilized where possible.
- B. Fuses used in circuits 200 VAC and above shall be time- delay, 13/32" x 1-1/2", and have an interrupting rating of 10,000 AIC at 500 VAC.
- C. Fuses shall be Bussman type FNQ or approved equal. Fuse holders shall feature open fuse indication lights and shall be rated 30A at 600 VAC. Fuse holders shall be Bussman Optima Series OPM or equal.
- D. Fuses used in 120 VAC shall be time-delay, 1/4" x 1-1/4", and have a rating of 250 VAC. Fuses shall be Bussman type MDA or approved equal. Fuse-holders shall be of the same manufacturer, series and color as the adjacent terminal blocks and have blown fuse neon indicators. Fuse holders shall be Entrelec ML 10/13.SFL, Allen Bradley 1492-H4 or equal.
- E. Fuses used in signal and 24 VDC circuits shall be fast acting, 5mm x 20mm and have a rating of 250 VAC. Fuses shall be Bussman type GMA or approved equal Fuse-holders shall be of the same manufacturer, series and color as the adjacent terminal blocks and have blown fuse LED indicators.
- F. Fuse holders shall be Entrelec M 4/8.SFDT, Allen Bradley 1492-H5 or equal.

2.6 TERMINAL BLOCKS AND ACCESSORIES

A. General

1. Terminal blocks to be clamp type, 5 spacing, 300 volt, minimum rating of 20 amps, and mounted on DIN rail. DIN rail shall be same type as used for the relays. Install extra DIN rail on each type of terminal strip with 10% spare terminals for future additions.
 - a. Provide larger terminal as necessary based on gauge of connected wiring. Those terminals with 10 gauge larger gauge wiring or more than one 12 gauge wire should be evaluated and changed.
2. Provide terminal blocks with "follower" plates that compress the wires and have wire guide tangs for ease of maintenance. Terminal blocks that compress the wires with direct screw compression are unacceptable. All power, control and instrument wires entering and leaving a compartment shall terminate on terminal blocks with wire numbers on terminals and on both ends of the wires.
3. Provide end clamps, separators, din rails, and jumpers to complete terminal block system. See drawings for additional information. Engineer can provide on request if not available in plans.
4. Terminal Tags and Markers: Each terminal strip shall have a unique identifying alphanumeric code at one end (i.e.: TB1, TB2, etc.) or as shown in drawings.
5. Plastic marking tabs shall be provided to label each terminal block. These marking tabs shall have a unique number/letter for each terminal which is identical to the

"elementary" and "loop" diagram wire designation. Numbers on these marking strip shall be machine printed and 1/8" high letters minimum.

6. Terminal blocks shall be physically separated into groups by the level of signal and voltage served an by PLC I/O card. Power and control wiring above 100 volts shall have a separate group of terminal blocks from terminal blocks for wiring below 100 volts, intermixing of these two types of wiring on the same group of terminal blocks is not allowed.
7. Provide a ground terminal or connection point for each grounding conductor.
8. Provide a separate signal, common, and/or neutral terminal for every wire and PLC or remote device connection at minimum.
9. All spare PLC input / output points shall be wired to terminal blocks.
10. A minimum of 20% spare unwired terminals shall be provided in each panel.
11. Terminal blocks shall be Allen-Bradley 1492 or equal.

2.7 PANEL GROUND

- A. Each electrical, control and instrumentation panel shall be provided with a 1 inch x 0.25 inch x 8 inch (minimum size) solid copper grounding bus bar, mounted on the inside of the enclosure. The grounding bar shall be mounted on insulated standoffs so that no electrical connection is made between the ground bar and the cabinet through the mounting. The ground bar shall be drilled and tapped for a 0.25-20 screws at 0.5 inch interval along its entire length.
- B. An un-insulated solid copper #8 AWG ground wire shall be attached between the ground bar and the panel enclosure, and between the ground bar and the mounting panels. The ground connection to the enclosure and panel shall be made by sanding the paint finish off a small area, drilling a hole for a 0.25 inch bolt and mounting a 0.25-20 bolt to the panel to serve as grounding stud. The grounding stud shall be attached with a nut and flat washers on both sides of the enclosure/panel, and with an inside tooth star lock washer next to the panel surface. The star lock washer shall be on the inside surface of the enclosure, and the front surface of the mounting panel. The grounding wire shall be secured to the stud with a nut and inside tooth star lock washer. These grounding points shall be located within 12 inches of the bottom to the grounding bar. Each terminal strip rail shall be individually grounded by means of a #12 AWG wire to the ground bus. The PLC rack, power supply, lightning arrestor shall be similarly grounded according to the manufacturer's recommendations.

2.8 ELECTRICAL TAPE / SHRINKABLE INSULATORS

- A. Vinyl tape shall be 7 mil, 600 volt rated, flame retardant, hot and cold weather resistant conforming to UL510. Provide 3M Scotch Super 33+ vinyl tape or equal
 1. Vinyl tape for color coding shall be 7 mil, 3/4" width, vinyl tape conforming to UL 510. Provide 3M Scotch 35 vinyl tape or equal.
- B. Rubber Tape: EPR rubber, 90 deg C continuous rated. Provide 3M 130C rubber tape or equal.
- C. Varnished Cambric Tape: Adhesive backed, 7 mil, bias cut cotton tape, coated with yellow insulating varnish. Provide 3M Scotch 2510 or equal.

- D. Shrinkable insulators shall be heat shrinkable, polyolefin thick wall sleeves, end caps and cable repair sleeves are designed for use in splicing, sealing and re-jacketing of direct bury secondary cables. The insulators shall comply with UL 486D and be rated up to 1000 Volts. They shall provide long-term reliable performance overhead, underground or submerged with mechanical and environmental protection. Shrinkable insulators shall be 3M ITCSN or 3M IMCSN per manufacturer instructions for the application or equal.

PART 3 -- EXECUTION

3.1 GENERAL

- A. The CONTRACTOR shall provide and terminate all power, control, and instrumentation conductors except where indicated.

3.2 INSTALLATION

- A. Conductors shall not be pulled into raceway until raceway has been cleared of moisture and debris.
- B. Pulling tensions on raceway cables shall be within the limits recommended by the cable manufacturer. Wire pulling lubricant, where needed, shall be UL approved.
- C. Instrumentation wire shall not be run in the same raceway with power and control wiring except where specifically indicated.
- D. Wire in panels, cabinets, and wireways shall be neatly grouped using nylon tie straps, and shall be fanned out to terminals.
- E. Single conductor cable in cable trays shall be No. 1/0 or larger and shall be of a type listed and marked for use in cable trays. Tray cable smaller than 1/0 shall be multi-conductor, with outer jacket.

3.3 SPLICES AND TERMINATIONS

A. General

1. Wire taps and splices shall be properly taped and insulated according to their respective classes.
2. There shall be no cable splices in underground manholes or pullboxes.
3. Stranded conductors shall be terminated directly on equipment box lugs making sure that conductor strands are confined within lug. Use forked-tongue lugs where equipment box lugs have not been provided.
4. Excess control and instrumentation wire shall be properly taped and terminated as spares.

B. Control Wire and Cable

1. Control conductors shall be spliced or terminated only at the locations indicated and only on terminal strips or terminal lugs of vendor furnished equipment.
2. In junction boxes, motor control centers, and control panels, control wire and spare wire shall be terminated on terminal strips.

C. Instrumentation Wire and Cable

1. Shielded instrumentation cables shall be grounded at one end only, preferably the receiving end on a 4-20 mA system.

D. Power Wire and Cable

1. Splices to motor leads in motor terminal boxes shall be wrapped with mastic material to form a mold and then shall be taped with a minimum of 2 layers of varnished cambric tape overtaped with a minimum of 2 layers of high temperature tape.

3.4 CABLE IDENTIFICATION

- A. General: Wire and cable shall be identified for proper control of circuits and equipment and to reduce maintenance effort.

- B. Identification Numbers: The CONTRACTOR shall assign to each control and instrumentation wire and cable a unique identification number. Numbers shall be assigned to conductors having common terminals and shall be shown on "as built" drawings. Identification numbers shall appear within 3-inches of conductor terminals. "Control Conductor" shall be defined as any conductor used for alarm, annunciator, or signal purposes.

1. Multiconductor cable shall be assigned a number which shall be attached to the cable at intermediate pull boxes and at stub-up locations beneath free-standing equipment. It is expected that the cable number shall form a part of the individual wire number. Individual control conductors and instrumentation cable shall be identified at pull points as described above. The instrumentation cable numbers shall incorporate the loop numbers assigned in the Contract Documents.
2. The 480/277-volt system conductors shall be color coded as follows: Phase A - Brown, Phase B - Orange, Phase C - Yellow, and Neutral - Gray. Color coding tape shall be used where colored insulation is not available. Branch circuit switch shall be yellow. Insulated ground wire shall be green, and neutral shall be gray. Color coding and phasing shall be consistent throughout the Site, but bars at panelboards, switchboards, and motor control centers shall be connected Phase A-B-C, top to bottom, or left to right, facing connecting lugs.
3. General purpose AC control cable shall be red. General purpose DC control cable shall be blue.
4. Spare cable shall be terminated on terminal screws and shall be identified with a unique number as well as with destination.
5. Terminal strips shall be identified by computer printable, cloth, self-sticking marker strips attached under the terminal strip.

3.5 TESTING

- A. Electrical Specifications, 26 08 01 Factory and Field Testing

- B. Cable Assembly and Testing: Cable assembly and testing shall comply with applicable requirements of ICEA Publication No. S-95-658/NEMA WC70 - Ethylene-Propylene-Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy. Factory test results shall be submitted in accordance with Section 26 05 00 prior to shipment of cable. END OF SECTION

GROUNDING

PART 1 -- GENERAL

1.1 THE SUMMARY

- A. The CONTRACTOR shall provide the electrical grounding modifications, complete and operable, in accordance with the Contract Documents. The ground system modifications shall consist of the following:
- B. The requirements of Section 26 05 00 - Electrical Work, General apply to this Section.
- C. Single Manufacturer: Like products shall be the end product of one manufacturer in order to achieve standardization of appearance, operation, maintenance, spare parts and manufacturer's services.

1.2 CONTRACTOR SUBMITTALS

- A. Furnish submittals in accordance with Section 26 05 00.
- B. Shop Drawings: Manufacturer's product information for connections, clamps, and grounding system components, showing compliance with the requirements of this Section.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. Components of the grounding electrode system shall be manufactured in accordance with UL 467 - Standard for Safety Grounding and Bonding Equipment, and shall conform to the applicable requirements of National Electrical Code Article 250 and local codes.

2.2 GROUNDING SYSTEM

- A. Grounding mat and riser conductors shall be bare annealed copper conductors suitable for direct burial. Conductors shall be No. 4/0 unless indicated otherwise.
- B. Ground Rods
 - 1. Ground rods shall be a minimum of 3/4-inch in diameter, 10-feet long, and have a uniform covering of electrolytic copper metallurgically bonded to a rigid steel core. The copper-to-steel bond shall be corrosion resistant.
 - 2. Conform to UL 467.
 - 3. Sectional type joined by threaded copper alloy couplings.
- C. Buried cable-to-cable and cable-to-ground rod connections shall be made using exothermic welds by Cadweld, Thermoweld, or equal.

- D. Exposed grounding connections shall be of the compression type (connector-to-cable), made of high copper alloy, and be manufactured specifically for the particular grounding application. The connectors shall be FCI-Burndy, O.Z. Gedney, or equal.
- E. Grounding clamps shall be used to bond each separately-derived system to the grounding electrode conductors.
- F. Equipment Grounding Circuit Conductors
 - 1. These conductors shall be the same type and insulation as the load circuit conductors. The minimum size shall be as outlined in Table 250.122 of the National Electrical Code, unless indicated otherwise.
 - 2. Metallic conduit systems shall have equipment grounding wires as well as being equipment grounding conductors themselves.
- G. Manufacturers of grounding materials shall be Copperweld, Thermoweld, FCI-Burndy, or equal.

PART 3 -- EXECUTION

3.1 GROUNDING

- 1. Furnish and install new ground mat for the extension of substation area.
- 2. Repair and/or replace grounding mat after foundations are excavated.
- 3. Furnish and install new ground connections.
- 4. Provide a separate grounding conductor, securely grounded in each raceway independent of raceway material.
- 5. Provide a separate grounding conductor in each individual raceway for parallel feeders.
- 6. Measure ground impedance in accordance with IEEE STD 81 after installation but before connecting the electrode to the remaining grounding system.
- 7. Embedded Ground Connections
- 8. Underground and grounding connections embedded in earth or concrete shall be exothermic welds.
- 9. The connection shall be made in accordance with the manufacturer's instructions.
- 10. The CONTRACTOR shall not conceal or cover any ground connections until the ENGINEER or authorized representative has established that every grounding connection conforms to the Contract Documents and has given the CONTRACTOR written confirmation.
- 11. Re-compact disturbed soils to original density in 6-inch layers.

END OF SECTION

FACTORY AND FIELD TESTING

PART 1 -- GENERAL

1.1 THE SUMMARY

- A. This division defines factory and field testing requirements of electrical and Instrumentation equipment and as specified in this section, in the electrical specifications and on the Drawings. All equipment provided under Electrical Specifications and electrical equipment provided under other sections shall be tested as specified herein.
- B. The Electrical Contractor shall coordinate at no additional cost to the Owner, the services of an approved qualified third party independent testing company for the purpose of performing specific tests as outlined in EXECUTION, Field Test of this section.
- C. The Testing Company and/or Electrical Contractor shall provide all labor, tools, material, power, and technical supervision to perform the specified tests and inspections.
- D. The Electrical Contractor shall be present during field testing and assist the System Integrator and/or Testing Company in testing all equipment. The Electrical Contractor shall be ready to correct any wiring issues found during testing.
- E. The Owner Representative will be actively engaged in Operational Testing and Commissioning. These efforts shall be combined efforts of the Owner/Engineer and Contractor. The Contractor shall facilitate test as outlined herein such that hardware and software are tested completely and all applicable test documentation is completed.
- F. It is the intent of these tests to ensure that all equipment is operational within industry and manufacturer's tolerances and is assembled in accordance with design plans and Specifications.
- G. All tests shall be documented in writing by the person performing the test on the test forms submitted (and similar to those shown at the end of this section) and signed by the Engineer as satisfactorily completed. The Testing Company, Electrical Contractor and System Integrator performing tests shall keep a detailed log of all tests, including date of occurrence and correction.
- H. The Contractor shall perform all applicable testing of Owner supplied or existing equipment as a unit and as part of a system. Testing shall include documentation and witness sign-off.
- I. The requirements of Section 26 05 00 – Electrical General, Project Documents, and additional testing may be specified in other Electrical Specifications apply to the WORK of this Section.

1.2 FACTORY AND FIELD GENERAL REQUIREMENTS

- A. Testing General

1. Prior to any field testing Operation & Maintenance Manuals shall have been submitted and approved.
2. The test forms shall be completed by the contractor during testing and calibration of all equipment. All tests shall be witnessed by the Owner's Representative. Completed test forms shall be given to the Owner's Representative the day of the test. Complete two sets of test forms if Contractor wants to keep a copy.
3. The Contractor shall give the Engineer 10 working days notice of the dates and time for inspections and testing using the "Scheduled Test Date Request Form."
4. Include test results in the Maintenance and Operational Manual.
5. As a minimum, all the tests indicated/specified on the test forms shall be performed and test forms filled out by the Contractor.
6. Prepare and submit formal test procedures and forms at least two weeks prior to the start of testing. Testing shall not commence until the test procedures have been reviewed and approved. Submit a combined test procedure submittal with separate sections for factory and field tests.
7. If the results of any of tests are unacceptable, the Contractor shall make corrections and perform the tests again until they are acceptable; these tests shall be done at no additional cost.

B. Failure to Meet Test

1. Any system, material or workmanship which is found defective on the basis of these tests shall be reported immediately following the test. The Contractor shall replace the defective material or equipment and have tests repeated.
2. The Contractor shall bear all expenses incurred for reviewing and/or witnessing tests after the second (repeated) test has failed.

C. Safety

1. Testing shall conform to the respective manufacturer's recommendations. All manufacturers' safety precautions shall be followed.
2. Safety, as shown herein and in other divisions, shall be a combination of all methods and practices described. Safety practices may not be determined based on the least restrictive requirement, but instead, on the most restrictive requirement. Obtain clarification if there is any question prior to performing tests.
3. The procedures stated herein are guidelines for the intended tests, the Contractor shall be responsible to modify these tests to fit the particular application and ensure personnel safety. Absolutely no tests shall be performed in such a fashion that personnel safety is jeopardized.
4. The Contractor shall have two or more personnel present at all tests.
5. Two non-licensed portable radios shall be provided by the Contractor for use during testing.

6. Contractor shall comply with California Electrical Safety Orders (ESO) and Occupational Safety and Health Act (OSHA): All test and procedures shall comply with ESO and OSHA as to safety, protective clothing, clearances, padlocks and barriers around electrical equipment energized during testing.
7. The first set of tests to be performed (pre-energization) shall determine the suitability for energization and shall be completed with all power turned off.

1.3 QUALIFICATIONS

A. Testing Company

1. The testing company shall meet federal OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907. Membership in the International Electrical Testing Association constitutes proof of meeting such criteria.
2. Testing company shall have been actively engaged in the type of electrical testing specified in this Division for the past three years (minimum). The Testing Company representative shall have two years experience in field testing of equipment working for the Testing Company or equivalent. The following Electrical Testing Companies are pre-approved.
 - a. EETS (916) 339-9691
 - b. Industrial Test (888)-809-8550
 - c. Emerson Electrical Reliability Services
 - d. Apparatus Testing and Engineering (916) 853-6280
 - e. Apparatus Testing and Engineering (925) 454-1363
 - f. Power Systems Testing (925) 583-2361
3. Testing Companies not listed are required to submit company and individual representative resumes for review and approval.

B. Electrical Contractor Representative

1. The Electrician shall have 5 years minimum experience working with industrial control systems and have a Journeyman level experience rating.

1.4 SUBMITTALS

- A. Furnish submittals in accordance with the requirements of Section 26 05 00 – Contractor Submittals and the Contractor shall ensure that the Testing Company and all equipment suppliers provide the submittal documentation required in this section. Submittals shall be complete, neat, orderly, and indexed. The Contractor shall check all submittals required under this Division for the correct number of copies, adequate identification, correctness, and compliance with the Contract Specifications and Drawings, and initial all copies certifying compliance.
- B. Test submittal shall include: (as applicable)

1. Proposed procedure for operational testing whether it is performed in the factory or field. Procedure shall include method and necessary materials and equipment to conduct test.
2. Testing schedule.
3. Test forms (for all tests, factory and field, and regardless of who performs tests). Test forms shall be electronically completed prior to submittal with entry spaces filled to the extent possible. The only remaining data that shall require completion during the test is the test data itself. Test forms shall be provided as illustrated at the end of this section or equal.
4. Approved shop one-line, elementary diagrams.

PART 2 -- PRODUCTS

2.1 REFERENCE PUBLICATIONS

- A. The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern.

1. International Electrical Testing Association (NETA) Publications
 - a. Maintenance Testing Specifications for Electric Power Distribution Equipment and Systems
 - b. Acceptance Testing Specifications for Electric Power Distribution Equipment and Systems
2. National Fire Protection Association - NFPA 70B - Electrical Equipment Maintenance
3. American National Standards Institute (ANSI)
4. American Society of Mechanical Engineers (ASME)
5. Instrument Society of America (ISA)

2.2 TEST EQUIPMENT

- A. Test equipment required to perform testing and document results shall be provided by Contractor, Testing Company.
- B. Test instruments shall be calibrated to references traceable to the National Institute of Standards and Technology. Instrument calibration shall be current to one year from date of start-up. Test equipment accuracy shall be at least twice the accuracy of instrument being calibrated. Test instrument certificates of calibration shall be on-hand and provided prior to testing.
- C. All test equipment to be used as part of the testing shall be listed in the submitted testing sheets. Contractor supplying the component or system to be tested shall provide all necessary test equipment.

PART 3 -- EXECUTION

3.01 FIELD TESTING

A. General Requirements

1. Field testing is broken down into 4 components:
 - a. Pre-Energization testing
 - b. Pre-Operational Testing
 - c. Operational Testing
 - d. Commissioning
2. Project wide, all Pre-Energization testing must be completed prior to Pre-Operational testing, all Pre-Operational testing must be completed prior to Operational Testing, and all Operational Testing must be completed prior to Commissioning.
 - a. Any deviation of this order, whether on a component level or larger scale, must be approved.
 - b. Out of order testing, if allowed, will be evaluated on a case-by-case basis when brought to the attention of the Owner's Representative. The Owner's Representative may require that the entire system, or portions thereof, be retested once the missing component(s) are installed and functional.
3. All equipment supplied by the Contractor or others shall be tested by Contractor per these specifications.
4. If the equipment is determined not to be ready for testing, the test will be cancelled and rescheduled for a later date.
5. Faulty and/or incorrect hardware or software operation of major portions of the system may be cause for suspension, cancellation, or restarting of the area of testing, at no additional cost or extension in Contract time.
6. Acceptance and witnessing of the tests does not relieve or exclude the Contractor from conforming to the requirements of the Contract Documents.
7. All modifications to documentation as a result of the tests shall be corrected and completed before the delivery of "as-built" documentation.
8. Copies of the completed and witnessed field testing forms shall be included in the Operation and Maintenance Manual.
9. The various contractors on this project (General Contractor, Electrical Contractor and Testing Company shall assume the lead role in testing activities as listed below. The Contractor shall obtain assistance of suppliers and/or manufacturer's representatives for any major equipment testing.
 - a. Electrical Contractor:

- 1) Pre Energization Tests
 - a) Visual Mechanical Tests
 - b) Wire Insulation and Continuity Tests
 - c) Panelboard Tests
 - d) Breaker Tests
 - 2) Operational Tests
 - 3) Commissioning
 - b. Testing Company
 - 1) Grounding System Tests
 - 2) Breaker Device Tests
 - 3) Infrared Testing
 - c. General Contractor
 - 1) Test Scheduling
 - 2) Operational Tests
 - 3) Commissioning
 - d. Owner Representative (software systems)
 - 1) Operational Tests
 - 2) Commissioning
- B. Electrical Field Tests – The following test shall be performed within each test category. Complete test forms for each electrical panel, instrument, and/or device. Provide separate form for each component to be tested.

1. Pre-Energization Inspections and Tests:

- a. Visual and Mechanical Inspection Tests
- b. Wire Insulation and Continuity Tests
 - 1) All three phase circuits shall be tested for insulation resistance with a 1000-volt megaohm meter. Testing shall be done after the equipment is terminated. Phase-to-phase A-B, B-C, A-C and phase-to-ground insulation resistance tests shall be performed on each cable prior to 5-kV and 25-kV cable termination at equipment but subsequent to stress cone makeup. Equipment which may be damaged during this test shall be disconnected. Perform tests with all other equipment connected to the circuit. In order to be acceptable, the cable must withstand the test high voltage without breakdown, have steady or decreasing leakage current during the high potential test, and have satisfactory comparable megger readings in each megger test. Cable operating at more than 2,000 volts shall be tested in accordance with ICEA publications S-68-61, S-61-402, S-19-81, and S-68-516. Cable testing and report submittal shall be performed by an organization sanctioned by the manufacturer of the cable to be tested. Testing shall verify the quality of cable terminations.

c. Grounding System Tests

- 1) Perform a ground test of the completed ground system prior to operating the equipment and report the results with other test report. Utilize the fall-of-potential method or alternative, in accordance with IEEE Standard 81.

2. Pre-Operational Tests:

- 1) The Contractor shall verify that all equipment meet the performance requirements, and are ready for operational testing. Revise all configurable parameters without additional cost to the Owner as required for an optimally functional system.
- 2) Power Instrumentation: Demonstrate that voltage and amperage measuring devices are functional. Demonstrate that measurements are within catalog accuracy as installed.
- 3) Test circuit breakers for proper operation.

3. Operational Tests:

- a. After all the previous tests in this subsection are complete, the test forms are completed and signed-off, the Contractor shall conduct operational testing.
- b. Representatives from the General Contractor, Electrical Contractor, and Owner's Representative shall be present during testing. Operational testing shall be performed by Contractor in the presence of the Owner's Representative.
- c. During operational testing the Contractor shall follow the instructions of the Owner. The Owner may place restrictions on operation that must be followed by the Contractor during testing. Any accidents or fines caused by actions of the Contractor where warnings or restrictions were placed, shall be remedied or paid by the Contractor.
- d. Operational Control Tests
 - 1) Verify that all parameters can operate according to the Specifications.
 - 2) Verify that all data, setpoints, alarms are being received correctly and that all I/O points are true and accurate representations of field information.
 - 3) Verify alarm notification software and/or systems are functional and call out to the appropriate device as specified.
- e. Other Tests
 - 1) Force a power failure and power fail/restart of PLC and all

other systems. Check the effects of each failure on each piece of equipment and automatic recovery.

