BIDDING AND CONTRACT DOCUMENTS

FOR

Rubidoux Screenhouse Conversion- Phase II Electrical

PROJECT NO. 950567
CONTRACT NO. 950567-LF-2022-68

City of Riverside, County of Riverside
California

November 30, 2021

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CERTIFICATION

Rubidoux Screenhouse Conversion- Phase II Electrical

Bidding Documents Prepared By:

Company Name: Goss Engineering, Inc.

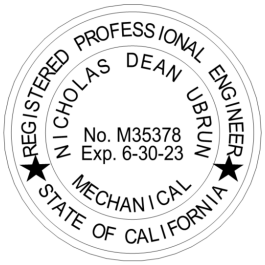
255 E Rincon St., Suite 301
(Street Address)

Corona, CA 92879
(City, State & Zip Code)

Signed: _____ Date: 11/29/21
(Signature of an Officer of the Firm Named Above)

Nick Ubrun, Principal
(Print Name & Title)

Certification:



(Affix professional registration stamp of the person named above with signature and expiration date.)

ADVERTISEMENT FOR BIDS

Subject to conditions prescribed by the University of California, Riverside, sealed bids for a lump sum contract are invited for the following Project:

RUBIDOUX SCREENHOUSE CONVERSION- PHASE II ELECTRICAL
PROJECT NO. 950567
CONTRACT NO. 950567-LF-2022-68
UNIVERSITY OF CALIFORNIA, RIVERSIDE
RIVERSIDE, CALIFORNIA

Installation of a new Riverside public utility transformer and concrete pad fed from the existing utility pole with new underground feeders. Also install a new 800amp switchboard, 208/120V, 3P, 4-wire service meter and main. The transformer will feed the switchboard and provide power to existing switchboard "MSB"

Bidding and Contract Documents will be available at **2:00 PM**, on **Tuesday, November 30, 2021**, upon request by sending an email to kara.longtin@ucr.edu. Interested parties must use the following in the subject header:

RUBIDOUX SCREENHOUSE CONVERSION- PHASE II ELECTRICAL – Request for Bid Documents

PRE-BID CONFERENCE & SITE VISIT

A mandatory Pre-Bid Zoom conference call will take place on **Friday, December 17, 2021** beginning promptly at **1:00 PM**. Only bidders who participate in the Pre-Bid conference will be allowed to bid on the Project as prime contractors. For further information, including the Zoom Meeting ID, interested bidders must contact the Project's Contract Administrator, **Kara Longtin** via email**,** at kara.longtin@ucr.edu. And must use the project's number and name in the subject header to request the Zoom information.

At this time, there are no plans for a site visit, if a bidder would like access to the site, this will be done by appointment only and through the coordination of the Contract Administrator noted above. Do not contact the project manager directly.

Any bidder who enters the Pre-Bid Conference after 1:05 PM will be precluded from bidding as a prime contractor and may only bid as a subcontractor. Subcontractors are not required to attend; however we encourage their attendance.

BID DEADLINE

Bids must be received at or before **11:00 AM, Wednesday, January 12, 2022** for furnishing all labor, materials, services, and equipment to complete the Work described below in accordance with the enclosed Bidding Documents. Due to COVID-19 restrictions, all bids will be received electronically only at the email address above; the low bidder must produce the original bid, bid bond, notary acknowledgement and surety notice within 24 hours of making an announcement of who the low bidder is.

Bids are to be submitted to The Regents of the University of California ("University") **via email only** at:

Email: kara.longtin@ucr.edu

Immediately following the Bid Deadline, bids will be opened and posted on the University's website. Bids will be made available to be reviewed by bidders shortly after bids have been validated. Efforts will be made to accommodate and observe all typical procedures during COVID-19 restrictions.

Bid Security in the amount of 10% of the Lump Sum Base Bid shall accompany each Bid. The Surety issuing the Bid Bond shall be, on the Bid Deadline, an admitted surety insurer (as defined in California Code of Civil Procedure Section 995.120).

The successful Bidder and its subcontractors will be required to follow the nondiscrimination requirements set forth in the Bidding and Contract Documents and to pay prevailing wage rates at the location of the Work.

Every effort will be made to ensure that all persons have equal access to contracts and other business opportunities with the University within the limits imposed by law or University policy. Each Bidder may be required to show evidence of its equal employment opportunity policy. The successful Bidder and its subcontractors will be required to follow the nondiscrimination requirements set forth in the Bidding Documents and to pay prevailing wage at the location of the work.

The successful Bidder must have the following State of California Contractor's license current and active at the time of submission of the Bid: **B, General Building**.

The work described in the contract is a public work subject to section 1771 of the California Labor Code.

The successful Bidder shall pay all persons providing construction services and/or any labor on site, including any University location, no less than the UC Fair Wage (defined as $13 per hour as of 10/1/15, $14 per hour as of 10/1/16, and $15 per hour as of 10/1/17) and shall comply with all applicable federal, state and local working condition requirements.

Estimated construction cost: **$145,000.00**

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
University of California, Riverside
Publication Dates: 11/23/2021 – 12/10/2021

PROJECT DIRECTORY

Project Name:	**RUBISOUX SCREENHOUSE CONVERSION- PHASE II ELECTRICAL**
Project Number:	**950567**
Location:	**University of California, Riverside**
University:	**The Regents of the University of California**
University's Representative:	**Tameesha Hayes** **Project Manager** Planning, Design & Construction University of California, Riverside 1223 University Avenue, Suite 240 Riverside, CA 92521 Tel: (951) 827-1412 Email: Tameesha.hayes@ucr.edu **Kara Longtin** **Contract Administrator** Planning, Design & Construction University of California, Riverside 1223 University Avenue, Suite 240 Riverside, CA 92521 Tel: (951) 827-2610 Email: kara.longtin@ucr.edu **Gilbert Cervantes** **Senior Construction Inspector** Planning, Design & Construction University of California, Riverside 1223 University Avenue, Suite 240 Riverside, CA 92521 Tel: (951) 827-1260 Email: gilbert.cervantes@ucr.edu
Design Professional:	**Nick Ubrun** **Principal Engineer** Goss Engineering 255 E. Main Street, Suite 301 Corona, CA. 92879 Tel: (951) 340-1090 Email: nubrun@goss-eng.com
Address for Stop Notices:	University of California, Riverside Accounting Office -002 Riverside, CA 92521-0123

Address for Demand for Arbitration:	Western Case Management Center 6795 N. Palm Avenue, 2nd Floor Fresno, CA 93704
A copy of the Demand for Arbitration must be sent to:	University of California Office of the General Counsel 1111 Franklin Street, 8th Floor Oakland, CA 94607-5200

END OF PROJECT DIRECTORY

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INSTRUCTIONS TO BIDDERS

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ARTICLE 1

DEFINITIONS

1.1 Except as otherwise specifically provided, definitions set forth in the General Conditions or in other Contract Documents are applicable to all Bidding Documents.

1.2 The term “Addenda” means written or graphic instruments issued by University prior to the Bid Deadline which modify or interpret the Bidding Documents by additions, deletions, clarifications, or corrections.

1.3 The term “Alternate” means a proposed change in the Work, as described in the Bidding Documents which, if accepted, may result in a change to either the Contract Sum or the Contract Time, or both.

1.4 The term “Bid Deadline” means the date and time on or before which Bids must be received, as designated in the Advertisement for Bids and which may be revised by Addenda.

1.5 The term “Bidder” means a person or firm that submits a Bid.

1.6 The term “Bidding Documents” means the construction documents prepared and issued for bidding purposes including all Addenda thereto.

1.7 The term “Estimated Quantity” means the estimated quantity of an item of Unit Price Work.

1.8 As used in these Instructions to Bidders, the term “Facility” means the University's Facility office issuing the Bidding Documents.

1.9 The term “Lump Sum Base Bid” means the sum stated in the Bid for which Bidder offers to perform the Work described in the Bidding Documents, but not including Unit Price items or Alternates.

1.10 The term “Planholder” means a person or entity known by the Facility to have received a complete set of Bidding Documents and who has provided a street address for receipt of any written pre-bid communications.

1.11 The term “Unit Price” means an amount stated in the Bid for which Bidder offers to perform an item of Unit Price Work for a fixed price per unit of measurement.

1.12 As used in these Instructions to Bidders, the term “Business Day” means any day other than a Saturday, a Sunday, and the holidays specified herein, and to the extent provided herein, if the Facility or applicable office of the University is closed for the whole of any day, insofar as the business of that office is concerned, that day shall be considered as a holiday for the purposes of computing time in these Instructions to Bidders. Holidays include January 1st, the third Monday in January, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, December 25th, and every day designated by the University as a holiday**.**

ARTICLE 2

BIDDER'S REPRESENTATIONS

2.1 Bidder, by making a Bid, represents that:

2.1.1 Bidder has read, understood, and made the Bid in accordance with the provisions of the Bidding Documents.

2.1.2 Bidder has visited the Project site and is familiar with the conditions under which the Work is to be performed and the local conditions as related to the requirements of the Contract Documents.

2.1.3 The Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception.

2.1.4 At the time of submission of the Bid, Bidder and all Subcontractors, regardless of tier, have the appropriate current and active licenses issued by the State of California Contractors State License Board for the Work to be performed and any licenses specifically required by the Bidding Documents. If Bidder is a joint venture, at the time of submission of the Bid, Bidder shall have the licenses required by the preceding sentence in the name of the joint venture itself. The State of California Business and Professions Code, Division 3, Chapter 9, known as the "Contractor's License Law," establishes licensing requirements for contractors.

2.1.5 Bidder has read and shall abide by the nondiscrimination requirements contained in the Bidding Documents.

2.1.6 Bidder has the expertise and financial capacity to perform and complete all obligations under the Bidding Documents.

2.1.7 The person executing the Bid Form is duly authorized and empowered to execute the Bid Form on behalf of Bidder.

2.1.8 Bidder is aware of and, if awarded the Contract, will comply with Applicable Code Requirements in its performance of the Work.

ARTICLE 3

BIDDING DOCUMENTS

3.1 COPIES

3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement for Bids for the sum stated therein, if any. Documents are only available in full sets and shall not be returned.

3.1.2 Bidders shall use a complete set of Bidding Documents in preparing Bids.

3.1.3 University makes copies of the Bidding Documents available, on the above terms, for the sole purpose of obtaining Bids for the Work and does not confer a license or grant permission for any other use of the Bidding Documents.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

3.2.1 Bidder shall, before submitting its Bid, carefully study and compare the components of the Bidding Documents and compare them with any other work being bid concurrently or presently under construction which relates to the Work for which the Bid is submitted; shall examine the Project site, the conditions under which the Work is to be performed, and the local conditions; and shall at once report to University's Representative errors, inconsistencies, or ambiguities discovered. If Bidder is awarded the Contract, Bidder waives any claim arising from any errors, inconsistencies or ambiguities, that Bidder, its subcontractors or suppliers, or any person or entity under Bidder on the Contract became aware of, or reasonably should have become aware of, prior to Bidder's submission of its Bid.

3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be addressed only to the person or firm designated in the Supplementary Instructions to Bidders.

3.2.3 Clarifications, interpretations, corrections, and changes to the Bidding Documents will be made by Addenda issued as provided in Article 3.5. Clarifications, interpretations, corrections, and changes to the Bidding Documents made in any other manner shall not be binding and Bidders shall not rely upon them.

3.3 PRODUCT SUBSTITUTIONS

3.3.1 No substitutions will be considered prior to award of Contract. Substitutions will only be considered after award of the Contract and as provided for in the Contract Documents.

3.4 SUBCONTRACTORS

3.4.1 Each Bidder shall list in the Bid Form all first-tier Subcontractors that will perform work, labor or render such services as defined in Article 9 of the Bid Form. The Bid Form contains spaces for the following information when listing Subcontractors: (1) portion of the Work; (2) name of Subcontractor; (3) city of Subcontractor's business location. The failure to list, on the Bid Form, any one of the items set forth above will result in the University treating the Bid as if no Subcontractor was listed for that portion of the Work and Bidder will thereby represent to University that Bidder agrees that it is fully qualified to perform that portion of the Work and shall perform that portion of the Work.

3.4.2 Subcontractors listed in the Bid Form shall only be substituted after the Bid Deadline with the written consent of University and in accordance with the State of California “Subletting and Subcontracting Fair Practices Act.”

3.5 ADDENDA

3.5.1 Addenda will be issued only by University and only in writing. Addenda will be identified as such and will be mailed or delivered to all Planholders. At its sole discretion, the University may elect to deliver Addenda via facsimile to Planholders who have provided a facsimile number for receipt of Addenda.

3.5.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for inspection.

3.5.3 Addenda will be issued such that Planholders should receive them no later than 3 full business days prior to the Bid Deadline. Addenda withdrawing the request for Bids or postponing the Bid Deadline may be issued anytime prior to the Bid Deadline.

3.5.4 Each Bidder shall be responsible for ascertaining, prior to submitting a Bid, that it has received all issued Addenda.

3.6 BUILDER'S RISK PROPERTY INSURANCE

3.6.1 University will provide builder's risk property insurance subject to the deductibles in the policy as required by the General Conditions if the Contract Sum exceeds $200,000 at the time of award and the requirements of the Project are not excluded by such coverage. A summary of the provisions of the policy is included as an Exhibit to the Contract; the policy may be reviewed at the Facility’s office. Bidder agrees that the University’s provision of builder’s risk property insurance containing said provisions meets the University’s obligation to provide builder’s risk property insurance under the Contract and, in the event of a conflict between the provisions of the policy and any summary or description of the provisions contained herein or otherwise, the provisions of the policy shall control and shall be conclusively presumed to fulfill the University’s obligation to provide such insurance.

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ARTICLE 4

PRE-BID CONFERENCE

4.1 Bidder shall attend the Pre-Bid Conference at which the requirements of the Bidding Documents are reviewed by University, comments and questions are received from Bidders, and a Project site visit is conducted. University requires all Pre-Bid Conference attendees to arrive for the meeting on time and to sign an attendance list, which in turn is used to determine if Bidders meet this requirement. Any Bidder not attending the Pre-Bid Conference in its entirety will be deemed to have not complied with the requirements of the Bidding Documents and its Bid will be rejected.

ARTICLE 5

BIDDING PROCEDURES

5.1 FORM AND STYLE OF BIDS

5.1.1 Bids shall be submitted on the Bid Form included with the Bidding Documents. Bids not submitted on the University's Bid Form shall be rejected.

5.1.2 The Bid Form shall be filled in legibly in ink or by typewriter. All portions of the Bid Form must be completed and the Bid Form must be signed before the Bid is submitted. Failure to comply with the requirements of this Article 5.1.2 will result in the Bid being rejected as nonresponsive.

5.1.3 Bidder's failure to submit a price for any Alternate or Unit Price will result in the Bid being considered as nonresponsive. If Alternates are called for and no change in the Lump Sum Base Bid is required, indicate “No Change” by marking the appropriate box.

5.1.4 Bidder shall make no stipulations on the Bid Form nor qualify the Bid in any manner.

5.1.5 The Bid Form shall be signed by a person or persons legally authorized to bind Bidder to a contract. Bidder's Representative shall sign and date the Declaration included in the Bid Form. Failure to sign and date the declaration will cause the Bid to be rejected.

5.2 BID SECURITY

5.2.1 Each Bid shall be accompanied by Bid Security in the amount of 10% of the Lump Sum Base Bid as security for Bidder's obligation to enter into a Contract with University on the terms stated in the Bid Form and to furnish all items required by the Bidding Documents. Bid Security shall be a Bid Bond on the form provided by University and included herein, or a certified check made payable to “The Regents of the University of California.” When a Bid Bond is used for Bid Security, failure to use University's Bid Bond form will result in the rejection of the Bid. Bidder must use the Bid Bond form provided by the University or an exact, true and correct photocopy of such form. The Bid Bond form may not be retyped, reformatted, transcribed onto another form, or altered in any manner except for the purpose of completing the form.

5.2.2 If the apparent lowest responsible Bidder fails to sign the Agreement and furnish all items required by the Bidding Documents within the time limits specified in these Instructions to Bidders, University may reject such Bidder’s Bid and select the next apparent lowest responsible Bidder until all Bids have been exhausted or University may reject all Bids. The Bidder whose Bid is rejected for such failure(s) shall be liable for and forfeit to University the amount of the difference, not to exceed the amount of the Bid Security, between the amount of the Bid of the Bidder so rejected and the greater amount for which University procures the Work.

5.2.3 If a Bid Bond is submitted, the signature of the person executing the Bid Bond must be notarized. If an attorney-in-fact executes the Bid Bond on behalf of the surety, a copy of the current power of attorney

bearing the notarized signature of the appropriate corporate officer shall be included with the Bid Bond. Additionally, the surety issuing the Bid Bond shall be, on the Bid Deadline, an admitted surety insurer (as defined in the California Code of Civil Procedure Section 995.120).

5.2.4 Bid Security will be returned after the contract has been awarded. Notwithstanding the preceding, if a Bidder fails or refuses, within 10 days after receipt of notice of selection, to sign the Agreement or submit to University all of the items required by the Bidding Documents, the University will retain that Bidder's Bid Security. If the Bid Security is in the form of a Bid Bond, the Bid Security will be retained until the University has been appropriately compensated; if the Bid Security is in the form of certified check, the University will negotiate said check and after deducting its damages, return any balance to Bidder.

5.3 SUBMISSION OF BIDS

5.3.1 The Bid Form, Bid Security, and all other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the office designated in the Supplementary Instructions to Bidders for receipt of Bids. The envelope shall be identified with the Project name, Bidder's name and address, and, if applicable, the designated portion of the Project for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

5.3.2 Bids shall be deposited at the designated location on or before the Bid Deadline. A Bid received after the Bid Deadline will be returned to Bidder unopened.

5.3.3 Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

5.3.4 Oral, telephonic, electronic mail (e-mail), facsimile, or telegraphic Bids are invalid and will not be accepted.

5.4 MODIFICATION OR WITHDRAWAL OF BID

5.4.1 Prior to the Bid Deadline, a submitted Bid may be modified or withdrawn by notice to the Facility receiving Bids at the location designated for receipt of Bids. Such notice shall be in writing over the signature of Bidder and, in order to be effective, must be received on or before the Bid Deadline. A modification so made shall be worded so as not to reveal the amount of the original Bid.

5.4.2 A withdrawn Bid may be resubmitted on or before the Bid Deadline, provided that it then fully complies with the Bidding Requirements.

5.4.3 Bid Security shall be in an amount sufficient for the Bid as modified or resubmitted.

5.4.4 Bids may not be modified, withdrawn, or canceled within 60 days after the Bid Deadline unless otherwise provided in Supplementary Instructions to Bidders.

ARTICLE 6

CONSIDERATION OF BIDS

6.1 OPENING OF BIDS

6.1.1 Bids which have the required identification as stipulated in Article 5.3.1 and are received on or before the Bid Deadline will be opened publicly.

6.2 REJECTION OF BIDS

6.2.1 University will have the right to reject all Bids.

6.2.2 University will have the right to reject any Bid not accompanied by the required Bid Security or any other item required by the Bidding Documents, or a Bid which is in any other way incomplete or irregular.

6.3 AWARD

6.3.1 University will have the right, but is not required, to waive nonmaterial irregularities in a Bid. If the University awards the Contract, it will be awarded to the responsible Bidder submitting the lowest responsive Bid as determined by University and who is not rejected by University for failing or refusing, within 10 days after receipt of notice of selection, to sign the Agreement or submit to University all of the items required by the Bidding Documents.

6.3.2 University will have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents. The opening of Bids and evaluation of Alternates will be conducted in accordance with a procedure that, at University's option, either (i) prescribes, prior to the time of Bid opening, the order in which Alternates will be selected or (ii) prevents, before the determination of the apparent low Bidder has been made, information that would identify which Bid belongs to which Bidder from being revealed to the representative of the University selecting the Alternates to be used in determining the low Bidder. After determination of the apparent low Bidder has been made, University will publicly disclose the identity of each Bidder that submitted a Bid and the amount of each such Bid.

6.3.3 University will determine the low Bidder on the basis of the sum of the Lump Sum Base Bid plus all Unit Prices multiplied by their respective Estimated Quantities as stated in the Bid Form, if any, plus the daily rate for Compensable Delay multiplied by the "multiplier" as stated in the Bid Form, plus the amounts of all Alternates to be included in the Contract Sum at the time of award. The Contract Sum will be the sum of the Lump Sum Base Bid and the additive or deductive amounts for all Alternates that University has elected to be included in the Contract Sum as of the time of award.

6.3.4 The University will post the Bid results in a public place at the address where the Bids are received (unless another address is specified in the Bidding Documents).

6.3.5 University will select the apparent lowest responsive and responsible Bidder and notify such Bidder on University's form within 50 days (unless the number of days is modified in Supplementary Instructions to Bidders) after the Bid Deadline or reject all Bids. Within 10 days after receipt of notice of selection as the apparent lowest responsive and responsible Bidder, Bidder shall submit to University all of the following items:

.1 Three originals of the Agreement signed by Bidder.

.2 Three originals of the Payment Bond required under Article 11 of the General Conditions.

.3 Three originals of the Performance Bond required under Article 11 of the General Conditions.

.4 Certificates of Insurance on form provided by University required under Article 11 of the General Conditions.

.5 Name of, qualifications of, and references for the Superintendent proposed for the Work.

.6 Names of all Subcontractors, with their addresses, telephone number, facsimile number, contact person, portion of the Work and designation of any Subcontractor

as a Small Business Enterprise (SBE), Disadvantaged Business Enterprise (DBE), Women-owned Business Enterprise (WBE) and Disabled Veteran Business Enterprise (DVBE) on Report of Subcontractor Information in the form contained in the Exhibits. Evidence, as required by University, of the reliability and responsibility of the proposed Subcontractors such as statements of experience, statements of financial condition, and references.

.7 Preliminary Contract Schedule as required under Article 3 of the General Conditions.

.8 If Bidder wishes to utilize securities in lieu of retention beginning with the first Application for Payment, Selection of Retention Options accompanied by a completed Escrow Agreement for Deposit of Securities in Lieu of Retention and Deposit of Retention in the form contained in the Exhibits.

.9 Cost Breakdown as required by Article 9 of the General Conditions.

6.3.6 Prior to award of the Contract, University will notify Bidder in writing, if University, after due investigation, objects to a Subcontractor or Superintendent proposed by Bidder, in which case Bidder shall propose a substitute acceptable to University. Substitution of Superintendent shall be made in accordance with Article 3 of the General Conditions. Substitution of a Subcontractor shall be made in accordance with Article 5 of the General Conditions. Failure of University to object to a proposed Superintendent or Subcontractor prior to award shall not preclude University from requiring replacement of Superintendent or any Subcontractor based upon information received subsequent to award, information which cannot be properly evaluated prior to award due to time constraints, or information relating to a failure to comply with the requirements of the Contract.

6.3.7 If Bidder submits three originals of the signed Agreement and all other items required to be submitted to University within 10 days after receipt of notice of selection as the apparent lowest responsive and responsible Bidder, and if all such items comply with the requirements of the Bidding Documents and are acceptable to University, University will award the Contract to Bidder by signing the Agreement and returning a signed copy of the Agreement to Bidder.

6.3.8 If University consents to the withdrawal of the Bid of the apparent lowest responsive and responsible Bidder, or the apparent lowest responsive and responsible Bidder fails or refuses to sign the Agreement or submit to University all of the items required by the Bidding Documents, within 10 days after receipt of notice of selection, or that Bidder is not financially or otherwise qualified to perform the Contract, University may reject such Bidder's Bid and select the next apparent lowest responsible Bidder, until all Bids are exhausted, or reject all Bids. Any Bidder whose Bid is rejected because the Bidder has failed or refused, within 10 days after receipt of notice of selection, to sign the Agreement or submit to University all of the items required by the Bidding Documents, shall be liable to the University for all resulting damages.

ARTICLE 7

BID PROTEST

7.1 FILING A BID PROTEST

7.1.1 Any Bidder, person, or entity may file a Bid protest. The protest shall specify the reasons and facts upon which the protest is based and shall be in writing and received by with the Facility not later than 5:00 PM on the 3rd business day following:

.1 if the Bid Form does not contain any Alternate(s), the date of the Bid opening;

.2 if the Bid Form contains any Alternate(s), the date of posting in a public place of Bid results.

7.1.2 If a Bid is rejected by the Facility, and such rejection is not in response to a Bid protest, any Bidder, person or entity may dispute that rejection by filing a Bid protest (limited to the rejection) in writing and received by the Facility not later than 5:00 PM on the 3rd business day following the rejected Bidder's receipt of the notice of rejection.

7.1.3 For the purpose of computing any time period in this Article 7, the date of receipt of any notice shall be the date on which the intended recipient of such notice actually received it. Delivery of any notice may be by any means, with verbal or written confirmation of receipt by the intended recipient.

7.2 RESOLUTION OF BID CONTROVERSY

7.2.1 Facility will investigate the basis for the Bid protest and analyze the facts. Facility will notify Bidder whose Bid is the subject of the Bid protest of evidence presented in the Bid protest and evidence found as a result of the investigation, and, if deemed appropriate, afford Bidder an opportunity to rebut such evidence, and permit Bidder to present evidence that it should be allowed to perform the Work. If deemed appropriate by Facility, an informal hearing will be held. Facility will issue a written decision within 15 days following receipt of the Bid protest, unless factors beyond Facility's reasonable control prevent such a resolution, in which event such decision will be issued as expeditiously as circumstances reasonably permit. The decision will state the reasons for the action taken by Facility. A written copy of the decision will be furnished to the protestor, the Bidder whose Bid is the subject of the Bid protest, and all Bidders affected by the decision. As used in this Article 7, a Bidder is affected by the decision on a Bid protest if a decision on the protest could have resulted in the Bidder not being the lowest responsible and responsive Bidder for the Contract. A written copy of the Facility's decision must be received by the protester, the Bidder whose Bid is the subject of the Bid protest, and all Bidders affected by the decision no later than 3 business days prior to award of the contract.

7.2.2 Notwithstanding the provisions of Article 7.2.1, at the election of Facility, a Bid protest may be referred directly to University's Construction Review Board without prior investigation and review by Facility. The Chair of the Construction Review Board will either decide the Bid protest or appoint a Hearing Officer. If a Hearing Officer is appointed, the Hearing Officer will review the Bid protest in accordance with the provisions of Article 7.2.4.

7.2.3 Bidder whose Bid is the subject of the protest, all Bidders affected by the Facility's decision on the protest, and the protestor have the right to appeal to the Construction Review Board if not satisfied with Facility's decision. The appeal must be in writing and shall specify the decision being appealed and all the facts and circumstances relied upon in support of the appeal. A copy of the appeal must be received by the Chair, Construction Review Board, not later than 5:00 pm on the 3rd business day following appellant's receipt of the written decision of Facility, at the following address:

Chair, Construction Review Board
University of California
Office of the President
1111 Franklin Street, 6th Floor
Oakland, CA 94607-5200
Attention: Associate Director, Design & Construction Policy

And, by email to:

constructionreviewboard@ucop.edu

A copy of the appeal must be sent to all parties involved in the Bid protest and to Facility, to the same address and in the same manner as the original protest. An appeal received after 5:00 pm is considered received as of the next business day. If the final date for receipt of an appeal falls on a Saturday, Sunday, or University holiday, the appeal will be considered timely only if received by 5:00 pm on the following business day. The burden of proving timely receipt of the appeal is on the appealing party.

7.2.4 The Chair of the Construction Review Board will review the Facility's decision and the appeal, and issue a written decision, or if appropriate, appoint a Hearing Officer to conduct a hearing and issue a written decision. If a hearing is held, the hearing shall be held not later than the 10th day following the appointment of the Hearing Officer unless the Hearing Officer for good cause determines otherwise. The written decision of the Chair or Hearing Officer will state the basis of the decision, and the decision will be final and not subject to any further appeal to University. The Chair or Hearing Officer may consult with the University's Office of the General Counsel on the decision as to legal form. The University will complete its internal Bid protest procedures before award of the Contract.

END OF INSTRUCTIONS TO BIDDERS

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

1. Contract Time: As specified in Section 1 of the Bid Form.

2. List of Subcontractors (Bid Form Paragraph 9.0) and List of Changes in Subcontractors Due to Alternates (Bid Form Paragraph 10.0).

   The default rule is that, if a Bidder lists one subcontractor for a Work Activity (such as "Electrical") under Bid Form Paragraph 9.0 and a different subcontractor for the same Work Activity (such as "Electrical") for the Alternate Work under Bid Form Paragraph 10.0 without reference to the Alternate, then it is deemed that the second subcontractor listed in Paragraph 10.0 will perform the Base Bid Work and the Alternate Work, unless the Bidder expressly writes otherwise.

   A Bidder may list more than one subcontractor per trade, provided that the Work Activity to be performed by each listed subcontractor is adequately described on the spaces provided on the Bid Form, so that which subcontractor will perform which Work Activity can be determined.

   For example, in case of Alternates, if a Bidder wants one subcontractor to perform the electrical Base Bid Work and another subcontractor to perform the electrical Alternate Work, then the Bidder should list the first subcontractor under Bid Form Paragraph 9.0 as performing the "Electrical" Work Activity, and list the second subcontractor under Bid Form Paragraph 10.0 (for listing changes in subcontractors due to Alternates) as performing the "Electrical Alt" or "Electrical Alt Work" or "Electrical Alt Only" or similarly to define the Alternate Work Activity separately to be performed.

3. Requests for clarification or interpretation of the Bidding Documents must be submitted in writing, and shall be addressed only to:

   Kara Longtin
   Email: kara.longtin@ucr.edu
   Tel: 951.827.2610

   The deadline to submit requests for clarification or interpretation is on or before 2:00 PM, on Wednesday, December 22, 2021.

4. The Pre-Bid Conference will be conducted via ZOOM conference call on **Friday, December 17, 2021**, at **1:00 PM**.

   To request the meeting link and ID, please email kara.longtin@ucr.edu and use the following in the subject header:

   Rubidoux Screenhouse Conversion- Phase II Electrical- Request for Pre-Bid Meeting Link

   At this time, there are no plans for a site visit, if a bidder would like access to the site, this will be done by appointment only and through the coordination of the Contract Administrator noted above. Do not contact the project manager directly.

5. Bids will be submitted electronically only. The Bid Form, and all other documents required to be submitted via email to kara.longtin@ucr.edu. The email shall be identified with the Project name, Bidder's name and address, and, if applicable, the designated portion of the Project for which the Bid is submitted.

6. Immediately following the Bid Deadline, bids will be opened and posted on the University's website. Bids will be made available to be reviewed by bidders shortly after bids have been validated. Efforts will be made to accommodate and observe all typical procedures during COVID-19 restrictions. .

7. Contractor will be assessed as liquidated damages the sum of **$0.00** for each day the Work remains incomplete beyond the expiration of the Contract Time. After Substantial Completion, the rate for liquidated damages shall be reduced to the sum of **$0.00** per day. See Article 5 of the Agreement for detailed requirements

8. Replace the existing Paragraph 1.4 with the following:

   1.4 The term "Bid Deadline" means the date and time on or before which Bids must be received, as designated in the **ADVERTISEMENT FOR BIDS** and which may be revised by Addenda.

9. Replace the existing Paragraph 3.1.1 with the following:

   3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the **ADVERTISEMENT FOR BIDS**.

10. Replace the existing Paragraph 3.5.1 with the following:

    3.5.1 Addenda will be issued only by University and only in writing. Addenda will be identified as such and will be mailed or delivered to all Planholders. At its sole discretion, the University may elect to deliver Addenda via facsimile or email to Planholders who have provided a facsimile number or email address for receipt of Addenda or communications.

11. Replace the existing Paragraph 3.5.3 with the following:

    3.5.3 Addenda will be issued such that Planholders should receive them no later than 72 hours prior to the Bid Deadline. Addenda withdrawing the request for Bids or postponing the Bid Deadline may be issued anytime prior to the Bid Deadline.

12. Replace the existing Paragraph 5.2.4 with the following:

    5.2.4 Bid Security will be returned after the contract has been awarded. Notwithstanding the preceding, if a Bidder fails or refuses, within **10** days after receipt of notice of selection, to sign the Agreement or submit to University all of the items required by the Bidding Documents, the University will retain that Bidder's Bid Security. If the Bid Security is in the form of a Bid Bond, the Bid Security will be retained until the University has been appropriately compensated; if the Bid Security is in the form of certified check, the University will negotiate said check and after deducting its damages, return any balance to Bidder.

13. Add the following as Paragraph 5.3.5:

    ~~5.3.5 As specified in the **ADVERTISEMENT FOR CONTRACTOR PREQUALIFICATION AND FOR BIDS**, the University has determined that bidders who submit bids for this Project must be prequalified. The names of the bidders prequalified to bid on this Project will appear in an addendum.~~

14. Replace the existing Paragraph 5.4.4 with the following:

5.4.4 Bids may not be modified, withdrawn, or canceled within **60** days after the Bid Deadline.

15. Replace the existing Paragraph 6.3.1 with the following:

6.3.1 University will have the right, but is not required, to waive nonmaterial irregularities in a Bid. If the University awards the Contract, it will be awarded to the responsible Bidder submitting the lowest responsive Bid as determined by University and who is not rejected by University for failing or refusing, within **10** days after receipt of notice of selection, to sign the Agreement or submit to University all of the items required by the Bidding Documents.

16. Replace the existing Paragraph 6.3.5 with the following:

6.3.5 University will select the apparent lowest responsive and responsible Bidder and notify such Bidder on University's form within **50** days (unless the number of days is modified in Supplementary Instructions to Bidders) after the Bid Deadline or reject all Bids. Within **10** days after receipt of notice of selection as the apparent lowest responsive and responsible Bidder, Bidder shall submit to University all of the following items:

.1 Three originals of the Agreement signed by Bidder.

.2 Three originals of the Payment Bond required under Article 11 of the General Conditions.

.3 Three originals of the Performance Bond required under Article 11 of the General Conditions.

.4 Certificates of Insurance on form provided by University required under Article 11 of the General Conditions.

.5 Names of all Subcontractors, with their addresses, telephone and facsimile numbers, contact persons, portions of the Work and designation of any Subcontractor as a Small Business Enterprise (SBE), Disadvantaged Business Enterprise (DBE), Women-owned Business Enterprise (WBE) and Disabled Veteran Business Enterprise (DVBE) on the Report of Subcontractor Information form, along with a completed Self-Certification form, contained in the Exhibits. Evidence, as required by University, of the reliability and responsibility of the proposed Subcontractors such as statements of experience, statements of financial condition, and references.

.6 Preliminary Contract Schedule as required under Article 3 of the General Conditions.

.7 If Bidder wishes to utilize securities in lieu of retention beginning with the first Application for Payment, a completed Selection of Retention Options form accompanied by a completed Escrow Agreement for Deposit of Securities in Lieu of Retention and Deposit of Retention in the form contained in the Exhibits.

.8 Cost Breakdown as required by Article 9 of the General Conditions.

17. Replace the existing Paragraph 6.3.7 with the following:

6.3.7 If Bidder submits three originals of the signed Agreement and all other items required to be submitted to University within **10** days after receipt of notice of selection as the apparent lowest responsive and responsible Bidder, and if all such items comply with the requirements of the Bidding Documents and are acceptable to University, University will award the Contract to Bidder by signing the Agreement and returning a signed copy of the Agreement to Bidder.

18. Replace the existing Paragraph 6.3.8 with the following:

6.3.8 If University consents to the withdrawal of the Bid of the apparent lowest responsive and responsible Bidder, or the apparent lowest responsive and responsible Bidder fails or refuses to sign the Agreement or submit to University all of the items required by the Bidding Documents, within **10** days after receipt of notice of selection, or that Bidder is not financially or otherwise qualified to perform the Contract, University may reject such Bidder's Bid and select the next apparent lowest responsible Bidder, until all Bids are exhausted, or reject all Bids. Any Bidder whose Bid is rejected because the Bidder has failed or refused, within **10** days after receipt of notice of selection, to sign the Agreement or submit to University all of the items required by the Bidding Documents, shall be liable to the University for all resulting damages.

19. The University has negotiated contracts with certain suppliers (listed in the “Information Available to Bidders”) to supply materials to University construction projects. Bidders may be able to obtain favorable pricing from the listed suppliers for materials required for this Contract. Bidders are not obligated to obtain any required materials from the listed suppliers. Use of any of the listed suppliers is at the Bidder’s risk, and the University does provide any warranties, express or implied, with respect to the listed suppliers, their products and/or services. In particular, University does not warrant that the listed suppliers, their products and/or services are suitable for this Project.

20. **PREVAILING WAGE INFORMATION:** A bidder can obtain the prevailing wage information through the internet at www.dir.ca.gov or at http://www.dir.ca.gov/DLSR/PWD.

END OF SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

INFORMATION AVAILABLE TO BIDDERS

The following information is made available for the convenience of bidders and is not a part of the Contract. The information is provided subject to the provisions of Article 3 of the General Conditions.

1. The University of California has contracts for materials, equipment and/or services with the suppliers listed on the Office of the President Procurement Services website at: https://www.ucop.edu/procurement-services/for-suppliers/construction-supplier-resources.html

   General Contractors or others submitting bids for University construction projects may enter into agreements with these suppliers that utilize the pricing and terms contained in the University-supplier agreements. The university does not represent or warrant that materials/equipment/services of these suppliers meet the requirements of the University's construction contracts.

   Use of such suppliers shall not relieve Contractor from its obligation to meet all contractual requirements in any contracts with the University. The university will not be a party to any agreements with such suppliers and accepts no performance obligations or liability with respect to such agreements.

2. Reports:

   None

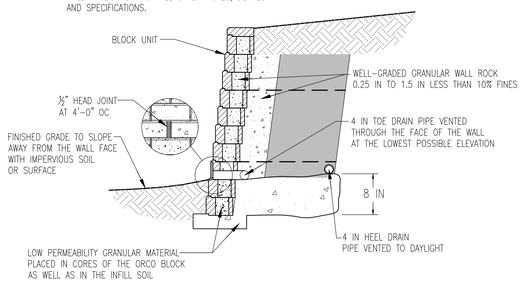
3. Record Documents and As-Builts:

   Reference Drawings for Alternates

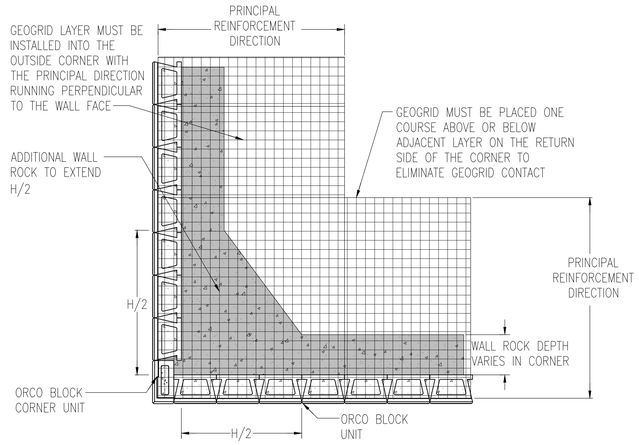
END OF INFORMATION AVAILABLE TO BIDDERS

*IN THE EVENT THAT THE DRAIN PIPE IS REQUIRED TO BE MOVED UP ABOVE GRADE, IT MUST BE APPROVED BY THE ENGINEER OF RECORD AND AN IMPERVIOUS GRANULAR MATERIAL MUST BE PLACED BELOW THE DRAIN PIPE.

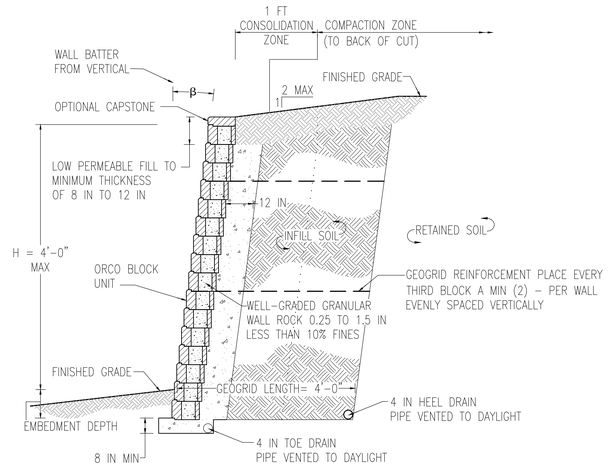
*REFER TO OTHER DETAILS: TYPICAL REINFORCED WALL APPLICATION FOR ALL OTHER NOTES, DETAILS AND SPECIFICATIONS.



LEVEL GRADE DRAIN — SCALE NONE — 8

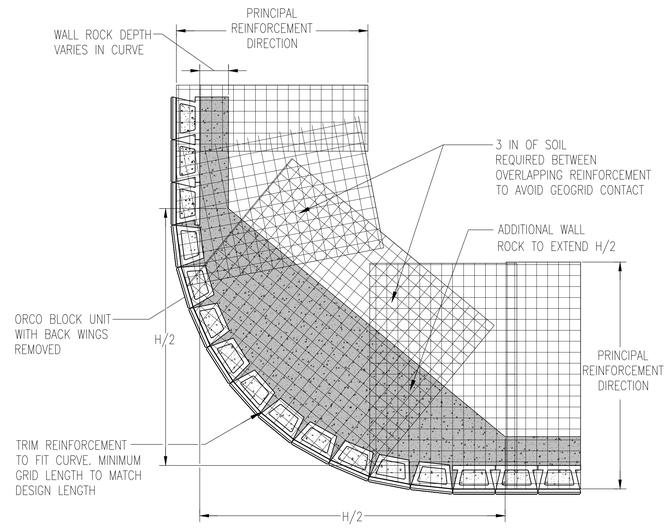


OUTSIDE CORNER — SCALE NONE — 4

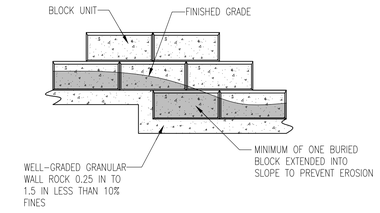


TYPICAL REINFORCING GEOGRID WALL — SCALE NONE — 1

NOT USED — SCALE NONE — 9

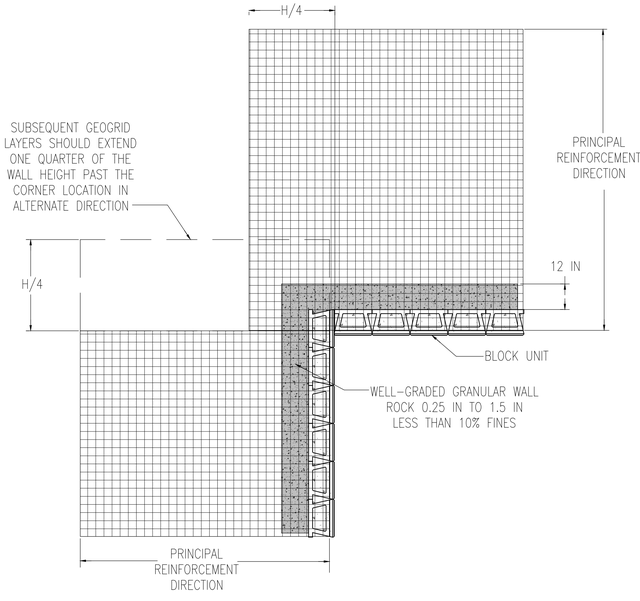


OUTSIDE CURVE — SCALE NONE — 5



STEP UP DETAIL — SCALE NONE — 2

NOT USED — SCALE NONE — 10



INSIDE CORNER — SCALE NONE — 3

NOT USED — SCALE NONE — 11

NOT USED — SCALE NONE — 7

NOT USED — SCALE NONE — 6

UNIVERSITY OF CALIFORNIA
UC RIVERSIDE
CAPITAL PROGRAMS
ARCHITECTS & ENGINEERS
1223 UNIVERSITY AVENUE, SUITE 240
RIVERSIDE, CA. 92521
TEL:(951) 827-1273 FAX:(951) 827-3890

Architect's Data:

Architect's Stamp:

Consultant's Stamp:

REGISTERED PROFESSIONAL ENGINEER — THOMAS W. HADLEY — No. S 5697 Exp. 6-30-23 — STRUCTURAL — STATE OF CALIFORNIA

09.01.21

NOTE: PLANS SHALL BE CONSIDERED PRELIMINARY AND NOT FOR CONSTRUCTION IF SEAL ABOVE IS NOT SIGNED IN WET INK AND IF NOT APPROVED BY LOCAL BUILDING JURISDICTION.

REVISIONS

REV #	DESCRIPTION	DATE
2	100% CD SUBMITTAL	09/02/21

RUBIDOUX MODULAR PLANT GROWTH UNIT INSTALLATION

Consultant's Data:

HADLEY ENGINEERING
P• 909/446-0712
THOMAS W. HADLEY S.E.
34159 YUCAIPA, BLVD. SUITE C
YUCAIPA, CA. 92399
THADLEY@HADLEYENGINEERING.COM

UCR Project Manager: SCOTT DONNELL

Scale: AS SHOWN	SD Approval: --
Drawn By: BJM/PCM	DD Approval: --
Checked By: TWH	CD Approval: --
Project No.: 957459	Construction Release: --
DSA No.: --	

Drawing Title: SRW BLOCK DETAILS

Sheet No. S2.1

BID FORM

FOR: HUB 2 ROOF REPAIRS
PROJECT NUMBER:
CONTRACT NUMBER:
UNIVERSITY OF CALIFORNIA, RIVERSIDE
RIVERSIDE, CALIFORNIA

November 30, 2021

BID TO:

Planning, Design & Construction
UNIVERSITY OF CALIFORNIA, RIVERSIDE
1223 University Avenue, Suite 240
Riverside, CA 92521

(951) 827-2610

BID FROM: _____
(Name of Bidder)

_____
(Contact Name)

_____
(Address)

_____
(City, State, Zip Code)

_____ _____
(Telephone Number) (Facsimile Number)

_____
(E-mail)

_____
(Date Bid Submitted)

Note: All portions of this Bid Form must be completed, and the Bid Form must be signed before the Bid is submitted. Failure to do so will result in the Bid being rejected as non-responsive.

BIDDER'S NAME: _____

1. 0 BIDDER'S REPRESENTATIONS

Bidder, represents that a) Bidder and all Subcontractors, regardless of tier, has the appropriate current and active Contractor's licenses required by the State of California and the Bidding Documents; b) it has carefully read and examined the Bidding Documents for the proposed Work on this Project; c) it has examined the site of the proposed Work and all Information Available to Bidders; d) it has become familiar with all the conditions related to the proposed Work, including the availability of labor, materials, and equipment; e) Bidder and all Subcontractors, regardless of tier, are currently registered with the California Department of Industrial Relations pursuant to California Labor Code Section 1725.5 and 1771.1. Bidder hereby offers to furnish all labor, materials, equipment, tools, transportation, and services necessary to complete the proposed Work on this Project in accordance with the Contract Documents for the sums quoted. Bidder further agrees that it will not withdraw its Bid within {60} days after the Bid Deadline, and that, if it is selected as the apparent lowest responsive and responsible Bidder, that it will, within 10 days after receipt of notice of selection, sign and deliver to University the Agreement in triplicate and furnish to University all items required by the Bidding Documents. If awarded the Contract, Bidder agrees to complete the proposed Work within 60 days after the date of commencement specified in the Notice to Proceed.

2.0 ADDENDA

Bidder acknowledges that it is Bidder's responsibility to ascertain whether any Addenda have been issued and if so, to obtain copies of such Addenda from University's Facility at the appropriate address stated on Page 1 of this Bid Form. Bidder therefore agrees to be bound by all Addenda that have been issued for this Bid.

3.0 NOT USED

4.0 LUMP SUM BASE BID

$ | | | , | | | | , | | | | . | | |

(Place figures in appropriate boxes.)

5.0 SELECTION OF APPARENT LOW BIDDER

Refer to the Instructions to Bidders for selection of apparent low bidder.

BIDDER'S NAME: _____

6.0 UNIT PRICES- NOT USED

7.0 DAILY RATE OF COMPENSATION FOR COMPENSABLE DELAYS WITH TWO OPTIONS- NOT USED

8.0 ALTERNATES

In order for a Bid to be responsive, Bidder must submit an additive bid, a deductive bid, or a "no change" bid, for each Alternate listed below. The failure to do so shall result in the Bid being rejected as non-responsive. The failure to quote an amount, unless the bidder marks the "no change" box, will result in the bid being rejected as non-responsive.

The Contract Time will change by the number of days, if any**,** specified for each accepted Alternate.

Alternate No. 1

Provide Labor & Materials for Block wall between Glasshouse & Greenhouses., as specified in 01 2300.

Bid for Alternate No. 1

If "Add" or "Deduct" is intended, indicate by placing figures in the corresponding boxes. If "No Change" is intended, indicate by marking the "No Change" box

Add $ ☐ , ☐☐☐ , ☐☐☐ . ☐☐

Deduct $ ☐ , ☐☐☐ , ☐☐☐ . ☐☐

☐ No Change: Bidder will perform this Alternate without change to Contract Sum.

No extension of time will be granted if this Alternate is accepted.

University reserves the right to accept this Alternate within 10 calendar days after the date University signs the Agreement:

BIDDER'S NAME: _____

Alternate No. 2

Provide labor & materials between for Block wall shown along Glenwood Drive., as specified in 01 2300.

Bid for Alternate No. 2

If "Add" or "Deduct" is intended, indicate by placing figures in the corresponding boxes. If "No Change" is intended, indicate by marking the "No Change" box

Add	$		,				,				.			
Deduct	$		,				,				.			

☐ No Change: Bidder will perform this Alternate without change to Contract Sum.

No extension of time will be granted if this Alternate is accepted.

University reserves the right to accept this Alternate within 10 calendar days after the date University signs the Agreement:

BIDDER'S NAME: _____

9.0 LIST OF SUBCONTRACTORS

Bidder will use Subcontractors for the Work:

☐ No ☐ Yes

If "yes", provide in the spaces below (a) the name, the location of the place of business, and the California contractor license number of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the state of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent of the prime contractor's total bid, (b) the portion of the work which will be done by each subcontractor. The prime contractor shall list only one subcontractor for each such portion as is defined by the prime contractor in its bid.

	Subcontractor			
Portion of the Work Activity (e.g. electrical, mechanical, concrete)	Name of Business	Location of Business (City)	License No.	DIR Registration No.

(Note: Add additional pages if required.)

BIDDER'S NAME: _____

10.0 LIST OF CHANGES IN SUBCONTRACTORS DUE TO ALTERNATES

The information below must be provided for all changes in first-tier Subcontractors if University selects Alternates. List changes in Subcontractors only for those portions of the Work valued in excess of one-half of 1 percent of prime contractor's total bid.

	Subcontractor			
Portion of the Work Activity (e.g. electrical, mechanical, concrete)	Name of Business	Location of Business (City)	License No.	DIR Registration No.

(Note: Add additional pages if required.)

BIDDER'S NAME: _____

11.0 BIDDER INFORMATION

TYPE OF ORGANIZATION

_____
(Corporation, Partnership, Individual, Joint Venture, etc.)

IF A CORPORATION, THE CORPORATION IS ORGANIZED UNDER THE LAWS OF:

THE STATE OF _____ .
(State)

NAME OF PRESIDENT OF THE CORPORATION:

_____ .
(Insert Name)

NAME OF SECRETARY OF THE CORPORATION:

_____ .
(Insert Name)

IF A PARTNERSHIP, NAMES OF ALL GENERAL PARTNERS:

_____ .
(Insert Name(s))

CALIFORNIA CONTRACTORS LICENSE(S):

_____	_____	_____
(Classification(s))	(License Number)	(Expiration Date)

(For Joint Venture, list Joint Venture's license and licenses for all Joint Venture partners.)

BIDDER'S NAME: _____

12.0 REQUIRED COMPLETED ATTACHMENTS

The following documents are submitted with and made a condition of this Bid:

1. Bid Security in the form of _____
(Bid Bond or Certified Check)

13.0 DECLARATION

I, _____ , hereby declare that I am the
(Printed Name)

_____ of _____
(Title) (Name of Bidder)

submitting this Bid Form; that I am duly authorized to execute this Bid Form on behalf of Bidder; and that all information set forth in this Bid Form and all attachments hereto are, to the best of my knowledge, true, accurate, and complete as of its submission date.

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

I declare, under penalty of perjury, that the foregoing is true and correct and that this Declaration was executed at:

_____ , in the State of _____ ,
(Name of City if within a City, otherwise Name of County) (State)

on _____ .
(Date)

_____
(Signature)

BID BOND

KNOW ALL PERSONS BY THESE PRESENTS:

That we, _____, as Principal, and _____, as Surety, are held and firmly bound unto THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, hereinafter called THE REGENTS, in the sum of 10% of the Lump Sum Base Bid amount for payment of which in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT, WHEREAS, Principal has submitted a Bid for the work described as follows:

Project Name: Rubidoux Screenhouse Conversion- Phase II Electrical
Project Number: 950567, Contract Number: 950567-LF-2022-68
Location: 900 University Avenue, Riverside, Ca. 92521

NOW, THEREFORE, if Principal shall not withdraw said Bid within the time period specified after the Bid Deadline, as defined in the Bidding Documents, or within **60** days after the Bid Deadline if no time period be specified, and, if selected as the apparent lowest responsible Bidder, Principal shall, within the time period specified in the Bidding Documents, do the following:

(1) Enter into a written agreement, in the prescribed form, in accordance with the Bid.
(2) File two bonds with THE REGENTS, one to guarantee faithful performance and the other to guarantee payment for labor and materials, as required by the Bidding Documents.
(3) Furnish certificates of insurance and all other items as required by the Bidding Documents.

In the event of the withdrawal of said Bid within the time period specified, or within **60** days if no time period be specified, or the disqualification of said Bid due to failure of Principal to enter into such agreement and furnish such bonds, certificates of insurance, and all other items as required by the Bidding Documents, if Principal shall pay to THE REGENTS an amount equal to the difference, not to exceed the amount hereof, between the amount specified in said Bid and such larger amount for which THE REGENTS procure the required work covered by said Bid, if the latter be in excess of the former, then this obligation shall be null and void, otherwise to remain in full force and effect.

In the event suit is brought upon this bond by THE REGENTS, Surety shall pay reasonable attorneys' fees and costs incurred by THE REGENTS in such suit.

IN WITNESS WHEREOF, we have hereunto set our hands this _____ day of _____, 20___.

PRINCIPAL:

_____
(Name of Company)

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

SURETY:

_____
(Name of Company)

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

Address for Notices:

_____
(Street Address)

_____
(City, State & Zip Code)

NOTE: Notary acknowledgement for Surety and Surety's Power of Attorney must be attached.

AGREEMENT

This AGREEMENT is made on_____, between THE REGENTS OF THE UNIVERSITY OF CALIFORNIA ("University"),

whose Facility is:	University of California, Riverside
whose address for notices is:	UCR Planning, Design & Construction UNIVERSITY OF CALIFORNIA, RIVERSIDE 1223 University Avenue, Suite 240 Riverside, CA 92521
and Contractor:	**Name**
whose address for notices is:	Street Address City, State & Zip
for the Project:	RUBIDOUX SCREENHOUSE CONVERSION-ELECTRICAL UPGRADE Project Number: 950567 University of California, Riverside County of Riverside Riverside, California 92521
University's Responsible Administrator:	Drew Hecht, Architect Director of Project Management Planning, Design & Construction
University's Representative is:	Tameesha Hayes Project Manager Planning, Design & Construction
whose address for notices is:	UCR Planning, Design & Construction UNIVERSITY OF CALIFORNIA, RIVERSIDE 1223 University Avenue, Suite 240 Riverside, CA 92521
Contract Documents for the Work Prepared by:	Nick Ubrun GOSS ENGINEERING 255 E. Main Street, Suite 301 Corona, CA. 92879 Tel: (951) 340-1090

University and Contractor hereby agree as follows:

ARTICLE 1 WORK

Contractor shall provide all work required by the Contract Documents (the "Work"). Contractor agrees to do additional Work arising from changes ordered by the University pursuant to Article 7 of the General Conditions. Contractor shall (1) pay all sales, consumer and other taxes and (2) obtain and pay for any governmental licenses and permits necessary for the work, than building and utility permits.

ARTICLE 2 CONTRACT DOCUMENTS

"Contract Documents" means the Advertisement for Bids, Instructions To Bidders, Supplementary Instructions to Bidders, Bid Form, this Agreement, General Conditions, Supplementary Conditions, Exhibits, Specifications, List of Drawings, Drawings, Addenda, Notice to Proceed, Change Orders, Notice of Completion, and all other documents identified in this Agreement that together form the contract between University and Contractor for the Work (the "Contract"). The Contract constitutes the complete agreement between University and Contractor and supersedes any previous agreements or understandings.

ARTICLE 3 CONTRACT SUM

Subject to the provisions of the Contract Documents University shall pay to Contractor, for the performance of the Work, **$** , the "Contract Sum".

The Contract Sum includes the following Allowances:

Not Applicable

The Contract Sum includes the following Alternates accepted by University:

List Alternates Accepted by University at Time of Award

University reserves the right to accept the following Alternates within 10 days after the date of this Agreement:

List Alternates Not Accepted by University at Time of Award

Unit Prices, if any, are as follows:

Not Applicable

The Contract Sum will be increased by an amount equal to the Unit Price multiplied by the actual number of units of each Unit Price item incorporated in the Work.

ARTICLE 4 CONTRACT TIME

Contractor shall commence the Work on the date specified in the Notice to Proceed and fully complete the work within **60** days, the "Contract Time".

By signing this agreement, Contractor represents to University that the Contract Time is reasonable for completion of the work and that Contractor will complete the Work within the Contract Time. Time limits stated in the Contract Documents are of the essence of the Contract.

ARTICLE 5 LIQUIDATED DAMAGES

If Contractor fails to complete the Work within the Contract Time, Contractor shall pay to University, as liquidated damages and not as a penalty, the sum of **$0.00** for each day after the expiration of the Contract Time that the Work remains incomplete. After Substantial Completion, the rate for liquidated damages shall be reduced to the sum of **$0.00** per day. University and Contractor agree that if the Work is not completed within the Contract Time, University's damages would be extremely difficult or impracticable to determine and that the aforesaid amounts are reasonable estimates of and reasonable sums for such damages. University may deduct any liquidated damages due from Contractor from any amounts otherwise due to Contractor under the Contract Documents. This provision shall not limit any right or remedy of University in the event of any other default of Contractor other than failing to complete the Work within the Contract Time.

ARTICLE 6 COMPENSABLE DELAY- NOT USED

ARTICLE 7 DUE AUTHORIZATION

The person or persons signing this Agreement on behalf of Contractor hereby represent and warrant to University that this Agreement is duly authorized, signed, and delivered by Contractor.

THIS AGREEMENT is entered into by University and Contractor as of the date set forth above.

CONTRACTOR:

_____ California Contractor's License(s):
(Name of Company)

a _____ _____
(Type of Organization) (Name of Licensee)

By: _____ _____
(Signature) (Classification and License Number)

_____ _____
(Print Name) (Expiration Date)

_____ _____
(Title) (Employer Identification Number)

Recommended:
By University's Representative:

_____
(Signature & Date)

Tameesha Hayes
Title
Planning, Design & Construction
(Print Name & Title)

Funds Sufficient:
By Financial Administrative Officer:

_____
(Signature & Date)

Susan McFadden
Senior Financial Analyst
Planning, Design & Construction
(Print Name & Title)

UNIVERSITY:
By The Regents of the University of California:

_____
(Signature & Date)

Drew Hecht, Architect
Director of Project Management
Planning, Design & Construction
(Print Name & Title)

Account No.: _____ Activity Code: _____
Fund: _____ Function: _____
Cost Center: _____ Project Code: _____

Attach notary acknowledgement for all signatures of Contractor. If signed by other than the sole proprietor, a general partner, or corporate officer, attach original notarized Power of Attorney or Corporate Resolution.

GENERAL CONDITIONS – LONG FORM
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ARTICLE 15. MISCELLANEOUS PROVISIONS

ARTICLE 1
GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 APPLICABLE CODE REQUIREMENTS
The term "Applicable Code Requirements" means all laws, statutes, the most recent building codes, ordinances, rules, regulations, and lawful orders of all public authorities having jurisdiction over University, Contractor, any Subcontractor, the Project, the Project site, the Work, or the prosecution of the Work including without limitation the requirements set forth in Article 3.7.

1.1.2 APPLICATION FOR PAYMENT
The term “Application For Payment” means the submittal from Contractor wherein payment for certain portions of the completed Work is requested in accordance with Article 9.

1.1.3 BENEFICIAL OCCUPANCY
The term “Beneficial Occupancy” means the University's occupancy or use of any part of the Work in accordance with Article 9.

1.1.4 CERTIFICATE FOR PAYMENT
The term “Certificate For Payment” means the form signed by University's Representative attesting to the Contractor's right to receive payment for certain completed portions of the Work in accordance with Article 9.

1.1.5 CHANGE ORDER
See Article 7.2 of the General Conditions.

1.1.6 CLAIM
See Article 4.3 of the General Conditions.

1.1.7 COMPENSABLE DELAY
The term “Compensable Delay” means a delay that entitles the Contractor to an adjustment of the Contract Sum and an adjustment of the Contract Time pursuant to Articles 7 and 8 of the General Conditions.

1.1.8 CONTRACT
The term “Contract” shall have the meaning identified in Article 2 of the Agreement.

1.1.9 CONTRACT DOCUMENTS
The term “Contract Documents” means all documents listed in Article 2 of the Agreement, as modified by Change Order, including but not limited to the Drawings and Specifications.

1.1.10 CONTRACT MILESTONE
The term “Contract Milestone” means any requirement in the Contract Documents that reflects a planned point in time for the start or completion of a portion of the Work measured from i) the date of the Notice to Proceed or ii) the date of another Contract Milestone defined in the Contract Documents, as applicable.

1.1.11 CONTRACT SCHEDULE
The term “Contract Schedule” means the graphical representation of a practical plan, in accordance with the Specifications, to perform and complete the Work within the Contract Time in accordance with Article 3.

1.1.12 CONTRACT SUM
The term “Contract Sum” means the amount of compensation stated in the Agreement for the performance of the Work, as adjusted by Change Order.

1.1.13 CONTRACT TIME
The term “Contract Time” means the number of days set forth in the Agreement, as adjusted by Change Order, within which Contractor must achieve Final Completion.

1.1.14 CONTRACTOR
The term “Contractor” means the person or firm identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number.

1.1.15 CONTRACTOR FEE
See Article 7.3 of the General Conditions.

1.1.16 COST OF EXTRA WORK
See Article 7.3 of the General Conditions.

1.1.17 DAY
The term “day,” as used in the Contract Documents, shall mean calendar day, unless otherwise specifically provided.

1.1.18 DEFECTIVE WORK
The term “Defective Work” means work that is unsatisfactory, faulty, omitted, incomplete, deficient, or does not conform to the requirements of the Contract Documents, directives of University's Representative, or the requirements of any inspection, reference standard, test, or approval specified in the Contract Documents.

1.1.19 DRAWINGS
The term “Drawings” means the graphic and pictorial portions of the Contract Documents showing the design, location, and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams. The Drawings are listed in the List of Drawings.

1.1.20 EXCUSABLE DELAY
The term “Excusable Delay” means a delay that entitles the Contractor to an adjustment of the Contract Time but not an adjustment of the Contract Sum, pursuant to Articles 7 and 8 of the General Conditions.

1.1.21 EXTRA WORK
The term “Extra Work” means Work beyond or in addition to the Work required by the Contract Documents.

1.1.22 FIELD ORDER
See Article 7.2 of the General Conditions.

1.1.23 FINAL COMPLETION
The term “Final Completion” means the date at which the Work has been fully completed in accordance with the requirements of the Contract Documents pursuant to Article 9.8.1 of the General Conditions.

1.1.24 GUARANTEE TO REPAIR PERIOD
See Article 12.2 of the General Conditions.

1.1.25 HAZARDOUS MATERIAL
The term “Hazardous Material” means any substance or material identified as hazardous under any California or federal statute governing handling, disposal and/or cleanup of any such substance or material.

1.1.26 PROJECT
The term “Project” means the Work of the Contract and all other work, labor, equipment, and materials necessary to accomplish the Project . The Project may include construction by University or by Separate Contractors.

1.1.27 PROJECT SITE
The term “Project Site” or “Project site” or “Site” or “site” means lands and facilities upon which the Work pertaining to physical construction operations is performed, including such access and other lands and facilities designated in the Contract Documents for use by Contractor.

1.1.28 SEPARATE CONTRACTOR
The term “Separate Contractor” means a person or firm under separate contract with University performing other work related to the Project.

1.1.29 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES
See Article 3.12 of the General Conditions.

1.1.30 SPECIFICATIONS
The term “Specifications” means that portion of the Contract Documents consisting of the written requirements

for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.

1.1.31 SUBCONTRACTOR
The term “Subcontractor” means a person or firm that has a contract with Contractor or with a Subcontractor to perform a portion of the Work. Unless otherwise specifically provided, the term Subcontractor includes Subcontractors of all tiers.

1.1.32 SUBSTANTIAL COMPLETION
See Article 9.7 of the General Conditions.

1.1.33 SUPERINTENDENT
The term “Superintendent” means the person designated by Contractor to represent Contractor at the Project site in accordance with Article 3.

1.1.34 TIER
The term “tier” means the contractual level of a Subcontractor or supplier with respect to Contractor. For example, a first-tier Subcontractor is under subcontract with Contractor, a second-tier Subcontractor is under subcontract with a first-tier Subcontractor, and so on.

1.1.35 UNEXCUSABLE DELAY
The term “Unexcusable Delay” means a delay that does not entitle the Contractor to an adjustment of the Contract Sum and does not entitle the Contractor to an adjustment of the Contract Time.

1.1.36 UNILATERAL CHANGE ORDER.
See Article 7.2 of the General Conditions.

1.1.37 UNIVERSITY
The term “University” means The Regents of the University of California.

1.1.38 UNIVERSITY’S BUILDING OFFICIAL
The term “University’s Building Official,” or “Certified Building Official,” means the individual the University has designated to act in the capacity as the “Building Official” as defined by the California Building Standards Code. The University’s Building Official will determine whether the Work complies with Applicable Code Requirements and will determine whether and when it is appropriate to issue a Certificate of Occupancy.

1.1.39 UNIVERSITY'S REPRESENTATIVE
The term “University's Representative” means the person identified as such in the Agreement.

1.1.40 UNIVERSITY’S RESPONSIBLE ADMINISTRATOR
The term “University’s Responsible Administrator“ means the person, or his or her authorized designee, who is authorized to execute the Agreement, Change Orders, Field Orders, and other applicable Contract Documents on behalf of the University.

1.1.41 WORK
The term “Work” means all construction, services and other requirements of the Contract Documents as modified by Change Order, whether completed or partially completed, and includes all labor, materials, equipment, tools, and services provided or to be provided by Contractor to fulfill Contractor's obligations. The Work may constitute the whole or a part of the Project.

1.2 OWNERSHIP AND USE OF CONTRACT DOCUMENTS

1.2.1 The Contract Documents and all copies thereof furnished to or provided by Contractor are the property of the University and are not to be used on other work.

1.3 INTERPRETATION

1.3.1 The Contract Documents are complementary and what is required by one shall be as binding as if required by all. In the case of conflict between terms of the Contract Documents, the following order of precedence shall apply:

.1 The Agreement,
.2 The Supplementary Conditions,
.3 The General Conditions,
.4 The Specifications,
.5 The Drawings.

1.3.2 With respect to the Drawings, figured dimensions shall control over scaled measurements and specific details shall control over typical or standard details.

1.3.3 With respect to the Contract Documents, Addenda shall govern over other portions of the Contract Documents to the extent specifically noted; subsequent Addenda shall govern over prior Addenda only to the extent specifically noted.

1.3.4 Organization of the Specifications into various subdivisions and the arrangement of the Drawings shall not control Contractor in dividing the Work among Subcontractors or in establishing the extent of work to be performed by any trade.

1.3.5 Unless otherwise stated in the Contract Documents, technical words and abbreviations contained in the Contract Documents are used in accordance with commonly understood construction industry meanings; and non-technical words and abbreviations are used in accordance with their commonly understood meanings.

1.3.6 The Contract Documents may omit modifying words such as “all” and “any,” and articles such as “the” and “an,” but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement. The use of the word “including,” when following any general statement, shall not be construed to limit such statement to specific items or matters set forth immediately following such word or to similar items or matters, whether or not nonlimiting language (such as “without limitation,” “but not limited to,” or words of similar import) is used with reference thereto, but rather shall be deemed to refer to all other items or matters that could reasonably fall within the broadest possible scope of such general statement.

1.3.7 Whenever the context so requires, the use of the singular number shall be deemed to include the plural and vice versa. Each gender shall be deemed to include any other gender, and each shall include corporation, partnership, trust, or other legal entity whenever the context so requires. The captions and headings of the various subdivisions of the Contract Documents are intended only for reference and convenience and in no way define, limit, or prescribe the scope or intent of the Contract Documents or any subdivision thereof.

ARTICLE 2
UNIVERSITY

2.1 INFORMATION AND SERVICES PROVIDED BY UNIVERSITY

2.1.1 If required for performance of the Work, as determined by University's Representative, University will make available a survey describing known physical characteristics, boundaries, easements, and utility locations for the Project site.

2.1.2 University is not subject to any requirement to obtain or pay for local building permits, inspection fees, plan checking fees, or certain utility fees. Except as otherwise provided in the Contract Documents, University will obtain and pay for any utility permits, demolition permits, easements, and government approvals for the use or occupancy of permanent structures required in connection with the Work.

2.1.3 Contractor will be furnished, free of charge, such copies of the Contract Documents as University deems reasonably necessary for execution of the Work.

2.2 ACCESS TO PROJECT SITE

2.2.1 University will provide, no later than the date designated in the Contract Schedule accepted by University's Representative, access to the lands and facilities upon which the Work is to be performed, including such access and other lands and facilities designated in the Contract Documents for use by

Contractor.

2.3 UNIVERSITY'S RIGHT TO STOP THE WORK

2.3.1 If Contractor fails to correct Defective Work as required by Article 12.2 or fails to perform the Work in accordance with the Contract Documents, University or University's Representative may direct Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated by Contractor. Contractor shall not be entitled to any adjustment of Contract Time or Contract Sum as a result of any such order. University and University's Representative have no duty or responsibility to Contractor or any other party to exercise the right to stop the Work.

2.4 UNIVERSITY'S RIGHT TO CARRY OUT THE WORK

2.4.1 If Contractor fails to carry out the Work in accordance with the Contract Documents, fails to provide sufficient labor, materials, equipment, tools, and services to maintain the Contract Schedule, or otherwise fails to comply with any material term of the Contract Documents, and, after receipt of written notice from University, fails within 2 days, excluding Saturdays, Sundays and legal holidays, or within such additional time as the University may specify, to correct such failure, University may, without prejudice to other remedies University may have, correct such failure at Contractor's expense. In such case, University will be entitled to deduct from payments then or thereafter due Contractor the cost of correcting such failure, including without limitation compensation for the additional services and expenses of University's consultants made necessary thereby. If payments then or thereafter due Contractor are not sufficient to cover such amounts, Contractor shall pay the additional amount to University.

2.5 UNIVERSITY'S RIGHT TO REPLACE UNIVERSITY'S REPRESENTATIVE

2.5.1 University may at any time and from time to time, without prior notice to or approval of Contractor, replace University's Representative with a new University's Representative. Upon receipt of notice from University informing Contractor of such replacement and identifying the new University's representative, Contractor shall recognize such person or firm as University's Representative for all purposes under the Contract Documents.

ARTICLE 3
CONTRACTOR

3.1 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.1.1 Contractor and its Subcontractors shall review and compare each of the Contract Documents with the others and with information furnished or made available by University, and shall promptly report in writing to University's Representative any errors, inconsistencies, or omissions in the Contract Documents or inconsistencies with Applicable Code Requirements observed by Contractor or its Subcontractors.