- 2) Perform additional operational testing that has not already been witnessed.
- 3) Perform any additional operational testing as necessary to confirm robust and error free operation under all operational conditions.

f. Infrared Testing

- 1) An infrared test shall be made on all Power Connections after the site has been placed into operation. The testing shall be made at as much full load as is possible as determined by the District. The testing instrument shall be a multi-component color thermal-camera system. A thermogram shall be taken and recorded for future reference. If the thermogram shows conditions that need immediate attention, the repairs shall be made before proceeding with the balance of the test and follow up testing shall be made to confirm correction.
- 2) When the scanning is complete for each site, the disk, which holds the thermograms shall be provided to the District for future reference. Software shall be provided to the District without cost which will allow hardcopy printouts.
- 3) A report of the testing shall be provided to the District. The report shall contain the following:
 - i Overview and explanation of the report, overall assessment of the testing and any other information deemed pertinent to the testing results.
 - ii Summary of the testing results.
 - iii List of all equipment tested
 - iv List of specific problems if any and necessary repairs made if any.
 - v Appendix containing each thermogram and or photos.
- 4) Power Connections as referenced above are any and all connections from service entrance to and including the loads whether factory or field made connections

4. Trial Period

- a. Station/Equipment shall be activated to automatically run for 5 days, 24 hours per day Monday through Friday.

- b. During the trial period the Owner's Representative will test all modes of operation and will look for errors and malfunctions. A punchlist will be generated to be completed by Contractor and re-tested prior to Commissioning.
- c. If equipment failure occurs during the trial period, the Contractor shall repair or replace the defective equipment and shall begin another trial period, Monday through Friday.
- d. This test shall be repeated until all new equipment functions acceptably and without failure for consecutive days.

C. Commissioning:

- 1. Commissioning shall not commence until Operational Testing and Training are complete with documentation submitted and with prior approval.
- 2. The Owner may delay Commissioning for a period up to 30 days, during which time all testing documentation will be reviewed and preparation for operation will be made. Costs for project delays during this review may not be forwarded on to the Owner.
- 3. Commissioning period
 - a. The new equipment shall be activated by the Contractor to operate in full automatic for 10 consecutive days, 24 hours per day. Commissioning shall only start on Mondays or Tuesdays.
 - b. During Commissioning, the Owner will monitor and run the station in normal automatic mode. If equipment failure occurs during Commissioning, the Contractor shall repair or replace the defective equipment and shall begin another commissioning period after repairs are complete.
 - c. Parallel, existing and/or back-up systems shall remain in place and functional during commissioning period. Demolition of parallel, existing or back-up systems shall not begin until commissioning is completed.
 - d. This test shall be repeated until the new equipment functions acceptably for a consecutive commissioning period.
 - e. Warranty will begin at the start of a successful commissioning period. However, if major hardware failure occurs during commissioning, the warranty and commissioning will restart once the problem has been identified and repaired.

3.02 TEST FORMS

A. Index of Forms:

PC Power Conductor Test Form

CC Control Conductor Test Form

GS Grounding System Test Form

VM Electrical Equipment Visual and Mechanical Inspection Form

CPO Control Panel Operational Test Form

BD Breaker Device Test Form

END OF SECTION

PAD MOUNTED TRANSFORMER

PART 1 -- GENERAL

1.1 THE SUMMARY

- A. This Specification Section covers the installing and testing of a Pad Mounted Transformer required to complete the electric service as specified herein and as shown.
- B. Suitable for operation in California Seismic Zone 4 and as specified in Section 26 05 00.

1.2 REFERENCE

- A. The provisions of Sections 26 05 00 of these Specifications shall apply, unless otherwise specified in this Section.
- B. Transformer supplied by the District will be designed, manufactured, and tested in accordance with the latest version of the following standards:
 - 1. American Society Testing Materials (ASTM)
 - 2. Underwriters Laboratory (UL)
 - 3. National Electrical Code (NEC)
 - 4. Institute of Electrical and Electronic Engineers (IEEE)

1.3 CONTRACTOR SUBMITTALS

- A. Descriptive literature for all materials furnished under this section will be available to the Contractor.
- B. Submittals for the Power Transformer are available as Reference Drawings:

1.4 QUALITY ASSURANCE

- A. The Pad Mounted Transformer will be tested under the control of a Quality Assurance program which meets the requirements of ANSI Standards.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Transformer Delivery – See Specification Section 26 05 00.
- B. Transformer shall be handled in a manner to prevent damage to the protective coatings.
- C. Maintain protective coverings until ready for installation.

PART 2 -- PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. See referenced drawings.

2.2 TRANSFORMER RATINGS

- A. Primary Voltage Rating: 69,000V Delta
- B. Secondary Voltage Rating: 20760Y/11986, Wye grounded
- C. No load tap changer: +/- 2-2.5% externally operated, full capacity primary taps
- D. Continuous Capacity: 2500kVA @ 55 degrees C rise
- E. Number of Phases/Wires: 3 Phase, 4 Wire, two winding.
- F. Frequency: 60 Hertz
- G. Impedance as shown:
- H. Temperature Rise: 65 degrees C
- I. High Voltage cable terminations sized for 69kV cables and terminations.
- J. Low Voltage cable termination area sized for 25kV cables and terminations.

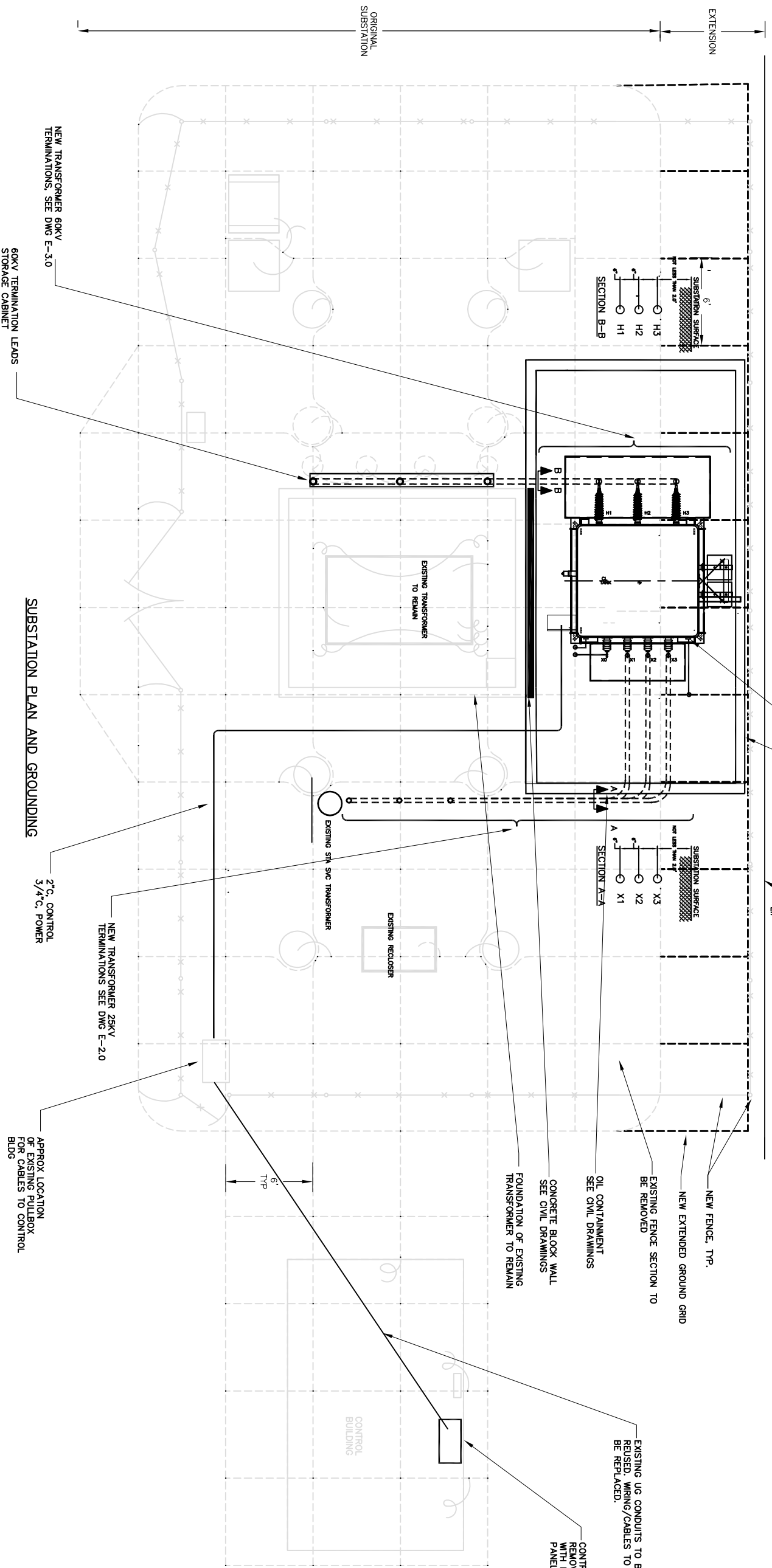
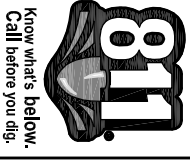
PART 3 -- EXECUTION

3.1 GENERAL REQUIREMENTS

- A. The transformer shall be installed on a concrete pad which shall include underground conduits for entrance of wire and cable into the termination enclosures.
- B. The drawings show the planned number and location of conduits entrances in each compartment. This arrangement shall be maintained unless otherwise mutually revised prior to the placement of the pad and in accordance with the requirements of the manufacturer of the transformer. The transformer will contain the number and size of bushings with NEMA spades to accommodate the number and size of the cables shown.
- C. The Pad Mount Transformer shall be located as shown. The service equipment shall be interconnected to all equipment, and made ready for service all in accordance with the drawings.
- D. The Contractor shall supply and install all materials and equipment required for the electric service as required and as shown on the drawings
- E. The Contractor shall take all necessary precautions in working in vaults/manholes/pullboxes to protect personnel, equipment, and energized feeders when installing new cables and components.
- F. The Contractor shall pull cable into the conduit with sufficient length remaining at the ends to conveniently make connections to all equipment or devices.

- G. Where practicable, the minimum radius to which an insulated conductor shall be bent, whether permanently or temporarily during installation, shall be minimum eighteen times the diameter over the outer covering unless cable manufacturer recommends a larger bending diameter.
 - H. Where a lubricant is needed as an aid in pulling wire or cable, a non-conducting lubricant or cable-pulling compound, which is approved by the cable manufacturer and is not injurious to the sheath or insulation shall be used.
 - I. Cable shall be continuous, with no splices permitted.
- 3.2 TESTING
- A. Testing and preparation for operation shall be performed in accordance with Section 26 08 00 Factory and Field Testing.

END OF SECTION



GENERAL NOTES:

1. GROUND GRID SHALL BE EXTENDED AND BURIED TO A DEPTH OF 18". GRID SHALL BE ROUTED UNDER FOUNDATIONS AND AROUND WHERE APPLICABLE. GRID SHALL BE ROUTED UNDER TRANSFORMER FOUNDATION.
2. ALL SUBSURFACE GROUND CONNECTIONS AND TEES SHALL BE PERFORMED AT ALL POINTS OF GRID CROSSING AND ENDINGS.
3. ALL SURFACE GROUND CONNECTIONS SHALL BE BY BOLTED GROUND TERMINATION. BOLTED TERMINATION DEVICES SHALL BE EXPRESSLY MANUFACTURED FOR COPPER GROUND CABLE TO STRUCTURE PROVISIONS OR EQUIPMENT GROUNDING PADS.
4. GROUND TRANSFORMER CASE WHERE SHOWN IN MANUFACTURER'S DRAWINGS.
5. GROUND RISERS SHALL BE #4/0 BCW CONDUCTORS TO BRONZE 4/0 TO 4-HOLE PAD, SIZE TO MATCH BUSHING.
6. GROUND RISERS TO TRANSFORMER SECONDARY NEUTRAL BUSHING SHALL BE TWO 4/0 BCW CONDUCTORS. BUSHING TERMINAL CONNECTOR SHALL BE BRONZE, STUD TO 4-HOLE PAD, SIZE TO MATCH BUSHING, ANDERSON TYPE HD5F, OR EQUAL. 4/0 BCW GROUND CONDUCTORS SHALL TERMINATE IN BRONZE, TWO HOLE BOLTED CONNECTORS.
7. UPON COMPLETION OF THE UNDERGROUND WORK, THE SURFACE OF THE SUBSTATION SHALL BE COVERED WITH 6 INCHES OF 6" CRUSHED ROCK.

REV.	DATE	BY	SUB	APP	DESCRIPTION



DESIGNED BY: RLH
 DRAWN BY: ZSP
 CHECKED BY: SEP
 IN CHARGE: RLH
 DATE: 12-01-20

EAST CONTRA COSTA IRRIGATION DISTRICT



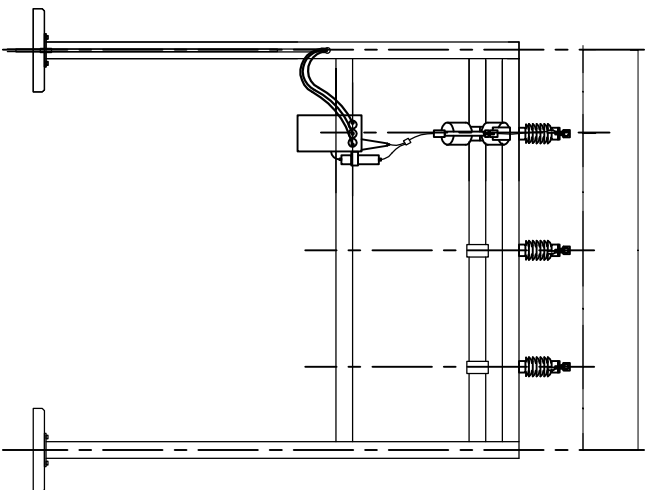
APPROVED: _____

ECCID
 SUBSTATION UPGRADE
 SITE PLAN

SCALE: AS SHOWN	SHEET NO. E-2.0	REVISION	PAGE NO. 2
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EXISTING 25KV STRUCTURE



SECTION A-A: EXISTING 25KV STRUCTURE

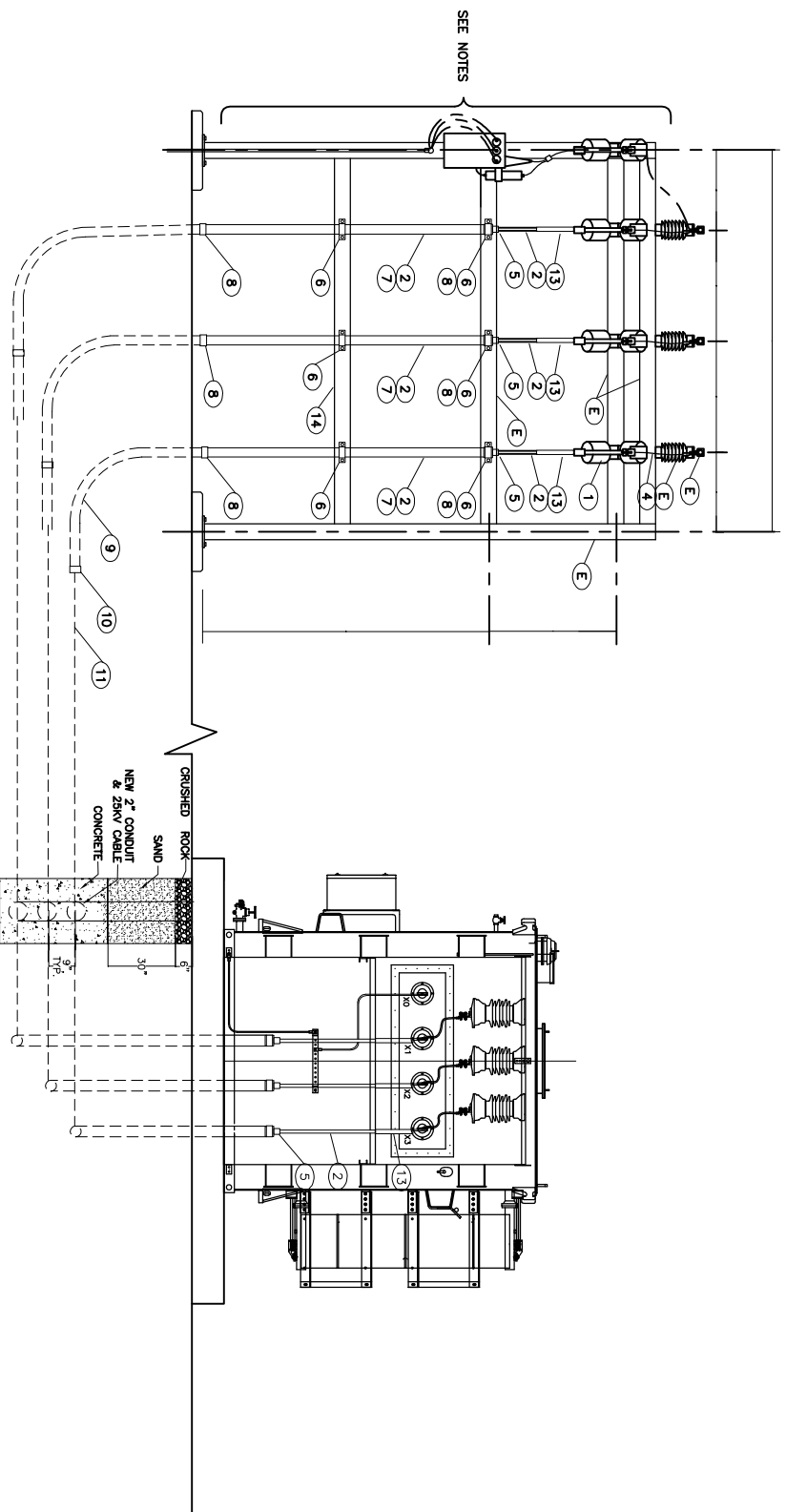
SCALE: 3/8" = 1'

EQUIPMENT + MATERIAL SCHEDULE

ID.	MATERIAL DESCRIPTION	QUANTITY	MANUF.	PART #
1	25KV, 100E, 150KV BIL FUSED SWITCH	3	S&C	SMD-20
2	25KV, #1/0 ALUMINUM CABLE	AS ROD	OKONITE	
3	CABLE TO BUS CONNECTOR	3	AFT	
4	#2 ASOR, 6/1 STRAND	AS ROD	HWC	
5	CABLE FITTING, TYPE CGB	3	CROUSE HINDS	AFT
6	CONDUIT CLAMP	6		
7	2" SCHEDULE 40 PVC	AS ROD		
8	2" SCHEDULE 40 PVC COUPLING	AS ROD		
9	2" SCHEDULE 40 ELBOW	AS ROD		
10	2" SCHEDULE 40 PVC COUPLING	AS ROD		
11	2" SCHEDULE 40 PVC	AS ROD		
12	25KV, COLD SHRINK TERMINATION	3	3M	7692
13	25KV, GALV STEEL CHANNEL-BOLTED IN PLACE	AS ROD		
14				

DRAWING REFERENCED NOTES:

1. THE PURPOSE OF MODIFICATIONS TO THE EXISTING STRUCTURE IS TO PROVIDE FOR THE INSTALLATION OF HOOK STICK OPERATED SWITCHES TO CONNECT THE STANDBY SECONDARY TRANSFORMER LEADS TO THE 20KV BUS.
2. THE EXISTING FUSED SWITCH THAT FEEDS THE STATION SERVICE TRANSFORMER SHALL BE MOVED TO THE COLUMN AS SHOWN. THIS WILL REQUIRE THE INSTALLATION OF A NEW MOUNT FOR THE FUSED SWITCH AND A NEW MOUNT FOR THE TRANSFORMER.
3. THE NEW MOUNTS SHALL BE WELDED TO THE EXISTING COLUMN SURFACES. THE AFFECTED AREAS OF THE WELD SHALL BE REPAIRED BY THERMAL ZINC SPRAYING.
4. MAINTAIN 6" CLEARANCE TO METAL STRUCTURE.
5. MISC MATERIALS AND PARTS SHALL BE FURNISHED AND INSTALLED AS NEEDED DURING MOVEMENT OF STATION SERVICE EQUIPMENT.
6. "E" NOTES EXISTING EQUIPMENT AND MATERIALS.



MODIFIED 25KV STRUCTURE

SCALE: 3/8" = 1'

NEW TRANSFORMER



REV.	DATE	BY	SUB	APP	DESCRIPTION



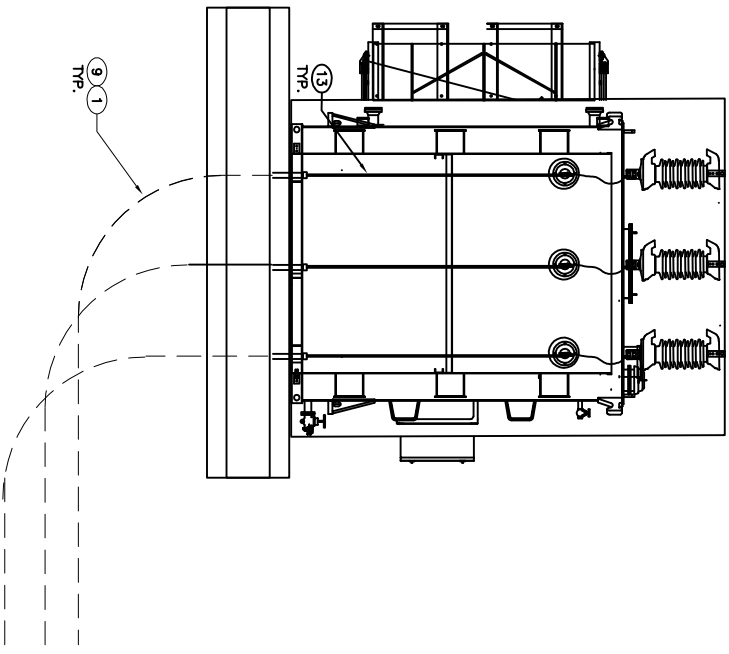
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 DRAWN BY: ZSP
 CHECKED BY: RLH
 IN CHARGE: RLH
 DATE: _____

EAST CONTRA COSTA IRRIGATION DISTRICT

WAVE Engineers, Inc.
 SACRAMENTO - CALIFORNIA

ECCID
 SUBSTATION UPGRADE
 ELECTRICAL
 25KV CONNECTION

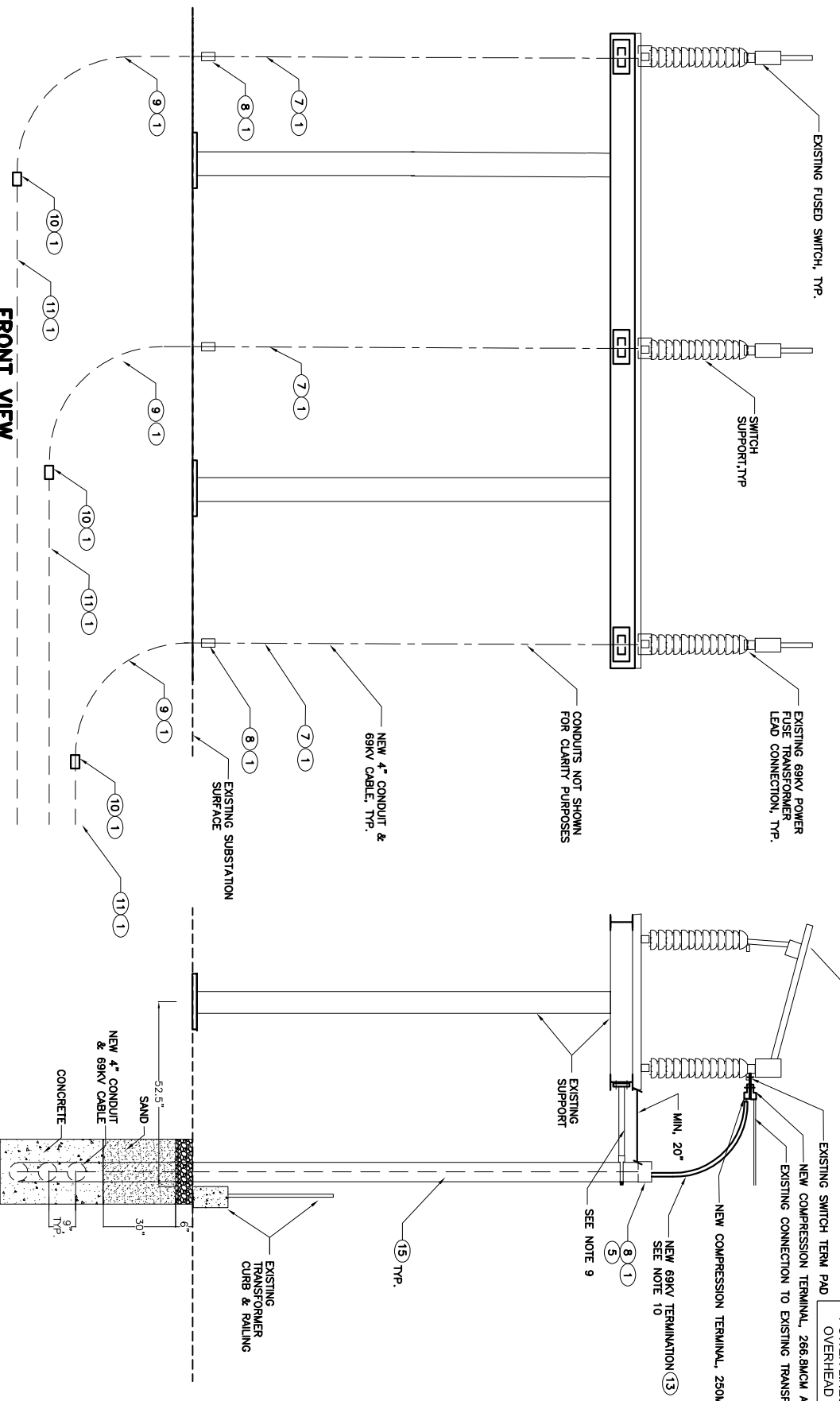
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 PAGE NO. 3