3.1.2 Contractor and its Subcontractors shall take field measurements, verify field conditions, and carefully compare with the Contract Documents such field measurements, conditions, and other information known to Contractor before commencing the Work. Errors, inconsistencies, or omissions discovered at any time shall be promptly reported in writing to University's Representative.

3.1.3 If Contractor and its Subcontractors performs any construction activity involving an error, inconsistency, or omission referred to in Articles 3.1.1 and 3.1.2, without giving the notice required in those Articles and obtaining the written consent of University's Representative, Contractor shall be responsible for the resultant losses, including, without limitation, the costs of correcting Defective Work.

3.2 SUPERVISION AND CONSTRUCTION PROCEDURES

3.2.1 Contractor shall supervise, coordinate, and direct the Work using Contractor's best skill and attention. Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, procedures, and the coordination of all portions of the Work.

3.2.2 Contractor shall be responsible to University for acts and omissions of Contractor's agents, employees, and Subcontractors, and their respective agents and employees.

3.2.3 Contractor shall not be relieved of its obligation to perform the Work in accordance with the Contract Documents either by acts or omissions of University or University's Representative in the administration of the Contract, or by tests, inspections, or approvals required or performed by persons or firms other than Contractor.

3.2.4 Contractor shall be responsible for inspection of all portions of the Work, including those portions already performed under this Contract, to determine that such portions conform to the requirements of the Contract and are ready to receive subsequent Work.

3.2.5 Contractor shall at all times maintain good discipline and order among its employees and Subcontractors. Contractor shall provide competent, fully qualified personnel to perform the Work.

3.3 LABOR AND MATERIALS

3.3.1 Unless otherwise provided in the Contract, Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and Final Completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

3.4 CONTRACTOR'S WARRANTY

3.4.1 Contractor warrants to University that all materials and equipment used in or incorporated into the Work will be of good quality, new, and free of liens, claims, and security interests of third parties; that the Work will be of good quality and free from defects; and that the Work will conform with the requirements of the Contract. If required by University's Representative, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

3.5 TAXES

3.5.1 Contractor shall pay all sales, consumer, use, and similar taxes for the Work or portions thereof provided by Contractor.

3.6 PERMITS, FEES, AND NOTICES

3.6.1 Except for the permits and approvals which are to be obtained by University or the requirements with respect to which University is not subject as provided in Article 2.1.2, Contractor shall secure and pay for all permits, approvals, government fees, licenses, and inspections necessary for the proper execution and performance of the Work. Contractor shall deliver to University all original licenses, permits, and approvals obtained by Contractor in connection with the Work prior to the final payment or upon termination of the Contract, whichever is earlier.

3.7 APPLICABLE CODE REQUIREMENTS

3.7.1 Contractor shall perform the Work in accordance with the following Applicable Code Requirements:

.1 All laws, statutes, the most recent building codes, ordinances, rules, regulations, and lawful orders of all public authorities having jurisdiction over University, Contractor, any Subcontractor, the Project, the Project site, the Work, or the prosecution of the Work.
.2 All requirements of any insurance company issuing insurance required hereunder.
.3 The Federal Occupational Safety and Health Act and all other Applicable Code Requirements relating to safety.
.4 Applicable titles in the State of California Code of Regulations.
.5 Applicable sections in the State of California Labor Code.
.6 All Applicable Code Requirements relating to nondiscrimination, payment of prevailing wages, payroll records, apprentices, and work day.

Without limiting the foregoing, Contractor shall comply with the provisions regarding nondiscrimination, payment of prevailing wages, payroll records, apprentices, and work day set forth in Article 14.

3.7.2 Contractor shall comply with and give notices required by all Applicable Code Requirements,

including all environmental laws and all notice requirements under the State of California Safe Drinking Water and Enforcement Act of 1986 (State of California Health and Safety Code Section 25249.5 and applicable sections that follow). Contractor shall promptly notify University's Representative in writing if Contractor becomes aware during the performance of the Work that the Contract Documents are at variance with Applicable Code Requirements.

3.7.3 If Contractor performs Work which it knows or should know is contrary to Applicable Code Requirements, without prior notice to University and University's Representative, Contractor shall be responsible for such Work and any resulting damages including, without limitation, the costs of correcting Defective Work.

3.8 SUPERINTENDENT

3.8.1 Contractor shall employ a competent Superintendent satisfactory to University who shall be in attendance at the Project site at all times during the performance of the Work. Superintendent shall represent Contractor and communications given to and received from Superintendent shall be binding on Contractor.

3.8.2 Contractor shall provide the Key Personnel, in addition to the Superintendent, as named in the Key Personnel Exhibit to this Contract. Substitution or replacement of any named individual requires the written approval of the University's Representative and approval will be at the sole discretion of University. Failure to maintain a Superintendent on the Project site at all times Work is in progress shall be considered a material breach of this Contract, entitling University to terminate the Contract or alternatively, issue a stop Work order until the Superintendent is on the Project site. If, by virtue of issuance of said stop Work order, Contractor fails to complete the Contract on time, Contractor will be assessed Liquidated Damages in accordance with the Agreement.

3.8.3 The Superintendent approved for the Project must be able to read, write and verbally communicate in English.

3.8.4 The Superintendent may not perform the Work of any trade, pick-up materials, or perform any Work not directly related to the supervision and coordination of the Work at the Project site when Work is in progress.

3.9 SCHEDULES REQUIRED OF CONTRACTOR

3.9.1 Contractor shall submit a Preliminary Contract Schedule to University's Representative in the form and within the time limit required by the Specifications. University's Representative will review the Preliminary Contract Schedule with Contractor within the time limit required by the Specifications, or, if no such time period is specified, within a reasonable period of time.

3.9.2 Contractor shall submit a Contract Schedule and updated Contract Schedules to University's Representative in the form and within the time limits required by the Specifications and acceptable to University's Representative. University's Representative will determine acceptability of the Contract Schedule and updated Contract Schedules within the time limits required by the Specifications, or if no such time period is specified, within a reasonable period of time. If University's Representative deems the Contract Schedule or updated Contract Schedule unacceptable, it shall specify in writing to Contractor the basis for its objection.

3.9.3 The Preliminary Contract Schedule, the Contract Schedule, and updated Contract Schedules shall represent a practical plan to complete the Work within the Contract Time. Schedules showing the Work completed in less than the Contract Time may be acceptable if judged by University's Representative to be practical. Schedules showing the Work completed beyond the Contract Time may be submitted under the following circumstances:

.1 If accompanied by a Change Order Request seeking an adjustment of the Contract Time consistent the requirements of paragraph 8.4 for Adjustment of the Contract Time for Delay.; or

.2 If the Contract Time has passed, or if it is a practical impossibility to complete the Work within the Contract Time, then the updated Contract Schedule or fragnet schedule shall show completion at the earliest practical date.

University's Representative will timely review the updated Contract Schedule or Fragnet Schedule submitted by Contractor. If University's Representative determines that additional supporting data are necessary to fully evaluate the updated Contract Schedule or Fragnet Schedule, University's Representative will request such additional supporting data in writing. Such data shall be furnished no later than 10 days after the date of such request. University's Representative will render a decision promptly and in any case within 30 days after the later of the receipt of the updated Contract Schedule or Fragnet Schedule or the deadline for furnishing such additional supporting data. Failure of University's Representative to render a decision by the applicable deadline will be deemed a decision denying approval of the updated Contract Schedule or Fragnet Schedule.
Acceptance of any schedule showing completion beyond the Contract Time by University's Representative shall not change the Contract Time and is without prejudice to any right of the University. The Contract Time, not the Contract Schedule, shall control in the determination of liquidated damages payable by Contractor under Article 4 and Article 5 of the Agreement and in the determination of any delay under Article 8 of the General Conditions.
3.9.4 If a schedule showing the Work completed in less than the Contract Time is accepted, Contractor shall not be entitled to extensions of the Contract Time for Excusable Delays or Compensable Delays or to adjustments of the Contract Sum for Compensable Delays until such delays extend the Final Completion of the Work beyond the expiration of the Contract Time.

3.9.5 Contractor shall prepare and keep current to the reasonable satisfaction of University's Representative, a Submittal Schedule in the form contained in the Exhibits, for each submittal, as required by the Specifications, and that are coordinated with the other activities in the Contract Schedule.
3.9.6 The Preliminary Contract Schedule, Contract Schedule, and the Updated Contract Schedules shall meet the following requirements:

.1 Schedules must be suitable for monitoring progress of the Work.
.2 Schedules must provide necessary data about the timing for University decisions and University furnished items.
.3 Schedules must be in sufficient detail to demonstrate adequate planning for the Work.
.4 Schedules must represent a practical plan to perform and complete the Work within the Contract Time.

3.9.7 University's Representative's review of the form and general content of the Preliminary Contract Schedule, Contract Schedule, and Updated Contract Schedules is for the purpose of determining if the above-listed requirements have been satisfied.

3.9.8 Contractor shall plan, develop, supervise, control, and coordinate the performance of the Work so that its progress and the sequence and timing of Work will permit its completion within the Contract Time, any Contract milestones and any Contract phases.

3.9.9 In preparing the Preliminary Contract Schedule, the Contract Schedule, and updated Contract Schedules, Contractor shall obtain such information and data from Subcontractors as may be required to develop a reasonable and appropriate schedule for performance of the work and shall provide such information and data to the University’s Representative upon request. Contractor shall continuously obtain from Subcontractors information and data about the planning for and progress of the Work and the delivery of equipment, shall coordinate and integrate such information and data into updated Contract Schedules, as appropriate, and shall monitor the progress of the Work and the delivery of equipment.

3.9.10 Contractor shall act as the expeditor of potential and actual delays, interruptions, hindrances, or disruptions for its own forces and those forces of Subcontractors, regardless of tier.

3.9.11 Contractor shall cooperate with University's Representative in the development of the Contract Schedule and updated Contract Schedules. University's Representative's acceptance of or its review comments about any schedule or scheduling data shall not relieve Contractor from its sole responsibility to plan for, perform, and complete the Work within the Contract Time. Acceptance of or review comments about any schedule shall not transfer responsibility for any schedule to University's Representative or University nor imply their agreement with (1) any assumption upon which such schedule is based or (2) any matter underlying or contained in such schedule. Failure of University's Representative to discover errors or omissions in schedules that it has reviewed, or to inform Contractor that Contractor, Subcontractors, or others are behind schedule, or to direct or enforce procedures for complying with the Contract Schedule shall not relieve

Contractor from its sole responsibility to perform and complete the Work within the Contract Time and shall not be a cause for an adjustment of the Contract Time or the Contract Sum.

3.10 AS-BUILT DOCUMENTS

3.10.1 Contractor shall maintain one set of As-built drawings and specifications, which shall be kept up to date during the Work of the Contract. All changes which are incorporated into the Work which differ from the documents as drawn and written shall be noted on the As-built set. Notations shall reflect the actual materials, equipment and installation methods used for the Work and each revision shall be initialed and dated by Superintendent. Prior to filing of the Notice of Completion each drawing and the specification cover shall be signed by Contractor and dated attesting to the completeness of the information noted therein. As-built Documents shall be turned over to the University's Representative and shall become part of the Record Documents.

3.11 DOCUMENTS AND SAMPLES AT PROJECT SITE

3.11.1 Contractor shall maintain the following at the Project site:

.1 One as-built copy of the Contract Documents, in good order and marked to record current changes and selections made during construction.
.2 The current accepted Contract Schedule.
.3 Shop Drawings, Product Data, and Samples.
.4 All other required submittals.

These shall be available to University's Representative and shall be delivered to University's Representative for submittal to University upon the earlier of Final Completion or termination of the Contract.

3.12 SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND ENVIRONMENTAL PRODUCT DECLARATIONS

3.12.1 Definitions:

.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by Contractor or a Subcontractor to illustrate some portion of the Work.
.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by Contractor to illustrate or describe materials or equipment for some portion of the Work.
.3 Samples are physical examples which illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged.
.4 Environmental Product Declarations are those documents and other submissions required to be furnished by Contractor or a Subcontractor pursuant to California Public Contract Code Section 3500 et seq., the Buy Clean California Act, as further described in Article 3.12.9 below.

3.12.2 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate, for those portions of the Work for which submittals are required, how Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

3.12.3 Contractor shall review, approve, and submit to University's Representative Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of University or of Separate Contractors. Submittals made by Contractor which are not required by the Contract Documents may be returned without action by University's Representative.

3.12.4 Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples, or similar submittals until the respective submittal has been reviewed by University's Representative and no exceptions have been taken by University's Representative. Such Work shall be in accordance with approved submittals and the Contract Documents.

3.12.5 By approving and submitting Shop Drawings, Product Data, Samples, and similar submittals,

Contractor represents that it has determined or verified materials and field measurements and conditions related thereto, and that it has checked and coordinated the information contained within such submittals with the requirements of the Contract Documents and Shop Drawings for related Work.

3.12.6 If Contractor discovers any conflicts, omissions, or errors in Shop Drawings or other submittals, Contractor shall notify University's Representative and receive instruction before proceeding with the affected Work.

3.12.7 Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by University's Representative's review of Shop Drawings, Product Data, Samples, or similar submittals, unless Contractor has specifically informed University's Representative in writing of such deviation at the time of submittal and University's Representative has given written approval of the specific deviation. Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals by University's Representative's review, acceptance, comment, or approval thereof.

1.12.8 Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by University's Representative on previous submittals.

1.12.9 Environmental Product Declarations

3.12.9.1 Contractor shall comply with California Public Contract Code Section 3500 et seq., the Buy Clean California Act (“BCCA”).

3.12.9.2 The term “Eligible Materials”, as used herein, shall mean the same as defined by the BCCA, and shall include at a minimum the following materials:
(1) Carbon steel rebar.
(2) Flat glass.
(3) Mineral wool board insulation.
(4) Structural steel.

3.12.9.3 Compliance with the BCCA and this Article applies to all Eligible Materials for the Project.

3.12.9.4 Contractor shall submit to University a current facility-specific Environmental Product Declaration (“EPD”), Type III, as defined by the International Organization for Standardization (“ISO”) standard 14025, or similarly robust life cycle assessment methods that have uniform standards in data collection consistent with ISO standard 14025, industry acceptance, and integrity, for each Eligible Material proposed to be used on the Project.

3.12.9.5 Eligible Materials installed on the Project by Contractor must comply with any standards to the extent established in the BCCA or by University, whichever is more stringent. The facility-specific global warming potential for any Eligible Material must not exceed any existing maximum acceptable global warming potential for that material pursuant to the BCCA or by University, whichever is more stringent (“EM Standards”).

3.12.9.6 Contractor shall not install any Eligible Materials on the Project until Contractor submits a facility-specific EPD for that material which demonstrates that the material complies with any existing EM Standards and this Article. Contractor shall be responsible for any losses, expenses, penalties or damages of any type incurred or sustained by University, including any tear out and replacement of Defective Work, which are caused by Contractor’s failure to comply with the requirements of the BCCA or this Article.

3.13 USE OF SITE AND CLEAN UP

3.13.1 Contractor shall confine operations at the Project site to areas permitted by law, ordinances, permits, and the Contract Documents. Contractor shall not unreasonably encumber the Project site with materials or equipment.

3.13.2 Contractor shall, during performance of the Work, keep the Project site and surrounding area free from the accumulation of excess dirt, waste materials, and rubbish caused by Contractor. Contractor shall

remove all excess dirt, waste material, and rubbish caused by the Contractor; tools; equipment; machinery; and surplus materials from the Project site and surrounding area at the completion of the Work.

3.13.3 Personnel of Contractor and Subcontractors shall not occupy, live upon, or otherwise make use of the Project site during any time that Work is not being performed at the Project site, except as otherwise provided in the Contract Documents.

3.14 CUTTING, FITTING, AND PATCHING

3.14.1 Contractor shall do all cutting, fitting, or patching of the Work required to make all parts of the Work come together properly and to allow the Work to receive or be received by work of Separate Contractors shown upon, or reasonably implied by, the Contract Documents.

3.14.2 Contractor shall not endanger the Work, the Project, or adjacent property by cutting, digging, or otherwise. Contractor shall not cut or alter the work of any Separate Contractor without the prior consent of University's Representative.

3.15 ACCESS TO WORK

3.15.1 University, University's Representative, their consultants, and other persons authorized by University will at all times have access to the Work wherever it is in preparation or progress. Contractor shall provide safe and proper facilities for such access and for inspection.

3.16 ROYALTIES AND PATENTS

3.16.1 Contractor shall pay all royalties and license fees required for the performance of the Work. Contractor shall defend suits or claims resulting from Contractor's or any Subcontractor's infringement of patent rights and shall Indemnify, defend and hold harmless University and University's Representative from losses on account thereof.

3.17 DIFFERING SITE CONDITIONS

3.17.1 If Contractor encounters any of the following conditions at the site, Contractor shall immediately notify the University's Representative in writing of the specific differing conditions before they are disturbed and before any affected Work is performed, and permit investigation of the conditions:

.1 Subsurface or latent physical conditions at the site (including Hazardous Materials) which differ materially from those indicated in this Contract, or if not indicated in this Contract, in the Information Available to Bidders; or

.2 Unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

3.17.2 Contractor shall be entitled to an adjustment to the Contract Sum and/or Contract Time as the result of extra costs and/or delays resulting from a materially differing site condition, if and only if Contractor fulfills the following conditions:

.1 Contractor fully complies with Article 3.17.1; and

.2 Contractor fully complies with Article 4 (including the timely filing of a Change Order Request and all other requirements for Change Orders Requests and Claims).

3.17.3 Adjustments to the Contract Sum and/or Contract Time shall be subject to the procedures and limitations set forth in Articles 7 and 8.

3.18 CONCEALED, UNFORESEEN, OR UNKNOWN CONDITIONS OR EVENTS

3.18.1 Except and only to the extent provided otherwise in Articles 3.17, 7 and 8 of the General Conditions, by signing the Agreement, Contractor agrees:

.1 To bear the risk of concealed, unforeseen or unknown conditions or events, if any, which may be encountered in performing the Contract; and
.2 That Contractor's bid for the Contract was made with full knowledge of this risk.

In agreeing to bear the risk of concealed, unforeseen or unknown conditions or events, Contractor understands that, except and only to the extent provided otherwise in Articles 3.17, 7 and 8, concealed, unforeseen or unknown conditions or events shall not excuse Contractor from its obligation to achieve Final Completion of the Work within the Contract Time, and shall not entitle the Contractor to an adjustment of the Contract Sum.

3.18.2 If Contractor encounters concealed, unforeseen or unknown conditions or events that may require a change to the design shown in the Contract Documents, Contractor shall immediately notify University's Representative in writing such that University's Representative can determine if a change to the design is required. Contractor shall be liable to University for any extra costs incurred as the result of Contractor's failure to immediately give such notice.

3.18.3 If, as the result of concealed, unforeseen or unknown conditions or events, the University issues a Change Order or Field Order that changes the design from the design depicted in the Contract Documents, Contractor shall be entitled, subject to compliance with all the provisions of the Contract, including those set forth in Articles 4, 7 and 8, to an adjustment of the Contract Sum and/or Contract Time, for the cost and delay resulting from implementing the changes to the design. Except as provided in this Article 3.18.3, or as may be expressly provided otherwise in the Contract, there shall be no adjustment of the Contract Sum and/or Contract Time as a result of concealed, unforeseen or unknown conditions or events. .

3.18.4 Contractor shall, as a condition precedent to any adjustment in Contract Sum or Contract Time under Article 3.18.3, fully comply with Article 4 (including the timely filing of a Change Order Request and all other requirements for Change Orders Requests and Claims).

3.19 HAZARDOUS MATERIALS

3.19.1 The University shall not be responsible for any Hazardous Material brought to the site by the Contractor.

3.19.2 If the Contractor: (i) introduces and/or discharges a Hazardous Material onto the site in a manner not specified by the Contract Documents; and/or (ii) disturbs a Hazardous Material identified in the Contract Documents, the Contractor shall hire a qualified remediation contractor at Contractor's sole cost to eliminate the condition as soon as possible. Under no circumstance shall the Contractor perform Work for which it is not qualified. University, in its sole discretion, may require the Contractor to retain at Contractor's cost an independent testing laboratory.

3.19.3 If the Contractor encounters a Hazardous Material which may cause foreseeable injury or damage, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such material or substance (except in an emergency situation); and (iii) notify University (and promptly thereafter confirm such notice in writing)

3.19.4 Subject to Contractor's compliance with Article 3.19.3, the University shall verify the presence or absence of the Hazardous Material reported by the Contractor, except as qualified under Section 3.19.1 and 3.19.3, and, in the event such material or substance is found to be present, verify that the levels of the hazardous material are below OSHA Permissible Exposure Levels and below levels which would classify the material as a state of California or federal hazardous waste. When the material falls below such levels, Work in the affected area shall resume upon direction by the University. The Contract Time and Sum shall be extended appropriately as provided in Articles 7 and 8.

3.19.5 The University shall indemnify and hold harmless the Contractor from and against claims, damages, losses and expenses, arising from a Hazardous Material on the Project site, if such Hazardous Material: (i) was not shown on the Contract Documents or Information Available to Bidders; (ii) was not brought to the site by Contractor; and (iii) exceeded OSHA Permissible Exposure Levels or levels which would classify the material as a state of California or federal hazardous waste. The indemnity obligation in this Article shall not apply to:

.1 Claims, damages, losses or expenses arising from the breach of contract, negligence or willful misconduct of Contractor, its suppliers, its Subcontractors of all tiers and/or any persons or entities working under Contractor; and

.2 Claims, damages, losses or expenses arising from a Hazardous Material subject to Article 3.19.2.

3.19.6 In addition to the requirements in Article 3.22, Contractor shall indemnify and hold harmless the University from and against claims, damages, losses and expenses, arising from a Hazardous Material on the Project site, if such Hazardous Material exceeded OSHA Permissible Exposure Levels or levels which would classify the material as a state of California or federal hazardous waste, and was either i) shown on the Contract Documents or Information Available to Bidders; or (ii) brought to the site by Contractor. Nothing in this paragraph shall obligate the Contractor to indemnify University in the event of the sole negligence of the University, its officers, agents, or employees.

3.20 INFORMATION AVAILABLE TO BIDDERS

3.20.1 Any information provided pursuant to INFORMATION AVAILABLE TO BIDDERS is subject to the following provisions:

.1 The information is made available for the convenience of Bidders and is not a part of the Contract.
.2 The Contractor may rely on written descriptions of physical conditions included in the information to the extent such reliance is reasonable.
.3 Other components of the information, including but not limited to recommendations, may not be relied upon by Contractor. University shall not be responsible for any interpretation of or conclusion drawn from the other components of the information by the Contractor.

3.21 LIABILITY FOR AND REPAIR OF DAMAGED WORK

3.21.1 Contractor shall be liable for any and all damages and losses to the Project (whether by fire, theft, vandalism, earthquake or otherwise) prior to University's acceptance of the Project as fully completed except that Contractor shall not be liable for damages and losses to the Project caused by earthquake in excess of magnitude 3.5 on the Richter Scale, tidal wave, or flood, provided that the damages or losses were not caused in whole or in part by the negligent acts or omissions of Contractor, its officers, agents or employees (including all Subcontractors and suppliers of all tiers). As used herein, "flood" shall have the same meaning as in the builder's risk property insurance.

3.21.2 Contractor shall promptly repair and replace any Work or materials damaged or destroyed for which the Contractor is liable under Article 3.21.1.

3.22 INDEMNIFICATION

3.22.1 Contractor shall indemnify, defend and hold harmless University, University's consultants, University's Representative, University's Representative's consultants, and their respective directors, officers, agents, and employees from and against losses (including without limitation the cost of repairing defective work and remedying the consequences of defective work) arising out of, resulting from, or relating to the following:

.1 The failure of Contractor to perform its obligations under the Contract.
.2 The inaccuracy of any representation or warranty by Contractor given in accordance with or contained in the Contract Documents.
.3 Any claim of damage or loss by any Subcontractor against University arising out of any alleged act or omission of Contractor or any other Subcontractor, or anyone directly or indirectly employed by Contractor or any Subcontractor.
.4 Any claim of damage or loss resulting from Hazardous Materials introduced, discharged, or disturbed by Contractor as required per Article 3.19.6.

3.22.2 The University shall not be liable or responsible for any accidents, loss, injury (including death) or damages happening or accruing during the term of the performance of the Work herein referred to or in connection therewith, to persons and/or property, and Contractor shall fully indemnify, defend and hold harmless University and protect University from and against the same as provided in paragraph 3.22.1 above.

In addition to the liability imposed by law upon the Contractor for damage or injury (including death) to persons or property by reason of the negligence of the Contractor, its officers, agents, employees or Subcontractors, which liability is not impaired or otherwise affected hereby, the Contractor shall defend, indemnify, hold harmless, release and forever discharge the University, its officers, employees, and agents from and against and waive any and all responsibility of same for every expense, liability, or payment by reason of any damage or injury (including death) to persons or property suffered or claimed to have been suffered through any negligent act, omission, or willful misconduct of the Contractor, its officers, agents, employees, or any of its Subcontractors, or anyone directly or indirectly employed by either of them or from the condition of the premises or any part of the premises while in control of the Contractor, its officers, agents, employees, or any of its Subcontractors or anyone directly or indirectly employed by either of them, arising out of the performance of the Work called for by this Contract. Contractor agrees that this indemnity and hold harmless shall apply even in the event of negligence of University, its officers, agents, or employees, regardless of whether such negligence is contributory to any claim, demand, loss, damage, injury, expense, and/or liability; but such indemnity and hold harmless shall not apply (i) in the event of the sole negligence of University, its officers, agents, or employees; or (ii) to the extent that the University shall indemnify and hold harmless the Contractor for Hazardous Materials pursuant to Article 3.19.5 .

3.22.3 In claims against any person or entity indemnified under this Article 3.22 that are made by an employee of Contractor or any Subcontractor, a person indirectly employed by Contractor or any Subcontractor, or anyone for whose acts Contractor or any Subcontractor may be liable, the indemnification obligation under this Article 3.22 shall not be limited by any limitation on amount or type of damages, compensation, or benefits payable by or for Contractor or any Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

3.22.4 The indemnification obligations under this Article 3.22 shall not be limited by any assertion or finding that the person or entity indemnified is liable by reason of a non-delegable duty.

3.22.5 Contractor shall indemnify University from and against Losses resulting from any claim of damage made by any Separate Contractor against University arising out of any alleged acts or omissions of Contractor, any Subcontractor, anyone directly or indirectly employed by either of them, or anyone for whose acts either of them may be liable.

3.22.6 Contractor shall indemnify Separate Contractors from and against Losses arising out of the negligent acts, omissions, or willful misconduct of Contractor, any Subcontractor, anyone directly or indirectly employed by either of them, or anyone for whose acts either of them may be liable.

ARTICLE 4
ADMINISTRATION OF THE CONTRACT

4.1 ADMINISTRATION OF THE CONTRACT BY UNIVERSITY'S REPRESENTATIVE

4.1.1 University's Representative will provide administration of the Contract as provided in the Contract Documents and will be the representative of University. University's Representative will have authority to act on behalf of University only to the extent provided in the Contract Documents.

4.1.2 University's Representative will have the right to visit the Project site at such intervals as deemed appropriate by the University's Representative. However, no actions taken during such Project site visit by University's Representative shall relieve Contractor of its obligations as described in the Contract Documents.

4.1.3 University's Representative will not have control over, will not be in charge of, and will not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, since these are solely Contractor's responsibility.

4.1.4 Except as otherwise provided in the Contract Documents or when direct communications have been specifically authorized, University and Contractor shall communicate through University's Representative. Except when direct communication has been specifically authorized in writing by University Representative, communications by Contractor with University's consultants and University's Representative's consultants shall be through University's Representative. Communications by University and University's Representative with Subcontractors will be through Contractor. Communications by Contractor and Subcontractors with Separate Contractors shall be through University's Representative. Contractor shall not rely on oral or other non-written communications.

4.1.5 Based on University's Representative's Project site visits and evaluations of Contractor's Applications For Payment, University's Representative will recommend amounts, if any, due Contractor and will issue Certificates For Payment in such amounts.

4.1.6 University's Representative will have the authority to reject the Work, or any portion thereof, which does not conform to the Contract Documents. University's Representative will have the authority to stop the Work or any portion thereof. Whenever University's Representative considers it necessary or advisable for implementation of the intent of the Contract Documents, University's Representative will have the authority to require additional inspection or testing of the Work in accordance with the Contract Documents, whether or not such Work is fabricated, installed, or completed. However, no authority of University's Representative conferred by the Contract Documents nor any decision made in good faith either to exercise or not exercise such authority, will give rise to a duty or responsibility of University or University's Representative to Contractor, or any person or entity claiming under or through Contractor.

4.1.7 University's Representative will have the authority to conduct inspections as provided in the Contract Documents, to take Beneficial Occupancy and to determine the dates of Substantial Completion and Final Completion; will receive for review and approval any records, written warranties, and related documents required by the Contract Documents and assembled by Contractor; and will issue a final Certificate For Payment upon Contractor's compliance with the requirements of the Contract Documents.

4.1.8 University's Representative will be, in the first instance, the interpreter of the requirements of the Contract Documents and the judge of performance thereunder by Contractor. Should Contractor discover any conflicts, omissions, or errors in the Contract Documents; have any questions about the interpretation or clarification of the Contract Documents; question whether Work is within the scope of the Contract Documents; or question that Work required is not sufficiently detailed or explained, then, before proceeding with the Work affected, Contractor shall notify University's Representative in writing and request interpretation, clarification, or furnishing of additional detailed instructions. University's Representative's response to questions and requests for interpretations, clarifications, instructions, or decisions will be made with reasonable promptness. Should Contractor proceed with the Work affected before receipt of a response from University's Representative, any portion of the Work which is not done in accordance with University's Representative's interpretations, clarifications, instructions, or decisions shall be removed or replaced and Contractor shall be responsible for all resultant losses.

4.2 CONTRACTOR CHANGE ORDER REQUESTS

4.2.1 Contractor may request changes to the Contract Sum and/or Contract Time for Extra Work, materially differing site conditions, or Delays to Final Completion of the Work.

4.2.2 Conditions precedent to obtaining an adjustment of the Contract Sum and/or Contract Time , payment of money, or other relief with respect to the Contract Documents, for any other reason, are:

.1 Timely submission of a Change Order Request that meets the requirements of Articles 4.2.3.1 and 4.2.3.2; and

.2 If requested, timely submission of additional information requested by the University Representative pursuant to Article 4.2.3.3.

4.2.3 Change Order Request:

4.2.3.1 A Change Order Request will be deemed timely submitted if, and only if, it is submitted within 7 days of the date the Contractor discovers, or reasonably should discover the circumstances giving rise to the Change Order Request, unless additional time is allowed in writing by University's Representative for submission of the Change Order Request, provided that if :

.1 the Change Order Request includes compensation sought by a Subcontractor; AND
.2 the Contractor requests in writing to the University's Representative, within the 7-day time period, additional time to permit Contractor to conduct an appropriate review of the Subcontractor Change Order Request,

the time period for submission of the actual Change Order Request shall be extended by the number of days specified in writing by the University's Representative.

4.2.3.2 A Change Order Request must state that it is a Change Order Request, state and justify the reason for the request, and specify the amount of any requested adjustment of the Contract Sum, Contract Time, and/or other monetary relief. If the Contractor requests an adjustment to the Contract Sum or other monetary relief, the Contractor shall submit the following with the Change Order Request:

.1 a completed Cost Proposal in the form contained in the Exhibits meeting the requirements of Article 7; OR

.2 a partial Cost Proposal and a declaration of what required information is not then known to Contractor. If Contractor failed to submit a completed Cost Proposal with the Change Order Request, Contractor shall submit a completed Cost Proposal meeting the requirements of Article 7 within 7 days of the date the Contractor submitted the Change Order Request unless additional time is allowed by the University's Representative.

4.2.3.3 Upon request of University's Representative, Contractor shall submit such additional information as may be requested by University's Representative for the purpose of evaluating the Change Order Request. Such additional information may include:

.1 If Contractor seeks an adjustment of the Contract Sum or other monetary relief, actual cost records for any changed or extra costs (including without limitation, payroll records, material and rental invoices and the like), shall be submitted by the deadline established by the University's Representative, who may require such actual cost records to be submitted and reviewed, on a daily basis, by the University's Representative and/or representatives of the University's Representative.

.2 If Contractor seeks an adjustment of the Contract Time, written documentation demonstrating Contractor's entitlement to a time extension under Article 8.4, which shall be submitted within 15 days of the date requested. If requested, Contractor may submit a fragnet in support of its request for a time extension. The University may, but is not obligated to, grant a time extension on the basis of a fragnet alone which, by its nature, is not a complete schedule analysis. If deemed appropriate by University Representative, Contractor shall submit a more detailed schedule analysis in support of its request for a time extension.

.3 If Contractor seeks an adjustment of the Contract Sum or other monetary relief for delay, written documentation demonstrating Contractor's entitlement to such an adjustment under Article 7.3.9, which shall be submitted within 15 days of the date requested.

.4 Any other information requested by the University's Representative for the purpose of evaluating the Change Order Request, which shall be submitted by the deadline established by the University's Representative.

4.2.4 University's Representative will make a decision on a Change Order Request, within a reasonable time, after receipt of a Change Order Request. In the event the Change Order Request is submitted pursuant to Article 8.4.1, the University's Representative shall promptly review and accept or reject it within thirty (30) days. A final decision is any decision on a Change Order Request which states that it is final. If University's Representative issues a final decision denying a Change Order Request in whole or in part, Contractor may contest the decision by filing a timely Claim under the procedures specified in Article 4.4.

4.2.5 Contractor may file a written demand for a final decision by University's Representative on all or part of any Change Order Request as to which the University's Representative has not previously issued a final decision pursuant to Article 4.2.4; such written demand may not be made earlier than the 30th day after submission of the Change Order Request. Within 30 days of receipt of the demand, University's Representative will issue a final decision on the Change Order Request. The University's Representative's failure to issue a decision within the 30-day period shall be treated as the issuance, on the last day of the 30-day period, of a final decision to deny the Change Order Request in its entirety.

4.3 CLAIMS

4.3.1 The term “Claim” means a written demand or assertion by Contractor seeking an adjustment or interpretation of the terms of the Contract Documents, payment of money, extension of time, or other relief with respect to the Contract Documents, including a determination of disputes or matters in question between University and Contractor arising out of or related to the Contract Documents or the performance of the Work. However, the term "Claim" shall not include, and the Claims procedures provided under this Article 4, including but not limited to arbitration, shall not apply to the following:

.1 Claims respecting penalties for forfeitures prescribed by statute or regulation which a government agency is specifically authorized to administer, settle, or determine.
.2 Claims respecting personal injury, death, reimbursement, or other compensation arising out of or resulting from liability for personal injury or death.
.3 Claims by University, except as set forth in Articles 4.5, 4.6, and 4.7.
.4 Claims respecting stop payment notices.

4.3.2 A Claim arises upon the issuance of a written final decision denying in whole or in part Contractor's Change Order Request pursuant to Articles 4.2.4 and 4.2.5.

4.3.3 A Claim must include the following:

.1 A statement that it is a Claim and a request for a decision pursuant to Article 4.5.
.2 A detailed factual narrative of events fully describing the nature and circumstances giving rise to the Claim, including but not limited to, necessary dates, locations, and items of work affected.
.3 A certification, executed by Contractor, that the claim is filed in good faith. The certification must be made on the Claim Certification form, included in the Exhibits to the Contract. The language of the Claim Certification form may not be modified.
.4 A certification, executed by each Subcontractor claiming not less than 5% of the total monetary amount sought by the claim, that the subcontractor’s portion of the claim is filed in good faith. The certification must be made on the Claim Certification form, included in the Exhibits to the Contract. The language of the Claim Certification form may not be modified.
.5 A statement demonstrating that a Change Order Request was timely submitted as required by Article 4.2.3
.6 If a Cost Proposal or declaration was required by Article 4.2.3, a statement demonstrating that the Cost Proposal or the declaration was timely submitted as required by Article 4.2.3.
.7 A detailed justification for any remedy or relief sought by the Claim, including to the extent applicable, the following:

.1 If the Claim involves Extra Work, a detailed cost breakdown of the amounts claimed, including the items specified in Article 7.3.2. An estimate of the costs must be provided even if the costs claimed have not been incurred when the Claim is submitted. To the extent costs have been incurred when the Claim is submitted, the Claim must include actual cost records (including without limitation, payroll records, material and rental invoices and the like) demonstrating that costs claimed have actually been incurred. To the extent costs have not yet been incurred at the time the Claim is submitted, actual cost records must be submitted on a current basis not less than once a month during any periods costs are incurred. A cost record will be considered current if submitted within 30 days of the date the cost reflected in the record is incurred. At the request of the University's Representative, claimed extra costs may be subject to further verification procedures (such as having an inspector verify the performance of alleged Extra Work on a daily basis). The cost breakdown must include an itemization of costs for i) labor including workers’ names, classifications, regular hours and overtime hours worked, dates worked, and other pertinent information; ii) materials stored or incorporated in the work including invoices, purchase orders, location of materials either

stored or incorporated into the work, dates materials were transported to the project or incorporated into the work, and other pertinent information; and iii) itemization of machinery and equipment including make, model, hours of use, dates of use and equipment rental rates of any rented equipment.

.2 If the Claim involves an extension of the Contract Time, written documentation demonstrating the Contractor's entitlement to a time extension under Article 8.4, including the specific dates for which a time extension is sought and the specific reasons for entitlement of a time extension.

.3 If the Claim involves an adjustment of the Contract Sum for delay, written documentation demonstrating the Contractor's entitlement to such an adjustment under Article 7.3.9, including but not limited to, a detailed time impact analysis of the Contract Schedule. The Contract Schedule must demonstrate Contractor's entitlement to such an adjustment under Article 7.3.9.

4.4 ASSERTION OF CLAIMS

4.4.1 Claims by Contractor shall be first submitted to University's Representative for decision.

4.4.2 Notwithstanding the making of any Claim or the existence of any dispute regarding any Claim, unless otherwise directed by University's Representative, Contractor shall not cause any delay, cessation, or termination in or of Contractor's performance of the Work, but shall diligently proceed with performance of the Work in accordance with the Contract Documents.

4.4.3 Contractor shall submit a Claim in writing, together with all supporting data specified in Article4.3.3, to University's Representative as soon as possible but not later than 30 days after the date the Claim arises under Article 4.3.2, provided that after written notification to the University's Representative within such time period, the time period for submission of the Claim shall be extended by the number of days specified in writing by the University's Representative where the Claim includes compensation sought by a Subcontractor and the Contractor requests an extension of time to permit it to discharge its responsibilities to conduct an appropriate review of the Subcontractor claim.

4.4.4 Strict compliance with the requirements of Articles 4.2, 4.3 and 4.4 are conditions precedent to Contractor's right to an informal conference to meet and confer to resolve a Claim, mediate a Claim, or arbitrate or litigate a Claim. Contractor specifically agrees to assert no Claims via an informal conference, mediation, arbitration or litigation unless there has been strict compliance with Articles 4.2, 4.3, and 4.4. The failure of Contractor to strictly comply with the requirements of Articles 4.2, 4.3 and 4.4 constitutes a failure by Contractor to exhaust its administrative remedies with the University, thereby denying any court or arbitration panel of jurisdiction to adjudicate the Claim.

4.5 DECISION OF UNIVERSITY'S REPRESENTATIVE ON CLAIMS

4.5.1 University's Representative will timely review Claims submitted by Contractor. If University's Representative determines that additional supporting data are necessary to fully evaluate a Claim, University's Representative will request such additional supporting data in writing. Such data shall be furnished no later than 10 days after the date of such request. University's Representative will render a decision promptly and in any case within 30 days after the later of the receipt of the Claim or the deadline for furnishing such additional supporting data; provided that, if the amount of the Claim is in excess of $50,000, the aforesaid 30-day period shall be 45 days. Failure of University's Representative to render a decision by the applicable deadline will be deemed a decision denying the Claim on the date of the deadline, unless, upon receipt of a Claim, Contractor and University mutually agree to extend the time periods provided herein, or unless otherwise extended by law. The decision of University's Representative will be final and binding unless appealed in accordance with Articles 4.5.2, 4.6, and 4.7. The University's Representative's decision on a Claim or dispute will include a written statement both identifying all disputed and undisputed portions of the Claim and substantially including the following:

"This is a decision under Article 4.5 of the General Conditions of your contract. If you are dissatisfied with the decision, and if you complied with the procedural requirements for

asserting claims specified in Article 4 of the General Conditions of your contract, you may have the right to demand in writing an informal conference to meet and confer for settlement of any remaining issues in dispute, following which, if still dissatisfied, you may demand in writing a further resolution via nonbinding mediation, after which you have the right to arbitrate or litigate this decision. If you fail to take appropriate action within 30 days of the date of this decision, the decision shall become final and binding and not subject to further appeal."

4.5.2 If either Contractor or University disputes University's Representative's decision on a Claim, then, within 30 days after the decision of University's Representative on the Claim, or, if no decision has been issued, within 30 days from the date of the applicable deadline in Article 4.5.1 for University Representative to render a decision, such party (the "Disputing Party") must provide written notice demanding an informal conference to meet and confer. University shall schedule the conference within 30 days upon receipt of the notice demanding an informal conference. The parties will attempt in good faith to resolve any controversy or Claim arising out of or relating to this Contract by negotiation at the conference.

4.6 MEDIATION

4.6.1 Within 10 business days following the informal conference to meet and confer stated in Article 4.5.2, if the Claim or any portion of the Claim remains in dispute, the University shall provide a written statement identifying the disputed and undisputed portions of the Claim. Within 30 days of receipt of the statement, if either Contractor or University disputes any portion of the Claim, then the Disputing Party must provide written notice to the non-disputing party demanding non-binding mediation. The Contractor and the University shall share the associated costs equally and shall mutually agree to a mediator within 10 business days. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim, with each party bearing the fees and costs of its respective mediator. Mediation shall include, but not be limited to, neutral evaluation, a dispute review board, or other negotiation or evaluation through an independent third party or board. The Contractor and the University may mutually agree to waive any individual mediation in writing and proceed to arbitration or litigation pursuant to this Contract.

4.7 LITIGATION AND ARBITRATION

4.7.1 Either party may provide a written notice of its election to arbitrate or provide written notice of its election to litigate the Claim within 30 days after the mediation pursuant to Article 4.6.1, or, if the parties mutually agreed in writing to waive mediation, within 30 days after the agreement is signed by both parties.

4.7.2 If a notice of election to arbitrate or litigate is not given by either party within 30 days pursuant to Article 4.7.1, University's Representative's decision on the Claim will be final and binding and not subject to appeal or challenge.

4.7.3 If the Disputing Party gives timely notice of its election to arbitrate the University's Representative's decision on a Claim, Disputing Party shall have the right, within 120 days after a Notice of Completion, or a Notice of Cessation, as applicable, is filed for the Contract, to make a demand for arbitration in accordance with Article 4.7. Failure to perfect a Claim for which a timely election to arbitrate has been made by the timely filing of a demand for arbitration and timely payment of all applicable and required fees to the American Arbitration Association ("AAA") shall result in the University's Representative's decision on said Claim becoming final and binding and not subject to appeal or challenge. If the Disputing Party makes a timely demand for arbitration, and the amount of the Claim in question, when combined with all other Claims, if any, which are the subject of previously filed demands for arbitration that have not been resolved by settlement or arbitration award, is $100,000 or more, then the other party may elect to litigate all such Claims by filing a written notice with the "AAA" within 30 days after its receipt of notice from the AAA of the Disputing Party's demand for arbitration of the Claim that raises the total amount of Claims subject to arbitration to $100,000 or more. If the other party fails to give notice of its election to litigate within such 30-day period, it shall be deemed to have consented to arbitration and waived the right to litigate. If after commencement of arbitration the amount of unresolved Claims in arbitration are allowed to be increased to $100,000 or more, through an AAA-allowed amendment or otherwise, either party may elect to litigate within 30 days following the date that the electing party first receives written notification from the AAA that total Claims in arbitration equal or exceed $100,000. If neither party gives notice of its election to litigate within such 30-day period as applicable, then

both parties shall be deemed to have consented to arbitration and waived the right to litigate.

4.7.4 A demand for arbitration pursuant to Article 4.7.3 shall include a copy of the Claim presented to University's Representative pursuant to Article 4.4, a copy of the decision of University's Representative pursuant to Article 4.5, if any, a copy of the University's written statement identifying the portion of the Claim that remained in dispute following the informal conference pursuant to Article 4.6.1, and a summary of the remaining portions of the Claim in dispute. The demand shall state the amount in controversy, if any, and state the remedy sought. The demand shall identify the University's Responsible Administrator as the representative of the responding party and the Office of the General Counsel as counsel for the responding party. The demand shall be filed with the AAA and shall not be deemed to have been made until all applicable fees have been paid to the AAA by the demanding party. Copies of the demand and attachments shall be sent to University's Responsible Administrator as the representative of the responding party and the University's Office of General Counsel as attorney for the responding party, at the addresses set forth in the Project Directory, at the time the demand for arbitration is initiated with the AAA.

4.7.5 Except as modified by this Article 4.7, arbitration shall be initiated and conducted in accordance with the Construction Industry Arbitration Rules of the AAA then in effect. The following additional modifications shall be made to the aforesaid AAA rules:

.1 Civil discovery shall be permitted for the production of documents and taking of depositions. Other discovery may be permitted at the discretion of the arbitrator. All disputes regarding discovery shall be decided by the arbitrator.

.2 University's Representative and/or University's consultants, shall if required by agreement with University, upon demand by University join in and be bound by the Arbitration. University's Representative and University's consultants will have the same rights in any arbitration proceeding as are afforded by the AAA rules to Contractor and University.

.3 Contractor's sureties shall be bound by any arbitration award and may join in any arbitration proceeding.

.4 Except as provided in Articles 4.7.5.2. and 4.7.5.3 above, no Subcontractor or other person shall have a right or obligation to join in or be a party to any arbitration proceeding provided for in this Article 4 either directly, by joinder, by consolidation or actions, by counterclaim or crossclaim, or otherwise without the express written consent of University, Contractor, and the joining party.

.5 If more than one demand for arbitration is made by a party with respect to Claims referred to University's Representative, all such Claims shall be consolidated into a single arbitration unless the parties otherwise agree in writing.

.6 If total Claims are less than $50,000, the AAA expedited procedures as modified by this Article 4 shall apply. If total Claims are between $50,000 and $100,000 they shall be heard by a single arbitrator who shall be an attorney. If total Claims are in excess of $100,000 and are submitted to arbitration, either by agreement or by failure to elect litigation the controversy shall be heard by a panel of three arbitrators, one of which shall be an attorney.

.7 No arbitrator shall be appointed and no discovery may be commenced prior to the date of Final Completion unless University and Contractor otherwise agree.

.8 The exclusive forum for determining arbitrability shall be the Superior Court of the State of California. The AAA shall not submit to any arbitrator any matter concerning the arbitrability of the dispute if the arbitrability is contested.

9 If the expedited procedures of the AAA are applicable, the AAA shall submit simultaneously to each party an identical list of 7 proposed arbitrators drawn from the National Panel of Commercial Arbitrators, and each party may strike 3 names from the list on a peremptory basis and return the list to the AAA within 10 days from the date of receipt.

.10 Except as provided herein, the arbitration shall be conducted and enforced under California law, including the California Arbitration Act (California Code of Civil Procedure section 1280 and following). The Federal Arbitration Act shall not apply to the arbitration.

4.7.6 Unless University and Contractor otherwise agree in writing, the arbitration decision shall be binding upon the parties, made under and in accordance with the laws of the State of California, supported by substantial evidence, and in writing. If the total of all Claims or cross Claims submitted to arbitration is in

excess of $50,000, the award shall contain the basis for the decision, findings of fact, and conclusions of law. Any arbitration award shall be subject to confirmation, vacation, or correction under the procedures and on the grounds specified in the California Code of Civil Procedure including without limitation Section 1296. The expenses and fees of the arbitrators and the administrative fees of the AAA shall be divided among the parties equally. Each party shall pay its own counsel fees, witness fees, and other expenses incurred for its own benefit.

4.7.7 University may, but is not required, to assert as a counterclaim any matter arising out of the claims asserted by Contractor in the arbitration. University's failure to assert any such counterclaim in an arbitration shall be without prejudice to the University's right to assert the counterclaim in litigation or other proceeding.
4.7.8 Any litigation shall be filed in the Superior Court of the State of California for the County in which the contract was to be performed.

4.8 WAIVER

4.8.1 A waiver of or failure by University or University's Representative to enforce any requirement in this Article 4 in connection with any Claim shall not constitute a waiver of, and shall not preclude the University or University's Representative from enforcing such requirements in connection with any other Claims.

4.8.2 The Contractor agrees and understands that no oral approval, either express or implied, of any Claim shall be binding upon University unless and until such approval is ratified by execution of a written Change Order.

ARTICLE 5
SUBCONTRACTORS

5.1 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.1.1 Unless otherwise stated in the Contract Documents, Contractor shall submit in writing, prior to entering into subcontract agreements, the names and addresses of all Subcontractors proposed for the Work that were not previously listed in Contractor's Bid.

5.1.2 Any Subcontractor may be disqualified if University or University's Representative determines that such Subcontractor fails to meet the requirements of the Contract Documents or for any other reason.

5.1.3 In accordance with the Subletting and Subcontracting Fair Practices Act, nothing herein shall be deemed to entitle Contractor, without the approval of University, to substitute other subcontractors for those named in Contractor's List of Subcontractors and List of Changes in Subcontractors Due to Alternates contained in the completed Bid Form; and, except with such approval, no such substitution shall be made.

5.1.4 Except as hereinafter provided, any increase in the cost of the Work resulting from the replacement or substitution of a Subcontractor, as required by University or University's Representative pursuant to Article 5.1.1 shall be borne solely by Contractor and Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time on account of such replacement or substitution.

5.2 SUBCONTRACTUAL RELATIONS

5.2.1 Any part of the Work performed for Contractor by a first-tier Subcontractor shall be pursuant to a written subcontract. Each such subcontract shall require the Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to Contractor by the terms of the Contract Documents, to assume toward Contractor all the obligations and responsibilities which Contractor assumes towards University by the Contract Documents, and to perform such portion of the Work in accordance with the Contract Documents. Each such subcontract shall preserve and protect the rights of University under the Contract Documents, with respect to the Work to be performed by Subcontractor, so that subcontracting thereof will not prejudice such rights. Contractor shall cause each such subcontract to expressly include the following requirements:

.1 Subcontractor waives all rights that Subcontractor may have against University for damages caused by fire or other perils covered by builder's risk property insurance carried by Contractor or University, except for such rights Subcontractor may have to the proceeds of such insurance held by University under Article 11.
.2 University and entities and agencies designated by University will have access to

and the right to audit and the right to copy at University's cost all of Subcontractor's books, records, contracts, correspondence, instructions, drawings, receipts, vouchers, purchase orders, and memoranda relating to the Work. Subcontractor shall preserve all such records and other items for a period of at least 3 years after Final Completion.

.3 Subcontractor recognizes the rights of University under Article 5.3, Contingent Assignment of Subcontracts, and agrees, upon notice from University that University has elected to accept said assignment and to retain Subcontractor pursuant to the terms of the subcontract, to complete the unperformed obligations under the subcontract and, if requested by University, to execute a written agreement confirming that Subcontractor is bound to University under the terms of the subcontract.

5.2.2 Upon the request of University, Contractor shall promptly furnish to University a true, complete, and executed copy of any subcontract.

5.2.3 Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and University, except when, and only to the extent that, University elects to accept the assignment of the subcontract with such Subcontractor pursuant to Article 5.3, Contingent Assignment of Subcontracts.

5.3 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

5.3.1 Contractor hereby assigns to University all its interest in first-tier subcontracts now or hereafter entered into by Contractor for performance of any part of the Work. The assignment will be effective upon acceptance by University in writing and only as to those subcontracts which University designates in writing. University may accept said assignment at any time during the course of the Work and prior to Final Completion in the event of a suspension or termination of Contractor's rights under the Contract Documents. Such assignment is part of the consideration to University for entering into the Contract with Contractor and may not be withdrawn prior to Final Completion.

ARTICLE 6
CONSTRUCTION BY UNIVERSITY OR BY SEPARATE CONTRACTORS

6.1 UNIVERSITY'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 University reserves the right to award separate contracts for, or to perform with its own forces, construction or operations related to the Work or other construction or operations at or affecting the Project site, including portions of the Work which have been deleted by Change Order. Contractor shall cooperate with University's forces and Separate Contractors.

6.1.2 University will provide coordination of the activities of University's forces and of each Separate Contractor with the Work of Contractor. Contractor shall participate with University and Separate Contractors in joint review of construction schedules and Project requirements when directed to do so. Contractor shall make necessary revisions to the Contract Schedule after such joint review.

6.2 MUTUAL RESPONSIBILITY

6.2.1 Contractor shall afford University and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities. Contractor shall connect, schedule, and coordinate its construction and operations with the construction and operations of University and Separate Contractors as required by the Contract Documents.

6.2.2 If a portion of the Work is dependent upon the proper execution or results of other construction or operations by University or Separate Contractors, Contractor shall inspect such other construction or operations before proceeding with that portion of the Work. Contractor shall promptly report to University's Representative apparent discrepancies or defects which render the other construction or operations unsuitable to receive the Work. Unless otherwise directed by University's Representative, Contractor shall not proceed with the portion of the Work affected until apparent discrepancies or defects have been corrected. Failure of Contractor to so report within a reasonable time after discovering such discrepancies or defects

shall constitute an acknowledgment that the other construction or operations by University or Separate Contractors is suitable to receive the Work, except as to defects not then reasonably discoverable.

6.3 UNIVERSITY'S RIGHT TO CLEAN UP

6.3.1 If a dispute arises between Contractor and Separate Contractors as to the responsibility under their respective contracts for maintaining the Project site and surrounding areas free from waste materials and rubbish, University may clean up and allocate the cost between those firms it deems to be responsible.

ARTICLE 7
CHANGES IN THE WORK

7.1 CHANGES

7.1.1 University may, from time to time, order or authorize additions, deletions, and other changes in the Work by Change Order or Field Order without invalidating the Contract and without notice to sureties. Absence of such notice shall not relieve such sureties of any of their obligations to University.

7.1.2 Contractor may request a Change Order under the procedures specified in Article 4.2.

7.1.3 A Field Order may be issued by University, does not require the agreement of Contractor, and shall be valid with or without the signature of Contractor.

7.1.4 Contractor shall proceed promptly with any changes in the Work, unless otherwise provided in the relevant Change Order or Field Order.

7.2 DEFINITIONS

7.2.1 A Change Order is a Contract Document (as shown in the Exhibits) which has been signed by both University and Contractor, and states their agreement, as applicable, to the following:

.1 A change in the Work, if any.
.2 The amount of an adjustment of the Contract Sum, if any.
.3 The amount of an adjustment of the Contract Time, if any.
.4 A modification to any other Contract term or condition.

7.2.2 A Unilateral Change Order may be issued by University, without the Contractor' signature, where the University determines that a change in the Work requires an adjustment of the Contract Sum or Contract Time, even though no agreement has been reached between University and Contractor with regard to such change in the Work.

7.2.3 A Field Order (as shown in the Exhibits) is a Contract Document issued by the University that orders the Contractor to perform Work. A Field Order may, but need not, constitute a change in the Work and may, but need not, entitle Contractor to an adjustment of the Contract Sum or Contract Time.

7.3 CHANGE ORDER PROCEDURES

7.3.1 Contractor shall provide a Change Order Request and Cost Proposal pursuant to Article 4.2 and this Article 7.3 of the General Conditions. Adjustments of the Contract Sum resulting from Extra Work and Deductive Work shall be determined using one of the methods described in this Article 7.3. Adjustments of the Contract Time shall be subject to the provisions in Article 8. Contractor's obligation to provide Cost Proposals shall be subject to the following:

.1 The obligation of Contractor to provide Cost Proposals is not Extra Work, and shall not entitle the Contractor to an adjustment of the Contract Sum or Contract Time.
.2 The failure of Contractor to timely provide a Cost Proposal pursuant to Article 4.2 and this Article 7.3.1 is a material breach of the Contract. Contractor shall be responsible for any delay in implementing a change for which Contractor failed to timely provide a Cost Proposal consistent with the requirements of Article 4.2 and this Article 7.3.1.

7.3.2 The term "Cost of Extra Work" as used in this Article 7.3 shall mean actual costs incurred or to be incurred by Contractor and each Subcontractor regardless of tier involved, to the extent not otherwise

disallowed under Article 7.3.3, and shall be limited to the following (to the extent the Contractor demonstrates that the costs are both reasonable and actually incurred, if such costs have been incurred):

.1 Straight-time wages or salaries for employees employed at the Project site, or at fabrication sites off the Project site, incurred as a result of the performance of the Extra Work.2 Fringe Benefits and Payroll Taxes for employees employed at the Project site, or at fabrication sites off the Project site, incurred as a result of the performance of the Extra Work.

.3 Overtime wages or salaries, specifically authorized in writing by University's Representative, for employees employed at the Project site, or at fabrication sites off the Project site, incurred as a result of the performance of the Extra Work.

.4 Fringe Benefits and Payroll Taxes for overtime Work specifically authorized in writing by University's Representative, for employees employed at the Project site, or at fabrication sites off the Project site, incurred as a result of the performance of the Extra Work.

.5 Costs of materials and consumable items which are furnished and incorporated into the Extra Work, as approved by University's Representative. Such costs shall be charged at the lowest price available to the Contractor but in no event shall such costs exceed competitive costs obtainable from other subcontractors, suppliers, manufacturers, and distributors in the area of the Project site. All discounts, rebates, and refunds and all returns from sale of surplus materials and consumable items shall accrue to University and Contractor shall make provisions so that they may be obtained.

.6 Sales taxes on the costs of materials and consumable items which are incorporated into and used in the performance of the Extra Work pursuant to Article 7.3.2.5 above.

.7 Rental charges for necessary machinery and equipment, whether owned or hired, as authorized in writing by University's Representative, exclusive of hand tools, used directly in the performance of the Extra Work. Such rental charges shall not exceed the current Equipment Rental Rates published by the California Department of Transportation for the area in which the work is performed. Such rental rates are found at http://www.dot.ca.gov/hq/construc/equipmnt.html . Contractor shall attach a copy of said schedule to the Cost Proposal. The charges for any machinery and equipment shall cease when the use thereof is no longer necessary for the Extra Work.

.8 Additional costs of royalties and permits due to the performance of the Extra Work.

.9 The cost for Insurance and Bonds shall not exceed 2% of items .1 through .8 above.

University and Contractor may agree upon rates to be charged for any of the items listed in this Article 7.3.2. Such agreed upon rates shall be subject to audit pursuant to Article 15.7. Contractor shall promptly refund to University any amounts (including associated mark-ups) in excess of the actual costs of such items.

7.3.3 Cost of Extra Work shall not include any of the following:

.1 Supervision
.2 Superintendent(s).
.3 Assistant Superintendent(s).
.4 Project Engineer(s).
.5 Project Manager(s).
.6 Scheduler(s).
.7 Estimator(s).
.8 Small tools (Replacement value does not exceed $300).
.9 Office expenses including staff, materials and supplies.
.10 On-site or off-site trailer and storage rental and expenses.
.11 Site fencing.
.12 Utilities including gas, electric, sewer, water, telephone, facsimile, copier equipment.

.13 Data processing personnel and equipment.
.14 Federal, state, or local business income and franchise taxes.
.15 Overhead and Profit.
.16 Costs and expenses of any kind or item not specifically and expressly included in Article 7.3.2.

7.3.4 The term “Contractor Fee” shall mean the full amount of compensation, both direct and indirect (including without limitation all overhead and profit), to be paid to Contractor for its own Work and the Work of all Subcontractors, for all costs and expenses not included in the Cost of Extra Work, whether or not such costs and expenses are specifically referred to in Article 7.3.3. The Contractor Fee shall not be compounded.

The Contractor Fee shall be computed as follows:

.1 Fifteen percent (15%) of the cost of that portion of the Extra Work to be performed by the prime contractor with its own forces.
.2 Fifteen percent (15%) of the cost of that portion of the Work to be performed by a Subcontractor with its own forces, plus 5% for the prime contractor. Total combined Contractor and Subcontractor fee shall not exceed 20%.
.3 Fifteen percent (15%) of the cost of that portion of the Work to be performed by a sub-subcontractor with its own forces, or any lower tier of Subcontractor, plus 5% for the Subcontractor, plus 5% for the prime contractor. Total combined Contractor, Subcontractor and all sub-subcontractor fee shall not exceed 25%.

7.3.5 Compensation for Extra Work shall be computed on the basis of one or more of the following:

.1 Where the Work involved is covered by Unit Prices contained in the Contract Documents, by application of the Unit Prices to the quantities of the items involved.
.2 Where Unit Prices are not applicable, a mutually agreed upon lump sum supported by a Cost Proposal pursuant to 7.3.1.
.3 Where Contractor and University cannot agree upon a lump sum, by Cost of Extra Work plus Contractor Fee applicable to such Extra Work.

7.3.6 As a condition to Contractor's right to an adjustment of the Contract Sum pursuant to Article 7.3.5.3, Contractor must keep daily detailed and accurate records itemizing each element of cost and shall provide substantiating records and documentation, including time cards and invoices. Such records and documentation shall be submitted to University's Representative on a daily basis.

7.3.7 For Work to be deleted by Change Order, the reduction of the Contract Sum shall be computed on the basis of one or more of the following:

.1 Unit Prices stated in the Contract Documents.
.2 Where Unit Prices are not applicable, a lump sum agreed upon by University and Contractor, based upon the actual costs which would have been incurred in performing the deleted portions of the Work as calculated in accordance with Articles 7.3.2 and 7.3.3, supported by a Cost Proposal pursuant to Article 7.3.1.

7.3.8 If any one Change involves both Extra Work and Deleted Work in the same portion of the Work, a Contractor fee will not be allowed if the deductive cost exceeds the additive cost. If the additive cost exceeds the deductive cost, a Contractor Fee will be allowed only on the difference between the two amounts.

7.3.9 The Contract Sum will be adjusted for a delay if, and only if, Contractor demonstrates that all of the following three conditions are met:

.1 Condition Number One: The delay results in an extension of the Contract Time pursuant to Article 8.4.1.

.2 Condition Number Two: The delay is caused solely by one or more of the following:

.1 An error or omission in the Contract Documents; or
.2 The University's decision to change the scope of the Work, where such decision is not the result of any default or

misconduct of the Contractor; or

.3 The University's decision to suspend the Work, where such decision is not the result of any default or misconduct of the Contractor; or

.4 The failure of the University (including the University acting through its consultants, Design Professionals, Separate Contractors or the University's Representative) to perform any Contract obligation where the failure to so perform is not the result of any default or misconduct of the Contractor.

.5 A materially differing site condition pursuant to Article 3.17.

.3 Condition Number Three: The delay is not concurrent with a delay caused by an event other than those listed in Article 7.3.9.2.

7.3.10 For each day of delay that meets all three conditions prescribed in Article 7.3.9 the Contract Sum will be adjusted by the daily rate included in the Agreement and specifically identified as the rate to be paid to Contractor for Compensable Delays. Pursuant to Article 9.7.4, said daily rate shall not apply to delays occurring after Substantial Completion.

7.3.11 Except as provided in Articles 7 and 8, Contractor shall have no claim for damage or compensation for any delay, interruption, hindrance, or disruption.

7.3.12 If for any reason one or more of the conditions prescribed in Article 7.3.9 is held legally unenforceable, the remaining conditions must be met as a condition to obtaining an adjustment of the Contract Time under Article 7.3.10.

7.4 FIELD ORDERS

7.4.1 Field Orders issued by the University Representative shall be subject to the following:

.1 A Field Order may state that it does or does not constitute a change in the Work.

.2 If the Field Order states that it does not constitute a change in the Work and the Contractor asserts that the Field Order constitutes a change in the Work, in order to obtain an adjustment of the Contract Sum or Contract Time for the Work encompassed by the Field Order, Contractor must follow all procedures set forth in Article 4, starting with the requirement of submitting a timely Change Order Request within 7 days of Contractor's receipt of the Field Order; failure to strictly follow those procedures is a bar to any Claim for an adjustment of the Contract Sum or Contract Time arising from performance of the Work described in the Field Order.

.3 If the Field Order states that it does constitute a change in the Work, the Work described in the Field Order shall be considered Extra Work and the Contractor shall be entitled to an adjustment of the Contract Sum and Contract Time, calculated under and subject to Contractor's compliance with the procedures for verifying and substantiating costs and delays in Articles 7 and 8.

.4 In addition, if the Field Order states that it does constitute a change in the Work, the Field Order may or may not contain University's estimate of adjustment of Contract Sum and/or Contract Time. If the Field Order contains an estimate of adjustment of Contract Sum or Contract Time, the Field Order is subject to the following:

.1 The Contractor shall not exceed the University's estimate of adjustment to Contract Sum or Contract Time without prior written notification to the University's Representative.

.2 If the Contractor asserts that the change in the Work encompassed by the Field Order may entitle Contractor to an adjustment of Contract Sum or Contract Time in excess of the University's estimate, in order not to be bound by University's estimate Contractor must follow all procedures set forth in Article 4, starting with the requirement of submitting a timely Change Order Request within 7 days of

Contractor's receipt of the Field Order; failure to strictly follow those procedures is a bar to any Claim for an adjustment of the Contract Sum or Contract Time, in excess of the University's estimate, arising from performance of the Work described in the Field Order.

7.4.2 Upon receipt of a Field Order, Contractor shall promptly proceed to perform the Work as ordered in the Field Order notwithstanding any disagreement by the Contractor concerning whether the Work is extra.

7.5 VARIATION IN QUANTITY OF UNIT PRICE WORK

7.5.1 University has the right to increase or decrease the quantity of any Unit price item for which an Estimated Quantity is stated in the Bid Form.

7.6 WAIVER

7.6.1 A waiver of or failure by University or University's Representative to enforce any requirement in this Article 7, including without limitation the requirements in Articles 7.3.6, 7.3.8, 7.3.9, 7.3.10, 7.3.11, or 7.3.12 in connection with any adjustment of the Contract Sum, will not constitute a waiver of, and will not preclude the University or University's Representative from enforcing, such requirements in connection with any other adjustments of the Contract Sum.

7.6.2 The Contractor agrees and understands that no oral approval, either express or implied, of any adjustment of the Contract Sum by University or its agents shall be binding upon University unless and until such approval is ratified by execution of a written Change Order.

ARTICLE 8
CONTRACT TIME

8.1 COMMENCEMENT OF THE WORK

8.1.1 The date of commencement of the Work shall be set forth in the Notice To Proceed. The date of commencement of the Work shall not be postponed by the failure of Contractor, Subcontractors, or of persons or firms for whom Contractor is responsible, to act.

8.2 PROGRESS AND COMPLETION

8.2.1 By signing the Agreement:

.1 Contractor represents to University that the Contract Time is reasonable for performing the Work and that Contractor is able to perform the Work within the Contract Time.

.2 Contractor agrees that University is purchasing the right to have the Contractor present on the Project site for the full duration of the Contract Time, even if Contractor could finish the Contract in less than the Contract Time.

8.2.2 Contractor shall not, except by agreement or instruction of University in writing, commence operations on the Project site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by Contractor. The dates of commencement and Final Completion of the Work shall not be changed by the effective date of such insurance.

8.2.3 Contractor shall proceed expeditiously with adequate forces and shall achieve full completion of the Work within the Contract Time. If University's Representative determines and notifies Contractor that Contractor's progress is such that Contractor will not achieve full completion of the Work within the Contract Time, Contractor shall immediately and at no additional cost to University, take all measures necessary, including working such overtime, additional shifts, Sundays, or holidays as may be required to ensure that the Work is fully completed within the Contract Time. Upon receipt of such notice from University's representative, Contractor shall immediately notify University's Representative of all measures to be taken to ensure full completion of the Work within the Contract Time. Contractor shall reimburse University for any extra costs or expenses (including the reasonable value of any services provided by University's employees) incurred by University as the result of such measures.

8.3 DELAY

8.3.1 Except and only to the extent provided otherwise in Articles 7 and 8, by signing the Agreement, Contractor agrees:

.1 to bear the risk of delays to the Work; and
.2 that Contractor's bid for the Contract was made with full knowledge of this risk.

In agreeing to bear the risk of delays to the Work, Contractor understands that, except and only to the extent provided otherwise in Articles 7 and 8, the occurrence of events that delay the Work shall not excuse Contractor from its obligation to achieve Final Completion of the Work within the Contract Time, and shall not entitle the Contractor to an adjustment of the Contract Sum.

8.4 ADJUSTMENT OF THE CONTRACT TIME FOR DELAY

8.4.1 Subject to Article 8.4.2, the Contract Time will be extended for each day of delay for which Contractor demonstrates that all of the following four conditions have been met; a time extension will not be granted for any day of delay for which Contractor fails to demonstrate compliance with the four conditions:

.1 Condition Number One: The delay is critical. A delay is critical if and only to the extent it delays a work activity that cannot be delayed without delaying Final Completion of the Work beyond the Contract Time. Under this Article 8.4.1.2, if the Contract Schedule shows Final Completion of the Work before expiration of the Contract Time, a delay is critical if and only to the extent the delay pushes Final Completion of the Work to a date that is beyond the Contract Time.

.2 Condition Number Two: Within 7 days of the date the Contractor discovers or reasonably should discover an act, error, omission or unforeseen condition or event causing the delay is likely to have an impact on the critical path of the Project, (even if the Contractor has not yet been delayed when the Contractor discovers or reasonably should discover the critical path impact of the act, error, omission or unforeseen condition giving rise to the delay) the Contractor submits both a timely and complete Change Order Request that meets the requirements of Article 4.2.

.3 Condition Number Three: The delay is not caused by:
- .1 A concealed, unforeseen or unknown condition or event except for a materially differing site condition pursuant to Article 3.17;or
- .2 The financial inability, misconduct or default of the Contractor, a Subcontractor or supplier; or
- .3 The unavailability of materials or parts.

.4 Condition Number Four: The delay is caused by:

- .1 Fire; or
- .2 Strikes, boycotts, or like obstructive actions by labor organizations; or
- .3 Acts of God (As used herein, “Acts of God” shall include only earthquakes in excess of a magnitude of 3.5 on the Richter Scale and tidal waves); or
- .4 A materially differing site condition pursuant to Article 3.17; or
- .5 An error or omission in the Contract; or
- .6 The University's decision to change the scope of the Work, where such decision is not the result of any default or misconduct of the Contractor; or
- .7 The University's decision to suspend the Work, where such decision is not the result of any default or misconduct of the Contractor; or
- .8 The failure of the University (including the University acting through its consultants, Design Professionals, Separate Contractors or the University's representative) to perform any

Contract obligation unless such failure is due to Contractor's default or misconduct.

.9 "Adverse weather," but only for such days of adverse weather, or on-site conditions caused by adverse weather, that are in excess of the number of days specified in the Supplementary Conditions. In order for a day to be considered a day of adverse weather for the purpose of determining whether Contractor is entitled to an adjustment in Contract Time, both of the following conditions must be met:

.1 the day must be a day in which, as a result of adverse weather, less than one half day of critical path work is performed by Contractor; and

.2 the day must be identified in the Contract Schedule as a scheduled work day.

8.4.2 If and only if a delay meets all four conditions prescribed in Article 8.4.1, then a time extension will be granted for each day that Final Completion of the Work is delayed beyond the Contract Time, subject to the following:

.1 When two or more delays (each of which meet all four conditions prescribed in Article 8.4.1) occur concurrently on the same day, and each such concurrent delay by itself without consideration of the other delays would be critical, then all such concurrent delays shall be considered critical. For the purpose of determining whether and to what extent the Contract Time should be adjusted pursuant to Article 8.4.2, such concurrent critical delays shall be treated as a single delay for each such day.