CONNECTIONS TO NEW TRANSFORMER

DRAWING REFERENCED NOTES:

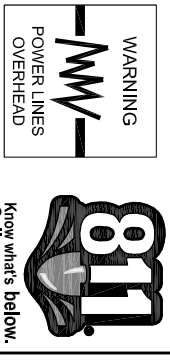
1. THE NEW STANDBY TRANSFORMER SHALL BE CONNECTED AND ENERGIZED FOR USE AT THE END OF CONSTRUCTION AND INSTALLATION. THE EXISTING TRANSFORMER SHALL BE DE-ENERGIZED.
2. THE CONNECTION OF THE STANDBY TRANSFORMER HIGH VOLTAGE TERMINALS SHALL BE BY 69KV CABLE IN CONDUIT TO THE 60KV FUSED SWITCHES.
3. THE TRANSFER OF POWER FROM THE EXISTING TRANSFORMER TO THE STANDBY TRANSFORMER SHALL BE MADE BY MANUALLY DISCONNECTING THE EXISTING TRANSFORMER LEADS, ARRESTERS AND CONNECTIONS.
4. THE INSTALLATION OF THE STANDBY TRANSFORMER LEADS AND TERMINATIONS SHALL BE ACCURATELY MEASURED AND INSTALLED SO THAT THE STANDBY TRANSFORMER LEADS CAN BE ATTACHED TO THE FUSED SWITCH LEADS, AS SHOWN, WITHOUT ANY ADJUSTMENT IN LENGTH.
5. THE INSTALLATION SHALL BE DEMONSTRATED AT COMPLETION OF PROJECT TO VERIFY THAT THE CONNECTIONS TO BOTH TRANSFORMERS CAN BE READILY MADE WITHOUT ADJUSTMENT IN LENGTH OR ADDITIONAL FITTINGS.
6. THE CONNECTING TAB OF THE FUSED SWITCHES SHALL BE MODIFIED TO ACCOMMODATE THE CONNECTION OF THE EITHER THE EXISTING TRANSFORMER OR THE STANDBY TRANSFORMER. NEW CABLE AND CONNECTORS SHALL BE SUPPLIED FOR CONNECTION OF BOTH TRANSFORMERS.
7. SEE DWG S-1 FOR STRUCTURAL DETAILS.
8. EACH OF THE THREE NEW CONDUITS AT THE FUSED SWITCH SHALL BE HELD IN PLACE BY A BRACKET. THE BRACKETS SHALL CONSIST OF A COMPLETE ASSEMBLY OF A BASE, AN EXTENSION AND A CONDUIT (PIPE) CLAMP. ALL TO BE FABRICATED FROM 3/4" STEEL PLATE WELDED TO FORM WASHERS TO THE EXISTING FUSED SWITCH SUPPORT FRAME. THE CONDUIT CLAMP SHALL BE LOOSE FITTED AROUND THE CONDUITS TO ALLOW FOR CONDUIT LENGTH EXPANSION AND CONTRACTION.
9. BOTH TRANSFORMER CABLE TERMINATIONS ARE SHOWN CONNECTED TO THE FUSED SWITCH. THIS IS FOR DEMONSTRATION ONLY. AT THE COMPLETION OF CONSTRUCTION/INSTALLATION, THE TERMINATION MATERIALS FOR THE EXISTING TRANSFORMER SHALL BE STORED IN THE CONTROL BUILDING UNTIL NEEDED. THE CONTRACTOR SHALL PROVIDE ALL CONNECTING PARTS FOR CONNECTION OF THE TERMINATIONS.
10. CONDUIT CAPS ARE TO BE FURNISHED FOR FUTURE USE TO CLOSE THE END OF THE CONDUITS WHEN THE POWER IS TRANSFERRED FROM THE NEW TRANSFORMER TO THE EXISTING TRANSFORMER.



EXISTING 69KV FUSE SWITCH STRUCTURE

EQUIPMENT + MATERIAL SCHEDULE

I.D.	MATERIAL DESCRIPTION	QUANTITY	MANUF.	PART#
1	69KV, 250KCMIL ALUMINUM CABLE	AS ROD	OKONITE	135-22-3765
2	69KV SEGMENTAL INTERPHASE SPACER	AS ROD	K-LINE	-
3	CABLE TO FLAT CONNECTION	AS ROD	ANDERSON/IBBEHL	H05E
4	CABLE FITTING, TYPE CG8	3	EATON/CH	CG88920
5	CABLE FITTING, TYPE CG8	3	EATON/CH	CG88920 SG
6	266.8 MCM AAC, 7 STRAND, DAST	AS ROD	-	-
7	4\"/>			



DESIGNED BY SEP	DRAWN BY ZSP	CHECKED BY RLH	IN CHARGE RLH	DATE	DATE
DESIGNED BY SEP	DRAWN BY ZSP	CHECKED BY RLH	IN CHARGE RLH	DATE	DATE

EAST CONTRA COSTA IRRIGATION DISTRICT

SACRAMENTO - CALIFORNIA

ECCID

69KV STRUCTURE

ELECTRICAL

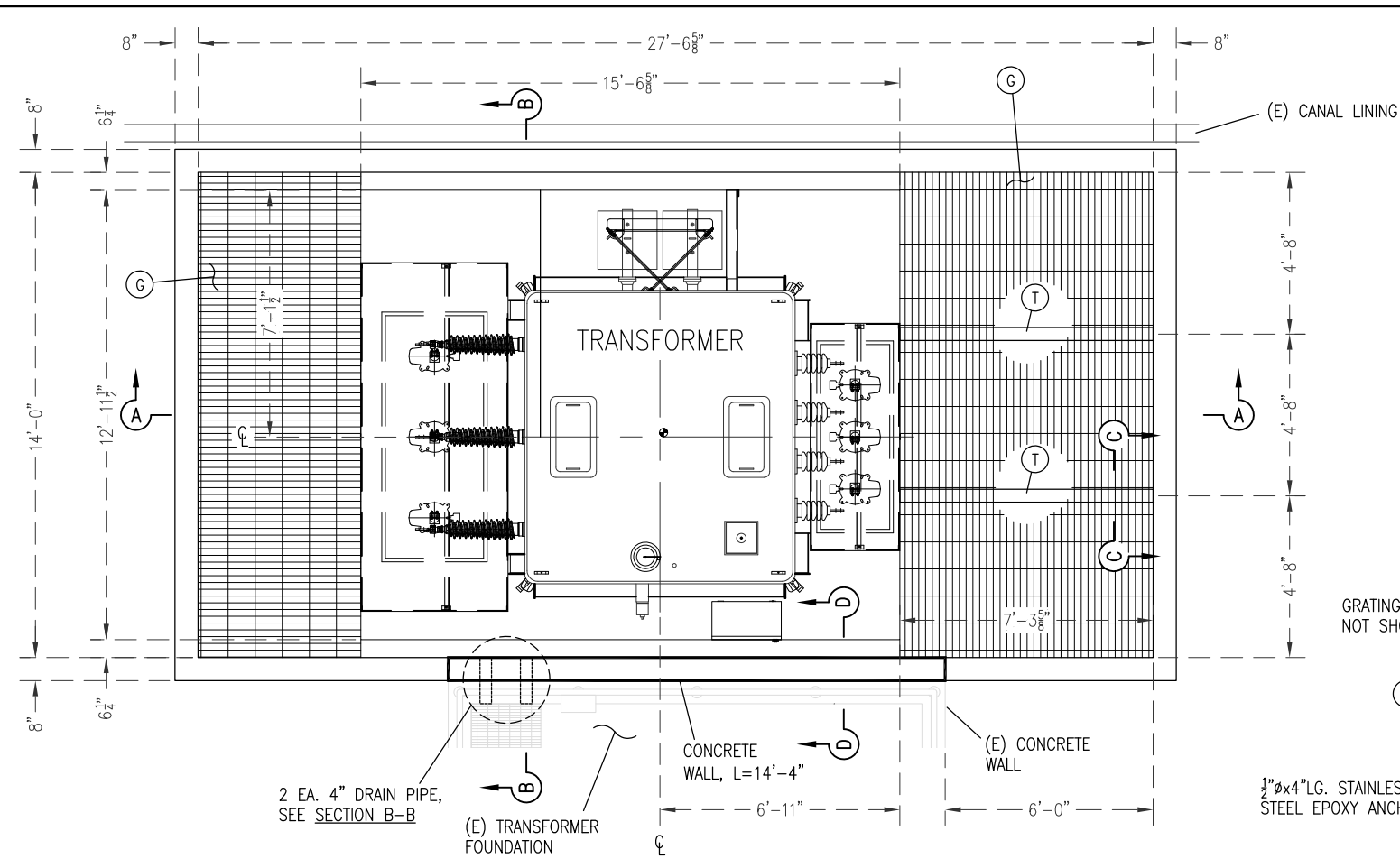
69KV CONNECTION

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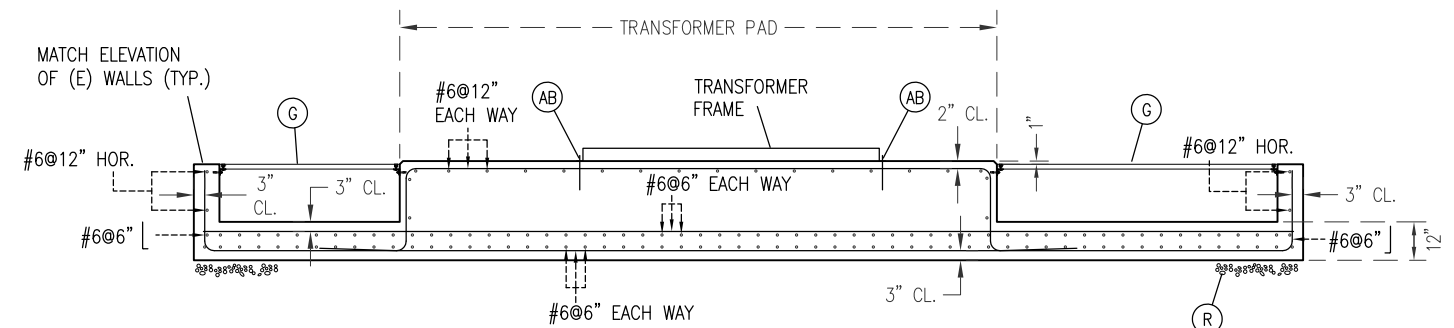
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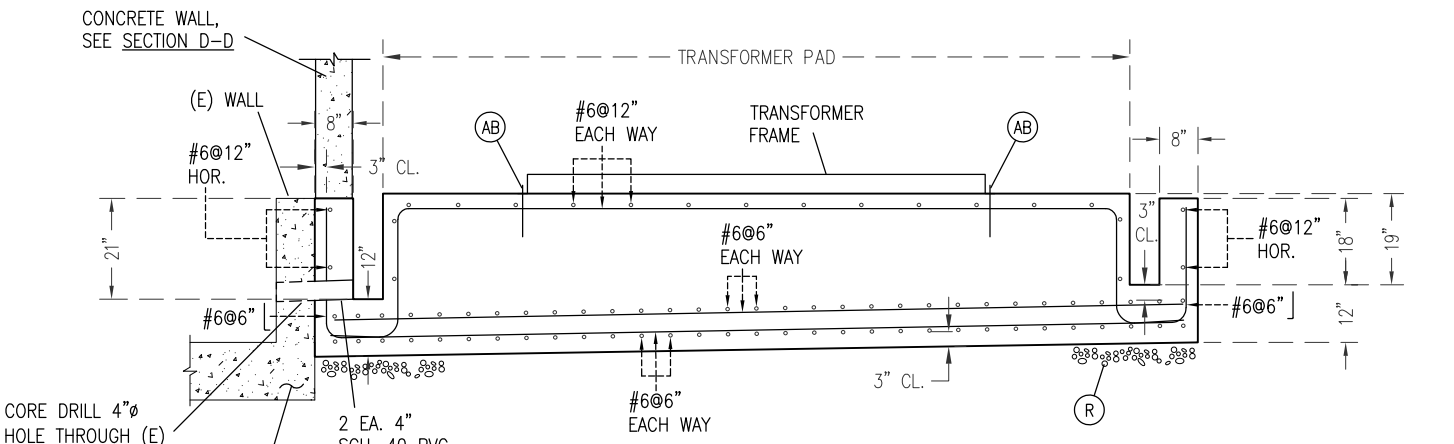
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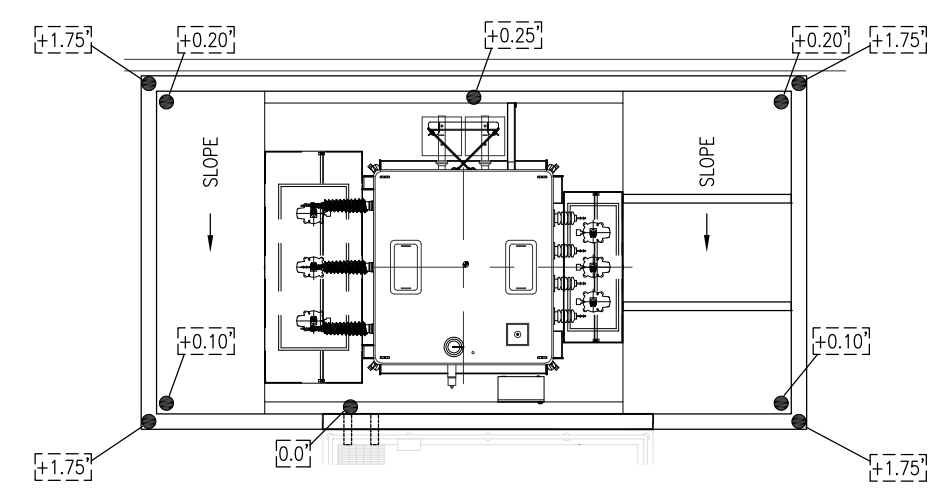
PLAN 1



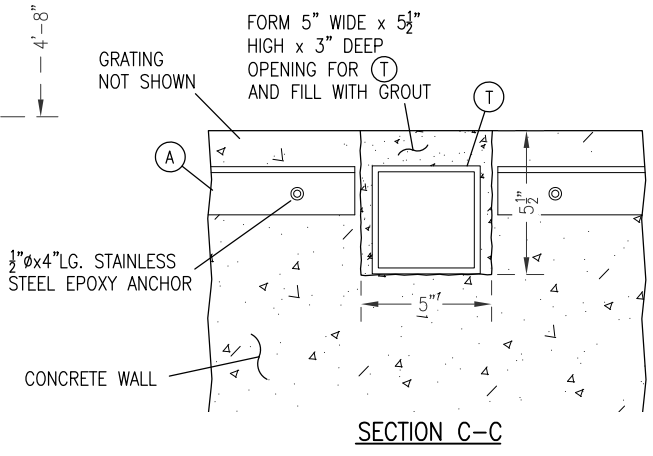
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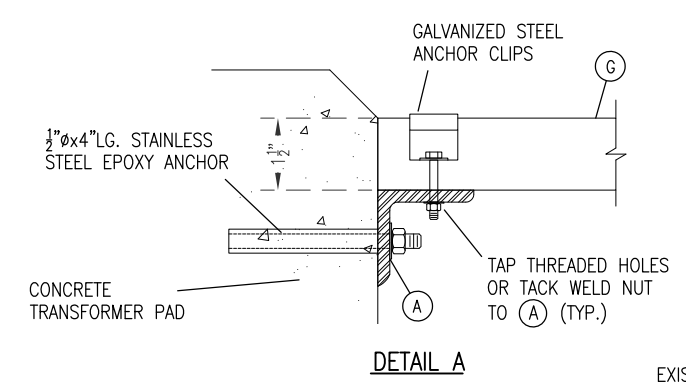
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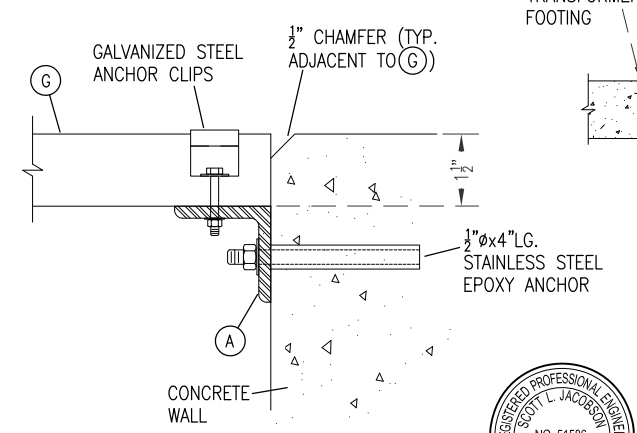
CONCRETE FLOOR SLOPE PLAN 1



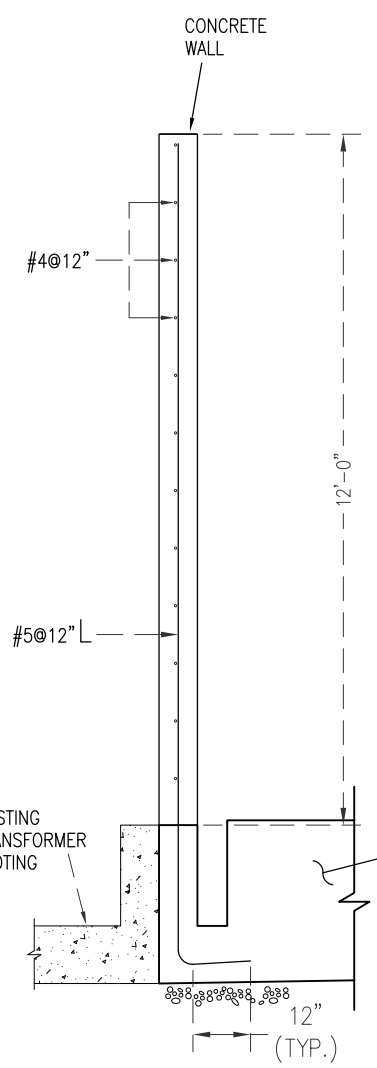
SECTION C-C



DETAIL A



DETAIL B



SECTION D-D 1

- GENERAL NOTES** 1
1. REINFORCED CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI. THE CEMENT SHALL BE PORTLAND CEMENT, TYPE II, AND SHALL CONFORM TO ASTM DESIGNATION C-150. A MINIMUM OF 5 1/2 SACKS OF CEMENT TO EACH CUBIC YARD OF CONCRETE SHALL BE USED. THE NET WATER-CEMENT RATIO SHALL NOT EXCEED 0.52 BY WEIGHT. MAXIMUM SLUMP SHALL NOT EXCEED 4-INCHES.
 2. REINFORCING STEEL SHALL CONFORM TO DESIGNATION A-615 GRADE 60 FOR DEFORMED AND PLAIN BILLET STEEL BARS FOR CONCRETE REINFORCEMENT. ALL REINFORCING BAR BENDS SHALL HAVE A MINIMUM RADIUS OF SIX BAR DIAMETERS AND SPLICES SHALL BE LAPPED FORTY BAR DIAMETERS.
 3. CHAMFER ALL EXPOSED CORNERS OF CONCRETE 1"±, UNLESS NOTED OTHERWISE.
 4. MISCELLANEOUS METAL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.

- EXPLANATION OF SYMBOLS**
- (A) 2"x2"x1/4" GALVANIZED STEEL ANGLE
 - (AB) 1"Ø ANCHOR BOLT, HILTI HAS-V HOT DIPPED GALVANIZED GRADE 36 OR APPROVED EQUAL W/ MIN. 9" EMBEDMENT (TYP. 4)
 - (G) WELDED GALVANIZED STEEL GRATING W/ 1 1/2"x3/8" BEARING BARS AT 1 1/8" C/C SPACING, SERRATED SURFACE AND Banded ENDS, SEE DETAIL A & DETAIL B
 - (R) 12" THICK LAYER OF 1" CRUSHED ROCK
 - (T) 4"x4"x1/4" GALVANIZED STEEL STRUCTURAL TUBING, 2 EA. AT L=7'-9"

ESTIMATED QUANTITIES 1

REINFORCED CONCRETE	37 CY
MISCELLANEOUS METAL	2,260 LBS

CORE DRILL 4"Ø HOLE THROUGH (E) CONC. WALL (TYP. 2)
EXISTING CONCRETE SUMP
2 EA. 4" SCH. 40 PVC DRAIN PIPE



DATE	12/15/2020	MG	SLJ	SLJ
DRAWN	MG	CHECKED	SLJ	APPROVED
REVISIONS				

EAST CONTRA COSTA IRRIGATION DISTRICT
BRENTWOOD CALIFORNIA

SUBSTATION TRANSFORMER

FOUNDATION DETAILS

SUMMERS ENGINEERING INC.
Consulting Engineers CALIFORNIA

HANFORD

DATE: DECEMBER 2020 APPROVED: *Scott Jacobson*

DRAWN: MG DRAWING NO.: S-1

CHECKED: SLJ SHEET: 1 OF 1

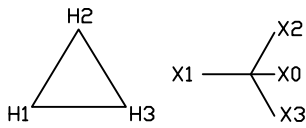
DRAWING NAME: ECCID20002.DWG

NEW TRANSFORMER SUBMITTAL DRAWINGS

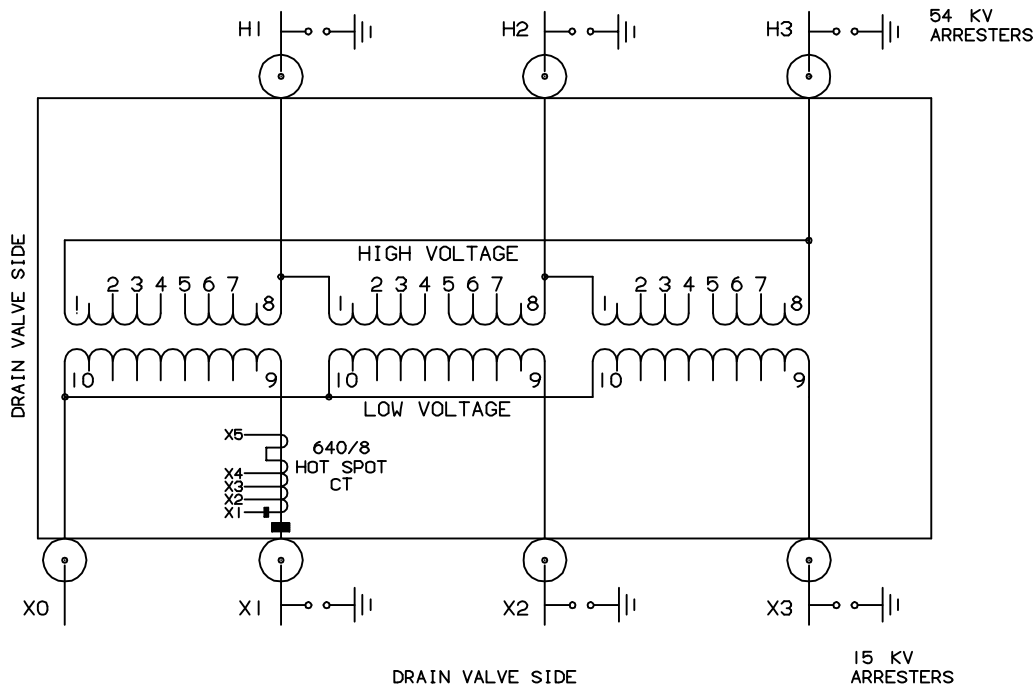
ABB TRANSFORMERS SOUTH BOSTON, VA.