.2 Contractor shall be entitled to a time extension for a day of delay that meets all four requirements of Article 8.4.1 if the delay is concurrent with a delay that does not meet all four conditions of Article 8.4.1.

8.4.3 If for any reason one or more of the four conditions prescribed in Article 8.4.1 is held legally unenforceable, then all remaining conditions must be met as a condition to obtaining an extension of the Contract Time under Article 8.4.2.

8.5 COMPENSATION FOR DELAY

8.5.1 To the maximum extent allowed by law, any adjustment of the Contract Sum as the result of delays shall be limited to the amounts specified in Article 7. Such adjustment shall, to the maximum extent allowed by law, constitute payment in full for all delay related costs (including costs for disruption, interruption and hindrance, general conditions, on and off-site overhead and profit) of Contractor, its Suppliers and Subcontractors of all tiers and all persons and entities working under or claiming through Contractor in connection with the Project.

8.5.2 By signing the Agreement, the parties agree that the University is buying the right to do any or all of the following, which are reasonable and within the contemplation of the parties:

.1 To order changes in the Work, regardless of the extent and number of changes, including without limitation:

.1 Changes to correct errors or omissions, if any, in the Contract Documents.

.2 Changes resulting from the University's decision to change the scope of the Work subsequent to execution of the Contract.

.3 Changes due to unforeseen conditions.

.2 To suspend the Work or any part thereof.

.3 To delay the Work, including without limitation, delays resulting from the failure of the University or the University's Representative to timely perform any Contract obligation and delays for University's convenience.

8.6 WAIVER

8.6.1 A waiver of or failure by University or University's Representative to enforce any requirement in this Article 8, including without limitation the requirements in Article 8.4, in connection with any or all past delays shall not constitute a waiver of, and shall not preclude the University or University's Representative from enforcing, such requirements in connection with any present or future delays.

8.6.2 Contractor agrees and understands that no oral approval, either express or implied, of any time extension by University or its agents shall be binding upon University unless and until such approval is ratified by execution of a written Change Order.

ARTICLE 9
PAYMENTS AND COMPLETION

9.1 COST BREAKDOWN

9.1.1 Within 10 days after receipt of the Notice of Selection as the apparent lowest responsible Bidder, and with the Agreement, Contractor shall submit to University's Representative a Cost Breakdown of the Contract Sum in the form contained in the Exhibits. The Cost Breakdown shall itemize as separate line items the cost of each Work Activity and all associated costs, including but not limited to warranties, as-built documents, overhead expenses, and the total allowance for profit. Insurance and bonds shall each be listed as separate line items. The total of all line items shall equal the Contract Sum. The Cost Breakdown, when approved by the University's Representative, shall become the basis for determining the cost of Work performed for Contractor's Applications for Payment.

9.2 PROGRESS PAYMENT

9.2.1 University agrees to pay monthly to Contractor, subject to Article 9.4.3, an amount equal to 95% of the sum of the following:

.1 Cost of the Work in permanent place as of the date of the Contractor’s Application For Payment.
.2 Plus cost of materials not yet incorporated in the Work, subject to Article 9.3.5.
.3 Less amounts previously paid.

Under this Article 9.2.1, University may, but is not required, to pay Contractor more frequently than monthly.

9.2.2 After Substantial Completion and subject to Article 9.4.3, University will make any of the remaining progress payments in full.

9.3 APPLICATION FOR PAYMENT

9.3.1 On or before the 10th day of the month or such other date as is established by the Contract Documents, Contractor shall submit to University's Representative an itemized Application For Payment, for the cost of the Work in permanent place, as approved by University's Representative, which has been completed in accordance with the Contract Documents, less amounts previously paid.

The Application For Payment shall be prepared as follows:

.1 Use the form contained in the Exhibits.
.2 Itemize in accordance with the Cost Breakdown.
.3 Include such data substantiating Contractor's right to payment as University's Representative may reasonably require, such as invoices, certified payrolls, daily time and material records, and, if securities are deposited in lieu of retention pursuant to Article 9.5, a certification of the market value of all such securities as of a date not earlier than 5 days prior to the date of the Application For Payment.
.4 Itemize retention.

9.3.2 Applications For Payment shall not include requests for payment on account of (1) changes which have not been authorized by Change Orders or (2) amounts Contractor does not intend to pay a Subcontractor

because of a dispute or other reason.

9.3.3 If required by University, an Application For Payment shall be accompanied by (1) a summary showing payments that will be made to Subcontractors covered by such application and conditional releases upon progress payment or final payment and (2) unconditional waivers and releases of claims and stop payment notices, in the form contained in the Exhibits, from each Subcontractor listed in the preceding Application For Payment covering sums disbursed pursuant to that preceding Application For Payment.

9.3.4 Contractor warrants that, upon submittal of an Application For Payment, all Work, for which Certificates For Payment have been previously issued and payment has been received from University, shall be free and clear of all claims, stop payment notices, security interests, and encumbrances in favor of Contractor, Subcontractors, or other persons or firms entitled to make claims by reason of having provided labor, materials, or equipment relating to the Work.

9.3.5 At the sole discretion of University, University's Representative may approve for inclusion in the Application For Payment the cost of materials not yet incorporated in the Work but already delivered and suitably stored either at the Project site or at some other appropriate location acceptable to University's Representative. In such case, Contractor shall furnish evidence satisfactory to University's Representative (1) of the cost of such materials and (2) that such materials are under the exclusive control of Contractor. Only materials to be incorporated in the Work will be considered for payment. Any payment shall not be construed as acceptance of such materials nor relieve Contractor from sole responsibility for the care and protection of such materials; nor relieve Contractor from risk of loss to such materials from any cause whatsoever; nor relieve Contractor from its obligation to complete the Work in accordance with the Contract; nor act as a waiver of the right of University to require fulfillment of all terms of the Contract. Nothing contained within this Article 9.3.5 shall be deemed to obligate University to agree to payment for any non-incorporated materials or any part thereof, payment being in the sole and absolute discretion of University.

9.4 CERTIFICATE FOR PAYMENT

9.4.1 If Contractor has submitted an Application For Payment in accordance with Article 9.3, University's Representative shall, not later than 5 working days after the date of receipt of the Application For Payment, issue to University, with a copy to Contractor, a Certificate For Payment for such amount as University's Representative determines to be properly due.

9.4.2 If any such Application For Payment is determined not to be in accordance with Article 9.3, University will inform Contractor as soon as practicable, but not later than 5 working days after receipt. Thereafter, Contractor shall have 3 days to revise and resubmit such Application For Payment; otherwise University's Representative may issue a Certificate For Payment in the amount that University's Representative determines to be properly due without regard to such Application For Payment.

9.4.3 Approval of all or any part of an Application For Payment may be withheld, a Certificate For Payment may be withheld, and all or part of a previous Certificate For Payment may be nullified and that amount withheld from a current Certificate For Payment on account of any of the following:

.1 Defective Work not remedied.
.2 Third-party claims against Contractor or University arising from the acts or omissions of Contractor or Subcontractors.
.3 Stop payment notices.
.4 Failure of Contractor to make timely payments due Subcontractors for material or labor.
.5 A reasonable doubt that the Work can be completed for the balance of the Contract Sum then unpaid.
.6 Damage to University or Separate Contractor for which Contractor is responsible.
.7 Reasonable evidence that the Work will not be completed within the Contract Time; and that the unpaid balance of the Contract Sum would not be adequate to cover University's damages for the anticipated delay.
.8 Failure of Contractor to maintain and update as-built documents.
.9 Failure of Contractor to submit schedules or their updates as required by the Contract Documents.
.10 Failure to provide conditional or unconditional releases from any Subcontractor or supplier, if such waiver(s) have been requested by University's Representative.

.11 Performance of Work by Contractor without properly processed Shop Drawings.
.12 Liquidated damages assessed in accordance with Article 5 of the Agreement.
.13 Failure to provide updated Reports of Subcontractor Information and Self-Certifications, as applicable.
.14 Failure to provide a Final Distribution of Contract Dollars with final Application for Payment.
.15 Any other failure of Contractor to perform its obligations under the Contract Documents.

9.4.4 Subject to the withholding provisions of Article 9.4.3, University will pay Contractor the amount set forth in the Certificate For Payment no later than 10 days after the issuance of the Certificate For Payment.

9.4.5 Neither University nor University's Representative will have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

9.4.6 Neither a Certificate For Payment nor a progress payment made by University will constitute acceptance of Defective Work.

9.5 DEPOSIT OF SECURITIES IN LIEU OF RETENTION AND DEPOSIT OF RETENTION INTO ESCROW

9.5.1 At the request and expense of Contractor, a substitution of securities may be made for any monies retained by University under Article 9.2 to ensure performance under the Contract Documents. Securities equivalent in value to the retention amount required by the Contract Documents for each Certificate For Payment shall be deposited by Contractor with a state or federally chartered bank in the State of California ("Escrow Agent"), which shall hold such securities pursuant to the escrow agreement referred to in Article 9.5.3 until retention is due in accordance with Article 9.8. Securities shall be valued as often as conditions of the securities market warrant, but in no case less than once per month. Contractor shall deposit additional securities so that the current market value of the total of all deposited securities shall be at least equal to the total required amount of retention.

9.5.2 Alternatively to Article 9.5.1, and at the request and expense of Contractor, University will deposit retention directly with Escrow Agent. Contractor may direct the investment of such deposited retention into interest bearing accounts or securities, and such deposits or securities shall be held by Escrow Agent upon the same terms provided for securities deposited by Contractor. Contractor and its surety shall bear the risk of failure of the Escrow Agent selected.

9.5.3 A prerequisite to the substitution of securities in lieu of retention or the deposit of retention into escrow shall be the execution by Contractor, University, and Escrow Agent of an Escrow Agreement for Deposit of Securities in Lieu of Retention and Deposit of Retention in the form contained in the Exhibits. The Contractor shall submit the Selection of Retention Options and the Escrow Agreement for Deposit of Securities in Lieu of Retention and Deposit of Retention not later than the date when 50% of the Work has been completed. The terms of such escrow agreement are incorporated into the requirements of this Article 9.5.

9.6 BENEFICIAL OCCUPANCY

9.6.1 University reserves the right, at its option and convenience, to occupy or otherwise make use of any part of the Work at any time prior to Substantial Completion or Final Completion upon 10 days' notice to Contractor. Such occupancy or use is herein referred to as "Beneficial Occupancy." Beneficial Occupancy shall be subject to the following conditions:

.1 University's Representative will make an inspection of the portion of the Project to be beneficially occupied and prepare a list of items to be completed or corrected prior to Final Completion. Prior to Beneficial Occupancy, University will issue a Certificate of Beneficial Occupancy on University's form.
.2 Beneficial Occupancy by University shall not be construed by Contractor as an acceptance by University of that portion of the Work which is to be occupied.
.3 Beneficial Occupancy by University shall not constitute a waiver of existing claims of University or Contractor against each other.

.4 Contractor shall provide, in the areas beneficially occupied and on a 24 hour and 7 day week basis as required, utility services, heating, and cooling for systems which are in operable condition at the time of Beneficial Occupancy. All responsibility for the operation and maintenance of equipment shall remain with Contractor while the equipment is so operated. Contractor shall submit to University an itemized list of each piece of equipment so operated with the date operation commences.

.5 The Guarantee to Repair Periods, as defined in Article 12.2, will commence upon the occupancy date stated in the Certificate of Beneficial Occupancy except that the Guarantee to Repair Periods for that part of equipment or systems that serve portions of the Work for which University has not taken Beneficial Occupancy or issued a Certificate of Substantial Completion shall not commence until the University has taken Beneficial Occupancy for that portion of the Work or has issued a Certificate of Substantial Completion with respect to the entire Project.

.6 University will pay all normal operating and maintenance costs resulting from its use of equipment in areas beneficially occupied.

.7 University will pay all utility costs which arise out of the Beneficial Occupancy.

.8 Contractor shall not be responsible for providing security in areas beneficially occupied.

.9 University will use its best efforts to prevent its Beneficial Occupancy from interfering with the conduct of Contractor's remaining Work.

.10 Contractor shall not be required to repair damage caused by University in its Beneficial Occupancy.

.11 Except as provided in this Article 9.6, there shall be no added cost to University due to Beneficial Occupancy.

.12 Contractor shall continue to maintain all insurance required by the Contract in full force and effect.

9.7 SUBSTANTIAL COMPLETION

9.7.1 “Substantial Completion” means the stage in the progress of the Work, as determined by University's Representative, when the Work is complete and in accordance with the Contract Documents except only for completion of minor items which do not impair University's ability to occupy and fully utilize the Work for its intended purpose and a Certificate of Occupancy has been issued by the University.

9.7.2 When Contractor gives notice to University's Representative that the Work is substantially complete, unless University's Representative determines that the Work is not sufficiently complete to warrant an inspection to determine Substantial Completion, University's Representative will inspect the Work. If the University’s Representative determines that the Work is not substantially completed the University’s Representative will prepare and give to Contractor a comprehensive list of items to be completed or corrected before establishing Substantial Completion. Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of Contractor to complete all Work in accordance with the Contract Documents. Upon notification that the items on the list are completed or corrected, as applicable, the University's Representative will make an inspection to determine whether the Work is substantially complete. Costs for additional inspection by University's Representative shall be deducted from any monies due and payable to Contractor.

9.7.3 When University's Representative determines that the Work is substantially complete, University's Representative will arrange for inspection by University’s Building Official and other officials, as appropriate, for the purpose of issuing a Certificate of Occupancy. After a Certificate of Occupancy has been issued by the University, the University’s Representative will prepare a Certificate of Substantial Completion on University's form as contained in the Exhibits, which, when signed by University, shall establish the date of Substantial Completion and the responsibilities of University and Contractor for security, maintenance, utilities, insurance, and damage to the Work. The University’s Representative will prepare and furnish to the Contractor a comprehensive “punch list” of items to be completed or corrected prior to Final Completion.

9.7.4 Unless otherwise provided in the Certificate of Substantial Completion, the Guarantee To Repair Period for the Work covered by the Certificate of Substantial Completion, shall commence on the date of Substantial Completion of the Work except that Substantial Completion shall not commence the Guarantee to Repair Period for any equipment or systems that:

.1 Are not operational (equipment or systems shall not be considered operational if they cannot be used to provide the intended service; or
.2 Are not accepted by the University.

The Guarantee To Repair Period for equipment or systems which become operational and accepted subsequent to Substantial Completion will begin on the date of their written acceptance by University.

9.7.5 The daily rate included in the Agreement and specifically identified as the rate to be paid to Contractor for Compensable Delays shall not apply to any delays occurring after the Work is substantially completed.

9.8 FINAL COMPLETION, FINAL PAYMENT, AND RELEASE OF RETENTION

9.8.1 Upon receipt of notice from Contractor that the Work is ready for final inspection, University's Representative will make such inspection. Final Completion shall be when University's Representative determines that the Work is fully completed and in accordance with the Contract Documents, including without limitation, satisfaction of all "punch list" items, and determines that a Certificate of Occupancy has been issued by the University. University will file a Notice of Completion within 15 days after Final Completion. After receipt of the final Application For Payment, if University's Representative determines that Final Completion has occurred, University's Representative will issue the final Certificate For Payment.

9.8.2 Final payment and retention shall be released to Contractor, as set forth in Article 9.8.3, after:

.1 Contractor submits the final Application For Payment and all submittals required in accordance with Article 9.3;

.2 Contractor submits all guarantees and warranties procured by Contractor from Subcontractors, all operating manuals for equipment installed in the Project, as-built documents, and all other submittals required by the Contract Documents;

.3 Contractor submits the Final Distribution of Contract Dollars in the form contained in the Exhibits; and

.4 University's Representative issues the final Certificate For Payment.

At its sole discretion, after Final Completion, University may waive the requirement that Contractor submit a final Application For Payment before making final payment and/or release of retention to Contractor.

9.8.3 Final payment shall be paid not more than 10 days after University's Representative issues the final Certificate For Payment. Retention shall be released to Contractor 35 days after the filing of the Notice of Completion.

9.8.4 Acceptance of final payment by Contractor shall constitute a waiver of all claims, except claims for retention and claims previously made in writing and identified by Contractor as unsettled at the time of the final Application For Payment.

ARTICLE 10
PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 Contractor shall take adequate precautions for safety of and shall provide adequate protection to prevent damage, injury, or loss to the following:

.1 Employees involved in the Work and other persons who may be affected thereby.

.2 The Work in place and materials and equipment to be incorporated therein, whether in storage on or off the Project site, under care, custody, or control of Contractor or Subcontractors.

.3 Other property at the Project site and adjoining property.

10.2.2 Contractor shall erect and maintain, as required by existing conditions and performance of the Work, adequate safeguards for safety and protection, including providing adequate lighting and ventilation, posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent sites and utilities.

10.2.3 When use or storage of explosives, other hazardous materials, equipment, or unusual methods are necessary for execution of the Work, Contractor shall exercise the utmost care and carry on such activities only under the supervision of properly qualified personnel.

10.2.4 Contractor shall designate a responsible member of Contractor's organization at the Project site whose duty shall be the prevention of accidents. That person shall be the Superintendent, unless otherwise designated by Contractor in writing to University and University's Representative.

10.2.5 Contractor shall not load or permit any part of the Work or the Project site to be loaded so as to endanger the safety of persons or property.

10.3 EMERGENCIES

10.3.1 In an emergency affecting the safety of persons or property, Contractor shall act to prevent or minimize damage, injury, or loss. Contractor shall promptly notify University's Representative, which notice may be oral followed by written confirmation, of the occurrence of such an emergency and Contractor's action.

ARTICLE 11
INSURANCE AND BONDS

11.1 CONTRACTOR'S INSURANCE

11.1.1 Contractor shall, at its expense, purchase and maintain in full force and effect such insurance as will protect itself and University from claims, such as for bodily injury, wrongful death, and property damage, which may arise out of or result from the Work required by the Contract Documents, whether such Work is done by Contractor, by any Subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. The amounts of such insurance and any additional insurance requirements are specified in the Supplementary Conditions. See Article 3.21 regarding the scope and extent of Contractor’s liability for and repair of damaged Work.

11.1.2 The following policies and coverages shall be furnished by Contractor:

.1 COMMERCIAL GENERAL LIABILITY INSURANCE subject to terms no less broad than the Insurance Services Office’s (ISO) form CG 0001 (2004 or later edition), or a substitute form providing coverage at least as broad as the ISO form specified, covering all Work done by or on behalf of Contractor and providing insurance for bodily injury, wrongful death, personal injury, property damage, and contractual liability. There shall be no limitations or exclusions of coverage beyond those contained in the standard ISO form CG 0001 (2004 or later edition). Except with respect to bodily injury and property damage included within the products and completed operations hazards, the aggregate limit shall apply separately to Work required of Contractor by these Contract Documents. Contractor shall continue to maintain Products/Completed Operations liability insurance coverage for a minimum completed operations period of 10 year(s) or the applicable Statute of Repose as provided by the law of the jurisdiction where the project is located as shown in the policy(ies), whichever is less. All terms and conditions of such coverage shall be maintained during this completed operations period, including the required minimum coverage limits and the requirement to provide the University with coverage as an additional insured for completed operations as

specified under this Article 11.1 and the Supplementary Conditions.

.2 BUSINESS AUTOMOBILE LIABILITY INSURANCE subject to terms no less broad than the Insurance Services Office's (ISO) form CA 0001 (1990 or later edition), or a substitute form providing coverage at least as broad as the ISO form specified, covering owned, hired, leased, and non-owned automobiles used by or on behalf of Insured, and providing liability insurance for bodily injury and property damage arising from the use or operation of such auto(s) with a minimum combined single limit of not less than $1,000,000 per accident. The minimum limits required may be satisfied by combination of primary and umbrella/excess policies. The Commercial Automobile Liability Insurance shall be provided by Contractor for all on site and off site Work.

.3 WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE as required by Federal and State of California law. Contractor shall also require all of its Subcontractors to maintain this insurance coverage.

11.1.3 The coverages required under this Article 11 shall not in any way limit the liability of Contractor.

11.1.4 Contractor's Certificates of Insurance, executed by a duly authorized representative of each broker of record or each insurer as evidence of the insurance required by these Contract Documents and on the form contained in the Exhibits, shall be submitted by Contractor to University prior to the commencement of Work by the Contractor. The Certificates of Insurance shall provide for no cancellation or modification of coverage without prior written notice to University, in accordance with policy provisions.

11.1.5 In the event Contractor does not comply with these insurance requirements, University may, at its option, provide insurance coverage to protect University; and the cost of such insurance shall be paid by Contractor and may be deducted from the Contract Sum.

11.1.6 Contractor's insurance as required by Article 11.1.2, shall, by endorsement to the policies, include the following:

.1 The Regents of the University of California, The University of California, University, and each of their Representatives, consultants, officers, agents, employees, and each of their Representative's consultants, regardless of whether or not identified in the Contract Documents or to the Contractor in writing, will be included as additional insureds on the Contractor's General Liability insurance for and relating to the Work to be performed by the Contractor and Subcontractors. Additional Insured provision or endorsement shall be at least as broad as the CG 20 07 04 in combination with the CG 20 37 07 04 (or earlier versions of CG 20 10 and CG 20 37 or Form B - CG 20 10 11 85 by itself), as published by Insurance Services Offices (ISO) and shall be included with Certificates of Insurance. The additional insured requirement shall not apply to Worker's Compensation and Employer's Liability insurance.

Further, the amount of insurance available to the University shall be for the full amount of the loss up to the available policy limits and shall not be limited to any minimum requirements stated in the Contract Documents.

.2 University, University's consultants, University's Representative, and University's Representative's consultants will not by reason of their inclusion as insureds incur liability to the insurance carriers for payment of premiums for such insurance.

.3 Coverage provided is primary and is not in excess of or contributing with any insurance or self-insurance maintained by University, University's consultants, University's Representative, and University's Representative's consultants. This provision, however, shall only apply as per the stipulations of Article 11.1.6.1.

11.1.7 The form and substance of all insurance policies required to be obtained by Contractor shall be subject to approval by University. All policies required by Articles 11.1.2.1, 11.1.2.2, and 11.1.2.3 shall be issued by companies with ratings and financial classifications as specified in the Supplementary Conditions.

11.1.8 Contractor shall, by mutual agreement with University, furnish any additional insurance as may be required by University. Contractor shall provide Certificates of Insurance evidencing such additional insurance.

11.1.9 The Certificate of Insurance shall show (1) all companies affording coverage and (2) the name of the insured exactly in the manner as shown on the Bid Form. The name of the insured must be the name under which the entity is licensed by the Contractors State License Board.

11.1.10 If insurance company refuses to use the Certificate of Insurance form as contained in the Exhibits, it must provide a Certificate of Insurance evidencing compliance with this Article including those provisions noted under DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES section of the Certificate of Insurance Exhibit by including an endorsement to its Certificate of Insurance form covering those noted provisions exactly as they appear on the Certificate of Insurance Exhibit.

11.1.11 At the request of University, Contractor shall submit to University copies of the policies obtained by Contractor.

11.2 BUILDER'S RISK PROPERTY INSURANCE

11.2.1 If and only if the Contract Sum exceeds $300,000 at the time of award, University will provide its standard builder's risk property insurance, subject to the deductibles, terms and conditions, exclusions, and limitations as contained in the provisions of the policy. A copy of the University's standard builder's risk property insurance policy is available at the University's Facility office. In addition, a summary of the provisions of the policy is included as an Exhibit to the Contract. Contractor agrees that the University's provision of its standard builder's risk property insurance policy meets the University's obligation to provide builder's risk property insurance under the Contract and, in the event of a conflict between the provisions of the policy and any summary or description of the provisions contained herein or otherwise, the provisions of the policy shall control and shall be conclusively presumed to fulfill the University's obligation to provide such insurance. The proceeds under such insurance policies taken out by University insuring the Work and materials will be payable to University and Contractor as their respective interests, from time to time, may appear. Contractor shall be responsible for the deductible amount in the event of a loss. In addition, nothing in this Article 11.2 shall be construed to relieve Contractor of full responsibility for loss of or damage to materials not incorporated in the Work, and for Contractor's tools and equipment used to perform the Work, whether on the Project site or elsewhere, or to relieve Contractor of its responsibilities referred to under this Article 11. Materials incorporated in the Work, as used in this Article 11.2, shall mean materials furnished while in transit to, stored at, or in permanent place at the Project site.

11.2.2 Insurance policies referred to under this Article 11.2 shall:

.1 Include a provision that the policies are primary and do not participate with nor are excess over any other valid collectible insurance carried by Contractor.

.2 Include a waiver of subrogation against Contractor, its Subcontractors, its agents, and employees.

11.2.3 Builder's risk insurance coverage under this Article 11.2 will expire on the date of Final Completion recited in a Notice of Completion filed pursuant to Article 9.8.1. Should a Notice of Completion be filed more than 10 days after the date of Final Completion, the date of Final Completion recited in the Notice of Completion will govern.

11.3 PERFORMANCE BOND AND PAYMENT BOND

11.3.1 Contractor shall furnish bonds covering the faithful performance of the Contract (Performance Bond) and payment of obligations arising thereunder (Payment Bond) on the forms contained in Exhibits 3 and 2.

11.3.2 The Payment Bond and Performance Bond shall each be in the amount of the Contract Sum.

11.3.3 The Payment Bond and Performance Bond shall be in effect on the date the Contract is signed by University.

11.3.4 Contractor shall promptly furnish such additional security as may be required by University to protect its interests and those interests of persons or firms supplying labor or materials to the Work. Contractor shall furnish supplemental Payment and Performance Bonds each in the amount of the current Contract Sum at the request of the University.

11.3.5 Surety companies used by Contractor shall be, on the date the Contract is signed by University, an admitted surety insurer (as defined in the California Code of Civil Procedure Section 995.120).

11.3.6 The premiums for the Payment Bond and Performance Bond shall be paid by Contractor.

ARTICLE 12
UNCOVERING AND CORRECTION OF WORK

12.1 UNCOVERING OF WORK

12.1.1 If a portion of the Work is covered contrary to University's Representative's request or direction, or contrary to the requirements of the Contract Documents, it must, if required in writing by University's Representative, be uncovered for University's Representative's observation and be replaced at Contractor's expense without adjustment of the Contract Time or the Contract Sum.

12.1.2 If a portion of the Work has been covered, which is not required by the Contract Documents to be observed or inspected prior to its being covered and which University's Representative has not specifically requested to observe prior to its being covered, University's Representative may request to see such Work and it shall be uncovered and replaced by Contractor. If such Work is in accordance with the Contract Documents, the costs of uncovering and replacing the Work shall be added to the Contract Sum by Change Order; and if the uncovering and replacing of the Work extends the Contract Time, an appropriate adjustment of the Contract Time shall be made by Change Order. If such Work is not in accordance with the Contract Documents, Contractor shall pay such costs and shall not be entitled to an adjustment of the Contract Time or the Contract Sum.

12.2 CORRECTION OF DEFECTIVE WORK AND GUARANTEE TO REPAIR PERIOD

12.2.1 The term "Guarantee To Repair Period" means a period of 1 year, unless a longer period of time is specified, commencing as follows:

.1 For any Work not described as incomplete in the Certificate of Substantial Completion, on the date of Substantial Completion.
.2 For space beneficially occupied or for separate systems fully utilized prior to Substantial Completion pursuant to Article 9.6, from the first date of such Beneficial Occupancy or actual use, as established in a Certificate of Beneficial Occupancy.
.3 For all Work other than .1 or .2 above, from the date of Final Completion.

12.2.2 Contractor shall (1) correct Defective Work that becomes apparent during the progress of the Work or during the Guarantee To Repair Period and (2) replace, repair, or restore to University's satisfaction any other parts of the Work and any other real or personal property which is damaged or destroyed as a result of Defective Work or the correction of Defective Work. Contractor shall promptly commence such correction, replacement, repair, or restoration upon notice from University's Representative or University, but in no case later than 10 days after receipt of such notice; and Contractor shall diligently and continuously prosecute such correction to completion. Contractor shall bear all costs of such correction, replacement, repair, or restoration, and all losses resulting from such Defective Work, including additional testing, inspection, and compensation for University's Representative's services and expenses. Contractor shall perform corrective Work at such times that are acceptable to University and in such a manner as to avoid, to the extent practicable, disruption to University's activities.

12.2.3 If immediate correction of Defective Work is required for life safety or the protection of property and is performed by University or Separate Contractors, Contractor shall pay to University all reasonable costs of correcting such Defective Work. Contractor shall replace, repair, or restore to University's satisfaction any other parts of the Work and any other real or personal property which is damaged or destroyed as a result of

such Defective Work or the correction of such Defective Work.

12.2.4 Contractor shall remove from the Project site portions of the Work and materials which are not in accordance with the Contract Documents and which are neither corrected by Contractor nor accepted by University.

12.2.5 If Contractor fails to commence correction of Defective Work within 10 days after notice from University or University's Representative or fails to diligently prosecute such correction to completion, University may correct the Defective Work in accordance with Article 2.4; and, in addition, University may remove the Defective Work and store salvageable materials and equipment at Contractor's expense.

12.2.6 If Contractor fails to pay the costs of such removal and storage as required by Articles 12.2.4 and 12.2.5 within 10 days after written demand, University may, without prejudice to other remedies, sell such materials at auction or at private sale, or otherwise dispose of such material. Contractor shall be entitled to the proceeds of such sale, if any, in excess of the costs and damages for which Contractor is liable to University, including compensation for University's Representative's services and expenses. If such proceeds of sale do not cover costs and damages for which Contractor is liable to University, the Contract Sum shall be reduced by such deficiency. If there are no remaining payments due Contractor or the remaining payments are insufficient to cover such deficiency, Contractor shall promptly pay the difference to University.

12.2.7 Contractor's obligations under this Article 12 are in addition to and not in limitation of its warranty under Article 3.4 or any other obligation of Contractor under the Contract Documents. Enforcement of Contractor's express warranties and guarantees to repair contained in the Contract Documents shall be in addition to and not in limitation of any other rights or remedies University may have under the Contract Documents or at law or in equity for Defective Work. Nothing contained in this Article 12 shall be construed to establish a period of limitation with respect to other obligations of Contractor under the Contract Documents. Establishment of the Guarantee To Repair Period relates only to the specific obligation of Contractor to correct the Work and in no way limits either Contractor's liability for Defective Work or the time within which proceedings may be commenced to enforce Contractor's obligations under the Contract Documents.

ARTICLE 13
TERMINATION OR SUSPENSION OF THE CONTRACT

13.1 TERMINATION BY CONTRACTOR

13.1.1 Subject to Article 13.1.2, Contractor shall have the right to terminate the Contract only upon the occurrence of one of the following:

.1 Provided that University has not commenced reasonable action to remove any order of a court within the 90 day period, the Work is stopped for 90 consecutive days, through no act or fault of Contractor, any Subcontractor, or any employee or agent of Contractor or any Subcontractor, due to an issuance of an order of a court or other public authority having jurisdiction or due to an act of government, such as a declaration of a national emergency making material unavailable.

.2 University fails to perform any material obligation under the Contract and fails to cure such default within 30 days, or University has not commenced to cure such default within 30 days where such cure will require a reasonable period beyond 30 days and diligently prosecutes the same to completion, after receipt of notice from Contractor stating the nature of such default(s).

.3 Repeated suspensions by University, other than such suspensions as are agreed to by Contractor under Article 13.3, which constitute in the aggregate more than 20% of the Contract Time.

13.1.2 Upon the occurrence of one of the events listed in Article 13.1.1, Contractor may, upon 10 days additional notice to University and University's Representative, and provided that the condition giving rise to Contractor's right to terminate is continuing, terminate the Contract.

13.1.3 Upon termination by Contractor, University will pay to Contractor the sum determined by Article 13.4.4. Such payment will be the sole and exclusive remedy to which Contractor is entitled in the event of

termination of the Contract by Contractor pursuant to Article 13.1; and Contractor will be entitled to no other compensation or damages and expressly waives the same.

13.2 TERMINATION BY UNIVERSITY FOR CAUSE

13.2.1 University will have the right to terminate the Contract for cause at any time after the occurrence of any of the following events:

.1 Contractor becomes insolvent or files for relief under the bankruptcy laws of the United States.
.2 Contractor makes a general assignment for the benefit of its creditors or fails to pay its debts as the same become due.
.3 A receiver is appointed to take charge of Contractor's property.
.4 The commencement or completion of any Work activity on the critical path is more than 30 days behind the date set forth in the Contract Schedule for such Work activity, as a resultof an Unexcusable Delay. For a Contract with a Contract Time of less than 300 days, the 30-day period shall be reduced to the number of days commensurate with 10% of the Contract Time.
.5 Contractor abandons the Work.

13.2.2 Upon the occurrence of any of the following events, University will have the right to terminate the Contract for cause if Contractor fails to promptly commence to cure such default and diligently prosecute such cure within 5 days after notice from University, or within such longer period of time as is reasonably necessary to complete such cure:

.1 Contractor persistently or repeatedly refuses or fails to supply skilled supervisory personnel, an adequate number of properly skilled workers, proper materials, or necessary equipment to prosecute the Work in accordance with the Contract Documents.
.2 Contractor fails to make prompt payment of amounts properly due Subcontractors after receiving payment from University.
.3 Contractor disregards Applicable Code Requirements.
.4 Contractor persistently or materially fails to execute the Work in accordance with the Contract Documents.
.5 Contractor is in default of any other material obligation under the Contract Documents.
.6 Contractor persistently or materially fails to comply with applicable safety requirements.

13.2.3 Upon any of the occurrences referred to in Articles 13.2.1 and 13.2.2, University may, at its election and by notice to Contractor, terminate the Contract and take possession of the Project site and all materials, supplies, equipment, tools, and construction equipment and machinery thereon owned by Contractor; accept the assignment of any or all of the subcontracts; and then complete the Work by any method University may deem expedient. If requested by University, Contractor shall remove any part or all of Contractor's materials, supplies, equipment, tools, and construction equipment and machinery from the Project site within 7 days of such request; and if Contractor fails to do so, University may remove or store, and after 90 days sell, any of the same at Contractor's expense.

13.2.4 If the Contract is terminated by University as provided in this Article 13.2, Contractor shall not be entitled to receive any further payment until the expiration of 35 days after Final Completion and acceptance of all Work by University.

13.2.5 If the unpaid balance of the Contract Sum exceeds the cost of completing the Work, including all additional costs and expenses made necessary thereby, including costs for University staff time, plus all losses sustained, including any liquidated damages provided under the Contract Documents, such excess shall be paid to Contractor. If such costs, expenses, losses, and liquidated damages exceed the unpaid balance of the Contract Sum, Contractor shall pay such excess to University.

13.2.6 No termination or action taken by University after termination shall prejudice any other rights or remedies of University provided by law or by the Contract Documents upon such termination; and University may proceed against Contractor to recover all losses suffered by University.

13.3 SUSPENSION BY UNIVERSITY FOR CONVENIENCE

13.3.1 University may, at any time and from time to time, without cause, order Contractor, in writing, to suspend, delay, or interrupt the Work in whole or in part for such period of time, up to 90 days, as University may determine, with such period of suspension to be computed from the date of delivery of the written order. Such order shall be specifically identified as a "Suspension Order" under this Article 13.3. The Work may be stopped for such further period as the parties may agree. Upon receipt of a Suspension Order, Contractor shall, at University's expense, comply with its terms and take all reasonable steps to minimize costs allocable to the Work covered by the Suspension Order during the period of Work stoppage. Within 90 days after the issuance of the Suspension Order, or such extension to that period as is agreed upon by Contractor and University, University shall either cancel the Suspension Order or delete the Work covered by such Suspension Order by issuing a Change Order.

13.3.2 If a Suspension Order is canceled or expires, Contractor shall continue with the Work. A Change Order will be issued to cover any adjustments of the Contract Sum or the Contract Time necessarily caused by such suspension. Any Claim by Contractor for an adjustment of the Contract Sum or the Contract Time shall be made within 21 days after the end of the Work suspension. Contractor agrees that submission of its claim within said 21 days is an express condition precedent to its right to Arbitrate or Litigate such a claim.

13.3.3 The provisions of this Article 13.3 shall not apply if a Suspension Order is not issued by University. A Suspension Order shall not be required to stop the Work as permitted or required under any other provision of the Contract Documents.

13.4 TERMINATION BY UNIVERSITY FOR CONVENIENCE

13.4.1 University may, at its option, terminate this Contract, in whole or from time to time in part, at any time by giving notice to Contractor. Upon such termination, Contractor agrees to waive any claims for damages, including loss of anticipated profits, on account thereof; and, as the sole right and remedy of Contractor, University shall pay Contractor in accordance with Article 13.4.4.

13.4.2 Upon receipt of notice of termination under this Article 13.4, Contractor shall, unless the notice directs otherwise, do the following:

.1 Immediately discontinue the Work to the extent specified in the notice.
.2 Place no further orders or subcontracts for materials, equipment, services, or facilities, except as may be necessary for completion of such portion of the Work as is not discontinued.
.3 Promptly cancel, on the most favorable terms reasonably possible, all subcontracts to the extent they relate to the performance of the discontinued portion of the Work.
.4 Thereafter do only such Work as may be necessary to preserve and protect Work already in progress and to protect materials, plants, and equipment on the Project site or in transit thereto.

13.4.3 Upon such termination, the obligations of the Contract shall continue as to portions of the Work already performed and, subject to Contractor's obligations under Article 13.4.2, as to bona fide obligations assumed by Contractor prior to the date of termination.

13.4.4 Upon such termination, University shall pay to Contractor the sum of the following:

.1 The amount of the Contract Sum allocable to the portion of the Work properly performed by Contractor as of the date of termination, less sums previously paid to Contractor.
.2 Plus an amount equal to the lesser of $50,000 or 5% of the difference between the Contract Sum and the amount of the Contract Sum allocable to the portion of the Work properly performed by Contractor as of the date of termination.
.3 Plus previously unpaid costs of any items delivered to the Project site which were fabricated for subsequent incorporation in the Work.
.4 Plus any proven losses with respect to materials and equipment directly resulting from such termination.
.5 Plus reasonable demobilization costs.

.6 Plus reasonable costs of preparing a statement of the aforesaid costs, expenses, and losses in connection with such termination.

The above payment shall be the sole and exclusive remedy to which Contractor is entitled in the event of termination of the Contract by University pursuant to Article 13.4; and Contractor will be entitled to no other compensation or damages and expressly waives same.

ARTICLE 14
STATUTORY AND OTHER REQUIREMENTS

14.1 PATIENT HEALTH INFORMATION

Contractor acknowledges that its employees, agents, subcontractors, consultants and others acting on its behalf may come into contact with Patient Health Information ("PHI") while performing work at the Project Site. This contact is most likely rare and brief (e.g. walking through a clinic where patient files may be visible, overhearing conversations between physicians while working or touring a hospital, noticing a relative or acquaintance receiving treatment in a University facility, etc.). Contractor shall immediately notify University Representative of any such contact. Any and all forms of PHI should not be examined closer, copied, photographed, recorded in any manner, distributed or shared. Contractor will adopt procedures to ensure that its employees, agents and subcontractors refrain from such activity. If Contractor, its employees, agents or subcontractors do further examine, copy, photograph, record in any manner, distribute or share this information, Contractor will report such actions immediately to the University Representative. Contractor will immediately take all steps necessary to stop any such actions and will ensure that no further violations of this contractual responsibility will occur. Contractor will report to University Representative within five (5) days after Contractor gives University Representative notice of the event/action of the steps taken to prevent future occurrences.

14.2 NONDISCRIMINATION

14.2.1 For purposes of this Article 14.2, the term Subcontractor shall not include suppliers, manufacturers, or distributors.

14.2.2 Contractor shall comply and shall ensure that all Subcontractors comply with Section 12900 through 12996, of the State of California Government Code.

14.2.3 Contractor agrees as follows during the performance of the Work:

.1 Contractor shall provide equal treatment to, and shall not willfully discriminate against or allow harassment of any employee or applicant for employment on the basis of: race; color; religion; sex; age; ancestry; national origin; sexual orientation; physical or mental disability; veteran's status; medical condition (as defined in Section 12926 of the State of California Government Code and including cancer-related medical conditions and or genetic characteristics); genetic information (as defined in the Genetic Information Nondiscrimination Act of 2008 and including family medical history); marital status; gender identity, pregnancy, or citizenship (within the limits imposed by law or University's policy) or service in the uniformed services (as defined by the Uniformed Services Employment and Reemployment Rights Act of 1994). Contractor will also take affirmative action to ensure that any such employee or applicant for employment is not discriminated against on any of the bases identified above. Such equal treatment shall apply, but not be limited to the following: employment; upgrade; demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor also agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that qualified applicants will receive consideration for employment without regard to: race; color; religion; sex; age; ancestry; national origin; sexual orientation; physical or mental disability; veteran's status; medical condition (as defined in Section 12926 of the State of California Government Code and including cancer-related medical conditions and or genetic characteristics); genetic information (as defined in the Genetic Information Nondiscrimination Act of 2008

and including family medical history); marital status; gender identity, pregnancy, or citizenship (within the limits imposed by law or University's policy) or service in the uniformed services (as defined by the Uniformed Services Employment and Reemployment Rights Act of 1994). For purposes of this provision: (1) "Pregnancy" includes pregnancy, childbirth, and medical conditions related to pregnancy and childbirth; and (2) "Service in the uniformed services" includes membership, application for membership, performance of service, application for service, or obligation for service in the uniformed services.

.2 Contractor and all Subcontractors will permit access to their records of employment, employment advertisements, application forms, and other pertinent data and records by University or any appropriate agency of the State of California designated by University for the purposes of investigation to ascertain compliance with this Article 14.2. The outcome of the investigation may result in the following:

.1 A finding of willful violation of the provisions of this Contract or of the Fair Employment Practices Act may be regarded by University as (1) a basis for determining that Contractor is not a “responsible bidder” as to future contracts for which such Contractor may submit bids or (2) a basis for refusing to accept or consider the bids of Contractor for future contracts.

.2 University may deem a finding of willful violation of the Fair Employment Practices Act to have occurred upon receipt of written notice from the Fair Employment Practices Commission that it has (1) investigated and determined that Contractor has violated the Fair Employment Practices Act and (2) issued an order under the State of California Government Code Section 12970 or obtained an injunction under Government Code Section 12973.

.3 Upon receipt of such written notice from the Fair Employment Practices Commission, University may notify Contractor that, unless it demonstrates to the satisfaction of University within a stated period that the violation has been corrected, Contractor's bids on future projects will not be considered.

.4 Contractor agrees that, should University determine that Contractor has not complied with this Article 14.2, Contractor shall forfeit to University, as a penalty, for each day or portion thereof, for each person who was denied employment as a result of such non-compliance, the penalties provided in Article 14.3 for violation of prevailing wage rates. Such penalty amounts may be recovered from Contractor; and University may deduct any such penalty amounts from the Contract Sum.

.5 Nothing contained in this Article 14.2 shall be construed in any manner so as to prevent University from pursuing any other remedies that may be available at law.

.6 Contractor shall meet the following standards for compliance and provide University with satisfactory evidence of such compliance upon University's request, which shall be evaluated in each case by University:

.1 Contractor shall notify its Superintendent and other supervisory personnel of the nondiscrimination requirements of the Contract Documents and their responsibilities thereto.

.2 Contractor shall notify all sources of employee referrals (including unions, employment agencies, and the State of California Department of Employment) of the nondiscrimination requirements of the Contract Documents by sending to such sources and by posting the Notice of Equal Employment Opportunity (EEO).

.3 Contractor or its representative shall, through all unions with whom it may have agreements, develop agreements that (1) define responsibilities for nondiscrimination in hiring, referrals, upgrading, and training and (2) implement an affirmative nondiscrimination program, in terms of the unions' specific areas of skill and geography, such that qualified minority women, nonminority women, and minority men shall be available and given an equal opportunity for employment.

.4 Contractor shall notify University of opposition to the nondiscrimination requirements of the Contract Documents by individuals, firms, or organizations during the term of the Contract.

.7 Contractor shall include the provisions of the foregoing Articles 14.2.3.2.1 through 14.2.3.2.6 in all subcontracts with Subcontractors, so that such provisions will be binding upon each such Subcontractor.

14.3 PREVAILING WAGE RATES

14.3.1 For purposes of this Article 14.3, the term Subcontractor shall not include suppliers, manufacturers, or distributors.

14.3.2 Contractor shall comply and shall ensure that all Subcontractors comply with prevailing wage law pursuant to the State of California Labor Code, including but not limited to Section 1720 et seq. of the State of California Labor Code. Compliance with these sections is required by this Contract. The Work under this Contract is subject to compliance monitoring and enforcement by the State of California Department of Industrial Relations.

14.3.3 The State of California Department of Industrial Relations has ascertained the general prevailing per diem wage rates in the locality in which the Work is to be performed for each craft, classification, or type of worker required to perform the Work. A copy of the general prevailing per diem wage rates will be on file at University's principal facility office and will be made available to any interested party upon request. Contractor shall post a copy of the general prevailing per diem wage rates as well as job site notices as prescribed by regulation at the job site. By this reference, such schedule is made part of the Contract Documents. Contractor shall pay not less than the prevailing wage rates, as specified in the schedule and any amendments thereto, to all workers employed by Contractor in the execution of the Work. Contractor shall cause all subcontracts to include the provision that all Subcontractors shall pay not less than the prevailing rates to all workers employed by such Subcontractors in the execution of the Work. Contractor shall forfeit to University, as a penalty, not more than $200 for each calendar day or portion thereof for each worker that is 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 portion of the Work done by Contractor or any Subcontractor. The amount of this penalty shall be determined pursuant to applicable law. Such forfeiture amounts may be deducted from the Contract Sum or sought directly from the surety under its Performance Bond if there are insufficient funds remaining in the Contract Sum. Contractor shall also pay to any worker who was paid less than the prevailing wage rate for the work or craft for which the worker was employed for any portion of the Work, for each day, or portion thereof, for which the worker was paid less than the specified prevailing per diem wage rate, an amount equal to the difference between the specified prevailing per diem wage rate and the amount which was paid to the worker. Review of any civil wage and penalty assessment shall be made pursuant to section 1742 of the California Labor Code.

14.4 PAYROLL RECORDS

14.4.1 For purposes of this Article 14.4, the term Subcontractor shall not include suppliers, manufacturers, or distributors.

14.4.2 Contractor and all Subcontractors shall keep an accurate payroll record, showing the name, address, social security number, job classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyworker, apprentice, worker, or other employee employed in connection with the Work. All payroll records shall be certified as being true and correct by Contractor or Subcontractors keeping such records; and the payroll records shall be available for inspection at all reasonable hours at the principal office of Contractor on the following basis:

.1 A certified copy of an employee's payroll record shall be made available for inspection or furnished to such employee or the employee's authorized representative on request.

.2 A certified copy of all payroll records shall be made available for inspection upon request to University, the State of California Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the State of California Division of Industrial Relations.

.3 A certified copy of all payroll records shall be made available upon request by the public for inspection or copies thereof made; provided, however, that the request by the public shall be made to either University, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. The public shall not be given access to such records at the principal offices of Contractor or

Subcontractors. Any copy of the records made available for inspection as copies and furnished upon request to the public or any public agency by University shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of Contractor awarded the Contract or performing the Contract shall not be marked or obliterated.

14.4.3 Contractor shall file a certified copy of the payroll records with the entity that requested the records within 10 days after receipt of a written request. Contractor shall inform University of the location of such payroll records for the Project, including the street address, city, and county; and Contractor shall, within 5 working days, provide notice of change of location of such records. In the event of noncompliance with the requirements of this Article 14.4 or with the State of California Labor Code Section 1776, Contractor shall have 10 days in which to comply following receipt of notice specifying in what respects Contractor must comply. Should noncompliance still be evident after the 10 day period, Contractor shall forfeit to University, as a penalty, $100 for each day, or portion thereof, for each worker, until strict compliance is accomplished. Such forfeiture amounts may be deducted from the Contract Sum.

14.5 APPRENTICES

14.5.1 For purposes of this Article 14.5, the term Subcontractor shall not include suppliers, manufacturers, and distributors.

14.5.2 Only apprentices, as defined in the State of California Labor Code Section 3077, who are in training under apprenticeship standards and written apprentice agreements under Chapter 4, Division 3, of the State of California Labor Code, are eligible to be employed by Contractor and Subcontractors as apprentices. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and written apprentice agreements under which the apprentice is training and in accordance with prevailing wage law pursuant to the Labor Code, including but not limited to Section 1777.5. The Contractor bears responsibility for compliance with this section for all apprenticeable occupations.

14.5.3 Every apprentice shall be paid the standard wage to apprentices, under the regulations of the craft or trade at which the apprentice is employed, and shall be employed only at the Work in the craft or trade to which the apprentice is indentured.

14.5.4 When Contractor or Subcontractors employ workers in any apprenticeship craft or trade on the Work, Contractor or Subcontractors shall 1) send contract award information to the applicable joint apprenticeship committee that can supply apprentices to the site of the public work and 2) apply to the joint apprenticeship committee, which administers the apprenticeship standards of the craft or trade in the area of the Project site, for a certificate approving Contractor or Subcontractors under the apprenticeship standards for the employment and training of apprentices in the area of the Project site. The committee will issue a certificate fixing the number of apprentices or the ratio of apprentices to journeypersons who shall be employed in the craft or trade on the Work. The ratio will not exceed that stipulated in the apprenticeship standards under which the joint apprenticeship committee operates; but in no case shall the ratio be less than 1 hour of apprentice work for every 5 hours of journeyperson work, except as permitted by law. Contractor or Subcontractors shall, upon the issuance of the approval certificate in each such craft or trade, employ the number of apprentices or the ratio of apprentices to journeypersons fixed in the certificate issued by the joint apprenticeship committee or present an exemption certificate issued by the Division of Apprenticeship Standards.

14.5.5 “Apprenticeship craft or trade,” as used in this Article 14.5, shall mean a craft or trade determined as an apprenticeship occupation in accordance with rules and regulations prescribed by the Apprenticeship Council.

14.5.6 If Contractor or Subcontractors employ journeyworkers or apprentices in any apprenticeship craft or trade in the area of the Project site, and there exists a fund for assisting to allay the cost of the apprenticeship program in the trade or craft, to which fund or funds other contractors in the area of the Project site are contributing, Contractor and Subcontractors shall contribute to the fund or funds in each craft or trade in which they employ journeyworkers or apprentices on the Work in the same amount or upon the same basis and in the same manner done by the other contractors. Contractor may include the amount of such contributions in computing its bid for the Contract; but if Contractor fails to do so, it shall not be entitled to any additional

compensation therefor from University.

14.5.7 In the event Contractor willfully fails to comply with this Article 14.5, it will be considered in violation of the requirements of the Contract.

14.5.8 Nothing contained herein shall be considered or interpreted as prohibiting or preventing the hiring by Contractor or Subcontractors of journeyworker trainees who may receive on-the-job training to enable them to achieve journeyworker status in any craft or trade under standards other than those set forth for apprentices.

14.6 WORK DAY

14.6.1 Contractor shall not permit any worker to labor more than 8 hours during any 1 day or more than 40 hours during any 1 calendar week, except as permitted by law and in such cases only upon such conditions as are provided by law. Contractor shall forfeit to University, as a penalty, $25 for each worker employed in the execution of this Contract by Contractor, or any Subcontractor, for each day during which such worker is required or permitted to work more than 8 hours in any 1 day and 40 hours in any 1 calendar week in violation of the terms of this Article 14.6 or in violation of the provisions of any law of the State of California. Such forfeiture amounts may be deducted from the Contract Sum. Contractor and each Subcontractor shall keep, or cause to be kept, an accurate record showing the actual hours worked each day and each calendar week by each worker employed on the Project, which record shall be kept open at all reasonable hours to the inspection of University, its officers and agents, and to the inspection of the appropriate enforcement agency of the State of California.

ARTICLE 15
MISCELLANEOUS PROVISIONS

15.1 GOVERNING LAW

15.1.1 The Contract shall be governed by the law of the State of California.

15.2 SUCCESSORS AND ASSIGNS

15.2.1 University and Contractor respectively bind themselves and their successors, permitted assigns, and legal representatives to the other party and to the successors, permitted assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract, in whole or in part, without prior written consent of the other party. Notwithstanding any such assignment, each of the original contracting parties shall remain legally responsible for all of its obligations under the Contract.

15.3 RIGHTS AND REMEDIES

15.3.1 All University's rights and remedies under the Contract Documents will be cumulative and in addition to and not in limitation of all other rights and remedies of University under the Contract Documents or otherwise available at law or in equity.

15.3.2 No action or failure to act by University or University's Representative will constitute a waiver of a right afforded them under the Contract, nor will such action or failure to act constitute approval of or acquiescence in a condition or breach thereunder, except as may be specifically agreed in writing. No waiver by University or University's Representative of any condition, breach or default will constitute a waiver of any other condition, breach or default; nor will any such waiver constitute a continuing waiver.

15.3.3 No provision contained in the Contract Documents shall create or give to third parties any claim or right of action against University, University's Representative, or Contractor.

15.4 SURVIVAL

15.4.1 The provisions of the Contract which by their nature survive termination of the Contract or Final Completion, including all warranties, indemnities, payment obligations, and University's right to audit Contractor's books and records, shall remain in full force and effect after Final Completion or any termination of the Contract.

15.5 COMPLETE AGREEMENT

15.5.1 The Contract Documents constitute the full and complete understanding of the parties and supersede any previous agreements or understandings, oral or written, with respect to the subject matter hereof. The Contract may be modified only by a written instrument signed by both parties or as provided in Article 7.

15.6 SEVERABILITY OF PROVISIONS

15.6.1 If any one or more of the provisions contained in the Contract Documents should be invalid, illegal, or unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions contained herein shall not in any way be affected or impaired thereby.

15.7 UNIVERSITY'S RIGHT TO AUDIT

15.7.1 University and entities and agencies designated by University will have access to and the right to audit and the right to copy at University's cost all of Contractor's books, records, contracts, correspondence, instructions, drawings, receipts, vouchers, purchase orders, and memoranda relating to the Work. Contractor shall preserve all such records and other items during the performance of the Contract and for a period of at least 3 years after Final Completion.

15.8 METHODS OF DELIVERY FOR SPECIFIED DOCUMENTS

15.8.1 The following documents must be delivered in a manner specified in Article 15.8.2:

.1 Contractor Notices of election to litigate or arbitrate;
.2 Written demand for an informal conference to meet and confer pursuant to Article 4.5;
.3 University's written statement identifying remaining disputes following informal conference pursuant to Article 4.6;
.4 Written demand for non-binding mediation pursuant to Article 4.6;
.5 Contractor claims pursuant to Article 4.3;
.6 Contractor notices of conditions pursuant to Articles 3.17, 3.18, or 3.19;
.7 University's notices of Contractor's failure to perform and/or correct defective work pursuant to Articles 4.1.6, 12.2 and 13.2.3;
.8 University's notice to stop work pursuant to Article 2.3.1:
.9 Notices of termination or suspension pursuant to Article 13.

15.8.2 Delivery methods for documents specified in Article 15.8.1:

.1 By personal delivery.
.2 Sent by facsimile copy where receipt is confirmed.
.3 Sent by Express Mail, or another method of delivery providing for overnight delivery where receipt is confirmed.
.4 Sent by registered or certified mail, postage prepaid, return receipt requested.

15.8.3 The documents identified in Article 15.8.1 shall only be effective if delivered in the manner specified in Article 15.8.2. Subject to the forgoing, such documents shall be deemed given and received upon actual receipt in the case of all except registered or certified mail; and in the case of registered or certified mail, on the date shown on the return receipt or the date delivery during normal business hours was attempted. Delivery of the specified documents shall be made at the respective street addresses set forth in the Agreement. Such street addresses may be changed by notice given in accordance with this Article 15.8.

15.9 TIME OF THE ESSENCE

15.9.1 Time limits stated in the Contract Documents are of the essence of the Contract.

15.10 MUTUAL DUTY TO MITIGATE

15.10.1 University and Contractor shall use all reasonable and economically practicable efforts to mitigate delays and damages to the Project and to one another with respect to the Project, regardless of the cause of such delay or damage.

15.11 UC FAIR WAGE

Contractor shall pay all persons providing construction services and/or any labor on site, including any University location, no less than the UC Fair Wage (defined as $13 per hour as of 10/1/15, $14 per hour as of 10/1/16, and $15 per hour as of 10/1/17) and shall comply with all applicable federal, state and local working condition requirements.

SUPPLEMENTARY CONDITIONS

1. MODIFICATION OF GENERAL CONDITIONS, ARTICLE 11 – INSURANCE AND BONDS

Contractor shall furnish and maintain insurance in the amounts below.

The insurance required by 11.1.2.1 and 11.1.2.2 shall be (i) issued by companies with a Best rating of A- or better, and a financial classification of VIII or better (or an equivalent rating by Standard & Poor or Moody's) or (ii) guaranteed, under terms consented to by the University (such consent to not be unreasonably withheld), by companies with a Best rating of A- or better, and a financial classification of VIII or better (or an equivalent rating by Standard & Poor or Moody's). Such insurance shall be written for not less than the following:

		Minimum Requirement
11.1.2.1	Commercial General Liability Insurance-Limits of Liability	
	Each Occurrence-Combined Single Limit for Bodily Injury and Property	$ 1,000,000.00
	Products-Completed Operations Aggregate	$ 1,000,000.00
	Personal and Advertising Injury	$ 1,000,000.00
	General Aggregate	$ 2,000,000.00
11.1.2.2	Business Automobile Liability Insurance-Limits of Liability Each Accident-Combined Single Limit for Bodily Injury and Property Damage	$ 1,000,000.00

Insurance required by Paragraph 11.1.2.3 shall be issued by companies (i) that have a Best rating of B+ or better, and a financial classification of VIII or better (or an equivalent rating by Standard & Poor or Moody's); or (ii) that are acceptable to the University. Such insurance shall be written for not less than the following:

		Minimum Requirement
11.1.2.3	WORKER'S COMPENSATION AND EMPLOYER'S LIABILITY –	
	Worker's Compensation:	(as required by Federal and State of California law)
	Employer's Liability:	
	Each Employee	$1,000,000
	Each Accident	$1,000,000
	Policy Limit	$1,000,000

3. MODIFICATION OF ARTICLE 8 – CONTRACT TIME

Rainy weather in excess of the following number of days will be granted a Contract Time extension pursuant to Article 8.4 of the General Conditions:

Total Number of days – 10 days

4. MODIFICATION OF GENERAL CONDITIONS ARTICLE 15 – MISCELLANEOUS PROVISIONS

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same Agreement. The counterparts of this Agreement may be executed via a University approved digital signature process and shall have the same force and effect as the use of a manual signature. The University reserves the right to reject any digital signature that cannot be positively verified by the University system as an authentic digital signature.

EXHIBITS

TABLE OF CONTENTS

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Project Name: Rubidoux Screenhouse Conversion- Phase II Electrical

Project Number: 950567

Contract Number: 950567-LF-2022-68

APPLICATION FOR PAYMENT

Application No. _____ Period From: _____ To: _____

Application Date: _____ Contract Date: _____

To **University**: THE REGENTS OF THE UNIVERSITY OF CALIFORNIA,
University of California, Riverside, and University's Representative

From Contractor: _____

Address: _____

_____

CHANGE ORDER SUMMARY:		Additions	Deductions
Change Orders approved in previous months:	Total:		
Change Orders approved this month:			
Number:	Date Approved:		
	Total:	$-	$-

NET CHANGE BY CHANGE ORDERS: $-

Application is made for payment under the Contract as shown below and in Schedule 1 attached hereto:

1.	ORIGINAL CONTRACT SUM		
2.	NET CHANGE BY CHANGE ORDERS		$-
3.	CONTRACT SUM TO DATE (Line 1 ± Line 2)		$-
4.	TOTAL AMOUNT COMPLETED TO DATE (Column E on Schedule 1)		
5.	RETENTION: _____ % of Completed Work (Column H on Schedule 1)*		
	a. Current Value of Securities Deposited in Escrow		
	b. Current Value of Retention Deposited in Escrow		
	c. Retention Held by University		
	Current Retention Value (a + b + c)	$-	
6.	TOTAL EARNED LESS RETENTION (Line 4 less Line 5)		$-
7.	TOTAL AMOUNT PREVIOUSLY PAID		
8.	CURRENT PAYMENT DUE (Line 6 less Line 7)		$-
9.	BALANCE TO FINISH, PLUS RETENTION (Line 3 less Line 6)		$-

*Pursuant to Article 9.2.2 of the General Conditions.

The undersigned Contractor hereby represents and warrants to University that all Work, for which Certificates For Payment have previously been issued and payment received from University, is free and clear of all claims, stop notices, security interests, and encumbrances in favor of Contractor, any Subcontractor, and any other persons or firms entitled to make claims by reason of having provided labor, materials, or equipment related to the Work.

The following Schedules are attached and incorporated herein, and made a part of this Application For Payment:

Schedule 1 Cost Breakdown Schedule
Schedule 2 Certification of Current Market Value of Securities in Escrow in Lieu of Retention
Schedule 3 List of Subcontractors
Schedule 4 Declaration of Releases of Claims

Contractor: _____

By: _____
(Signature & Date)

_____
(Print Name & Title)

DECLARATION

I, _____, hereby declare that I am the
(Print Name)

_____ of Contractor submitting this Application For
(Title)

Payment; that I am duly authorized to execute and deliver this Application For Payment on behalf of Contractor; and that all information set forth in this Application For Payment and all Schedules attached hereto are true, accurate, and complete as of its date.

I declare, under penalty of perjury, that the foregoing is true and correct and that this declaration was subscribed at _____, _____,
(City) (County)

State of _____ on _____.
(Date)

_____
(Signature & Date)

_____
(Print Name & Title)

UC RIVERSIDE | Planning, Design & Construction

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

(for non-UCIP Construction Projects and Consultant/Design Contracts)

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	

INSURED	INSURER(S) AFFORDING COVERAGE	NAIC #
	INSURER A :	
	INSURER B :	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	GENERAL LIABILITY ☐ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☐ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PRO-JECT ☐ LOC						
	AUTOMOBILE LIABILITY ☐ ANY AUTO ☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS ☐ HIRED AUTOS ☐ NON-OWNED AUTOS						
	☐ **UMBRELLA LIAB** ☐ OCCUR ☐ **EXCESS LIAB** ☐ CLAIMS-MADE ☐ DED ☐ RETENTION $						
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N ☐ **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	**N/A**					☐ WC STATU-TORY LIMITS ☐ OTH-ER
	PROFESSIONAL LIABILITY ☐ OCCUR ☐ CLAIMS-MADE						

Special Provisions:

1. The Regents of the University of California, The University of California, University, and each of their Representatives, consultants, officers, agents, employees, and each of their Representative's consultants, are included as additional insureds on the general liability policy as required by contract and pursuant to additional insured endorsement CG2010 (11/85) or a combination of both CG 2010 (10/01 or 07/04) and CG 2037 (10/01 or 07/04) but only in connection with Rubidoux Screenhouse Conversion- Phase II Electrical, Project No. 950567, Contract No. 950567-LF-2022-68.
2. The General Liability coverage contains a Severability of Interest provision and shall be primary insurance as respects The Regents of the University of California, its officers, agents and employees. Any insurance or self-insurance maintained by The Regents of the University of California shall be excess of and non-contributory with this insurance.

CERTIFICATE HOLDER: The Regents of the University of California

Forward to: UCR CAPITAL PROGRAMS PLANNING, DESIGN & CONSTRUCTION, ATTN: CONTRACTS 1223 UNIVERSITY AVENUE, SUITE 240 RIVERSIDE, CA 92521	**SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.** ***AUTHORIZED REPRESENTATIVE***

CERTIFICATE OF SUBSTANTIAL COMPLETION

Contractor: _____ Date of Issuance: _____

The Work has been reviewed and the date of Substantial Completion is hereby established as of the date of issuance above.

A Certificate of Occupancy has been issued by the University's Building Official **Name**, **Title** on **Date**.

A punch list of items to be completed or corrected is included herein. The failure to include any items on such list does not alter the responsibility of Contractor to complete all of the Work in accordance with the Contract Documents.

In accordance with the Contract Documents, Contractor is notified as follows:

1. Without limitation of Contractor's obligation to fully complete the Work within the Contract Time, Contractor shall complete or correct the Work on the list of items ("Punch List") attached hereto within days from the date of Substantial Completion.

2. University will be responsible for **INSERT "NONE" OR STATE ANY UNIVERSITY RESPONSIBILITIES AFTER SUBSTANTIAL COMPLETION: security, maintenance, utilities (e.g. water, sewer, electrical, gas, etc.)**

3. Contractor shall be responsible for all Contract requirements except items or responsibilities of University set forth in Paragraph 2 above.

4. List of items to be completed or corrected: **INSERT "NONE" or "SEE ATTACHMENT: LIST OF ITEMS TO BE COMPLETED OR CORRECTED."**

UNIVERSITY'S REPRESENTATIVE

(Signature & Date)
Tameesha Hayes
Project Manager
Planning, Design & Construction
(Print Name & Title)

UNIVERSITY:
By: The Regents of the University of California
University of California, Riverside

(Signature & Date)
Drew Hecht, Architect
Director of Project Management
Planning, Design & Construction
(Print Name & Title)

cc: Office of Risk Management

PUNCH LIST OF ITEMS TO BE COMPLETED OR CORRECTED

ATTACHMENT TO CERTIFICATE OF SUBSTANTIAL COMPLETION ISSUED

Contractor:

CHANGE ORDER REQUEST

Date: _____ Change Order Request (COR) No. _____

Scope of Change:

Instructions:

1. Complete this form by providing (a) all information required above, (b) the amount and justification based upon the Contract Schedule for any proposed adjustment of Contract Time, (c) the proposed adjustment of Contract Sum, (d) the attached "Cost Proposal Summary," and (e) the attached form entitled, "Supporting Documentation for the Cost Proposal Summary."

2. Attach the form entitled "Supporting Documentation for the Cost Proposal Summary" for Contractor and each Subcontractor involved in the Extra Work. Each such form shall be completed and signed by Contractor or Subcontractor actually performing the Work Activity identified on the form. Attach supporting data to each such form to substantiate the individually listed costs. The costs provided on these forms shall be used to substantiate additional costs shown on the Cost Proposal Summary.

3. The Contractor Fee shall be computed on the Cost of Extra Work of Contractor and each Subcontractor involved in the Extra Work; and shall constitute full compensation for all costs and expenses related to the subject change and not listed in the "Supporting Documentation for the Cost Proposal Summary," including overhead and profit.

4. Refer to Article 7.3 of the General Conditions for the method of computing the Contractor Fee.

Adjustment of the Contract Time (Include justification based upon the Contract Schedule): _____ (Days)
Refer to Article 8 of the General Conditions.

Adjustment of the Contract Sum (Total from Line 18, Col. 4 of Cost Proposal Summary): $ _____
Refer to Article 7 of the General Conditions.

Submitted: CONTRACTOR **Received: UNIVERSITY'S REPRESENTATIVE**

_____
(Company Name)

_____ _____
(Signature & Date) (Signature & Date)

Tameesha Hayes
Project Manager
Planning, Design & Construction

_____ _____
(Print Name & Title) (Print Name & Title)

cc: Executive Director, Architects & Engineers, Capital Programs

COST PROPOSAL SUMMARY

Contractor: _____ COR No. _____

		(1) Contractor	(2) 1st Tier Subs	(3) 2nd & Lower Tier Subs	(4) Total
ACTUAL COSTS	1. Straight Time Wages/Salaries-Labor				-
	2. Fringe Benefits and Payroll Taxes-Labor				-
	3. Overtime Wages/Salaries-Labor				-
	4. Fringe Benefits & Payroll Taxes-Overtime				-
	5. Materials & Cnsumable Items				-
	6. Sales Taxes (On Line 5)				-
	7. Rental Charges				-
	8. Royalties				-
	9. Permits				-
	10. Total Direct Expense (Sum of Lines 1-9)	$-	$-	$-	$-
	11. Insurance & Bonds (up to 2% of Line 10)	-	-	-	-
CONTRACTOR FEE	12. Sub-Sub (15% of Line 10, Col. 3)			-	-
	13. Subcontractor (5% of Line 10, Col. 3)		-		-
	14. Subcontractor (15% of Line 10, Col. 2)		-		-
	15. Contractor (5% of Line 10, Col. 2 & 3)	-			-
	16. Contractor (15% of Line 10, Col. 1)	-			-
	17. Contractor Fee (Sum of Lines 12-16)	$-	$-	$-	$-
TOTAL	18. Sum of Lines 10, 11, & 17	$-	$-	$-	$-

Actual Costs are taken from Line 12 of the attached forms entitled, “Supporting Documentation For the Cost Proposal Summary” for Contractor and each Subcontractor involved in the Extra Work.

SUPPORTING DOCUMENTATION FOR THE COST PROPOSAL SUMMARY

Supporting Documentation From: _____ COR No. _____
(Contractor/Subcontractor Name)

Work Activity: _____

COST ITEM	DESCRIPTION	COST[1]
ACTUAL COSTS	1. Straight Time Wages/Salaries-Labor	
	2. Fringe Benefits & Payroll Taxes-Labor: ___% of Line 1	
	3. Overtime Wages/Salaries-Labor (Attach University's Representative's written authorization.)	
	4. Fringe Benefits & Payroll Taxes-Overtime: ___% of Line 3	
	5. Materials & Consumable Items	
	6. Sales Taxes: ___% of Line 5	
	7. Rental Charges (Attach CalTrans' Schedule.)	
	8. Royalties	
	9. Permits	
	10. Total Direct Expense (Sum of Lines 1-9)	$-
	11. Insurance & Bonds ___% of Line 10 (up to 2% of Line 10)	-
TOTAL	12. Sum of Lines 10 & 11	$-

Prepared By:[2]

_____
(Company Name)

_____
(Signature & Date)

_____
(Print Name & Title)

CONTRACTOR:[3]

_____
(Company Name)

_____
(Signature & Date)

_____
(Print Name & Title)

Notes:

(1) This form shall be prepared and signed by Contractor or Subcontractor actually performing the Work Activity indicated above.
(2) If this form is signed by a Subcontractor, it shall be reviewed and signed by Contractor certifying the accuracy of the information.

UC RIVERSIDE | Planning, Design & Construction

Project Name: Rubidoux Screenhosue Conversion- Phase II Electrical

Project Number: 950567

Contract Number: 950567-LF-2022-68

CHANGE ORDER

Contract Date: _____

Change Order No.: _____

Date Issued: _____

To Contractor: _____

Attn: _____

Address: _____

_____

DESCRIPTION OF CHANGE: (Reference attachments)	Contract Sum Adjustment	Contract Time Adjustment
1.		
2.		
☐ **Description of Change continued on Page 2. Subtotal from Page 2:**	**$0.00**	**0**

Adjustment of Contract Sum:		Adjustment of Contract Time:		
Original Contract Sum:		Original Contract Time:	0	(Days)
Prior Adjustments:		Prior Adjustments:	0	(Days)
Contract Sum before this Change:	**$-**	Contract Time before this Change:	**0**	(Days)
Adjustment for this Change:	**$-**	Adjustment for this Change:	**0**	(Days)
Revised Contract Sum:	**$-**	Revised Contract Time:	**0**	(Days)
		Start Date:		
		Original Final Completion Date:	##########	
		Revised Final Completion Date:	##########	

Contractor waives any claim for further adjustments of the Contract Sum and the Contract Time related to the above described change in the Work.