VOLTS		THREE PHASE OIL INSULATED SUBSTATION TRANSFORMER CLASS ONAN INSULDUR INSULATION	FULL LOAD KVA					
HV	69000-		2500/2800	ONAN				
LV	20760Y/11986		55/65	°C RISE				
60 HERTZ		GALLONS LIQUID		3597				
INSTRUCTION BOOK	PC-1002	MFR ID	1LUS	SERIAL	BS00579-####	MANUFACTURE DATE	##/##	
FULL WAVE IMPULSE TEST LEVEL: H.V. 350 KV., L.V. 150 KV.								
IMPEDANCE		IMP_VAL1 % AT 2500 KVA 69000 TO 20760Y VOLTS.						
APPROX. WEIGHT IN LBS. CORE AND COILS		25845	CASE	12602	LIQUID	26980	TOTAL	65427
MADE IN U.S.A.		ABB INC.				1LUSBS00579N1		

DYN1



CONNECTIONS				
WINDING	VOLTS	2800 KVA AMPERES	TAP CHANGER	
			POS.	CONNECTS
HIGH VOLTAGE DELTA COPPER	72450	22.3	1	4 TO 5
	70730	22.8	2	3 TO 5
	69000	23.4	3	3 TO 6
	67280	24.1	4	2 TO 6
	65550	24.6	5	2 TO 7
LOW VOLTAGE WYE COPPER	20760	77.9	-----	



MFR. ID	SHOP ORDER
1LUS	BS00579
MFR. ID	DRAWING #
1LUS	BS00579N1

THIS TRANSFORMER WILL CARRY 3500 KVA WITHOUT EXCEEDING 65°C AVERAGE TEMPERATURE RISE WHEN ADEQUATE COOLING EQUIPMENT IS ADDED. THE OPERATING PRESSURE IS LIMITED BY THE SEALED-AIR FLUID PRESERVATION SYSTEM, UNLESS REMOVED TO 6.5 LBS. PER SQUARE INCH POSITIVE AND 6.5 LBS. PER SQUARE INCH NEGATIVE. THE TRANSFORMER TANK IS DESIGNED TO WITHSTAND A POSITIVE OR NEGATIVE PRESSURE OF 15 LBS. PER SQUARE INCH. THE 25°C LIQUID LEVEL IS 12.31 INCHES BELOW HIGHEST MANHOLE FLANGE. LIQUID LEVEL CHANGES .70 INCH FOR EACH 10°C CHANGE IN AVERAGE LIQUID TEMPERATURE. THE TRANSFORMER MUST NOT BE ENERGIZED FROM ANY VOLTAGE SOURCE WHEN TAP CHANGER IS OPERATED. SUITABLE FOR OPERATION AT OR BELOW 3300 FEET ALTITUDE AT NAMEPLATE RATING. AT THE TIME OF SHIPMENT THIS UNIT CONTAINED LESS THAN 1 PPM OF PCBs.

5/16 INCH HOLES FOR 190-32 X 3/16 SCREW
SIZE 6.25 INCHES X 10.0 INCHES AREA 62.5 SQUARE INCHES
DISTANCE BETWEEN CENTERS OF HOLES ON LONG EDGE 9 19/32 INCH ± 1/64 ON SHORT EDGE 5 27/32 INCH ± 1/64

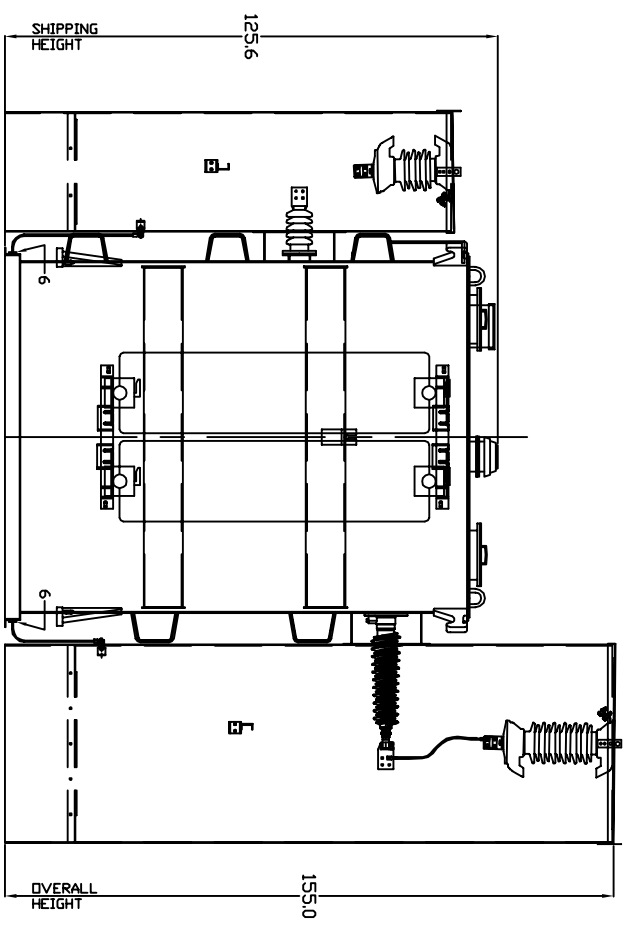
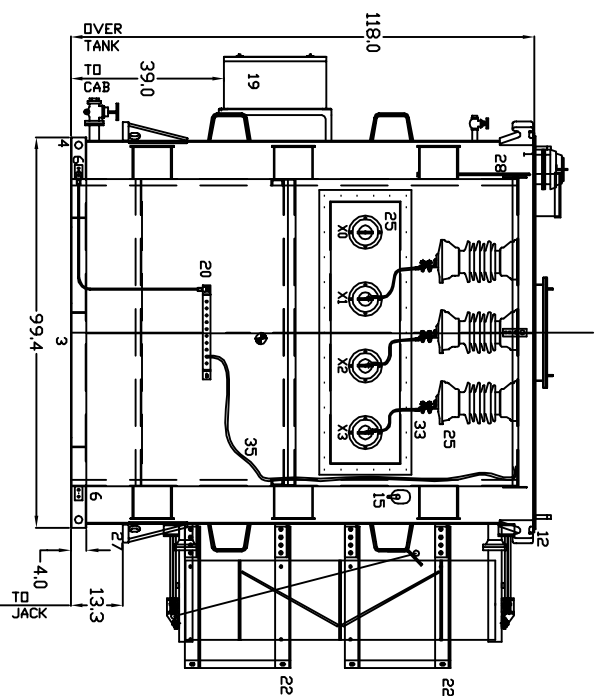
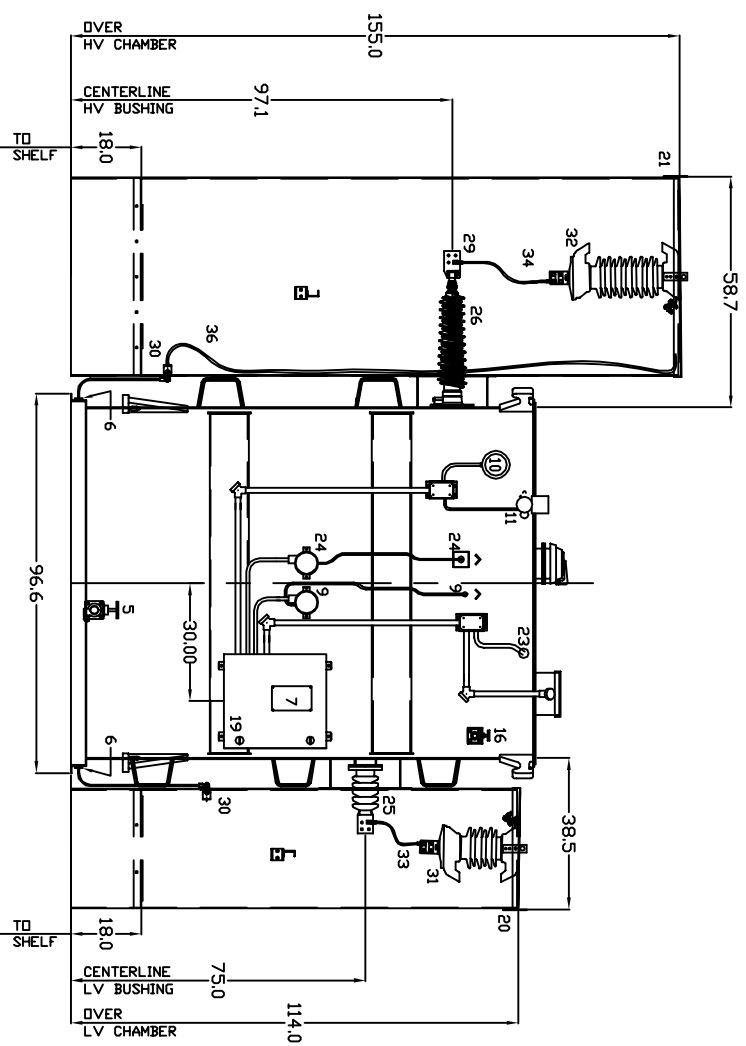
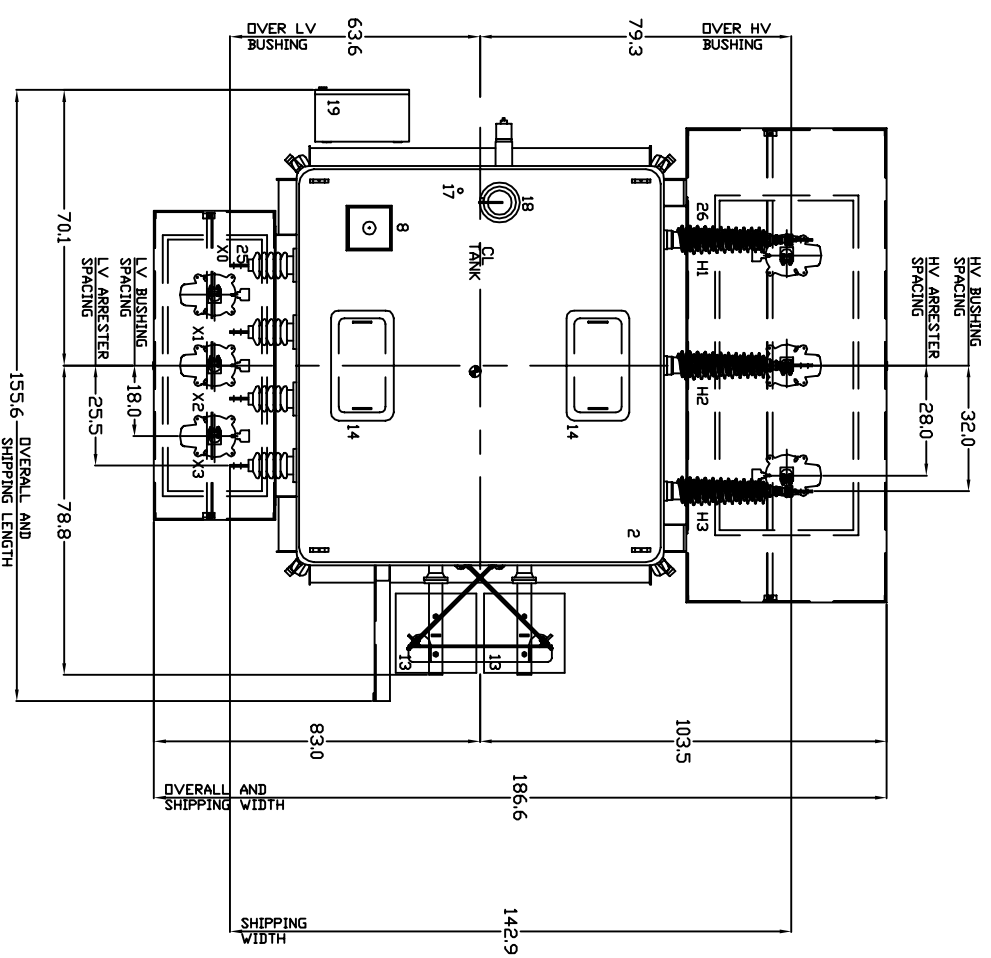
CUSTOMER NOTE: N.P. DWG. IS FOR YOUR INFO & REVIEW. THE IMPEDANCE, MANUFACTURE DATE, AND ABB SERIAL NUMBER ARE LEFT BLANK SINCE DRAWING IS SUBMITTED PRIOR TO MANUFACTURING. THE ACTUAL VALUES ARE ENGRAVED ON THE NAMEPLATE AT TIME OF SHIPMENT. THIS DRAWING IS NOT SUBSEQUENTLY REVISED TO ADD TESTED VALUES.

1				
N.P. DRAFT.	DATE	N.P. DRAFT.	DATE	N.P. DRAFT.
DRAFT.	DATE	DRAFT.	DATE	DRAFT.
ENGINEER	DATE	ENGINEER	DATE	ENGINEER
J. Richardson	10/10/20			

APPROXIMATE NET WEIGHTS

CORE AND COILS	25845 LBS.
TANK AND FITTINGS	12602 LBS.
LIQUID - OIL	26980 LBS.
LIQUID - DIL	65427 LBS.
TOTAL WEIGHT	60468 LBS.
APPROXIMATE TRANSFORMER SHIPPING WEIGHT	345 LBS.
COOLER LIQUID TOTAL - 46 GAL.	614 LBS.
MAXIMUM COOLER ASSEMBLY WEIGHT EACH	614 LBS.
COOLER WEIGHTS ARE INCLUDED IN TANK AND FITTINGS WEIGHTS	
COOLER LIQUID WEIGHT IS INCLUDED IN LIQUID WEIGHTS	
LV CHAMBER WEIGHT	1053 LBS.
HV CHAMBER WEIGHT	2337 LBS.

SHOP ORDER BS00579
DL D1 - MAIN OUTLINE OF
SEE DL D2 FOR BILL OF
MATERIALS AND ITEM NOTES

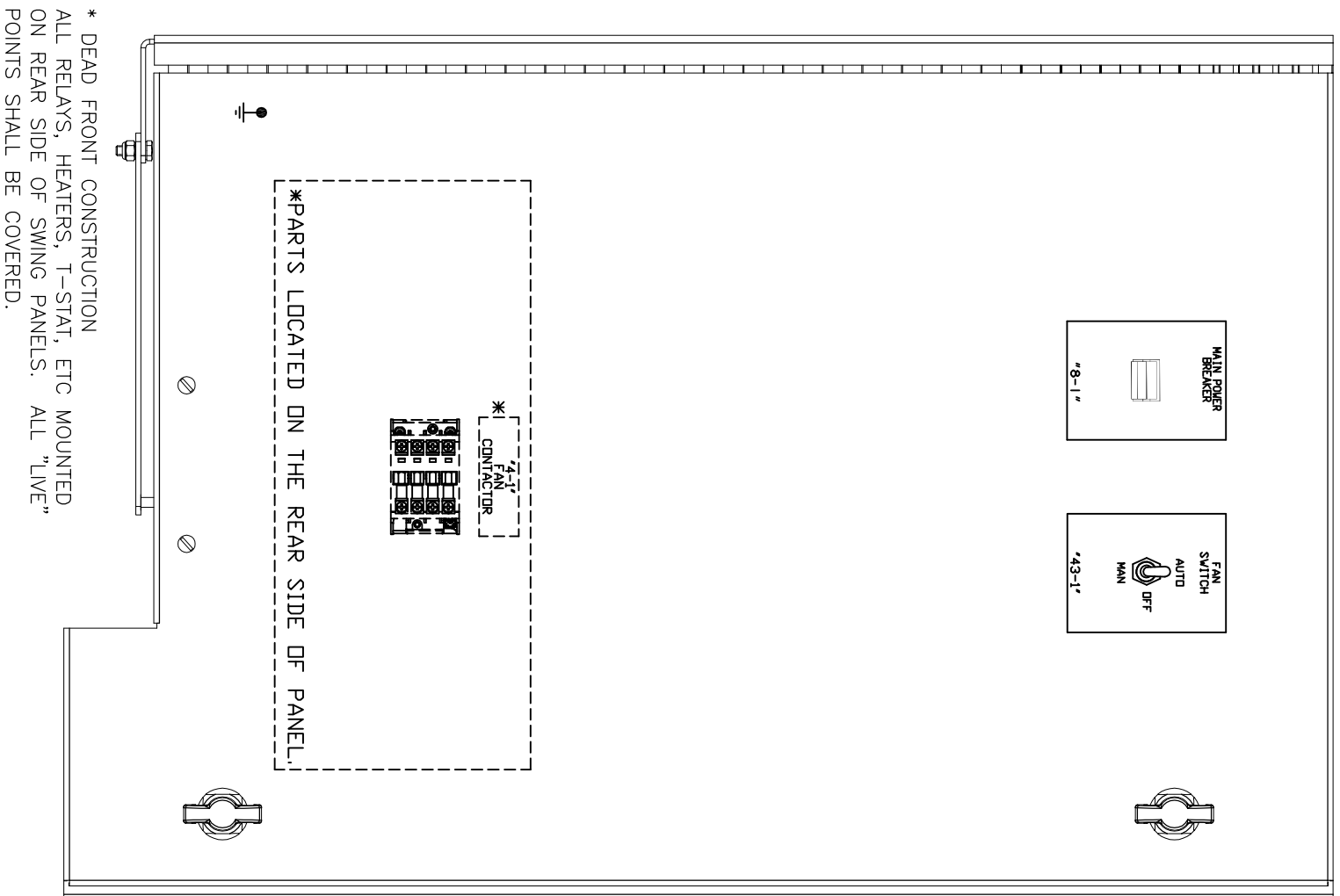


DESIGNATES CENTER OF GRAVITY COMPLETE

FROM GROUND IN FRONT VIEW	48.431	TEMP	RISE	ONAN KVA	-
RIGHT OF CENTERLINE TOP VIEW	1.534		55° C		2500
BELOW CENTERLINE TOP VIEW	1.28		65° C		2800
DESIGN IMPEDANCE	5.000 %				

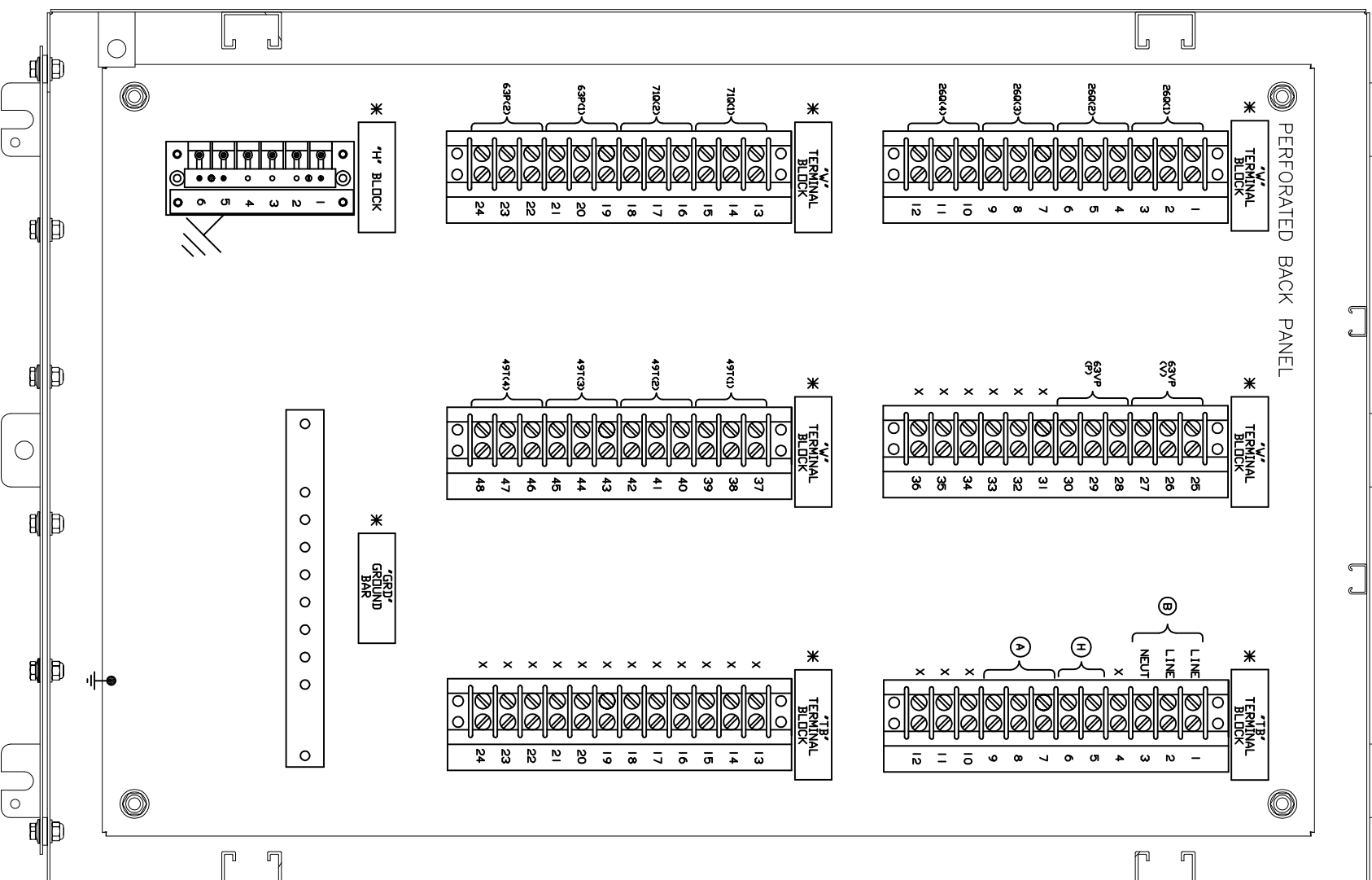
HV	350	KV BILL	LV	150	KV BILL	CLASS	ONAN	OUTDOOR
APPARATUS UNIT SUBSTATION TRANSFORMER								
60 HERTZ	2600 KVA	DELTA	LV	20760V/111986	3 PH			
DFTM P.KRANZKY	10/29/20	DR	ILUSBS00579U1	WTR. ID	DR			
CHKD J.B.HARDSON	10/29/20	DATE	ILUSBS00579U1	WTR. ID	DR			
APPD		BOOK	PC-1002					
TRANSFORMER						DIMENSIONS IN INCHES-SCALE NTS		

PERFORATED SWING PANEL



* DEAD FRONT CONSTRUCTION
 ALL RELAYS, HEATERS, T-STAT, ETC MOUNTED
 ON REAR SIDE OF SWING PANELS. ALL "LIVE"
 POINTS SHALL BE COVERED.

*PARTS LOCATED ON THE REAR SIDE OF PANEL.



NOTE: THIS WIRING DIAGRAM MUST NOT BE USED TO DETERMINE THE EXACT LOCATION OF APPARATUS, WIRES OR CABLES. ALL APPARATUS IS SHOWN IN DE-ENERGIZED POSITION. ALL ALARM CONTACTS SHOWN IN NORMAL OPERATING CONDITION.
 THE MATERIAL SUPPLIED BY ABB INC. IS ACCORDING TO CONTRACT AND IS NOT MODIFIED BY ANYTHING SHOWN ON THIS DIAGRAM.

- 260 THERMOMETER
 1 FAN CONTACT 70° C
 2 AUXILIARY CONTACT 75° C (NOT USED)
 3 ALARM CONTACT 112° C
 4 TRIP CONTACT 117° C
- 4-1 FAN CONTACTOR
- 49T DIAL HOT SPOT THERMOMETER
 1 FAN CONTACT 70° C
 2 AUXILIARY CONTACT 75° C (NOT USED)
 3 ALARM CONTACT 112° C
 4 TRIP CONTACT 117° C
 H HEATER
- 63P PRESSURE RELIEF DEVICE (CONTACTS MUST BE MANUALLY RESET)
 63VP VACUUM PRESSURE ALARM
 P SET AT 3.5 PSIG VACUUM
 P SET AT 7.0 PSIG PRESSURE
- 710 LIQUID LEVEL GAUGE
 1 ALARM CONTACT (LOW LEVEL)
 2 ALARM CONTACT (GRIT LOW LEVEL)
- 8-1 MAIN AC POWER BREAKER
- 43-1 FAN SWITCH
 GRD GROUND BAR

- (A) THE EXACT NUMBER OF FUTURE FANS IS 1
- (B) CUSTOMER SUPPLY - 240/120 VAC, 3 WIRE, 1 PH, 60 HZ
- (H) FAN SHUTDOWN CONTACT - REMOVE JUMPER WHEN CONTACT IS APPLIED

- * ALL WIRING TO BE SIS TYPE.
- * ONE SET OF FINAL DRAWINGS TO BE PLACED IN CONTROL CABINET BEFORE SHIPMENT.
- * ALL WIRING TO BE IN LIQUID TIGHT FLEXIBLE METAL CONDUIT.
- * ALL INSTRUMENT WIRING SHALL BE #14 AWG.
- * ALL CONTROL POWER WIRING SHALL BE A MIN. OF #12 AWG.
- * ALL CURRENT TRANSFORMER WIRING SHALL BE #10 AWG.
- * NO CONDUIT SHALL ENTER THE TOP OF EITHER WIRING GATHERING BOXES OR CONTROL CABINET.