Accepted:

By: Contractor

_____

(Signature & Date)

_____

(Print Name & Title)

Recommended:

By: University's Representative

_____

(Signature & Date)

Tameesha Hayes

Project Manager

Planning, Design & Construction

(Print Name & Title)

Funds Sufficient:

By: Financial Administrative Officer

_____

(Signature & Date)

Susan McFadden

Senior Financial Analyst

Planning, Design & Construction

(Print Name & Title)

Approved:

University: The Regents of the University of California

_____

(Signature & Date)

Drew Hecht, Architect

Director of Project Management

Planning, Design & Construction

(Print Name & Title)

Account No.: _____ Activity Code: _____

Fund: _____ Function: _____

Cost Center: _____ Project Code: _____

UC RIVERSIDE | Planning, Design & Construction

Project Name: Rubidoux Screenhosue Conversion- Phase II Electrical

Project Number: 950567

Contract Number: 950567-LF-2022-68

CHANGE ORDER

Contract Date: _____ Change Order No.: _____

	DESCRIPTION OF CHANGE - CONTINUED	Contract Sum Adjustment	Contract Time Adjustment
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	Subtotals:	**$0.00**	**0**

CLAIM CERTIFICATION - GENERAL CONTRACTOR

Pursuant to Article 4.3.3 of the General Conditions, I certify as follows:

1. The Claim to which this certification is attached is made in good faith.

2. Amounts claimed for costs, expenses and damages incurred by Contractor are accurate and complete. Supporting data for amounts incurred by Contractor is accurate and complete. Any such supporting data, including any such new amounts, submitted after the execution of this certification, will be accurate and complete.

3. To the best of my knowledge and belief, amounts claimed, and supporting data submitted by Contractor on behalf of any and all subcontractors or suppliers, of all tiers, or any person or entity under Contractor, are accurate and complete. Contractor will not submit, after the date of execution of this certification, any such supporting data, including any such new amounts that, to the best of my knowledge and belief, is not accurate and complete.

4. The amount requested accurately reflects the adjustment of the Contract Sum for which the Contractor believes the University is liable.

5. Attached hereto is a certification that has been executed by each Subcontractor claiming not less than 5% of the total monetary amount sought by the claim to which this certification is attached.

6. I am duly authorized to certify the Claim on behalf of the Contractor.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration was executed at _____ (Name of City if within a City, otherwise, Name of County),

in the State of _____ (Name of State), on _____ (Date).

_____
(Name of Contractor)

By: _____
(Signature)

_____
(Print Name & Title)

CLAIM CERTIFICATION - SUBCONTRACTOR

Pursuant to Article 4.3.3 of the General Conditions, I certify as follows:

1. The portion of the Claim made on behalf of the Subcontractor to which this certification is attached is made in good faith.

2. Amounts claimed for costs, expenses and damages incurred by the Subcontractor are accurate and complete. Supporting data for amounts incurred by the Subcontractor is accurate and complete. Any such supporting data, including any such new amounts, submitted to Contractor after the execution of this certification, will be accurate and complete.

3. To the best of my knowledge and belief, amounts claimed, and supporting data submitted to Contractor by the Subcontractor on behalf of any and all subcontractors or suppliers to Subcontractor, of all tiers, or any person or entity under Subcontractor, are accurate and complete. Subcontractor will not submit, after the date of execution of this certification, any such supporting data, including any such new amounts that, to the best of my knowledge and belief, is not accurate and complete.

4. The amount requested accurately reflects the amount for which the Subcontractor believes the University is liable to Contractor.

5. I am duly authorized to certify the Claim on behalf of the Subcontractor.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration was executed at _____ ,
(Name of City if within a City, otherwise, Name of County)

in the State of _____ , on _____ .
(Name of State) (Date)

_____
(Name of Subcontractor)

By: _____
(Signature)

_____
(Print Name & Title)

CONDITIONAL WAIVER AND RELEASE ON FINAL PAYMENT

NOTICE:
THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Identifying Information:

Name of Claimant: _____

Name of Customer: _____

Job Location: **Rubidoux Screenhouse Conversion- Phase II Electrical, Project No. 950567**

University of California, Riverside, City of Riverside, County of Riverside

Owner: **The Regents of the University of California**

Conditional Waiver and Release:

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is

Maker of Check: _____

Amount of Check: $ _____

Check Payable to: _____

Exceptions:

This document does not affect any of the following: Disputed claims for extras in the amount of:

$ _____ .

Signature:

Claimant's Signature & Date: _____

Claimant's Name & Title: _____

Prime Contractor's Application for Payment # _____

CONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT

NOTICE:
THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Identifying Information:

Name of Claimant: _____

Name of Customer: _____

Job Location: **Rubidoux Screenhouse Conversion- Phase II Electrical, Project No. 950567**
University of California, Riverside, City of Riverside, County of Riverside

Owner: **The Regents of the University of California**

Through Date: _____

Conditional Waiver and Release:

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: $ _____

Check Payable to: _____

Exceptions:

This document does not affect any of the following:

(1) Retentions.
(2) Extras for which the claimant has not received payment.
(3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of Waiver and Release: _____

Amount(s) of Unpaid Progress Payment(s): $ _____

(4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Signature:

Claimant's Signature & Date: _____

Claimant's Name & Title: _____

Prime Contractor's Application for Payment # _____

RETURN THIS AGREEMENT SIGNED BY CONTRACTOR AND ESCROW AGENT TO:
UNIVERSITY OF CALIFORNIA, RIVERSIDE
Planning, Design & Construction
1223 University Ave, Suite 240
Riverside, CA 92521
USE THIS ADDRESS FOR ALL CORRESPONDENCE

Escrow Account No.: _____

ESCROW AGREEMENT FOR DEPOSIT OF SECURITIES IN LIEU OF RETENTION AND DEPOSIT OF RETENTION

This Escrow Agreement is made as of _____ (Date), and entered into by and between THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, hereinafter called "University," and

_____ ,

whose address is _____ ,

hereinafter called "Contractor," and _____ ,

a state or federally chartered bank in the state of California, whose address is

_____ ,

hereinafter called "Escrow Agent."

For consideration hereinafter set forth, University, Contractor, and Escrow Agent agree as follows:

(1) Contractor has the option to deposit securities with Escrow Agent as a substitute for retention required to be withheld by University pursuant to the Contract Documents, hereinafter referred to as "Contract," entered into between University and Contractor for the Project titled

_____ ,

Project Number _____ , in the amount of $ _____ ,

dated _____ . Alternatively, on written request of Contractor, University shall deposit retention directly with Escrow Agent. Contractor and its surety shall be at risk for failure of the Escrow Agent selected. When Contractor deposits the securities as a substitute for retention, Escrow Agent shall notify University within 5 days after the deposit. At all times, Contractor shall have on deposit securities the market value of which is at least equal to the cash amount then required to be withheld as retention under the terms of the Contract. Securities shall be held in the name of The Regents of the University of California, Riverside; and Contractor shall be designated as the beneficial owner.

(2) Escrow Agent shall review the market value of securities deposited in escrow under this Escrow Agreement as often as conditions of the securities market warrant, but in no case less than once per month. Escrow Agent shall promptly notify University and Contractor of the market value of the deposited securities if such market value is less than the total amount of retention required to be withheld under the terms of the

Contract. Contractor shall promptly deposit additional securities so that the current market value of the total of all deposited securities shall be at least equal to the total required amount of retention. Escrow Agent shall, within 5 days after University's request, provide a statement to University of the current market value of all securities deposited under this Escrow Agreement as of a date not earlier than 5 days prior to such request. The provisions of this Paragraph 2 shall not apply to securities consisting of monetary deposits as allowed by Paragraph 7 held by a bank as Escrow Agent, provided the bank provides monthly statements reflecting the status of the monetary deposits held by the bank to University and Contractor.

(3) Contractor shall not use any or all of the securities deposited in lieu of retention under this Escrow Agreement for any other obligations, including deposits in lieu of retention for other contracts. Contractor represents, covenants and warrants that all deposited securities shall be lien free when tendered to the Escrow Agents and shall remain lien free during their retention by the Escrow Agent.

(4) University shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to the Contract provision, provided that Escrow Agent holds securities in the form and amount specified herein.

(5) Prior to Contractor's submission of each Application For Payment, Escrow Agent shall issue a current statement of (a) the value of the securities currently being deposited in lieu of retention and (b) the current value of all securities being held in escrow pursuant to this Escrow Agreement. Such statement shall be no more than 5 days old at the time of submission, shall be notarized or have a guarantee of signature, and shall be submitted to Contractor with a copy to University under separate cover. Contractor shall attach such original statement to each Application For Payment. The provisions of this Paragraph 5 shall not apply to securities consisting of monetary deposits as allowed by Paragraph 7 held by a bank as Escrow Agent, provided the bank provides monthly statements reflecting the status of the monetary deposits held by the bank to University and Contractor.

(6) If, at the request of Contractor, University deposits retention directly with Escrow Agent, Escrow Agent shall hold such retention for the benefit of Contractor until such time as the escrow created under the Contract is terminated. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when University deposits retention directly with Escrow Agent.

(7) University will allow Contractor to deposit the following securities in lieu of retention and direct the investment of the retention deposits into any of the following which at the time of payment are legal investments under the laws of the State of California:

a. Direct obligations of the United States of America (including obligations issued or held in book-entry form on the books of the Department of the Treasury of the United States of America or any Federal Reserve Bank), or obligations the timely payment of the principal of and interest on which are fully guaranteed by the United States of America, or tax-exempt obligations which are rated in the highest rating category of a nationally recognized bond rating agency.

b. Obligations, debentures, notes or other evidence of indebtedness issued or guaranteed by any of the following: Banks for Cooperatives, Federal Intermediate Credit Banks, Federal Home Loan Bank System, Export-Import Bank of the United States, Federal Financing Bank, Federal Land Banks, Federal Farm Credits, Government National Mortgage Association, Farmer's Home Administration, Federal Home Loan Mortgage Corporation, or Federal Housing Administration.

c. Bonds of the State of California or those for which the faith and credit of the State of California are pledged for the payment of principal and interest.

d. Interest-bearing bankers acceptances and demand or time deposits (including certificates of deposit) in banks, provided such deposits are either (1) secured at all times, in the manner and to the extent provided by law, by collateral security described in clauses a or b of this Paragraph 7 continuously having a market value at least equal to the amount so invested so long as such

underlying obligations or securities are in the possession of the Securities Investors Protection Corporation, (2) in banks having a combined capital and surplus of at least One Hundred Million Dollars, or (3) fully insured by the Federal Deposit Insurance Corporation.

e. Taxable government money market portfolios restricted to obligations with maturities of one (1) year or less, issued or guaranteed as to payment of principal and interest by the full faith and credit of the United States of America.

f. Commercial paper rated in the highest rating category of a nationally recognized rating agency, and issued by corporations organized and operating within the United States of America and having total assets in excess of Five Hundred Million Dollars.

(8) Contractor shall be responsible for paying all fees, costs, and expenses incurred by Escrow Agent in administering the escrow account. These expenses and payment terms shall be determined by Contractor and Escrow Agent. All fees, costs, and expenses of this Escrow Agreement and any transactions carried out hereunder shall be billed by Escrow Agent to Contractor. In the event that any fees, costs, or expenses shall remain unpaid in excess of 30 days from the date due, Escrow Agent may withhold such unpaid amount from any income distributable to Contractor, but shall not withhold such unpaid amount from any income distributable to University.

(9) Interest earned on the securities or the money market accounts held in escrow and all interest earned on the interest shall be for the sole account of Contractor and shall be held in escrow. Interest may be withdrawn by Contractor from time to time, without notice to University, only to the extent that the total amount held in escrow meets or exceeds the required amount of retention.

(10) Except as provided in Paragraph 9, Contractor shall have the right to withdraw all or any part of the escrow account only by written notice to Escrow Agent accompanied by written authorization from University to Escrow Agent stating that University consents to the withdrawal of the amount sought to be withdrawn by Contractor. University shall not be obligated to consent to any withdrawal to the extent of stop notice claims which cannot be satisfied from other funds then due and payable to Contractor.

(11) University shall have the right to draw upon the securities, any interest earned on the securities, and any interest earned on the interest in the event of default by Contractor. Upon 7 days written notice to Escrow Agent from University, with a copy to Contractor, Escrow Agent shall immediately convert the securities, any interest earned on the securities, and all interest earned on the interest to cash and shall distribute the cash as instructed by University. Escrow Agent shall have no duty to determine whether a default has occurred and may rely solely upon the written notice of such default from University.

(12) Upon receipt of written notification from University certifying that final payment is due under the Contract, Escrow Agent shall release to Contractor the amount, if any, by which the value of all securities and interest on deposit less escrow fees and charges of the escrow account exceeds 125% of all stop notice claims on file. Escrow Agent shall pay the remaining amount to University or as directed by University. The escrow shall be closed immediately upon disbursement of all monies and securities on deposit and payment of fees and charges.

(13) Escrow Agent shall rely upon the written notifications from University and Contractor pursuant to this Escrow Agreement; and University and Contractor shall hold Escrow Agent harmless from Escrow Agent's release, conversion, and disbursement of the securities and interest as set forth herein.

(14) Escrow Agent shall have the right to terminate this Escrow Agreement upon 30 days notice to all parties hereunder. Upon receipt of such notice, University and Contractor shall appoint a successor Escrow Agent in writing and deliver written notice of such appointment to Escrow Agent. Thereupon, Escrow Agent shall deliver all assets in its custody to such successor Escrow Agent and all responsibility of Escrow Agent under this Escrow Agreement shall terminate; provided, however, if Contractor and University fail to appoint a successor Escrow Agent on or before the end of the 30 day notice period, then Escrow Agent is authorized and instructed to return all assets, documents, and other items in its custody to University and this Escrow Agreement shall be terminated without further instruction.

(15) The duties and responsibilities of Escrow Agent shall be limited to those expressly set forth in this Escrow Agreement; provided, however, that, with Escrow Agent's written consent, the duties and responsibilities in this Escrow Agreement may be amended at any time or times by an instrument in writing signed by all parties.

(16) Whenever Contractor tenders securities to be deposited in lieu of retention, an authorized representative of the Contractor shall declare under penalty of perjury that the securities are lien free and shall remain lien free during their retention by the Escrow Agent. The declaration shall be in the following form:

"The undersigned, on behalf of _____ whose address is
(Name of Contractor)

_____ ,
(Street Address, City, State & Zip Code)

represents, covenants and warrants that the securities tendered herewith are lien free and shall remain lien free during their retention by the Escrow Agent.

I, _____ , hereby declare that I am the
(Name)

_____ of _____ ,
(Title) (Name of Contractor)

that I am duly authorized to make this representation, and that I declare under perjury under the laws of the State of California that the foregoing is true and correct."

_____ _____
(Signature) (Date)

(17) The names of the persons authorized to give written notice or to receive written notice on behalf of University and on behalf of Contractor in connection with this Escrow Agreement, and exemplars of their respective signatures, are as set forth below. Such names may be changed by written notice to the other parties.

On behalf of University:

1. _____
(Signature)

Drew Hecht, Architect
Director of Project Management
Planning, Design & Construction
(Print Name & Title)

951.827.1485
(Telephone Number)

2. _____
(Signature)

Bobbi McCracken
Associate Vice Chancellor and Controller
Business and Financial Services
(Print Name & Title)

951.827.3303
(Telephone Number)

On behalf of Contractor:

1. _____
(Signature)

_____
(Print Name & Title)

_____
(Telephone Number)

2. _____
(Signature)

_____
(Print Name & Title)

_____
(Telephone Number)

Contractor, Escrow Agent, and University hereby agree to the covenants contained herein.

IN WITNESS WHEREOF, Contractor, Escrow Agent, and University have executed this Escrow Agreement, the day and year first written above.

University:

By: _____
(Signature)

Blythe R. Wilson, Architect
Director of Project Management
Planning, Design & Construction
(Print Name & Title)

951.827.1485
(Telephone Number)

By: _____
(Signature)

Bobbi McCracken
Associate Vice Chancellor and Controller
Business and Financial Services
(Print Name & Title)

951.827.3303
(Telephone Number)

Contractor:

By: _____
(Signature)

_____
(Print Name & Title)

_____
(Telephone Number)

By: _____
(Signature)

_____
(Print Name & Title)

_____
(Telephone Number)

Escrow Agent:

By: _____
(Signature)

_____
(Print Name & Title)

_____
(Telephone Number)

FIELD ORDER

Contract Date: _____ Field Order No. _____

To Contractor: _____

Attn: _____
Address: _____
_____

	Description of Work	Estimated Adjustment, Contract Sum	Estimated Adjustment, Contract Time
1.			
2.			
3.			

By University's Representative:

_____
(Signature & Date)
Tameesha Hayes
Project manager
Planning, Design & Construction
(Print Name & Title)

NOTE: If the work described above constitutes a change, this Field Order will be superseded by a Change Order that will include the scope of the change in the Work and any actual adjustments of the Contract Sum and the Contract Time.

cc: Director of Project Management, Planning, Design & Construction

UC RIVERSIDE | Planning, Design & Construction

Rubidoux Screenhouse Conversion- Phase II Electrical
Project Number: 950567
Contract Number: 950567-LF-2022-68

FINAL DISTRIBUTION OF CONTRACT DOLLARS

Completed By: _____ (Signature) _____ (Printed Name) _____ (Title) Date: _____

Provide the following information for each contracting party including the prime Contractor and each subcontractor/subconsultant regardless of tier.* Attach additional sheets if necessary.

Sheet No. _____ of _____

1	2	3	4	5	6					7a	7b	7c
Full Name of Business	Street Address City, State & Zip Code	Telephone # & Fax #	Contact Name	Type of Owner-ship	Business Categories (Check all that apply [X])					Portion of the Work	Amount $	Percent %
					SBE	DVBE	DBE	WBE	N/A			
Prime:												
Sub:												
Sub:												
Sub:												

	Column 5 – Type of	Column 6 – Business Categories	Subtotals	
Total Contract Amount: $ _____	C = Corporation	SBE = Small Business Enterprise		
	JV = Joint Venture	DVBE = Disabled Veteran Business Enterprise		
	P = Partnership	DBE = Disadvantaged Business Enterprise		
	SP = Sole Proprietorship	WBE = Women-Owned Business Enterprise		
	O = Other	N/A = Not Applicable		

*Regardless of tier, a completed Self-Certification form must be submitted for the prime Contractor and each subcontractor/subconsultant shown on this Exhibit.

**If a prime Contractor, refer to the Report of Subcontractor Information for license and other information.

FINAL INSPECTION ACCEPTANCE

Contract Date: _____ Final Inspection Date: _____

To Contractor: _____

Attn: _____

Address: _____

_____

The above Project was inspected and accepted as of the above Final Inspection Date. No outstanding work remains to be performed. All required submittals have been received. All training has been performed pursuant to the Contract.

The following Change Orders for time and/or money ONLY remain unexecuted:

Upon receipt of this executed document for Final Inspection Acceptance, Contracts Administration will file a Notice of Completion with the county recorder's office. This action terminates the construction contract for this Project.

By: Inspector

_____
(Signature & Date)
Name
Senior Construction Inspector
Planning, Design & Construction
(Print Name & Title)

By: Design Professional

_____
(Signature & Date)

_____
(Print Name & Title)

By: University's Representative

_____
(Signature & Date)
Tameesha Hayes
Project Manager
Planning, Design & Construction
(Print Name & Title)

By: University's Responsible Administrator

_____
(Signature & Date)
Drew Hecht, Architect
Director of Project Management
Planning, Design & Construction
(Print Name & Title)

Bond No. _____

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, The Regents of the University of California ("The Regents") has awarded to _____ as Principal a contract dated the _____ day of _____, 20 _____, (the "Contract") for the work described as follows:

Project Name: Rubidoux Screenhouse Conversion- Phase II Electrical
Project No. 950567, Contract No. 950567-LF-2022-68

AND WHEREAS, the Principal is required to furnish a bond in connection with the Contract, to secure the payment of claims of laborers, mechanics, material suppliers, and other persons as provided by law;

NOW, THEREFORE, we, the undersigned Principal and _____ as Surety, are held and firmly bound unto The Regents in the sum of _____ Dollars ($ _____), for which payment well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its heirs, executors, administrators, successors, or assigns approved by The Regents, or its subcontractors shall fail to pay any of the persons named in State of California Civil Code Section 9100, or amounts due under the State of California Unemployment Insurance Code with respect to work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the State of California Employment Development Department from the wages of employees of Principal and subcontractors pursuant to Section 13020 of the State of California Unemployment Insurance Code with respect to such work and labor, that Surety will pay for the same in an amount not exceeding the sum specified in this bond, otherwise the above obligation shall become and be null and void.

This bond shall inure to the benefit of any of the persons named in State of California Civil Code Section 9100 as to give a right of action to such persons or their assigns in any suit brought upon this bond.

Surety, for value received, hereby expressly agrees that no extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder, shall in any way affect the obligation of this bond; and it does hereby waive notice of any such extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder.

Surety's obligations hereunder are independent of the obligations of any other surety for the payment of claims of laborers, mechanics, material suppliers, and other persons in connection with the Contract; and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing The Regents' rights against the other.

In the event suit is brought upon this bond, the parties not prevailing in such suit shall pay reasonable attorneys' fees and costs incurred by the prevailing parties in such suit.

Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

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

PRINCIPAL:

_____
(Name of Company)

By: _____
(Signature)

_____
(Print Name)

_____
(Title)

SURETY:

_____
(Name of Company)

By: _____
(Signature)

_____
(Print Name)

_____
(Title)

Address for Notices:

_____
(Street Address)

_____
(City, State & Zip Code)

NOTE: Notary acknowledgement for Surety and Surety's Power of Attorney must be attached.

Bond No. _____

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, The Regents of the University of California ("The Regents") has awarded to _____ as Principal a contract dated the _____ day of _____ , 20 _____ , (the "Contract"), which Contract is by this reference made a part hereof, for the work described as follows:

Project Name: Rubidoux Screenhouse Conversion- Phase II Electrical
Project No. 950567, Contract No. 950567-LF-2022-68

AND WHEREAS, Principal is required to furnish a bond in connection with the Contract, guaranteeing the faithful performance thereof;

NOW, THEREFORE, we, the undersigned Principal and _____ as Surety are held and firmly bound unto The Regents in the sum of _____ Dollars ($ _____), to be paid to The Regents or its successors and assigns; for which payment, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its heirs, executors, administrators, successors, or assigns approved by The Regents, shall promptly and faithfully perform the covenants, conditions, and agreements of the Contract during the original term and any extensions thereof as may be granted by The Regents, with or without notice to Surety, and during the period of any guarantees or warranties required under the Contract, and shall also promptly and faithfully perform all the covenants, conditions, and agreements of any alteration of the Contract made as therein provided, notice of which alterations to Surety being hereby waived, on Principal's part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify, defend, protect, and hold harmless The Regents as stipulated in the Contract, then this obligation shall become and be null and void; otherwise it shall be and remain in full force and effect.

No extension of time, change, alteration, modification, or addition to the Contract, or of the work required thereunder, shall release or exonerate Surety on this bond or in any way affect the obligation of this bond; and Surety does hereby waive notice of any such extension of time, change, alteration, modification, or addition.

Whenever Principal shall be and declared by The Regents to be in default under the Contract, Surety shall promptly remedy the default, or shall promptly:

1. Undertake through its agents or independent contractors, reasonably acceptable to The Regents, to complete the Contract in accordance with its terms and conditions and to pay and perform all obligations of Principal under the Contract, including without limitation, all obligations with respect to warranties, guarantees, and the payment of liquidated damages, or, at Surety's election, or, if required by The Regents,

2. Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and, upon determination by The Regents of the lowest responsible bidder, arrange for a contract between such bidder and The Regents and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Sum, and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees, and the payment of liquidated damages; but, in any event, Surety's total obligations hereunder shall not exceed the amount set forth in the third paragraph hereof. The term "balance of the Contract Sum," as used in this paragraph, shall mean the total amount payable by The Regents to the Principal under the Contract and any amendments thereto, less the amount paid by The Regents to Principal.

Surety's obligations hereunder are independent of the obligations of any other surety for the performance of the Contract, and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing The Regents' rights against the others.

No right of action shall accrue on this bond to or for the use of any person or corporation other than The Regents or its successors or assigns.

Surety may join in any arbitration proceedings brought under the Contract and shall be bound by any arbitration award.

In the event suit is brought upon this bond by The Regents, Surety shall pay reasonable attorney's fees and costs incurred by The Regents in such suit.

Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

IN WITNESS WHEREOF, we have hereunto set our hands this _____ day of _____ , 20 ____ .

PRINCIPAL:	**SURETY:**
_____ (Name of Company)	_____ (Name of Company)
By: _____ (Signature)	By: _____ (Signature)
_____ (Print Name)	_____ (Print Name)
_____ (Title)	_____ (Title)
	Address for Notices:
	_____ (Street Address)
	_____ (City, State & Zip Code)

NOTE: Notary acknowledgement for Surety and Surety's Power of Attorney must be attached.

UC RIVERSIDE | Planning, Design & Construction

Rubidoux Screenhouse Conversion- Phase II Electrical
Project Number: 950567
Contract Number: 950567-LF-2022-68

REPORT OF SUBCONTRACTOR/SUBCONSULTANT INFORMATION

(NOTE: THIS EXHIBIT IS NOT TO BE SUBMITTED WITH BID)

Completed By: _____ (Signature) _____ (Print Name) _____ (Title) Date: _____

Provide the following information for each contracting party including the prime Contractor and each subcontractor regardless of tier*. Sheet No. ____ of ____

Attach additional sheets if necessary.

1	2	3	4	5	6					7a	7b	8	
Full Name of Business	Street Address City, State & Zip Code	Telephone # & Fax #	Contact Name	Type of Owner-ship	Business Categories* (Check all that apply [X])					Portion of the Work	Amount $	License Information**	
					SBE	DVBE	DBE	WBE	N/A			License Classification	License #
Prime:													
Sub:													
Sub:													
Sub:													

Column 5 – Type of Ownership	Column 6 – Business Categories
C = Corporation	SBE = Small Business Enterprise
JV = Joint Venture	DVBE = Disabled Veteran Business Enterprise
P = Partnership	DBE = Disadvantaged Business Enterprise
SP = Sole Proprietorship	WBE = Women-Owned Business Enterprise
O = Other	N/A = Not Applicable

*Regardless of tier, a completed Self-Certification form must be submitted for the prime Contractor and each subcontractor shown on this Exhibit.
**List only those license classifications and numbers relevant to this Project.

SELECTION OF RETENTION OPTIONS

I (we): _____
(Contractor)

SELECT OPTION 1 _____ Initial and date here for OPTION 1

University will withhold retention.

OR SELECT OPTION 2 _____ Initial and date here for OPTION 2

herewith elect to substitute securities in the form of:

_____
(Type of Security)

in lieu of retention being withheld by University for the above-referenced project.

OR SELECT OPTION 3 _____ Initial and date here for OPTION 3

herewith elect to have retention on the above-referenced project paid directly into the Escrow Account.

_____
(Type of Security to be Purchased)

An Escrow Account will be opened with: _____
(Name of state or federally chartered bank in California)

whose address is:

_____
(Street)

_____
(City, County)

_____
(State, Zip Code)

On Behalf of Contractor*:	On Behalf of University: Acknowledged and Approved
By: _____ (Signature)	By: _____ (Signature)
_____ (Print Name & Title)	Drew Hecht, Architect Director of Project Management Planning, Design & Construction (Print Name & Title)

* Signature shall be by the authorized party who signs the Escrow Agreement for Deposit of Securities in Lieu of Retention and Deposit of Retention ("Escrow Agreement").

Note: If a completed and signed Escrow Agreement is not submitted with this form, University will not allow deposit of securities in lieu of retention.

SELF-CERTIFICATION

For the Contractor and each subcontractor/subconsultant, the following must be completed.

Indicate all Business category(ies) that apply by initialing next to the applicable category(ies):

_____ (Initial, if applicable) **Small Business Enterprise (SBE)** - an independently owned and operated concern certified, or certifiable, as small business by the Federal Small Business Administration (SBA). (Size standards by Standard Industrial Classification codes required by the Federal Acquisition Regulations, Section 19.102, may be found at http://www.sba.gov/content/table-small-business-size-standards.) The eligibility requirements for California contracting purposes is on the Department of General Services website at http://www.dgs.ca.gov/pd/Programs/OSDS/SBEligibilityBenefits.aspx. The University may rely on written representation by the vendors regarding their status.

_____ (Initial, if applicable) **Disabled Veteran Business Enterprise (DVBE)** - a business that is at least 51% owned by one or more disabled veterans or, in the case of any publicly owned business, at least 51% of the stock of which is owned by such individuals and whose management and daily business operations are controlled by one or more of such individuals. A Disabled Veteran is a veteran of the military, naval, or air service of the United States with a service connected disability who is a resident of the State of California. To qualify as a veteran with a service connected disability, the person must be currently declared by the United States Veterans Administration to be 10% or more disabled as a result of service in the armed forces.

_____ (Initial, if applicable) **Disadvantaged Business Enterprise (DBE)** - a business concern that is at least 51% owned by one or more socially and economically disadvantaged individuals or, in the case of any publicly owned business, at least 51% of the stock of which is owned by such individuals and whose management and daily business operations are controlled by one or more of such individuals. Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as members of a group without regard to their individual qualities. Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free private enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business area who are not socially disadvantaged. Business owners who certify that they are members of named groups (Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Asian-Indian Americans) are to be considered socially and economically disadvantaged.

_____ (Initial, if applicable) **Women-Owned Business Enterprise (WBE**) - a business that is at least 51% owned by a woman or women who also control and operate it. “Control” in this context means exercising the power to make policy decisions. “Operate” in this context means being actively involved in the day-to-day management.

_____ (Initial, if applicable) **None of the above categories apply.**

I hereby certify under penalty of perjury under the laws of the State of California that I have read this certification and know the contents thereof, and that the business category indicated above reflects the true and correct status of the business in accordance with Federal Small Business Administration criteria and Federal Acquisition Regulations, FAR 19 pertaining to small, disadvantaged, women-owned, and disabled veteran business enterprises. I understand that falsely certifying the status of this business, obstructing, impeding or otherwise inhibiting any University of California official who is attempting to verify the information on this form may result in suspension from participation in University of California business contracts for a period up to five (5) years and the imposition of any civil penalties allowed by law.

INFORMATION FURNISHED BY: _____
(Print Name of Owner and/or Principal)

_____
(Name of Business or Firm)

a _____
(Insert type of business e.g. corporation, sole proprietorship, partnership, etc.)

By: _____ _____
(Print Name) (Title)

_____ _____
(Signature) (Date)

PRIVACY NOTICE

The State of California Information Practices Act of 1977 (effective July 1, 1978) requires the University of California to provide the following information to individuals who are asked to supply personal information about themselves. Information furnished on the Self-Certification form may, in some cases, identify personal information of an individual.

- The University of California, Riverside, is requesting the information contained in this form and the accompanying Report of Subcontractor Information.
- The Small Business Outreach Program Manager at the University of California, Riverside, is responsible for maintaining the requested information. The contact information for the Small Business Outreach Program Manager may be found at: http://www.ucop.edu/procurement-services/_files/sbdmgr.xlsx.
- The maintenance of information is authorized in part by Public Contract Code section 10500.5.
- Furnishing the information requested on this form is mandatory. If SBE, DBE, WBE and/or DVBE status is applicable, furnishing such information is mandatory.
- Failure to provide the information may be a violation of bidding procedures and/or breach of the contract and the University may pursue any and all remedies permitted by the provisions of the Contract Documents.
- The information on this form is collected for monitoring and reporting purposes in accordance with state law and University policy.
- The individual may access information contained in this form and related forms by contacting the Small Business Outreach Program Manager(s).

SUBMITTAL SCHEDULE

Contract Date: _____

Subcontractor: _____

Specification Section: _____

Work Activity: _____

Event	Scheduled Completion Date	Actual Completion Date	Calendar Days Required to Complete
1. Received by Contractor and Time for Checking			
2. First Delivered to University's Representative and Time for Checking			
3. Return to Contractor			
4. Corrections Completed and Time for Corrections			
5. Next Delivered (1st Resubmission) to University's Representative and Time for Checking			
6. Return to Contractor			
7. Approval for Job Information			
8. Approval for Fabrication and Time for Fabrication			
9. Fabrication Completed			
10. Shipping Date and Time In Route			
11. Delivery to Job			

*Contractor must revise Submittal Schedule to reflect number of resubmissions.

SUBSTITUTION OF SUBCONTRACTOR - INDEMNITY AGREEMENT and CONSENT

WHEREAS, on **Date**, **The Regents of the University of California** (University) and _____ (Contractor)
(Full Company Name & Address of Prime Contractor)
entered into an Agreement (Contract Number **950567-LF-2022-68**) for the construction of **Rubidoux Screenhouse Conversion- Phase II Electrical, Project No. 950567**, University of California, Riverside (Project); and

WHEREAS, Contractor's Bid, which was accepted by University for said Project, listed **Name of Listed Sub** as Subcontractor for the **work activity** work called for by the Bidding Documents and Contract Documents; and

WHEREAS, Contractor has represented and does hereby represent to University that **Name of Listed Sub** has **reasons for substitution**;

In consideration of the consent of University to the substitution of:

_____ , for
*(Full Company Name & Address of **Substitute** Subcontractor)*

Name of Listed Sub , as
*(Full Company Name of **Listed** Subcontractor)*

Subcontractor to provide the **work activity** work called for in the Bidding Documents and Contract Documents for the Project, Contractor does hereby agree to indemnify the University and hold it harmless from any and all claims, expenses, losses or liabilities arising out of said substitution of subcontractor or said consent thereto, and to defend at Contractor's expense any and all claims, protests, suits, actions or other proceedings in connection therewith; provided, however, that the University shall be given prompt notice of all such proceedings and it shall be entitled, if it so desires, to participate in the response to or defense of any such proceedings. If any such proceedings causes or results in a delay in the completion of said Project, the loss to the University for such delay shall be deemed to be the amount determined by applying the liquidated damages provisions of said Agreement for the period of such delay.

IN WITNESS WHEREOF, this Indemnity Agreement has been executed on _____ ,
(Date)

at _____ , California.
(Location: City & County)

CONTRACTOR:

By: _____
(Signature)

_____
(Typed or Printed Name & Title)

CONSENT TO SUBSTITUTION OF SUBCONTRACTOR

In consideration of the indemnification of University by Contractor, above, University agrees and does hereby consent to the substitution of:

_____ , for
*(Full Company Name & Address of **Substitute** Subcontractor)*

Name of Listed Sub , as
*(Full Company Name of **Listed** Subcontractor)*

Subcontractor to provide the **work activity** work called for in the Bidding Documents and Contract Documents for the above named Project.

IN WITNESS WHEREOF, University and Contractor have executed this Consent to Substitution of Subcontractor as of the above date.

CONTRACTOR:

By: _____
(Signature)

_____
(Typed or Printed Name & Title)

UNIVERSITY:

By: _____
(Signature)

_____
(Typed or Printed Name & Title)

UNCONDITIONAL WAIVER AND RELEASE ON FINAL PAYMENT

NOTICE TO CLAIMANT:
THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Identifying Information:

Name of Claimant: _____

Name of Customer: _____

Job Location: **Rubidoux Screenhouse Conversion- Phase II Electrical, Project No. 950567**

University of California, Riverside, City of Riverside, County of Riverside

Owner: **The Regents of the University of California**

Unconditional Waiver and Release:

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions:

This document does not affect the following: Disputed claims for extras in the amount of:

$ _____ .