* MICARTA TAGS ALL DEVICES IN CONTROL CABINET MUST BE IDENTIFIED WITH MICARTA TAGS WHILE WITH 1/4" HIGH BLACK LETTERS

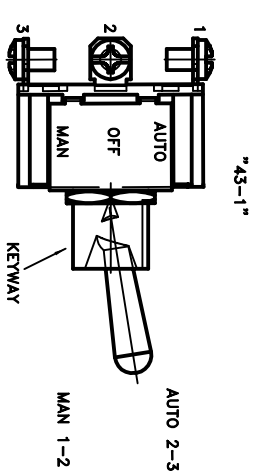
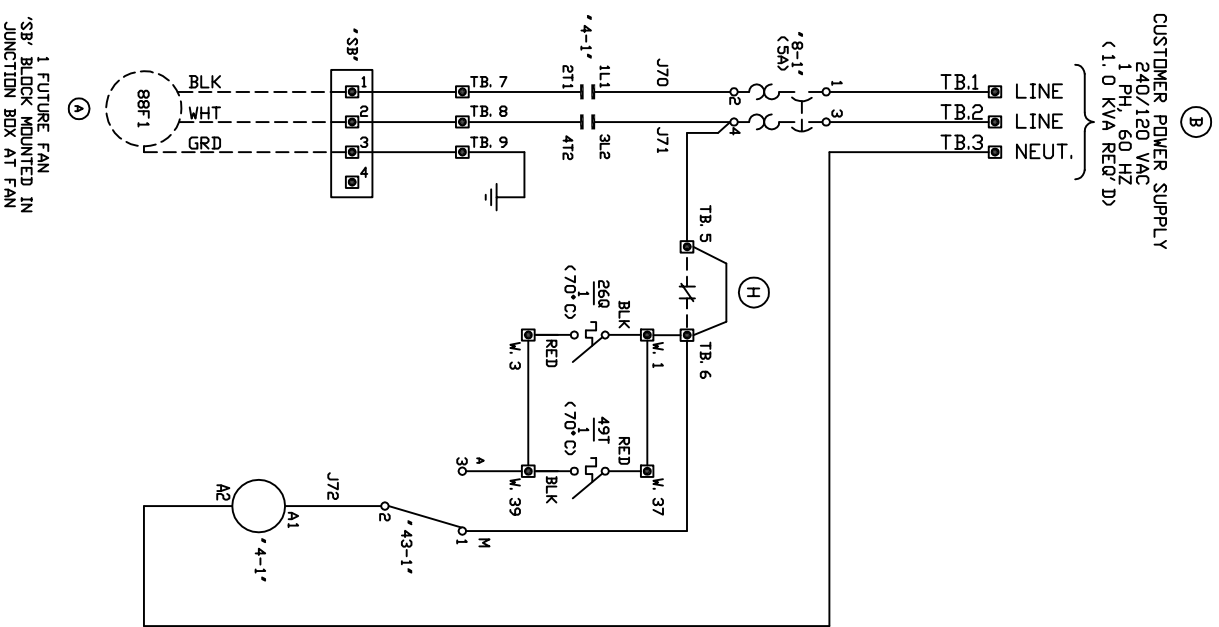
1	CHANGE
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CUSTOMER ID	EXPLANATION
-------------	-------------

SCHEMATIC	DEVICE	TERMINAL
-----------	--------	----------

WIRE CONN. ON PANEL	DATE	BY	CHKD	APP'D
1 5/1	10/23/2024	J. Knapp		J. Richardson
2 5/2				
3 5/3				
4 5/4				
5 5/5				
6 5/6				
7 5/7				
8 5/8				
9 5/9				
10 5/10				

WIRE CODE	FROM	TO	FROM	TO
TB1	TB 1	8-1	1	12
TB2	TB 2	8-1	3	12
J70	8-1	4-1	11L	12
J71	4-1	3L2	8-1	4
TB5	TB 5	TB 6	6	12
TB7	4-1	2T1	TB 7	SB 1
TB8	4-1	4T2	TB 8	SB 2
TB9	GRD	TB 9	9	SB 3
V1	TB 6	V 1	V 37	12
TB6	TB 6	43-1	1	12
V29	43-1	3	V 39	12
J72	43-1	2	4-1	A1
TB3	TB 3	4-1	A2	12



VIEW OF FAN SWITCH

- NOTE: THIS WIRING DIAGRAM MUST NOT BE USED TO DETERMINE THE EXACT LOCATION OF APPARATUS, WIRES OR CABLES. ALL APPARATUS IS SHOWN IN DE-ENERGIZED POSITION. ALL ALARM CONTACTS SHOWN IN NORMAL OPERATING CONDITION.
- THE MATERIAL SUPPLIED BY ABB INC. IS ACCORDING TO THE CONTRACT AND IS NOT MODIFIED BY ANYTHING SHOWN ON THIS DIAGRAM.
- STAY PUT
 - △ SPRING RETURN
 - |— NORMALLY OPEN
 - |/— NORMALLY CLOSED
 - ⊞ SWITCH CONTACT
 - ⊞ RELAY CONTACT
 - ⊞ OPERATING COIL
 - ⊞ DISCONNECT DEVICE
 - ⊞ OPERATING COIL
 - ⊞ CAPACITOR
 - ⊞ CIRCUIT BREAKER
 - ⊞ THERMAL ELEMENT

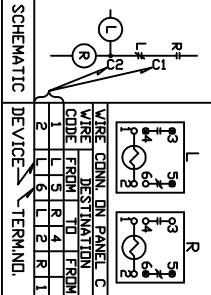
ABB ABB INC. TRANSFORMERS SOUTH BOSTON, VIRGINIA U.S.A.

1

CHANGE

CUSTOMER ID

EXPLANATION



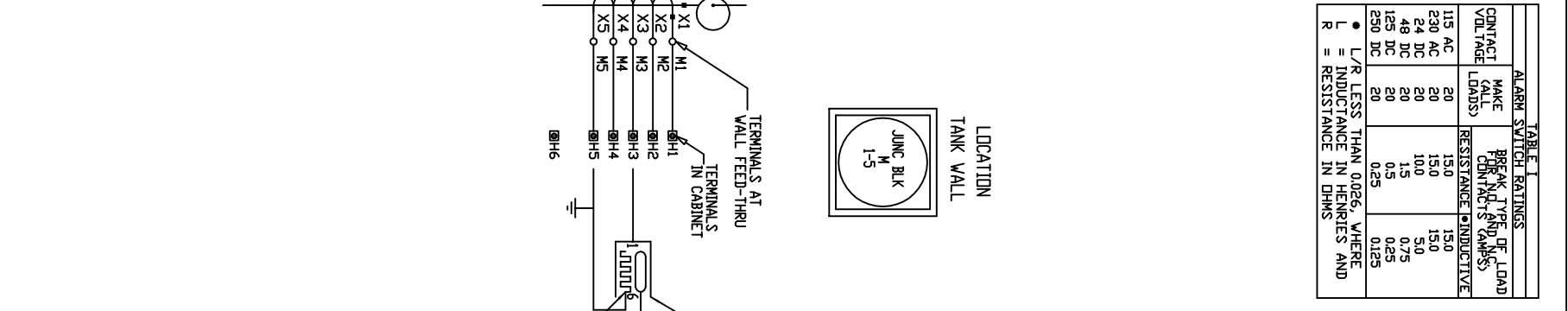
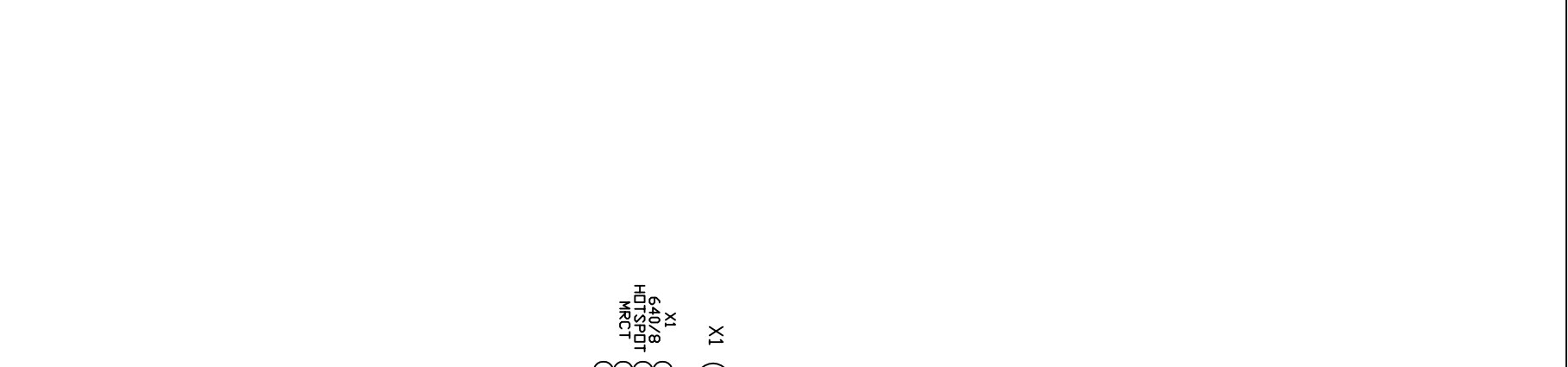
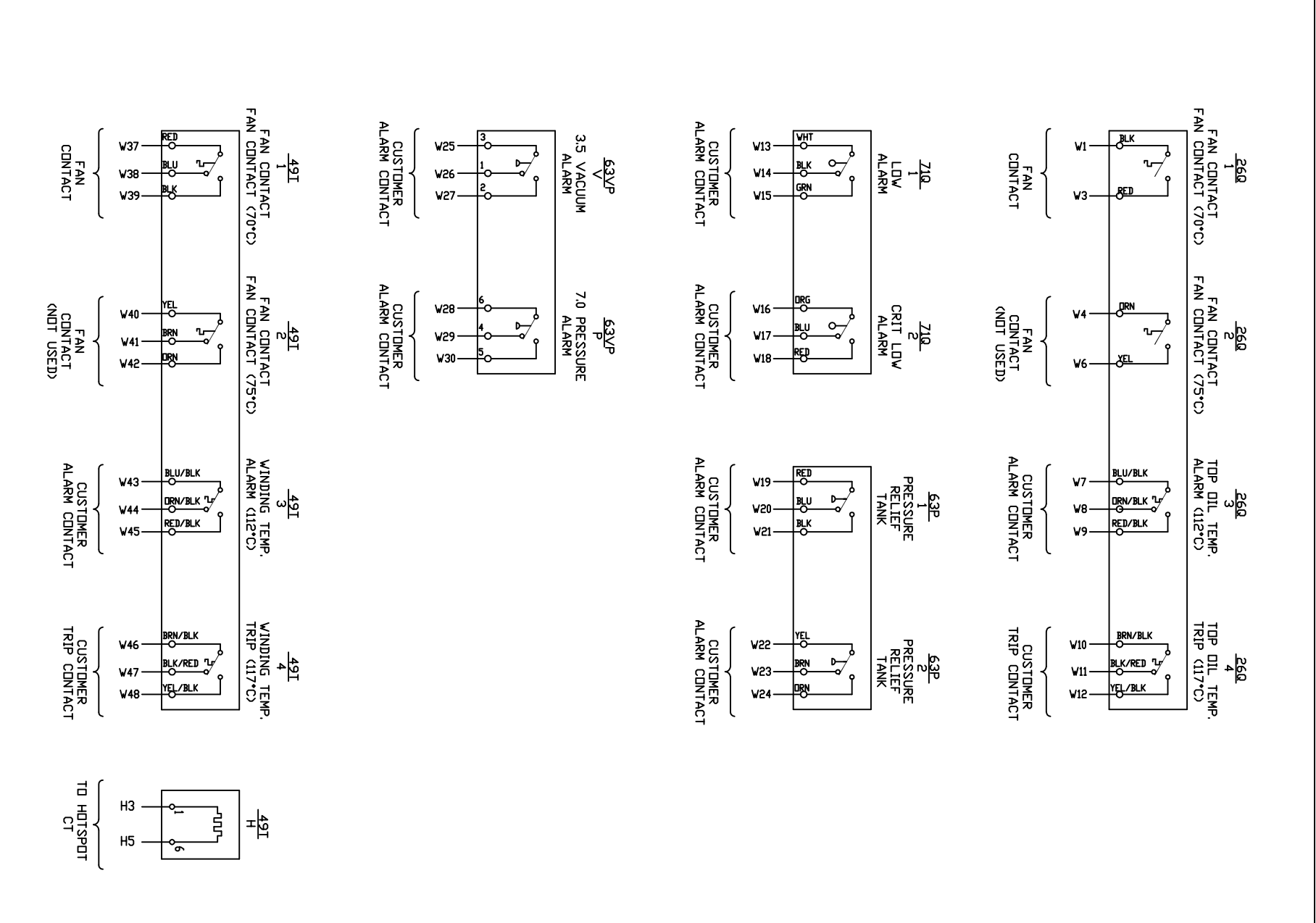
WIRE CODE	FROM	TO	FROM	TO
1	1	2	1	1
2	2	3	2	2
3	3	4	3	3
4	4	5	4	4
5	5	6	5	5
6	6	7	6	6
7	7	8	7	7
8	8	9	8	8
9	9	10	9	9
10	10	11	10	10

ABB INC. TRANSFORMER WIRING DIAGRAM
 APP'D J. Richardson 10/23/2021 11US BS00579W2
 DRAWING NUMBER

WIRE CODE	FROM	DESTINATION	TO	FROM	WIRE CODE
V1	266(K) BLK	V	1	14	
V3	266(K) RED	V	3	14	
V4	266(K) BRN	V	4	14	
V6	266(K) YEL	V	6	14	
V7	266(K) BLU/BLK	V	7	14	
V8	266(K) BRN/BLK	V	8	14	
V9	266(K) RED/BLK	V	9	14	
V10	266(K) BRN/BLK	V	10	14	
V11	266(K) BLK/RED	V	11	14	
V12	266(K) YEL/BLK	V	12	14	
V13	710(K) WHT	V	13	14	
V14	710(K) BLK	V	14	14	
V15	710(K) GRN	V	15	14	
V16	710(K) BRG	V	16	14	
V17	710(K) BLU	V	17	14	
V18	710(K) RED	V	18	14	
V19	63P(K) RED	V	19	14	
V20	63P(K) BLU	V	20	14	
V21	63P(K) BLK	V	21	14	
V22	63P(K) YEL	V	22	14	
V23	63P(K) BRN	V	23	14	
V24	63P(K) GRN	V	24	14	
V25	63P(K) V	V	25	14	
V26	63P(K) 1	V	26	14	
V27	63P(K) 2	V	27	14	
V28	63P(K) 3	V	28	14	
V29	63P(K) 4	V	29	14	
V30	63P(K) 5	V	30	14	
V37	49T(K) RED	V	37	14	
V38	49T(K) BLU	V	38	14	
V39	49T(K) BLK	V	39	14	
V40	49T(K) YEL	V	40	14	
V41	49T(K) BRN	V	41	14	
V42	49T(K) GRN	V	42	14	
V43	49T(K) BLU/BLK	V	43	14	
V44	49T(K) BRN/BLK	V	44	14	
V45	49T(K) RED/BLK	V	45	14	
V46	49T(K) BRN/BLK	V	46	14	
V47	49T(K) BLK/RED	V	47	14	
V48	49T(K) YEL/BLK	V	48	14	
H2	49T(K) 1	H	2	14	
H3	49T(K) 6	H	3	14	
H1	M	H	1	10	
H2	M	H	2	10	
H3	M	H	3	10	
H4	M	H	4	10	
H5	M	H	5	10	

1	CHANGE	IT
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CUSTOMER ID	EXPLANATION	SCHEMATIC	WIRE CONNECTIONS FOR THE PHYSICAL LAYOUT OF THE PANEL COMPARTMENT, OR GENERAL AREA TO WHICH THEIR LISTINGS APPLY ARE SHOWN EITHER ADJOINING THESE AREAS OR ON DWG. LISTED AT THE RIGHT OF THIS EXPLANATION.
			WIRE CODE NOS. CORRESPOND TO THOSE APPEARING IN THE DEVICE TERMINAL INDICATES UNUSED TERMINAL.
			ABB INC. TRANSFORMER WIRING DIAGRAM
			DRIVING NUMBER BS00579W3



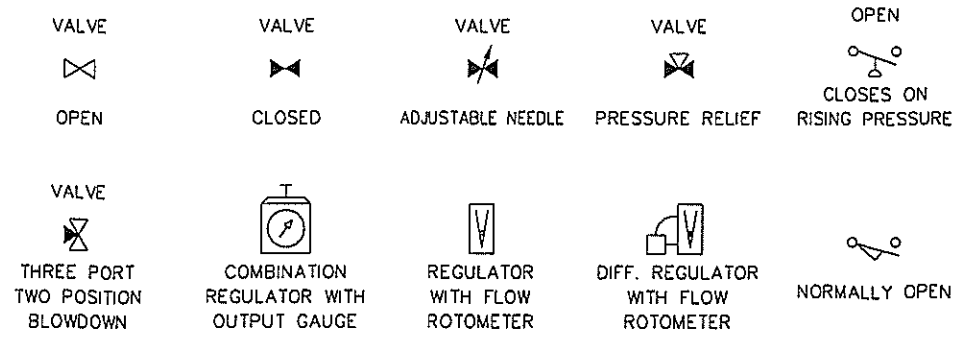
CONTACT VOLTAGE	MAKE LOADS	BREAK TYPE (IN HENRIES)	INDUCTIVE RESISTANCE	RESISTIVE
115 AC	20	150	150	150
230 AC	20	150	100	50
24 DC	20	150	1.5	0.75
48 DC	20	150	0.5	0.25
125 DC	20	150	0.25	0.125
250 DC	20	150	0.125	0.0625

• L/R LESS THAN 0.026, WHERE L = INDUCTANCE IN HENRIES AND R = RESISTANCE IN OHMS

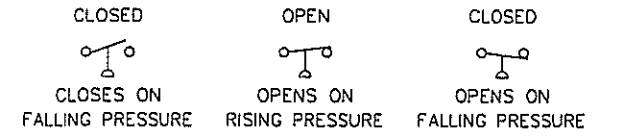


EXISTING CONTROL PANEL REFERENCE DRAWINGS

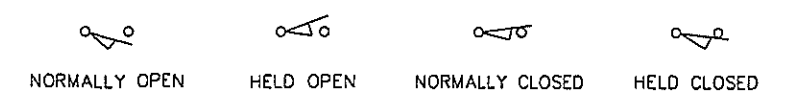
PNEUMATIC COMPONENTS



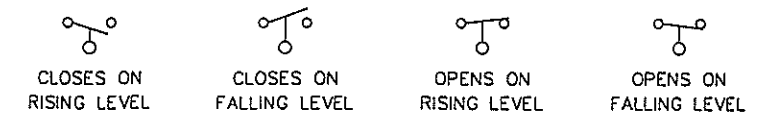
PRESSURE SWITCHES



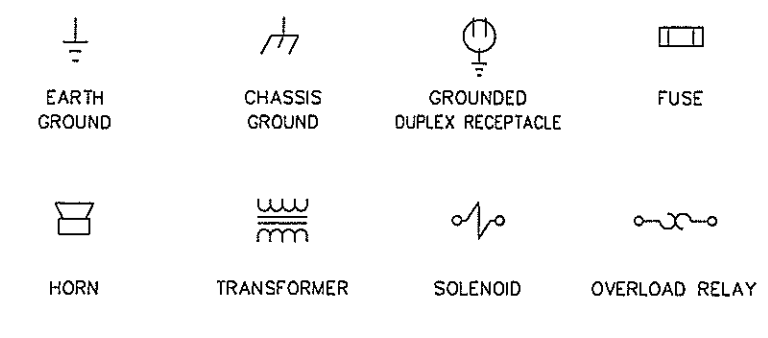
LIMIT SWITCHES



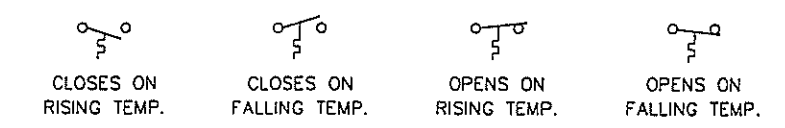
LEVEL SWITCHES



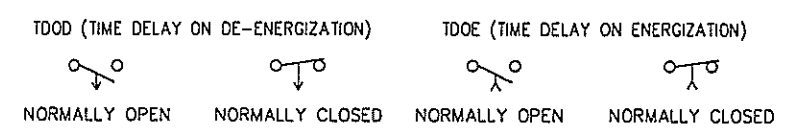
ELECTRICAL EQUIPMENT



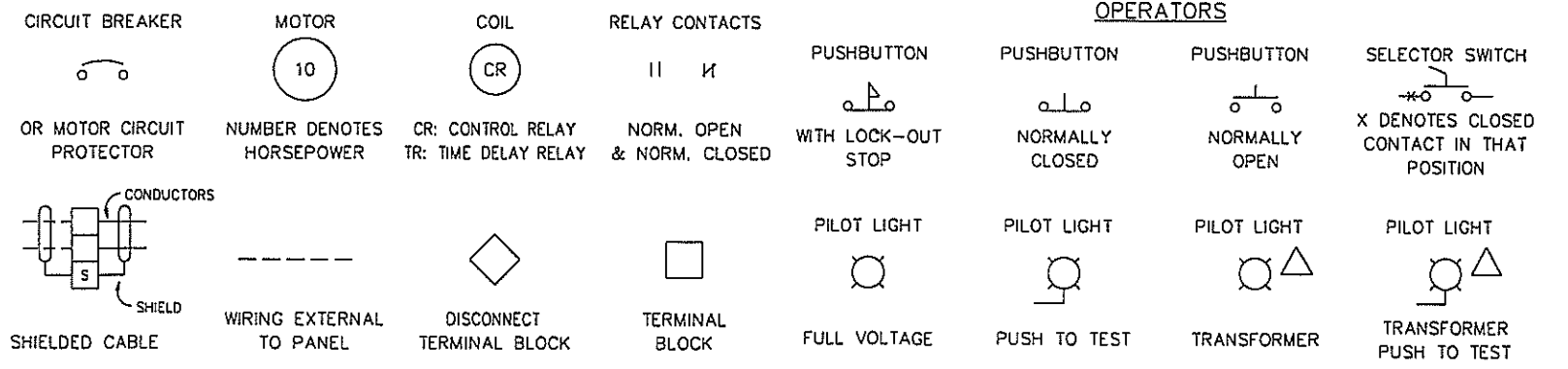
TEMPERATURE SWITCHES



TIME DELAY CONTACTS



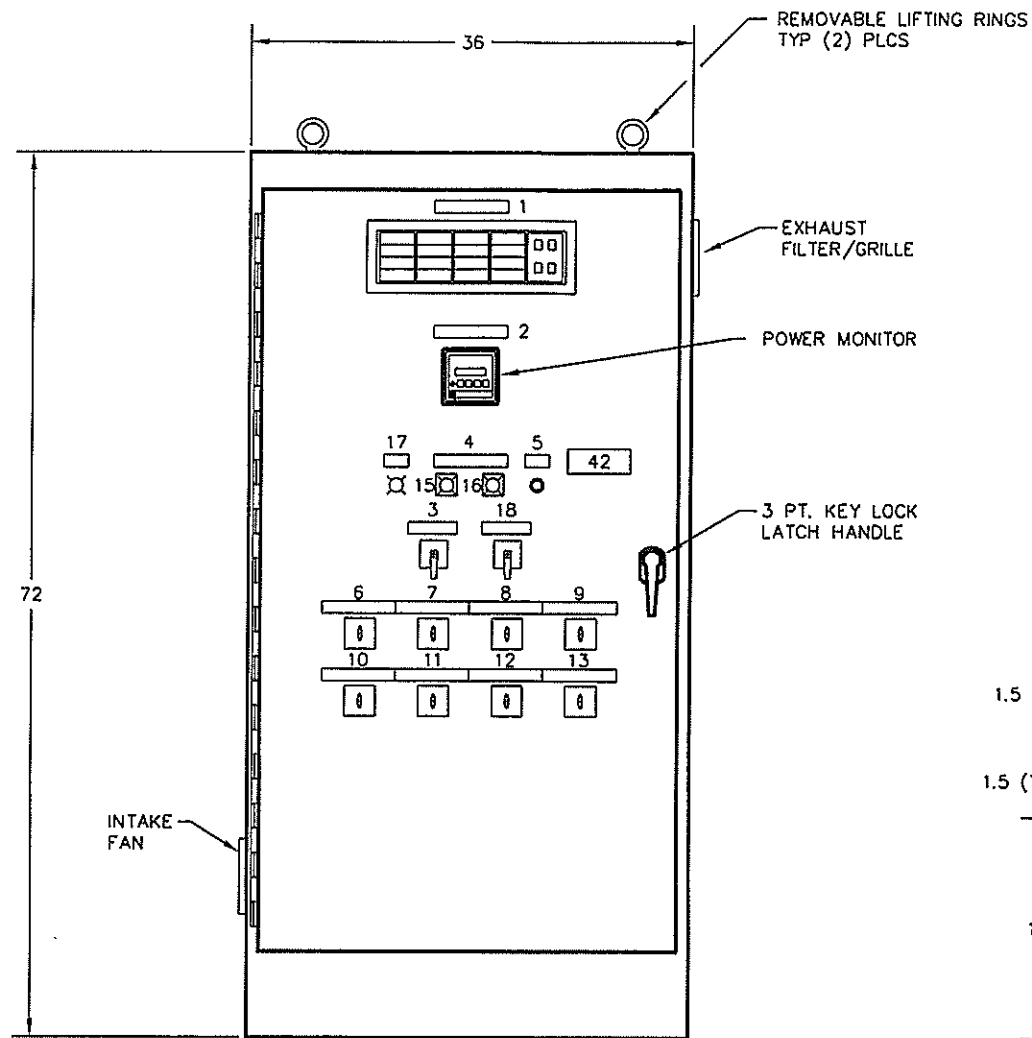
OPERATORS



- 9. BACK PANEL COMPONENTS IDENTIFIED WITH NAMEPLATES
- 8. NAMEPLATES: BLACK WITH WHITE CORE, 1/8" MINIMUM HEIGHT, ATTACHED WITH STAINLESS STEEL SELF TAPPING SCREWS.
- 7. WIRING COLOR CODE: AC POWER: BLACK
AC CONTROL: RED
AC NEUTRAL: WHITE
AC GROUND: GREEN
DC LINE: BLUE
FOREIGN VOLTAGE: YELLOW
- 6. WIRE MARKERS: HEAT SHRINK (WHT w/BLK LTR) MACHINE PRINTED
- 5. WIRE: 600 VOLT STRANDED COPPER, TYPE MTW, #16 AWG.
- 4. SIGNAL CABLE: SHIELDED PAIRS, #18 AWG MINIMUM
- 3. SUPPLIED BY CONTROL MFG CO., INC. MOUNTED AND WRED BY OTHERS.
- 2. EXISTING EQUIPMENT
- 1. NOT SUPPLIED BY CONTROL MFG CO., INC.

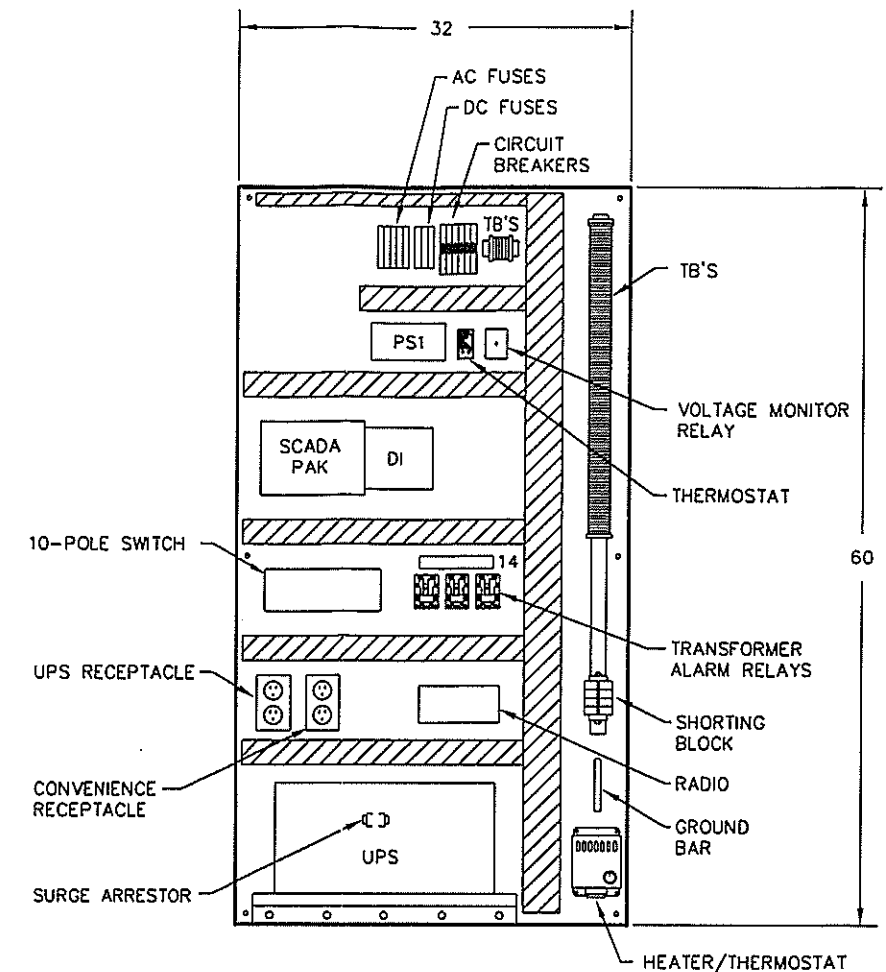
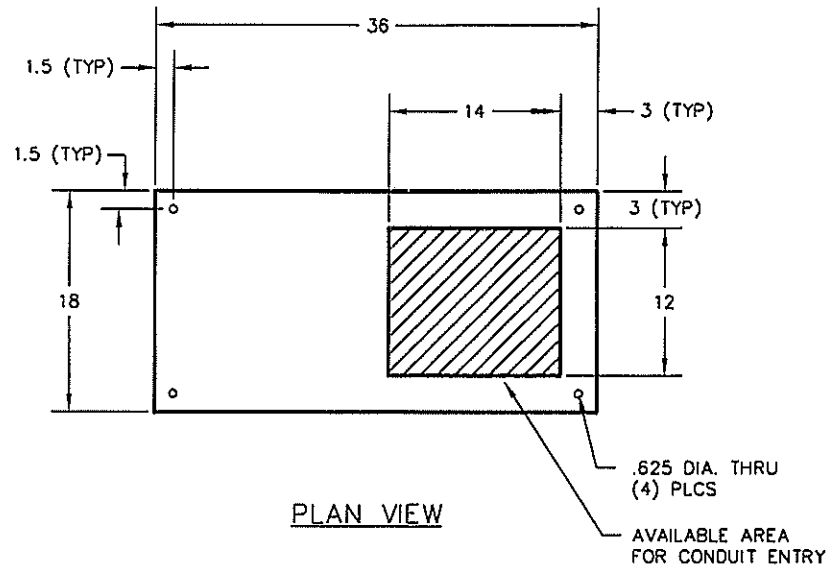
△ NOTE SYMBOL PERTAINING TO THIS SHEET
 ⬡ NOTE SYMBOL PERTAINING TO THE SHEET ON WHICH IT IS SHOWN

(SEE ABOVE) NOTES: UNLESS OTHERWISE SPECIFIED	CONTROL MANUFACTURING COMPANY, INC. 2650 NAPA VALLEY CORPORATE DRIVE NAPA, CA. 94558 (707) 258-8400 FAX: (707) 258-8465				WIRE NUMBERS ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING		PROJECT TITLE: EAST CONTRA COSTA IRRIGATION DISTRICT 69KV SUBSTATION CONTROL PANEL DRAWING TITLE: GENERAL NOTES / SYMBOLS CUSTOMER: INDEPENDENT POWER SYSTEMS	
	USED:		USED:		THIS DRAWING IS LOANED ON THE CONDITION THAT IT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, WITHOUT THE PERMISSION OF CHC.		DRAWING NUMBER: 2610-00	
	NOT USED:		NOT USED:		TESTED:		SCALE: SIZE D	
	NOT USED:		NOT USED:		CHECKED:		SHEET 1 OF 1	
REVISIONS				DRAWN: PC 3/00 DESIGNED: SH 3/00		SHEET 1 OF 1		



FRONT VIEW

NEMA 12 ENCLOSURE
(72.06 x 36.06 x 18.06)
ANSI-61 GRAY EXTERIOR



1. REF. DWG. 2610-00 FOR GENERAL NOTES
NOTES: UNLESS OTHERWISE SPECIFIED

REV	BY	DATE	DESCRIPTION	APP
B	PC	10/00	AS BUILT	
A	PC	8/00	REV. PER PRODUCTION REVIEW	
REVISIONS				



CONTROL
MANUFACTURING
COMPANY, INC.

2650 NAPA VALLEY CORPORATE DRIVE
NAPA, CA. 94558
(707) 258-8400
FAX: (707) 258-8465

WIRE NUMBERS	
PANEL	SYSTEM
USED:	USED:
NOT USED:	NOT USED:

ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING	
THIS DRAWING IS LOANED ON THE CONDITION THAT IT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, WITHOUT THE PERMISSION OF CMC.	
TESTED:	TR 10/00
CHECKED:	
DRAWN:	PC 3/00
DESIGNED:	SH 3/00

PROJECT TITLE:		EAST CONTRA COSTA IRRIGATION DISTRICT	
DRAWING TITLE:		69KV SUBSTATION CONTROL PANEL ELEVATION DETAIL	
CUSTOMER:		INDEPENDENT POWER SYSTEMS	
SCALE	SIZE	DRAWING NUMBER:	SHEET
	D	2610-A1	1 of 1

NAMEPLATE ENGRAVING SCHEDULE						
ITEM	DESCRIPTION	TAG NO.	QTY	LTR SIZE	N/P SIZE	INSCRIPTION
1	NAMEPLATE		1	3/16	1 x 6	ANNUNCIATOR
2	NAMEPLATE		1	3/16	1 x 6	MULTIFUNCTION METER
3	NAMEPLATE		1	3/16	1 x 6	BREAKER CONTROL SWITCH
4	NAMEPLATE		1	3/16	1 x 6	252-1 BREAKER CONTROL SWITCH
5	NAMEPLATE		1	3/16	1 x 2	RESET
6	NAMEPLATE		1	3/16	1 x 6	FCO-1 TX OIL TEMP TRIP CUTOUT
7	NAMEPLATE		1	3/16	1 x 6	FCO-2 TX WDG TEMP TRIP CUTOUT
8	NAMEPLATE		1	3/16	1 x 6	FCO-3 TX FAULT PRESS. TRIP CUTOUT
9	NAMEPLATE		1	3/16	1 x 6	FCO-4 TX WDC TEMP. ALARM CUTOUT
10	NAMEPLATE		1	3/16	1 x 6	FCO-5 TX OIL TEMP ALARM CUTOUT
11	NAMEPLATE		1	3/16	1 x 6	FCO-6 TX OIL LEVEL ALARM CUTOUT
12	NAMEPLATE		1	3/16	1 x 6	FCO-7 TX GAS PRESS. ALARM CUTOUT
13	NAMEPLATE		1	3/16	1 x 6	FCO-8 TX PRESS. RELIEF ALARM CUTOUT
14	NAMEPLATE		1	3/16	1 x 5	74T TRANSFORMER ALARM RELAY
15	PILOT LIGHT; RED		1	1/8	⑦	TRIP
16	PILOT LIGHT; GREEN		1	1/8	⑦	CLOSE
17	NAMEPLATE		1	3/16	1 x 3	LOCKOUT RELAY RESET
18	NAMEPLATE		1	3/16	1 x 6	TRANSFORMER LOCKOUT RELAY
19	NAMEPLATE		1	1/8	.50 x 1	49T-2X
20	NAMEPLATE		1	1/8	.50 x 1	26T-2X
21	NAMEPLATE		1	1/8	.50 x 1	86T
22	NAMEPLATE		1	1/8	.50 x 1	PS1
23	NAMEPLATE		1	1/8	.50 x 1	SURGE PROTECTOR
24	NAMEPLATE		1	1/8	.50 x 1	TS-M1
25	NAMEPLATE		1	1/8	.50 x 3.5	ANNUNCIATOR POWER SUPPLY

NAMEPLATE ENGRAVING SCHEDULE						
ITEM	DESCRIPTION	TAG NO.	QTY	LTR SIZE	N/P SIZE	INSCRIPTION
26	NAMEPLATE		1	1/8	.50 x 2	PLC RACK #1
27	NAMEPLATE		1	1/8	.50 x 2	HEATER / THERMOSTAT
28	NAMEPLATE		1	1/8	.50 x 2	mP CONTROLLER
29	NAMEPLATE		1	1/8	.50 x 2	CONVENIENCE RECEPTACLE
30	NAMEPLATE		1	1/8	.50 x 2	UPS RECEPTACLE
31	NAMEPLATE		1	1/8	.50 x 1	74T
32	NAMEPLATE		1	1/8	.50 x 1	27S
33	NAMEPLATE		1	1/8	.50 x 1	UPS
34	NAMEPLATE		1	1/8	.50 x 1	CB1
35	NAMEPLATE		1	1/8	.50 x 1	CB2
36	NAMEPLATE		1	1/8	.50 x 1	RADIO
37	NAMEPLATE		1	1/8	.50 x 2	DI MODULE
38	NAMEPLATE		1	1/8	.50 x 1	TB1
39	NAMEPLATE		1	1/8	.50 x 1	TB2
40	NAMEPLATE		1	1/8	.50 x 1	TB3
41	NAMEPLATE		1	1/8	.50 x 1	TB4
42	NAMEPLATE ⑧		1	3/16	2 x 5	INDICATING LIGHT LEGEND RED = ENERGIZED GREEN = DEENERGIZED
43						
44	NAMEPLATE		1	1/8	.50 x 1	SCTB
45	NAMEPLATE		1	1/8	.50 x 1	TS
46						
47						
48						
49						

⑧ MAT'L: RED W/WHITE CORE

- ⑦ ALLEN-BRADLEY LEGEND PLATES
- ⑥ NAMEPLATES TO BE ATTACHED W/ ADHESIVE BACKING
- 5. TYPE STYLE TO BE COND. GOTHIC
- ④ LAYOUT NAMEPLATE AS SHOWN
- 3. MATERIAL: BLACK W/WHITE CORE
- ② CENTER ALL ENGRAVING HORIZONTALLY & VERTICALLY
- 1. REF. DWG. 2610-00 FOR GENERAL NOTES

NOTES: UNLESS OTHERWISE SPECIFIED

REV	BY	DATE	DESCRIPTION	APP
B	PC	10/00	AS BUILT	
A	PC	8/00	REV. PER PRODUCTION REVIEW	



CONTROL
MANUFACTURING
COMPANY, INC.

2650 NAPA VALLEY CORPORATE DRIVE
NAPA, CA. 94558
(707) 258-8400
FAX: (707) 258-8465

WIRE NUMBERS		ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING	PROJECT TITLE: EAST CONTRA COSTA IRRIGATION DISTRICT
PANEL	SYSTEM		
USED:	USED:	THIS DRAWING IS LOANED ON THE CONDITION THAT IT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, WITHOUT THE PERMISSION OF CMC.	DRAWING TITLE: 69KV SUBSTATION CONTROL PANEL NAMEPLATE SCHEDULE
NOT USED:	NOT USED:		CUSTOMER: INDEPENDENT POWER SYSTEMS
		TESTED: TR 10/00	SCALE: SIZE: DRAWING NUMBER: 2610-A2
		CHECKED:	SHEET 1 of 1
		DRAWN: PC 3/00	
		DESIGNED: SH 3/00	

BILL OF MATERIAL LIST

ITEM	DESCRIPTION	TAG NO.	MFG.	PART NO.	P.O. NO.	QTY.
1	ENCLOSURE NEMA 12 (72 x 36 x 18)		HOFFMAN	A-723618FS	04868	1
2	BACKPAN		HOFFMAN	A-72P36F1	04868	1
3	WORK LIGHT		HOFFMAN	A-LF16D24	04868	1
4	HEATER/THERMOSTAT: 120VAC		HOFFMAN	D-AH1001A	04868	1
5	NAMEPLATES		CMC	REF. DWG. 2610-A2	04869	1
6						
7						
8	FUSE BLOCKS (24VDC); INDICATING TYPE		ENTRELEC	19916626	S	3
9	FUSE BLOCKS (120VAC); INDICATING TYPE		ENTRELEC	19916800	S	5
10	FUSE BLOCK END COVER		ENTRELEC	19963524	S	1
11	TERMINAL BLOCKS		ENTRELEC	11511607	04870	60
12	TERMINAL BLOCK END COVERS		ENTRELEC	118368.16	04870	4
13	GROUND BLOCKS		ENTRELEC	16511316	04870	10
14	END CLAMPS: LOW PROFILE		ENTRELEC	19940802	04870	6
15	TERMINAL BLOCK MARKERS		ENTRELEC	RC610	04870	2 EA.
16	GROUND BLOCK END COVER		ENTRELEC	10306221	04870	2
17						
18	CIRCUIT BREAKER; 10 AMP, 1-POLE		CUTLER HAMMER	QCR1010	04871	3
19	CIRCUIT BREAKER; 15 AMP, 1-POLE		CUTLER HAMMER	QCR1015	04871	2
20	CIRCUIT BREAKER; 20 AMP, 1-POLE		CUTLER HAMMER	QCR1020	04871	1
21						
22						
23						
24	CONVENIENCE RECEPTACLE: KAMP SRJ		LEVITON	6599-1	04868	1
25	DUPLEX RECEPTACLE (15AMP) w/ COVER/BOX	UPS	LEVITON	5320-ICP	04868	1

BILL OF MATERIAL LIST

ITEM	DESCRIPTION	TAG NO.	MFG.	PART NO.	P.O. NO.	QTY.
26	RADIO		FREEWAVE	DGMR-115R	04875	1
27	SURGE ARRESTOR		POLYPHASER	IS-50NX-C2	04872	1
28						
29	REMOTE TELEMETRY UNIT		CONTROL MICROSYSTEMS	SCADAPACK P3-200-01-0-0	04864	1
30	DISCRETE INPUT MODULE 16 PT. (24VDC)		CONTROL MICROSYSTEMS	5404-24 297157	04864	1
31	RADIO TO SUREGE ARRESTOR CABLE		TMS	LMR-400-3FT	04872	1
32	24VDC POWER SUPPLY: 4.1 AMPS	PS1	IDEC	PS5R-E24	04873	1
33	VOLTAGE MONITOR RELAY SOCKET		IDEC	SR2P-06	S	1
34						
35	PUSHBUTTON - RED		ALLEN BRADLEY	800T-A6A	04868	1
36	PILOT LIGHT - RED		ALLEN BRADLEY	800T-QH10R	04868	1
37	PILOT LIGHT - GREEN		ALLEN BRADLEY	800T-QH10G	04868	1
38	PILOT LIGHT - AMBER		ALLEN BRADLEY	800T-QH10A	04868	1
39						
40						
41	VOLTAGE MONITOR RELAY: 120VAC	27S	TIME MARK	2601-120VAC	04868	1
42	FUSES: 10 AMP 1 AMP 2 AMP		LITTLEFUSE	313-10 313-1 312-1	04873	2 3 3
43						
44	TRANSFORMER ALARM RELAY	63FPX 49T-2X 26T-2X	GE	12HMA11B27	04889	3
45	SMH, 10-POLE TEST SWITCH	TS-M1	AVO INTERNATIONAL	C3-410-A1	05109	1
46	THERMOSTAT		HOFFMAN	A-TEMNO	04868	1
47	COOLING FAN: 6"		HOFFMAN	A-PA6AXFN	04868	1
48	EXHAUST GRILLE: 6"		HOFFMAN	A-EXGR6	04868	1
49						
50						

1. REF. DWG. 2610-00 FOR GENERAL NOTES
NOTES: UNLESS OTHERWISE SPECIFIED

REV	BY	DATE	DESCRIPTION	APP
B	PC	10/00	AS BUILT	
A	PC	8/00	REV. PER PRODUCTION REVIEW	
REVISIONS				



CONTROL MANUFACTURING COMPANY, INC.

2650 NAPA VALLEY CORPORATE DRIVE
NAPA, CA. 94558
(707) 258-8400
FAX: (707) 258-8465

WIRE NUMBERS

PANEL	SYSTEM
USED:	USED:
NOT USED:	NOT USED:

ALL DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWING
THIS DRAWING IS LOANED ON THE
CONDITION THAT IT IS NOT TO BE
REPRODUCED, IN WHOLE OR IN PART,
WITHOUT THE PERMISSION OF CMC.
TESTED: TR 10/00
CHECKED:
DRAWN: PC 3/00
DESIGNED: SH 3/00

PROJECT TITLE: EAST CONTRA COSTA IRRIGATION DISTRICT
DRAWING TITLE: 69KV SUBSTATION CONTROL PANEL BILL OF MATERIAL
CUSTOMER: INDEPENDENT POWER SYSTEMS

SCALE: SIZE D DRAWING NUMBER: 2610-A3 SHEET 1 of 2

BILL OF MATERIAL LIST

ITEM	DESCRIPTION	TAG NO.	MFG.	PART NO.	P.O. NO.	QTY.
51	UPS: 120VAC, 750VA	UPS	BEST	0520-750U		1
52	UPS POWER CORD		ALLIED ELEC.	663-7029	S	1
53						
54	MULTIFUNCTION DIGITAL METER		SQUARE D	PM620	04907	1
55	MULTIFUNCTION DIGITAL METER DISPLAY		SQUARE D	PMD32	04907	
56	SHORTING TERMINAL BLOCK		BUCHANAN	3B104P	S	1
57	ANNUNCIATOR		RIS	AN-3100-1X5-INT-4-16-W-M-X-B-FOD	04906	1
58						
59						
60	LOCKOUT RELAY SWITCH	86T-1	ELECTROSWITCH	7803D	04131	1
61	CUTOUT SWITCH	FCO-*	ELECTROSWITCH	20KB-1104A4	04131	8
62	CONTROL SWITCH	252/CS	ELECTROSWITCH	2438-D	04131	1
63	GROUND BAR		CUTLER HAMMER	GBK10	S	1
64						
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						

BILL OF MATERIAL LIST

ITEM	DESCRIPTION	TAG NO.	MFG.	PART NO.	P.O. NO.	QTY.
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
86						
87						
88						
89						
90						
91						
92						
93						
94						
95						
96						
97						
98						
99						
100						

1. REF. DWG. 2610-00 FOR GENERAL NOTES
 NOTES: UNLESS OTHERWISE SPECIFIED

REV	BY	DATE	DESCRIPTION	APP
B	PC	10/00	AS BUILT	
A	PC	8/00	REV. PER PRODUCTION REVIEW	

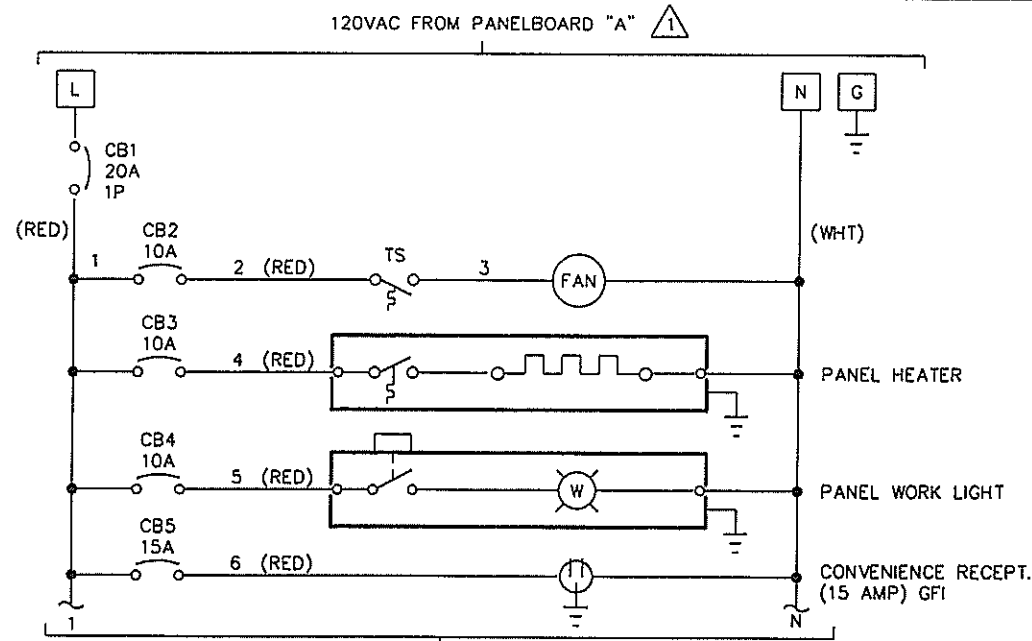
REVISIONS



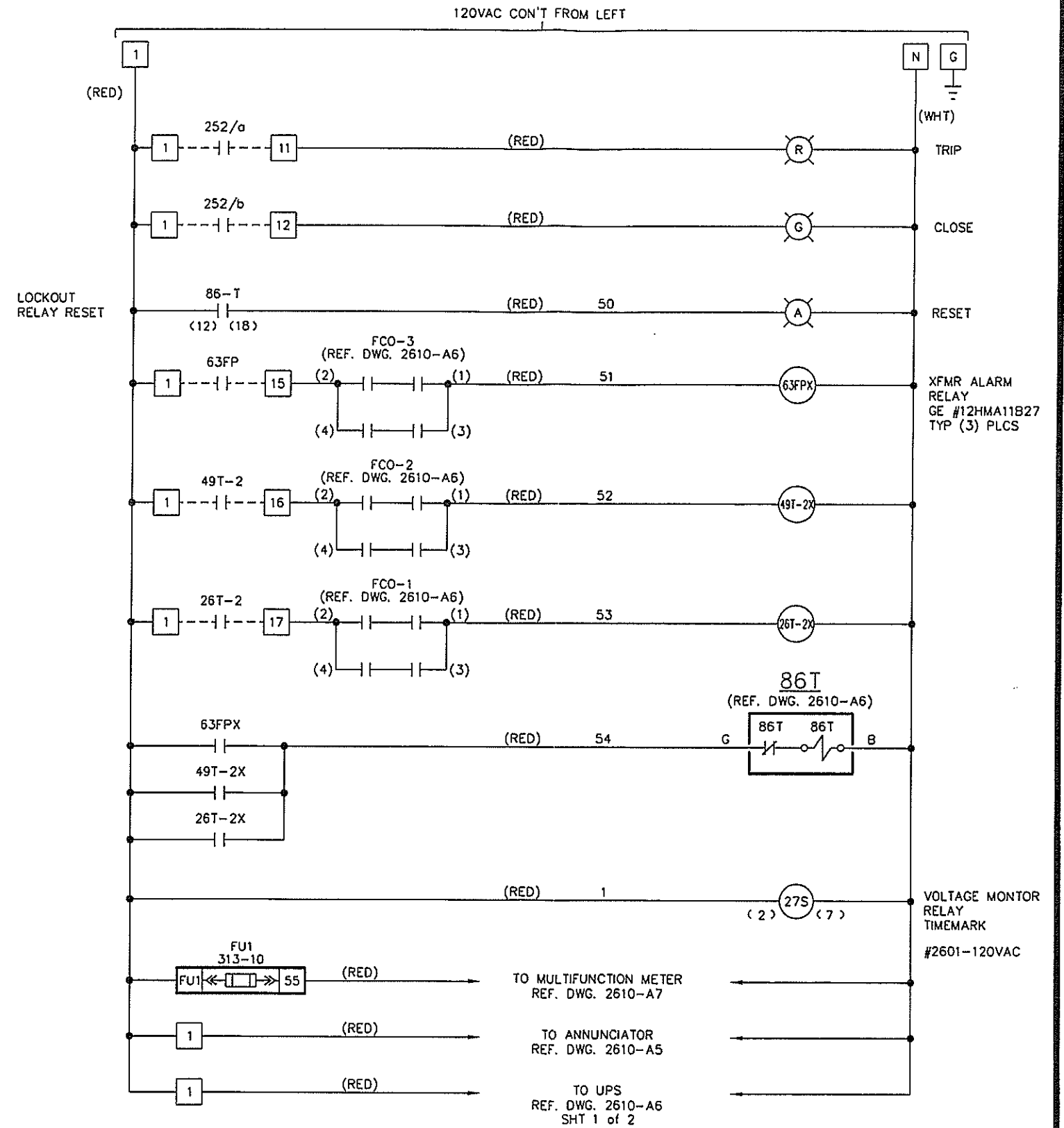
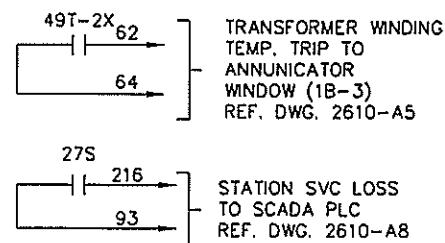
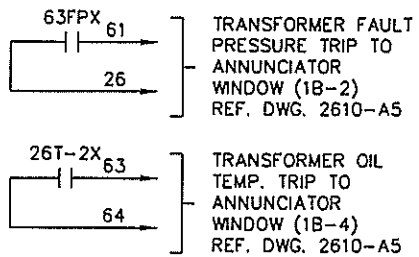
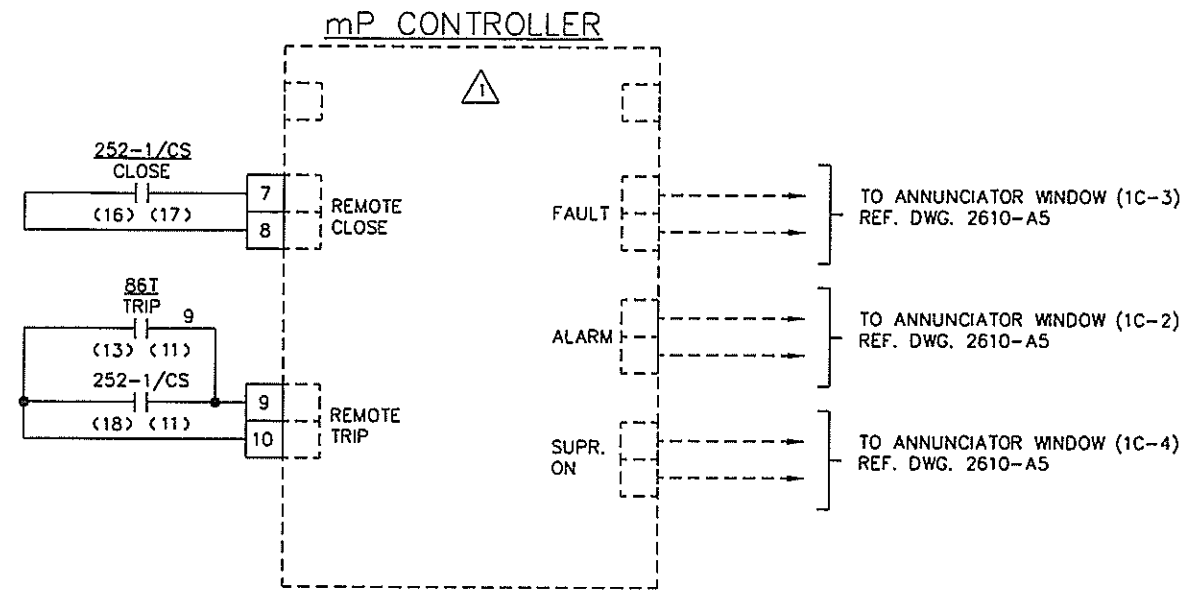
CONTROL MANUFACTURING COMPANY, INC.
 2650 NAPA VALLEY CORPORATE DRIVE
 NAPA, CA. 94558
 (707) 258-8400
 FAX: (707) 258-8465

WIRE NUMBERS		ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING	
PANEL	SYSTEM		
USED:	USED:	THIS DRAWING IS LOANED ON THE CONDITION THAT IT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, WITHOUT THE PERMISSION OF CMC.	
NOT USED:	NOT USED:	TESTED:	TR 10/00
		CHECKED:	
		DRAWN:	PC 3/00
		DESIGNED:	SH 3/00

PROJECT TITLE:	EAST CONTRA COSTA IRRIGATION DISTRICT		
DRAWING TITLE:	69KV SUBSTATION CONTROL PANEL BILL OF MATERIAL		
CUSTOMER:	INDEPENDENT POWER SYSTEMS		
SCALE	SIZE	DRAWING NUMBER:	SHEET
	D	2610-A3	2 of 2



CONT'D ABOVE RIGHT



1. REF. DWG. 2610-00 FOR GENERAL NOTES
NOTES: UNLESS OTHERWISE SPECIFIED

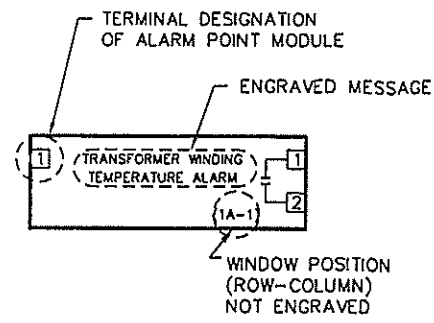
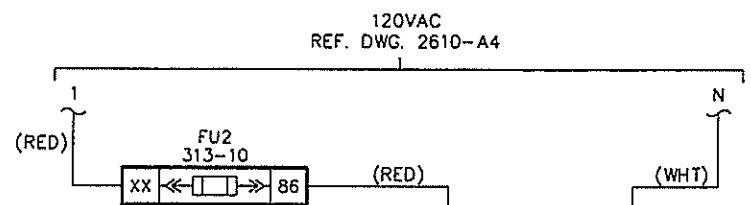
REV	BY	DATE	DESCRIPTION	APP
B	PC	10/00	AS BUILT	
A	PC	8/00	REV. PER PRODUCTION REVIEW	
REVISIONS				



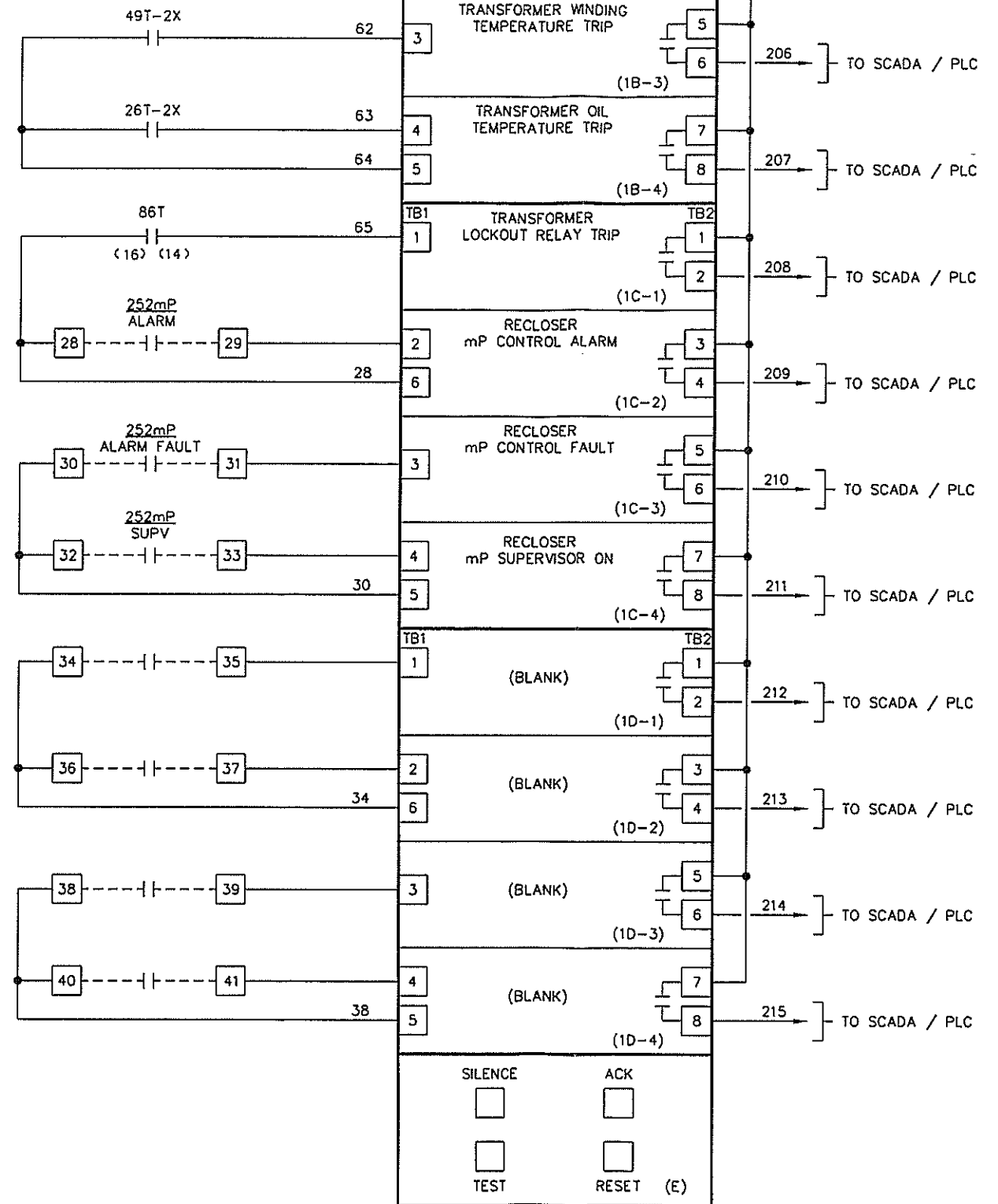
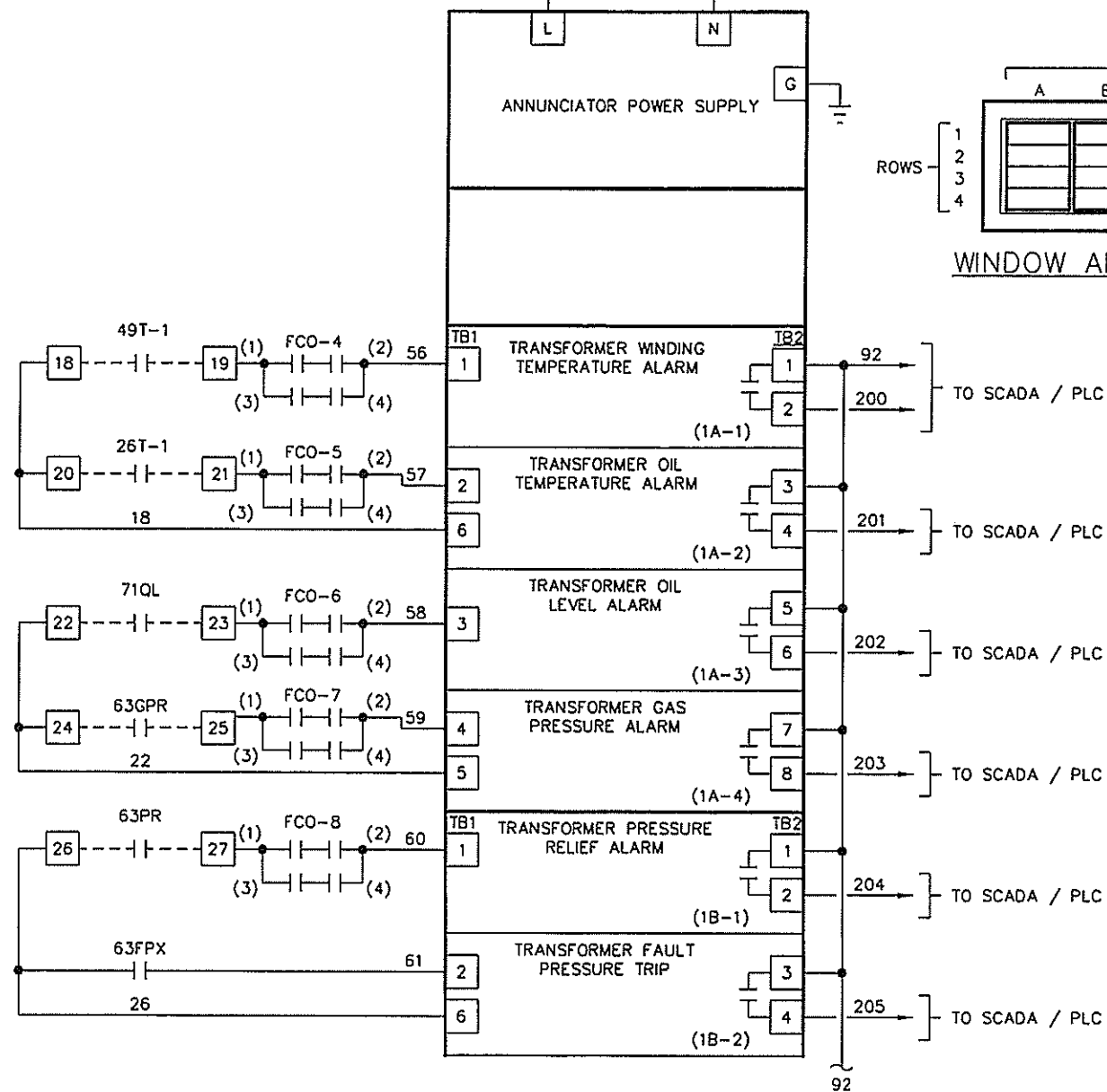
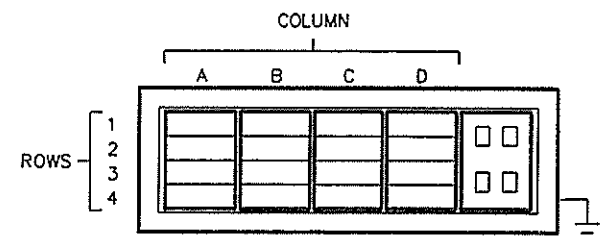
CONTROL MANUFACTURING COMPANY, INC.

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NAPA, CA. 94558
(707) 258-8400
FAX: (707) 258-8465

WIRE NUMBERS		ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING	PROJECT TITLE: EAST CONTRA COSTA IRRIGATION DISTRICT
PANEL	SYSTEM		
USED:	USED:	THIS DRAWING IS LOANED ON THE CONDITION THAT IT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, WITHOUT THE PERMISSION OF CMC.	DRAWING TITLE: 69KV SUBSTATION CONTROL PANEL POWER DISTRIBUTION WIRING DIAGRAM
NOT USED:	NOT USED:		CUSTOMER: INDEPENDENT POWER SYSTEMS
		TESTED: TR 10/00	SCALE: SIZE D DRAWING NUMBER: 2610-A4 SHEET 1 of 1
		CHECKED:	
		DRAWN: PC 3/00	
		DESIGNED: SH 3/00	



ANNUNCIATOR WINDOW DETAIL



REF. DWG. 2610-A8

1. REF. DWG. 2610-00 FOR GENERAL NOTES
NOTES: UNLESS OTHERWISE SPECIFIED

REV	BY	DATE	DESCRIPTION	APP
B	PC	10/00	AS BUILT	
A	PC	8/00	REV. PER PRODUCTION REVIEW	
REVISIONS				

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NAPA, CA. 94558
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FAX: (707) 258-8465

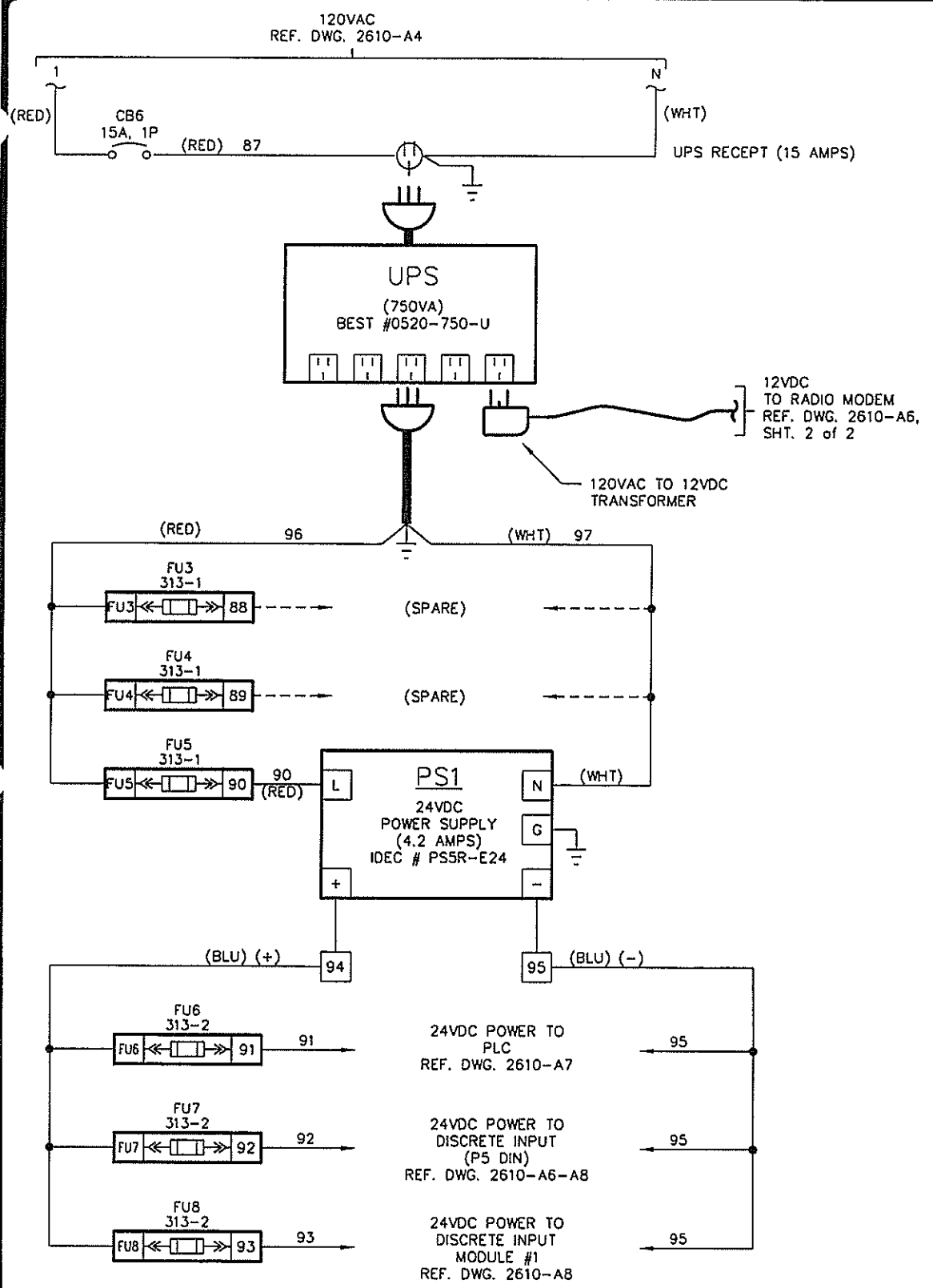
WIRE NUMBERS	
PANEL	SYSTEM
USED:	USED:
NOT USED:	NOT USED:

ALL DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWING

THIS DRAWING IS LOANED ON THE
CONDITION THAT IT IS NOT TO BE
REPRODUCED, IN WHOLE OR IN PART,
WITHOUT THE PERMISSION OF CHC.

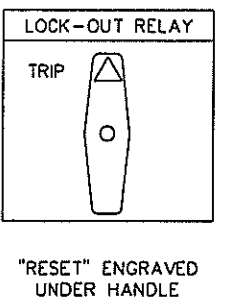
TESTED: TR 10/00
CHECKED:
DRAWN: PC 3/00
DESIGNED: SH 3/00

PROJECT TITLE:	EAST CONTRA COSTA IRRIGATION DISTRICT		
DRAWING TITLE:	69KV SUBSTATION CONTROL PANEL ANNUNCIATOR WINDOW WIRING DIAGRAM		
CUSTOMER:	INDEPENDENT POWER SYSTEMS		
SCALE	SIZE	DRAWING NUMBER:	SHEET
	D	2610-A5	1 of 1



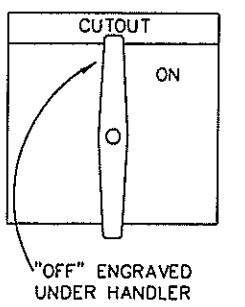
TRANSFORMER LOCKOUT RELAY			
DEVICE 86T-1			
ELECTROSWITCH CAT. NO. 7803D			
DECK	CONTACTS	TRIP	RESET
1	11 o--- --- o 13		X
	12 o--- --- o 18	X	
	15 o--- --- o 17		X
	14 o--- --- o 16	X	
2	21 o--- --- o 23		X
	22 o--- --- o 28	X	
	25 o--- --- o 27		X
	24 o--- --- o 26	X	
3	31 o--- --- o 33		X
	32 o--- --- o 38	X	
	35 o--- --- o 37		X
	34 o--- --- o 36	X	

OVAL HANDLE - MAINTAIN POSITION QTY 1



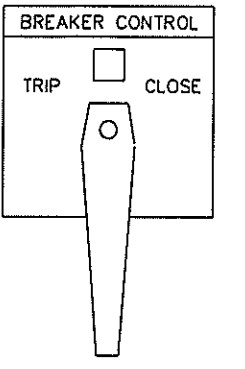
FEATURE CUTOFF			
DEVICE FCO - ()			
ELECTROSWITCH CAT. NO. 20KB - 1104A4			
DECK	CONTACTS	OFF	ON
1	1 o--- --- o 2		X
	3 o--- --- o 4		X
2	5 o--- --- o 6		X
	7 o--- --- o 8		X

OVAL HANDLE - MAINTAIN POSITION QTY 8



BREAKER CONTROL SWITCH					
DEVICE 252/CS					
ELECTROSWITCH CAT. NO. 2438D					
DECK	CONTACTS	TRIP	NORM AFTER TRIP	NORM AFTER CLOSE	CLOSE
1	11 o--- --- o 18	X			
	16 o--- --- o 17				X

PISTOL GRIP HANDLE - SPRING RETURN TO NORMAL TYPICAL FOR 252-1 AND 252-2 QTY 1



1. REF. DWG. 2610-00 FOR GENERAL NOTES
 NOTES: UNLESS OTHERWISE SPECIFIED

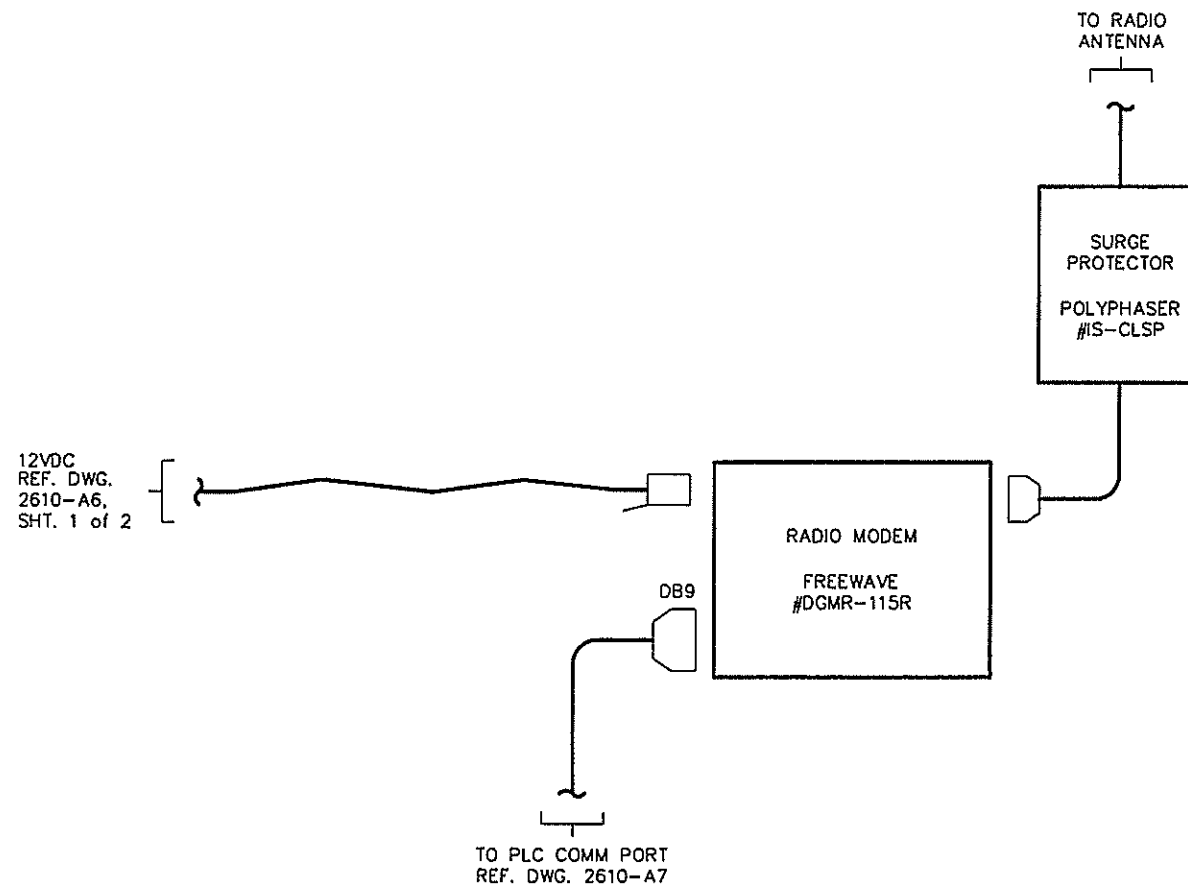
REV	BY	DATE	DESCRIPTION	APP
B	PC	10/00	AS BUILT	
A	PC	8/00	REV. PER PRODUCTION REVIEW	

REVISIONS

CAR CONTROL MANUFACTURING COMPANY, INC.
 2650 NAPA VALLEY CORPORATE DRIVE
 NAPA, CA. 94558
 (707) 258-8400
 FAX: (707) 258-8465

WIRE NUMBERS		ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING
PANEL	SYSTEM	
USED:	USED:	THIS DRAWING IS LOANED ON THE CONDITION THAT IT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, WITHOUT THE PERMISSION OF CMC.
NOT USED:	NOT USED:	
TESTED:	TR 10/00	
CHECKED:		
DRAWN:	PC 3/00	
DESIGNED:	SH 3/00	

PROJECT TITLE:	EAST CONTRA COSTA IRRIGATION DISTRICT		
DRAWING TITLE:	69KV SUBSTATION CONTROL PANEL POWER DISTRIBUTION WIRING DIAGRAM		
CUSTOMER:	INDEPENDENT POWER SYSTEMS		
SCALE	SIZE	DRAWING NUMBER:	SHEET
	D	2610-A6	1 of 2



1. REF. DWG. 2610-00 FOR GENERAL NOTES
NOTES: UNLESS OTHERWISE SPECIFIED

REV	BY	DATE	DESCRIPTION	APP
B	PC	10/00	AS BUILT	
A	PC	8/00	REV. PER PRODUCTION REVIEW	
REVISIONS				

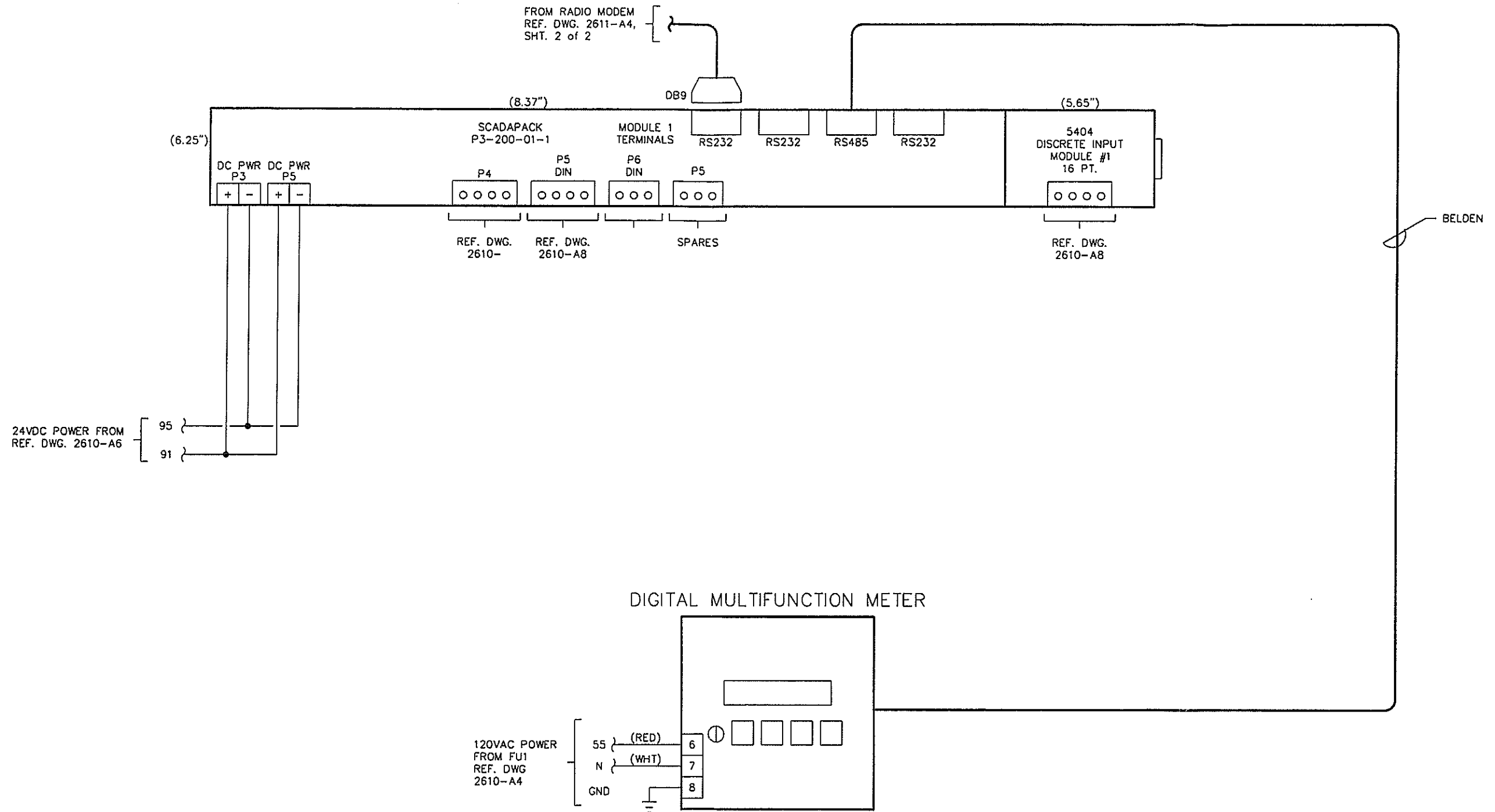


**CONTROL
MANUFACTURING
COMPANY, INC.**

2650 NAPA VALLEY CORPORATE DRIVE
NAPA, CA. 94558
(707) 258-8400
FAX: (707) 258-8465

WIRE NUMBERS		ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING	
PANEL	SYSTEM	THIS DRAWING IS LOANED ON THE CONDITION THAT IT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, WITHOUT THE PERMISSION OF CMC.	
USED:	USED:	TESTED:	TR 10/00
NOT USED:	NOT USED:	CHECKED:	
		DRAWN:	PC 3/00
		DESIGNED:	SH 3/00

PROJECT TITLE:	EAST CONTRA COSTA IRRIGATION DISTRICT		
DRAWING TITLE:	69KV SUBSTATION CONTROL PANEL POWER DISTRIBUTION WIRING DIAGRAM		
CUSTOMER:	INDEPENDENT POWER SYSTEMS		
SCALE	SIZE	DRAWING NUMBER:	SHEET
	D	2610-A6	2 of 2



1. REF. DWG. 2610-00 FOR GENERAL NOTES
NOTES: UNLESS OTHERWISE SPECIFIED

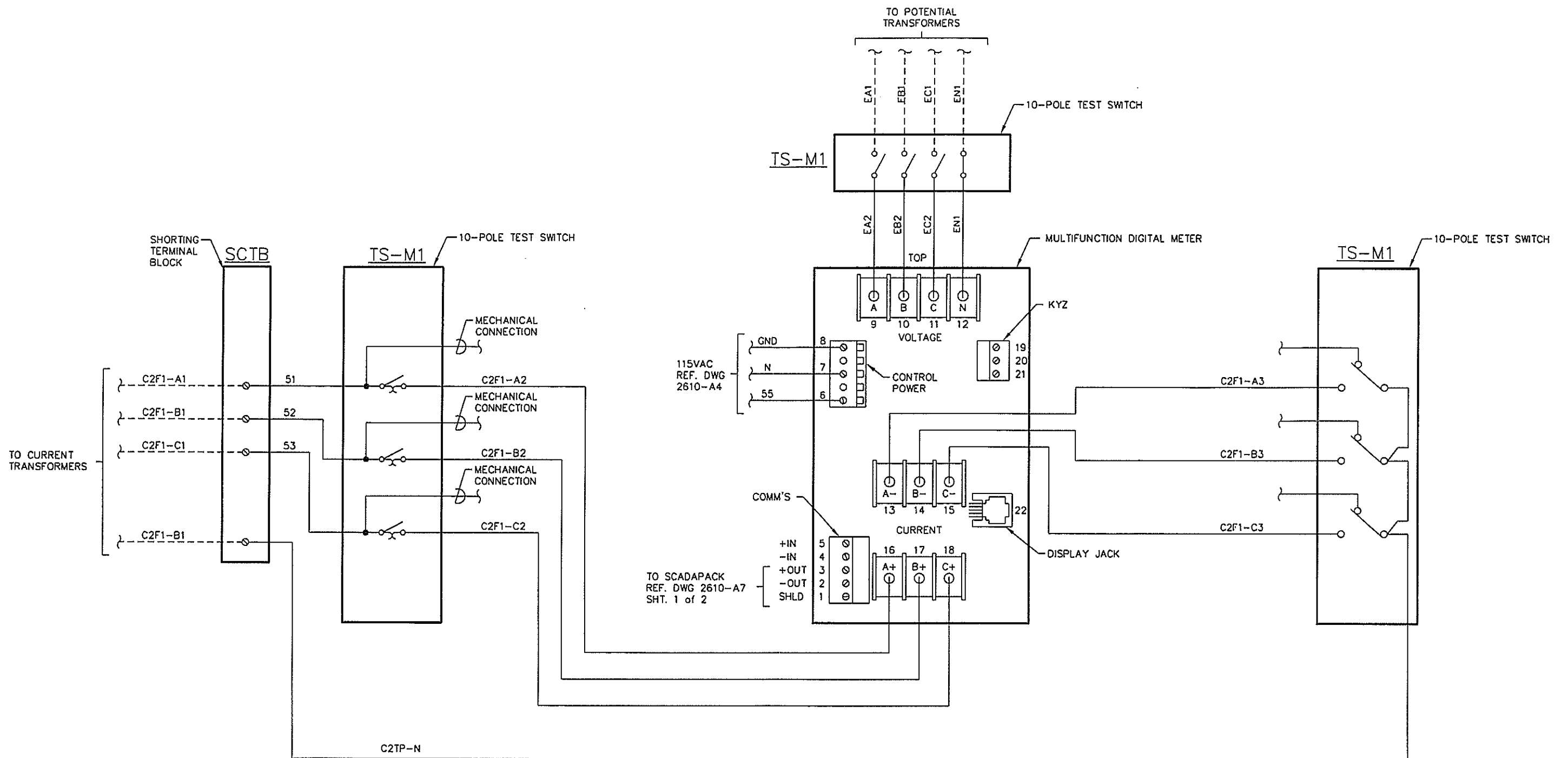
REV	BY	DATE	DESCRIPTION	APP
B	PC	10/00	AS BUILT	
A	PC	8/00	REV. PER PRODUCTION REVIEW	
REVISIONS				



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NAPA, CA. 94558
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FAX: (707) 258-8465

WIRE NUMBERS		ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING
PANEL	SYSTEM	
USED:	USED:	THIS DRAWING IS LOANED ON THE CONDITION THAT IT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, WITHOUT THE PERMISSION OF CMC.
NOT USED:	NOT USED:	
TESTED: TR 10/00		
DRAWN: PC 3/00		
DESIGNED: SH 3/00		

PROJECT TITLE:	EAST CONTRA COSTA IRRIGATION DISTRICT		
DRAWING TITLE:	SCADAPAK ELEVATION WIRING DIAGRAM		
CUSTOMER:	INDEPENDENT POWER SYSTEMS		
SCALE	SIZE	DRAWING NUMBER:	SHEET
	D	2610-A7	1 of 2



1. REF. DWG. 2610-00 FOR GENERAL NOTES
 NOTES: UNLESS OTHERWISE SPECIFIED

REV	BY	DATE	DESCRIPTION	APP
B	PC	10/00	AS BUILT	
A	PC	8/00	REV. PER PRODUCTION REVIEW	
REVISIONS				



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 2650 NAPA VALLEY CORPORATE DRIVE
 NAPA, CA. 94558
 (707) 258-8400
 FAX: (707) 258-8465

WIRE NUMBERS	
PANEL	SYSTEM
USED:	USED:
NOT USED:	NOT USED:

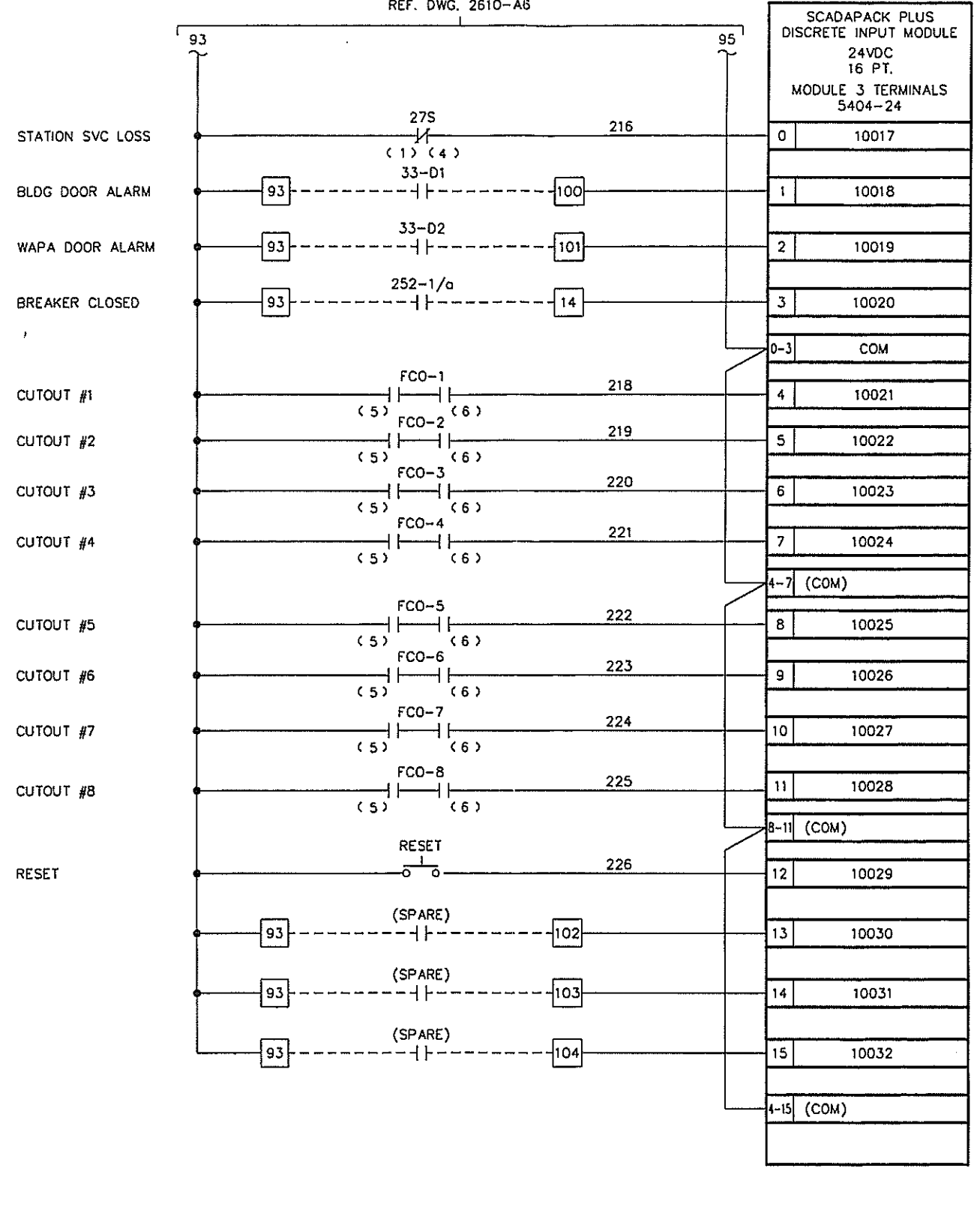
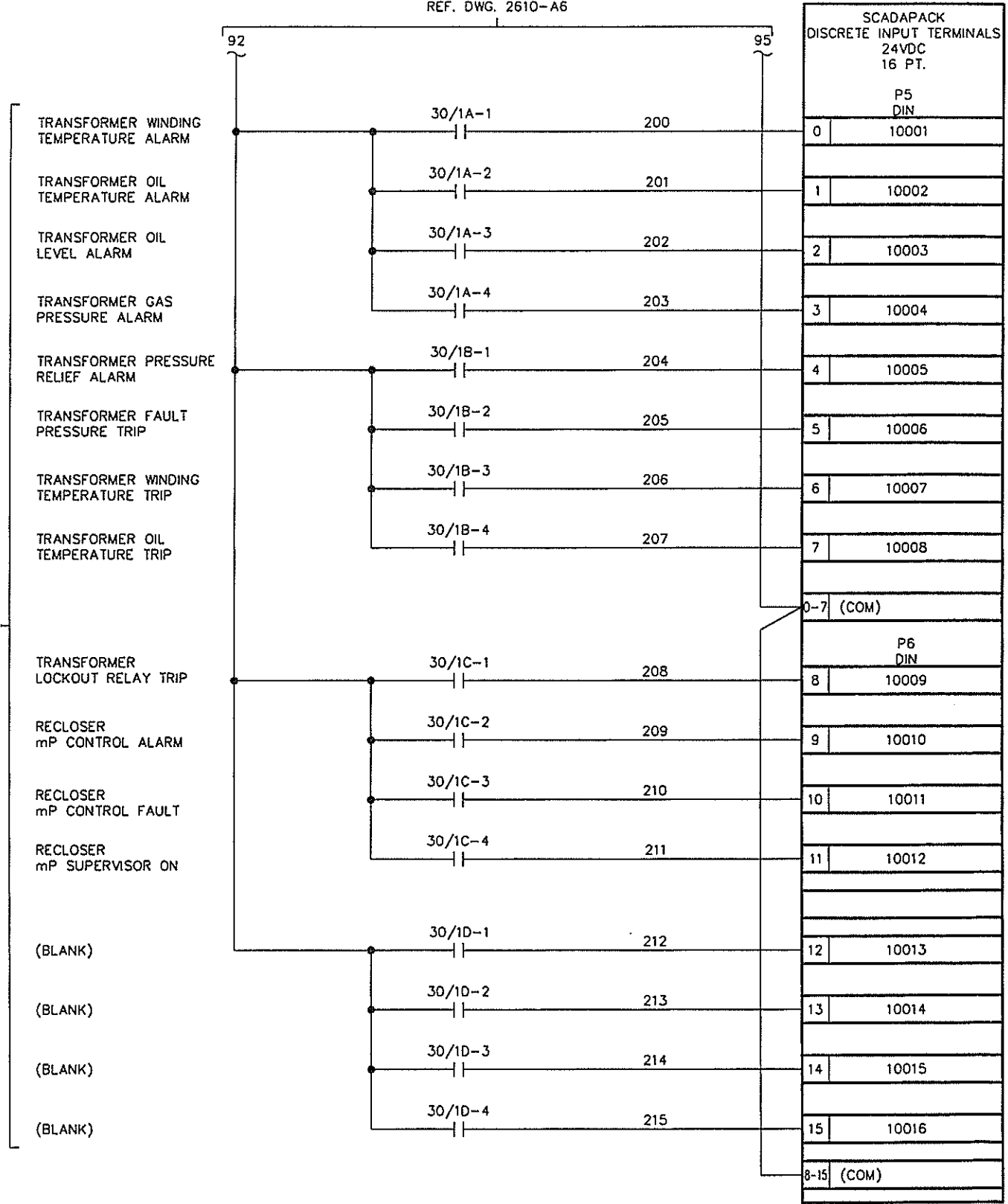
ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING	
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TESTED:	TR 10/00
CHECKED:	
DRAWN:	PC 3/00
DESIGNED:	SH 3/00

PROJECT TITLE: EAST CONTRA COSTA IRRIGATION DISTRICT			
DRAWING TITLE: POWER MONITOR WIRING DIAGRAM			
CUSTOMER: INDEPENDENT POWER SYSTEMS			
SCALE	SIZE	DRAWING NUMBER:	SHEET
	D	2610-A7	2 of 2

24VDC FROM POWER SUPPLY
REF. DWG. 2610-A6

24VDC FROM POWER SUPPLY
REF. DWG. 2610-A6

REF. DWG.
2610-A5



1. REF. DWG. 2610-00 FOR GENERAL NOTES
NOTES: UNLESS OTHERWISE SPECIFIED

REV	BY	DATE	DESCRIPTION	APP
B	PC	10/00	AS BUILT	
A	PC	8/00	REV. PER PRODUCTION REVIEW	
REVISIONS				



CONTROL MANUFACTURING COMPANY, INC.
2650 NAPA VALLEY CORPORATE DRIVE
NAPA, CA. 94558
(707) 258-8400
FAX: (707) 258-8465

WIRE NUMBERS		ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING
PANEL	SYSTEM	
USED:	USED:	THIS DRAWING IS LOANED ON THE CONDITION THAT IT IS NOT TO BE REPRODUCED, IN WHOLE OR IN PART, WITHOUT THE PERMISSION OF C.M.C.
NOT USED:	NOT USED:	

PROJECT TITLE:	EAST CONTRA COSTA IRRIGATION DISTRICT		
DRAWING TITLE:	69KV SUBSTATION CONTROL PANEL DIGITAL INPUT MODULE WIRING DIAGRAM		
CUSTOMER:	INDEPENDENT POWER SYSTEMS		
SCALE	SIZE	DRAWING NUMBER:	SHEET
	D	2610-A8	1 of 1