Signature:

Claimant's Signature & Date: _____

Claimant's Name & Title: _____

Prime Contractor's Application for Payment # _____

UNCONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT

NOTICE TO CLAIMANT:
UNCONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Identifying Information:

Name of Claimant: _____

Name of Customer: _____

Job Location: **Rubidoux Screenhouse Conversion- Phase II Electrical, Project No. 950567**
University of California, Riverside, City of Riverside, County of Riverside

Owner: **The Regents of the University of California**

Through Date: _____

Unconditional Waiver and Release:

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: $ _____

Exceptions:

This document does not affect any of the following:
(1) Retentions.
(2) Extras for which the claimant has not received payment.
(3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Signature:

Claimant's Signature & Date: _____

Claimant's Name & Title: _____

Prime Contractor's Application for Payment # _____

LIST OF DRAWINGS

SHEET NO.	TITLE	DATE
T1.0	TITLE SHEET, INDEX OF DRAWINGS, GENERAL NOTES AND LOCATION MAP	09/09/2021
E1.0	ELECTRICAL LEGEND, SYMBOLS AND DXESTINATIONS	09/09/2021
E2.0	ELECTRICAL SITE DEMOLITION PLAN	09/09/2021
E3.0	ELECTRICAL SITE RECONSTRUCTION PLAN	09/09/2021
E4.0	SINGLE LINE DIAGRAMS	09/09/2021
E5.0	ELECTRICAL DETAILS	09/09/2021
S0.1	STRUCTURAL GENERAL NOTES	09/09/2021
S0.2	STRUSTURAL OBSERVATION	09/09/2021
S1.1	STRUCTURAL SITE PLAN	09/09/2021
S1.2	FOUNDATION PLAN	09/09/2021
S2.1	CONCRETE DETAILS	09/09/2021
	STRUCTURAL CALCUATIONS	09/09/2021

END OF LIST OF DRAWINGS

UNIVERSITY OF CALIFORNIA, RIVERSIDE
RUBIDOUX GREENHOUSE
ELECTRICAL SERVICE UPGRADE

UCR PROJECT NO.: 950567
RPU/100%CD SUBMITTAL R2
09/09/2021

LOCATION MAP

NO SCALE

APPLICABLE CODES

2019 CALIFORNIA BUILDING CODE (CBC) PART 2, VOLUMES 1 AND 2, TITLE 24
[BASED ON 2018 INTERNATIONAL BUILDING CODE]

2019 CALIFORNIA ELECTRICAL CODE (CEC) PART 3, TITLE 24
[BASED ON 2017 NATIONAL ELECTRIC CODE]

2019 CALIFORNIA MECHANICAL CODE (CMC) PART 4, TITLE 24
[BASED ON 2018 UNIFORM MECHANICAL CODE]

2019 CALIFORNIA PLUMBING CODE (CPC) PART 5, TITLE 24
[BASED ON 2018 UNIFORM PLUMBING CODE]

2019 CALIFORNIA FIRE CODE (CFC) PART 9, TITLE 24
[BASED ON 2018 INTERNATIONAL FIRE CODE]

2019 CALIFORNIA REFERENCED STANDARD CODE, PART 12, TITLE 24

TITLE 19, PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS

PARTIAL LIST OF APPLICABLE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS

NFPA 13, 2016 EDITION - INSTALLATION OF SPRINKLER SYSTEMS (AS AMENDED BY CSFM)
NFPA 14, 2016 EDITION - INSTALLATION OF STANDPIPE AND HOSE SYSTEMS (AMENDED BY CSFM)
NFPA 17A, 2017 EDITION - WET CHEMICAL EXTINGUISHING SYSTEMS
NFPA 24, 2016 EDITION - INSTALLATION OF PRIVATE FIRE SERVICE MAINS (AS AMENDED BY CSFM)
NFPA 25, (2013 CALIFORNIA EDITION, BASED ON NFPA 25, 2011 EDITION) - INSPECTION, TESTING, & MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS
NFPA 72, 2016 EDITION - NATIONAL FIRE ALARM AND SIGNALING CODE (AMENDED BY CSFM)
NFPA 80, 2016 EDITION - FIRE DOORS AND OTHER OPENING PROTECTIVES

REFER TO CBC CHAPTER 35 FOR ADDITIONAL STANDARDS NOT PROVIDED ON THIS LIST

GENERAL NOTES

1. THE ARRANGEMENT OF THE SYSTEM SHOWN ON THESE DRAWINGS IS BASED UPON INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME OF DESIGN. THE DRAWINGS ARE NOT INTENDED TO SHOW EXACT DIMENSIONS. THESE DRAWINGS ARE IN PART DIAGRAMMATIC, AND SOME FEATURES OF THE ILLUSTRATED EQUIPMENT INSTALLATION MAY REQUIRE REVISION TO MEET ACTUAL INSTALLATION REQUIREMENTS.
2. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE CALIFORNIA ADMINISTRATIVE CODES, CALIFORNIA BUILDING STANDARD CODES, CALIFORNIA MECHANICAL CODE, CALIFORNIA ELECTRICAL CODE, NFPA STANDARDS, LOCAL CODES, AND REQUIREMENTS SPECIFIED HEREIN.
3. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO BID IN ORDER TO THOROUGHLY FAMILIARIZE THEMSELVES WITH THE EXISTING FIELD CONDITIONS AND SCOPE OF WORK TO BE PERFORMED. THE CONTRACTOR SHALL ALSO VERIFY ALL DIMENSIONS OF THE EXISTING FACILITIES AND EQUIPMENT PERTINENT TO THE SCOPE OF WORK TO THIS PROJECT PRIOR TO BID.
4. THE CONTRACTOR SHALL PROVIDE AND BE RESPONSIBLE FOR PROTECTION AND REPAIR OF ADJACENT EXISTING SURFACES, AREAS, DUCTWORK, PIPING, AND EQUIPMENT WHICH MAY BE DAMAGED AS A RESULT OF DEMOLITION AND/OR NEW WORK. THE CONTRACTOR SHALL NOT DEMOLISH OR ALTER ANY WORK WHICH IS NOT A PART OF THIS CONTRACT WITHOUT WRITTEN PERMISSION FROM THE UNIVERSITY.

SCOPE OF WORK

IN BRIEF, THIS PROJECT SHALL ONLY CONSIST OF INSTALLING A NEW RIVERSIDE PUBLIC UTILITY TRANSFORMER AND CONCRETE PAD FED FROM THE EXISTING UTILITY POLE WITH NEW UNDERGROUND FEEDERS, AND A NEW 800-AMP SWTCHBOARD "MSA" 208Y/120V, 3-PHASE, 4-WIRE SERVICE METER AND MAIN. THE DISCONNECTION OF THE EXISTING 180kW / 225 kVA GENERATOR SHALL ALSO BE WITHIN THE PROJECT SCOPE OF WORK.

THE TRANSFORMER WILL FEED A NEW SWITCHBOARD "MSA", THAT WILL ALSO PROVIDE POWER TO THE EXISTING SWITCHBOARD 'MDB'.

THE SPLICING AND/OR TERMINATION OF THE EXISTING 225 kVA GENERATOR AND ALL OTHER ADDITIONAL BRANCH LOADS TO BE SERVED BY THE NEW 800-AMP SWITCHBOARD "MSA" SHALL BE WITHIN A SEPARATE PROJECT. REFER TO UCR PROJECT: 957459 - RUBIDOUX MODULAR PLANT GROWTH UNIT INSTALLATION.

INDEX OF DRAWINGS

DWG NO.	DESCRIPTION
ELECTRICAL	
T1.0	TITLE SHEET, INDEX OF DRAWINGS, GENERAL NOTES, AND LOCATION MAP
E1.0	ELECTRICAL LEGEND, SYMBOLS AND DESIGNATIONS
E2.0	ELECTRICAL SITE DEMOLITION PLAN
E3.0	ELECTRICAL SITE RECONSTRUCTION PLAN
E4.0	SINGLE LINE DIAGRAMS
E5.0	ELECTRICAL DETAILS
STRUCTURAL	
S0.1	STRUCTURAL GENERAL NOTES
S0.2	STRUCTURAL OBSERVATION
S1.1	STRUCTURAL SITE PLAN
S1.2	FOUNDATION PLAN
S2.1	CONCRETE DETAILS

PROJECT TEAM

PRIME CONSULTANT:

GOSS ENGINEERING, INC.
255 E. RINCON ST., SUITE 301
CORONA, CA 92879
PHONE: (951) 340-1977
CONTACT: NICK UBRUN, P.E.
EMAIL: NUBRUN@GOSS-ENG.COM

STRUCTURAL CONSULTANT:

HADLEY ENGINEERING
34159 YUCAIPA BLVD., SUITE C
YUCAIPA, CA 92399
PHONE: (909) 446-0712
CONTACT: BETHANY MACDUFF, P.E.
EMAIL: BMACDUFF@HADLEYENGINEERING.COM

ELECTRICAL ENGINEERING

GOSS ENGINEERING, INC.
255 E. RINCON ST., SUITE 301
CORONA, CA 92879
PHONE: (951) 340-1977
CONTACT: ED BURTCH, P.E.
EMAIL: EBURTCH@GOSS-ENG.COM

UNIVERSITY REPRESENTATIVE:

UNIVERSITY OF CALIFORNIA, RIVERSIDE, ARCHITECTS & ENGINEERS
1223 UNIVERSITY AVENUE, SUITE 240
RIVERSIDE, CA 92521
PHONE: (951) 827-4706
CONTACT: SCOTT DONNELL, PROJECT MANAGER
EMAIL: SCOTT.DONNELL@UCR.EDU

PROJECT ADDRESS

4650 14TH STREET, RIVERSIDE 92501

RIVERSIDE PUBLIC UTILITIES NOTES

ELECTRIC METER ROOM DOOR SHALL HAVE SCHLAGE LOCK, KEYED TO RIVERSIDE PUBLIC UTILITIES' MASTER KEY, OR SHALL HAVE DOUBLE HASP. WORKING SPACE NEAR THE METER PANEL PER 2018 NEC 110-26 IS REQUIRED. THE MOUNTING HEIGHT OF ELECTRIC METERS SHALL BE BETWEEN 48 AND 75 INCHES ABOVE THE WORKSPACE FLOOR AREA REQUIRED BY NEC 110-26. ELECTRIC ROOM DOOR OPENING SHALL EXTEND TO OR ABOVE THE FULL HEIGHT OF THE SWITCHGEAR.

THE ELECTRIC UTILITY STRUCTURES SHOWN ARE FOR PERMIT APPLICATION PURPOSES ONLY AND DOES NOT CONSTITUTE THE FINAL DESIGN. COORDINATE WITH THE CITY OF RIVERSIDE, PUBLIC UTILITIES ELECTRIC DIVISION (951-826-5489) FOR ACTUAL CONSTRUCTION PLANS, SPECIFICATIONS AND SERVICE CHARGES. COORDINATE WITH THE UTILITY INSPECTOR (951-826-2335) PRIOR TO INSTALLATION OF FACILITIES AND BACKFILLING.

UNIVERSITY OF CALIFORNIA
UC RIVERSIDE
CAPITAL PROGRAMS
ARCHITECTS & ENGINEERS
1223 UNIVERSITY AVENUE, SUITE 240
RIVERSIDE, CA. 92521
TEL:(951) 827-1273 FAX:(951) 827-3890

Architect's Data:

Architect's Stamp:

Consultant's Stamp:

REGISTERED PROFESSIONAL ENGINEER
ED D. BURTCH
No. E17083
ELECTRICAL
STATE OF CALIFORNIA

[illegible]

Project Number: 120-10-10

APPROVED
UC RIVERSIDE
Office of Planning, Design & Construction Signed CBO: Gilbert Cervantes
Building, Safety and Compliance Division
CAMPUS BUILDING PERMIT

OFFICE OF THE STATE FIRE MARSHAL
APPROVED FIRE AND PANIC ONLY
09/29/2021 UCR 2021-2022-950567
Approval of plans does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

[illegible]

REVISIONS		
REV #	DESCRIPTION	DATE
1	RPU/100% CD SUBMITTAL	01/28/21
2	RPU/100% CD SUBMITTAL	03/03/21
3	RPU/100% CD SUBMITTAL	05/10/21
4	RPU/100% CD SUBMITTAL R1	08/13/21
5	RPU/100% CD SUBMITTAL R2	09/09/21

RUBIDOUX GREENHOUSE ELECTRICAL SERVICE UPGRADE

Consultant's Data:

GOSS ENGINEERING
255 East Rincon St., Suite 301
Corona, CA 92879
P 951.340.1977 | F 951.340.1090
www.gossengineering.com

UCR Project Manager: –

Scale:	AS SHOWN	SD Approval:	–
Drawn By:	RDR	DD Approval:	–
Checked By:	EDB	CD Approval:	–
Project No.:	–	Construction Release:	–
DSA No.:	–		

Drawing Title:	Sheet No.
TITLE SHEET, INDEX OF DRAWINGS, GEN. NOTES AND LOCATION MAP	T1.0

LEGEND

ELECTRICAL SYMBOL	DESCRIPTION
	SWITCH
	FUSE
	FUSED DISCONNECT SWITCH
1	COMBINATION MOTOR STARTER/DISCONNECT SWITCH (NUMBER INDICATES STARTER SIZE)
	DISCONNECT SWITCH (NON-FUSED)
F	DISCONNECT SWITCH (FUSED), HORSE POWER RATED
	RECESSED PANELBOARD 120V/208V
	RECESSED PANELBOARD 277V/480V
	SURFACE MOUNTED PANELBOARD 120V/208V
	SURFACE MOUNTED PANELBOARD 277V/480V
▨	DISTRIBUTION BOARD
	GROUND CONNECTION
	GROUND BUS BAR
	MOTOR
	3/4" CONDUIT WITH 2#12 + 1#12 GRD.
	3/4" CONDUIT WITH 3#12 + 1#12 GRD.
	3/4" CONDUIT WITH 4#12 + 1#12 GRD.
	DUPLEX RECEPTACLE 20A, 5-20R +18" A.F.F. (U.O.N.)
	GFCI DUPLEX RECEPTACLE 20A, 5-20R +18" A.F.F. (U.O.N.)
	SINGLE CIRCUIT DEDICATED OUTLET +18" A.F.F. (U.O.N.) (SEE PLANS FOR NEMA RATING)
	208V RECEPTACLE +18" A.F.F. (U.O.N.) (SEE PLANS FOR NEMA RATING)
	DOUBLE DUPLEX (QUAD) RECEPTACLE 20A, 5-20R +18" A.F.F. (U.O.N.)
	DUPLEX RECEPTACLE 20A, 5-20R +42" A.F.F. (U.O.N.)
	DEDICATED DUPLEX RECEPTACLE 20A, 5-20R +42" A.F.F. (U.O.N.)
	GFCI DUPLEX RECEPTACLE 20A, 5-20R +42" A.F.F. (U.O.N.)
	DEDICATED GFCI DUPLEX RECEPTACLE 20A, 5-20R +42" A.F.F. (U.O.N.)
	DOUBLE DUPLEX (QUAD) RECEPTACLE 20A, 5-20R +42" A.F.F. (U.O.N.)
	CEILING MOUNTED DUPLEX RECEPTACLE
3	CEILING MOUNTED COMMUNICATIONS OUTLET
	FLOOR MOUNTED DUPLEX RECEPTACLE
	FLOOR MOUNTED 208V OUTLET
	FLOOR MOUNTED QUAD RECEPTACLE
3	FLOOR MOUNTED COMMUNICATION OUTLET
	THROUGH-FLOOR FITTING
3	COMMUNICATION OUTLET. 4S BOX WITH 1 GANG PLASTER RING. PROVIDE 1" CONDUIT STUBBED INTO ACCESSIBLE CEILING SPACE. "3" INDICATES QUANTITY OF PLENUM RATED CAT-6 CABLES. (2 DATA AND 1 VOICE) +18" A.F.F. (U.O.N.)
3	DATA OUTLET. 4S BOX WITH 1 GANG PLASTER RING. PROVIDE 1" CONDUIT STUBBED INTO ACCESSIBLE CEILING SPACE. "3" INDICATES QUANTITY OF PLENUM RATED CAT-6 CABLES. +18" A.F.F. (U.O.N.)
J	JUNCTION BOX WITH COVER (MINIMUM 4" SQUARE OR AS REQUIRED)
	RACEWAY TRANSITION BOX OR CONNECTION POINT

LEGEND

ELECTRICAL SYMBOL	DESCRIPTION
$	120V. 20A LIGHT SWITCH (+42" A.F.F.)
$DM	STANDARD TRIAC DIMMER SWITCH
$3	DENOTES 3-WAY SWITCH
$M	MANUAL MOTOR STARTER SWITCH WITH THERMAL OVERLOADS RATED AT 250V-30A-2P
$2	2-POLE TOGGLE SWITCH FOR MECHANICAL UNIT
DM	LOW VOLTAGE ON/OFF DIMMER SWITCH
DO	LOW VOLTAGE ON/OFF DIMMER SWITCH WITH OCCUPANCY SENSOR
OS	LOW VOLTAGE ON/OFF MANUAL SWITCH WITH OCCUPANCY SENSOR
CS	LOW VOLTAGE CEILING MOUNTED OCCUPANCY SENSOR
R EM	LOW VOLTAGE LIGHTING CONTROLS POWER/RELAY PACK, 'EM' INDICATES EMERGENCY CIRCUIT
PC x	LOW VOLTAGE DAYLIGHT HARVESTER PHOTOCELL SENSOR
	TELECOM BACKBOARD 8'x4'x3/4", FIRE TREATED. PROVIDE 1#6 GROUND WIRE TO SYSTEM GROUND
FX-1	LIGHTING FIXTURE IDENTIFICATION
	CABLE TRAY, SEE SPECIFICATIONS.
—W—W—	SURFACE MOUNTED METAL SINGLE/DUAL CHANNEL RACEWAY (2' O.C. FOR RECEPTACLES AND 4' O.C FOR DATA), SEE SPECIFICATIONS.
	PLUGMOLD STRIP
J	POWER CONNECTION TO FURNITURE SYSTEM. PROVIDE 1" CONDUIT STUBBED INTO ACCESSIBLE CEILING SPACE
3	VOICE/DATA CONNECTION TO FURNITURE SYSTEM. PROVIDE 1-1/4" CONDUIT STUBBED INTO ACCESSIBLE CEILING SPACE
WAP	WIRELESS ACCESS POINT
TC	365-DAYS ASTRONOMIC TIME CLOCK SWITCH
CR	CARD READER
TV	TV OUTLET BOX
S	SPEAKER OUTLET BOX
AV	AUDIO-VISUAL OUTLET BOX
DMM	DIGITAL MULTI - METER
STD	SHUNT TRIP DEVICE

ABBREVIATIONS

A	AMPERE
AC	ALTERNATING CURRENT
AF	AMPERE FRAME
AS	AMPERE SWITCH
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CAPACITY
ANN	ANNUNCIATOR
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BKR	BREAKER
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
CATV	CABLE TELEVISION
CEC	CALIFORNIA ELECTRICAL CODE
CKT	CIRCUIT
CLG	CEILING
CO	CONDUIT ONLY
COMM	COMMUNICATIONS
COMP	COMPUTER
DISC	DISCONNECT
DIST	DISTRIBUTION
DL	DOUBLE LUG
DP	DISTRIBUTION PANEL
DWG	DRAWING
E	EXISTING TO REMAIN
EG	EQUIPMENT GROUND
ELEC	ELECTRICAL
EMH	ELECTRICAL MAN HOLE
EMT	ELECTRICAL METALLIC TUBING
EPO	EMERGENCY POWER OFF
EQUIP	EQUIPMENT
F	FUSE, FUSED
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPERES
GRD	GROUND
GALV	GALVANIZE, GALVANIZED
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HPF	HEAT PUMP HIGH POWER FACTOR
HPS	HIGH PRESSURE SODIUM
JB	JUNCTION BOX
KA	THOUSAND AMPERES
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT-AMPERE
KW	KILOWATT
LTG	LIGHTING
MC	METAL CLAD CABLE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MH	METAL HALIDE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTR	MOTOR
MTS	MANUAL TRANSFER SWITCH
NEC	NATIONAL ELECTRIC CODE
NF	NON-FUSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
P	POLE, POLES
PF	POWER FACTOR
PNL	PANEL
PRI	PRIMARY
PVC	POLYVINYL CHLORIDE CONDUIT
PWR	POWER
Ø	PHASE
R	REMOVE
RR	REMOVE AND RELOCATE
RL	RELOCATED
RECEPT	RECEPTACLE
RGS	RIGID GALVANIZED STEEL CONDUIT
RM/S	ROOM/S
SEC	SECONDARY
SPKR	SPEAKER
SUSP	SUSPEND, SUSPENDED
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TBB	TELECOMMUNICATIONS BACKBOARD
TMH	TELECOMMUNICATIONS MAN HOLE
TYP.	TYPICAL
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
UON	UNLESS OTHERWISE NOTED
V	VOLT, VOLTS
VA	VOLT-AMPERES
VAV	VARIABLE AIR VOLUME
WT	WATERTIGHT
W	WATT OR WIRE
WP	WEATHER PROOF
X'FMR	TRANSFORMER
Y	WYE CONNECTION

LINE TYPES

	WIRING SYSTEM ABOVE FLOOR LEVEL, CONCEALED IN WALL OR ABOVE CEILING UON
— — —	WIRING SYSTEM IN OR UNDER FLOOR OR CONCEALED IN OR BEHIND STRUCTURE OR EQUIPMENT
	CONDUIT STUB ENDING WITH CAP
- - - - -	REMOVE/RELOCATE/DEMOLISH
	EXISTING

GENERAL NOTES

1. ELECTRICAL CONTRACTOR SHALL PERFORM ELECTRICAL INSTALLATION WORK IN CONFORMANCE WITH THE 2019 EDITION OF THE CALIFORNIA ELECTRICAL CODE (CEC) AND ALL APPLICABLE CODES, ORDINANCES, REGULATIONS AND UNIVERSITY'S STANDARDS.

2. CONDUIT ROUTING AND OUTLET LOCATION AS SHOWN ON THE ELECTRICAL POWER PLAN ARE DIAGRAMMATIC IN NATURE. VERIFY FEASIBILITY OF THE INSTALLATION BEFORE COMMENCING THE JOB. ANY OBSERVATIONS TO THE EXECUTION OF THE WORK SHALL BE BROUGHT TO THE ATTENTION OF THE UNIVERSITY'S REPRESENTATIVE IMMEDIATELY.

3. PER SPECIFICATION SECTION "CONDUCTORS AND CABLES":
   A. CONDUCTOR MATERIAL APPLICATIONS:
      a. 1 FEEDER: COPPER. STRANDED FOR NO. 10 AWG AND LARGER.
      b. 2 BRANCH CIRCUITS: COPPER. STRANDED FOR NO. 10 AWG AND LARGER.
   B. CONDUCTOR INSULATION AND MULTI-CONDUCTOR CABLE APPLICATIONS AND WIRING METHODS:
      a. 1 BRANCH CIRCUIT CONCEALED IN CEILINGS, WALLS AND PARTITIONS: TYPE THHN-2-THWN-2, SINGLE CONDUCTORS IN RACEWAYS.
      b. 2 BRANCH CIRCUITS CONCEALED IN CONCRETE, BELOW SLABS-ON-GRADE, AND UNDERGROUND: TYPE THHN-2-THWN-2, SINGLE CONDUCTORS IN RACEWAYS.

4. COORDINATE ALL WORK WITH OTHER CONSTRUCTION. NOTIFY THE UNIVERSITY'S REPRESENTATIVE OF ANY UNRESOLVED ISSUES THAT MAY DELAY INSTALLATION OF WORK.

5. MAINTAIN PROPER WORKING SPACE PER CALIFORNIA ELECTRICAL CODE (CEC), PARAGRAPH 110-26.

6. PROVIDE NECESSARY HARDWARE AND SUPPORTS AS REQUIRED FOR ELECTRICAL CONDUIT/WIRE NOT SCHEDULED FOR DEMOLITION PER CALIFORNIA ELECTRICAL CODE (CEC), PARAGRAPH 110-12.

7. CONNECTIONS TO VIBRATING EQUIPMENT AND SEISMIC SEPARATIONS:
   - LIQUID-TIGHT FLEXIBLE STEEL CONDUIT IN DRY INTERIOR LOCATIONS.
   - LIQUID-TIGHT FLEXIBLE STEEL CONDUIT IN AREAS EXPOSED TO WEATHER, DAMP LOCATIONS, CONNECTIONS TO TRANSFORMER ENCLOSURES, AND FINAL CONNECTIONS TO MOTORS.

   PROVIDE A SEPARATE INSULATED EQUIPMENT GROUNDING CONDUCTOR IN FLEXIBLE CONDUIT RUNS. MAXIMUM LENGTH SHALL BE SIX FEET UNLESS OTHERWISE NOTED.

8. EQUIPMENT OUTLETS, LIGHTING FIXTURES, CONDUIT, WIRE, AND CONNECTION METHODS IN HVAC AIR-PLENUMS SHALL BE APPROVED FOR USE IN PLENUMS AND SHALL CONFORM TO THE CEC.

9. ROUTE EXPOSED CONDUIT AND CONDUIT ABOVE ACCESSIBLE CEILING SPACES PARALLEL AND PERPENDICULAR TO WALLS AND ADJACENT PIPING.
   ARRANGE CONDUIT TO MAINTAIN HEADROOM AND TO PRESENT A NEAT APPEARANCE.

10. WHENEVER A DISCREPANCY IN QUANTITY OR SIZE OF CONDUIT, WIRE, EQUIPMENT DEVICES, CIRCUIT BREAKERS, GROUND FAULT PROTECTION SYSTEMS, ETC. (ALL MATERIALS), ARISES ON THE DRAWINGS OR SPECIFICATIONS, PROVIDE AND INSTALL ALL MATERIAL AND SERVICES REQUIRED BY THE STRICTEST CONDITIONS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS TO ENSURE COMPLETE AND OPERABLE SYSTEMS.

11. ALL RECESSED LIGHTING FIXTURES, SPEAKERS, RECEPTACLES, SWITCHES, ETC., MOUNTED IN THE FIRE RATED CEILINGS OR WALLS SHALL BE ENCLOSED WITH AN APPROVED ENCLOSURE CARRYING THE SAME FIRE RATING AS THE CEILING OR WALL.

ANNOTATION SYMBOLS

DETAIL

1 / E0.1 TYP.
- DETAIL IDENTIFICATION
- OCCURRENCE
- SHEET WHERE DETAIL IS LOCATED.

MISCELLANEOUS

1	RECONSTRUCTION KEY NOTE
1	DEMOLITION KEY NOTE

REVISION

	REVISED AREA
1	REVISION TAG

UNIVERSITY OF CALIFORNIA
UCRIVERSIDE
CAPITAL PROGRAMS
ARCHITECTS & ENGINEERS
1223 UNIVERSITY AVENUE, SUITE 240
RIVERSIDE, CA. 92521
TEL:(951) 827-1273 FAX:(951) 827-3890

Architect's Data:

Architect's Stamp:

Consultant's Stamp:

REGISTERED PROFESSIONAL ENGINEER
EDWARD D. BOOTH
No. E17083
ELECTRICAL
STATE OF CALIFORNIA

[illegible]

Project Number: 120-10-10

APPROVED
UC RIVERSIDE
Office of Planning, Design & Construction Signed CBO: [illegible]
Building, Safety and Compliance
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REVISIONS		
REV #	DESCRIPTION	DATE
1	RPU/100% CD SUBMITTAL	01/28/21
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3	RPU/100% CD SUBMITTAL	05/10/21
4	RPU/100% CD SUBMITTAL R1	08/13/21
5	RPU/100% CD SUBMITTAL R2	09/09/21

RUBIDOUX
GREENHOUSE
ELECTRICAL SERVICE
UPGRADE

Consultant's Data:

GOSS ENGINEERING
255 East Rincon St., Suite 301
Corona, CA 92879
P 951.340.1977 | F 951.340.1090
www.gossengineering.com

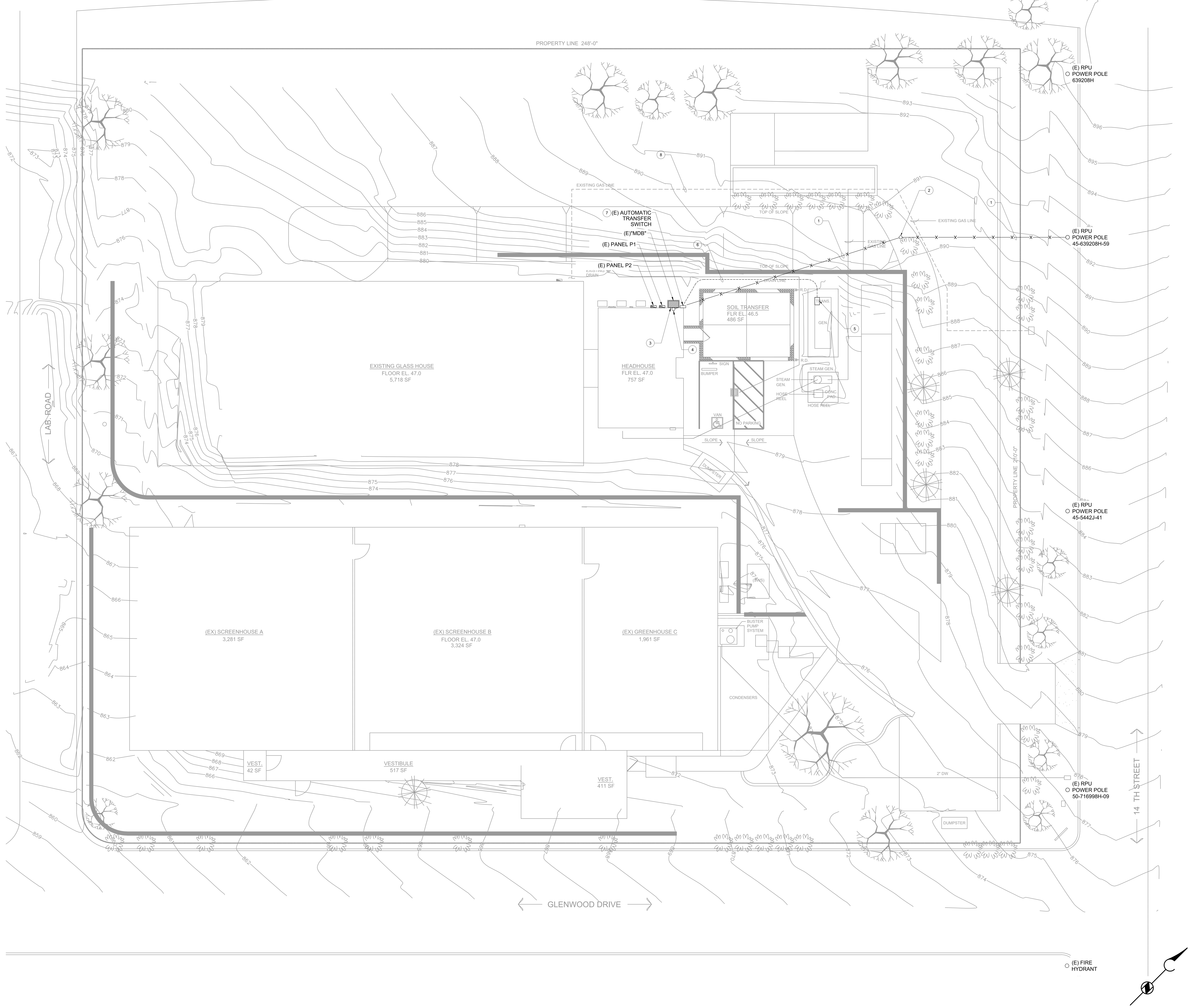
UCR Project Manager: –

Scale:	AS SHOWN	SD Approval:	–
Drawn By:	RDR	DD Approval:	–
Checked By:	EDB	CD Approval:	–
Project No.:	–	Construction Release:	–
DSA No.:	–		

Drawing Title: ELECTRICAL LEGEND, SYMBOLS AND DESIGNATIONS

Sheet No. E1.0

Reviewed for Code Compliance 11/01/21



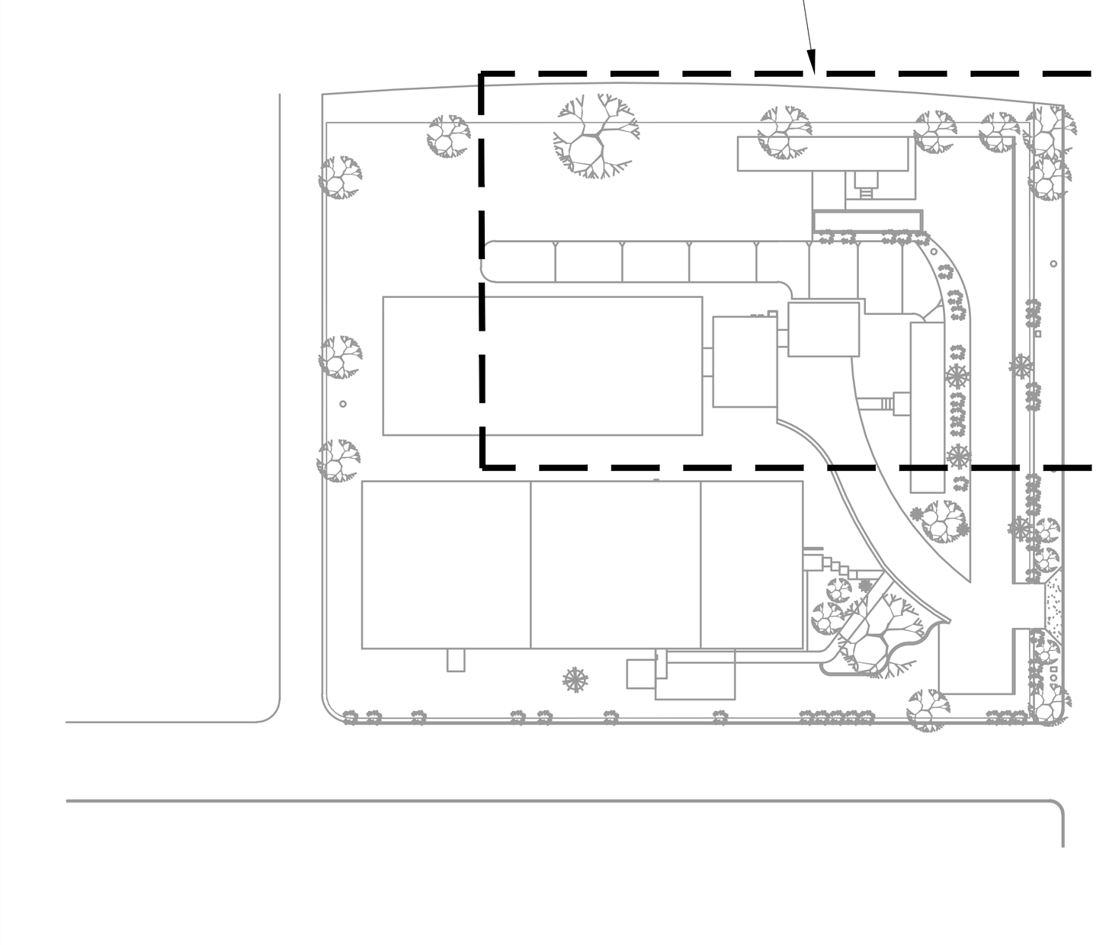
ELECTRICAL SITE DEMOLITION PLAN — SCALE 3/32" = 1'-0" — 1

DEMOLITION NOTES:

1. EXISTING OVERHEAD RPU POWER LINES TO BE DEMOLISHED BY RPU.
2. EXISTING RPU POWER POLE TO BE REMOVED BY RPU.
3. RPU TO REMOVE EXISTING SERVICE CONNECTION AND RPU METER #313657332.
4. (2) CONDUITS AND GOOSENECKS TO BE DEMOLISHED. PAINT AND PATCH ROOF.
5. DEMOLISH 400A CIRCUIT BREAKER.
6. DEMOLISH EXISTING FEEDER FROM GENERATOR TO AUTOMATIC TRANSFER SWITCH.
7. DEMOLISH EXISTING 400A AUTOMATIC TRANSFER SWITCH.
8. EXISTING GAS LINE. PROTECT IN-PLACE.

LEGEND:

EXISTING	———————
REMOVE	——X——X——
DEMOLISH	- - - - - - - -



KEY PLAN — SCALE N.T.S. — 0

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Architect's Data:

Architect's Stamp:

Consultant's Stamp:

REGISTERED PROFESSIONAL ENGINEER ED D. BURCH No. E17083 ELECTRICAL STATE OF CALIFORNIA

[illegible]

Project Number: 120-10-10

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RUBIDOUX GREENHOUSE ELECTRICAL SERVICE UPGRADE

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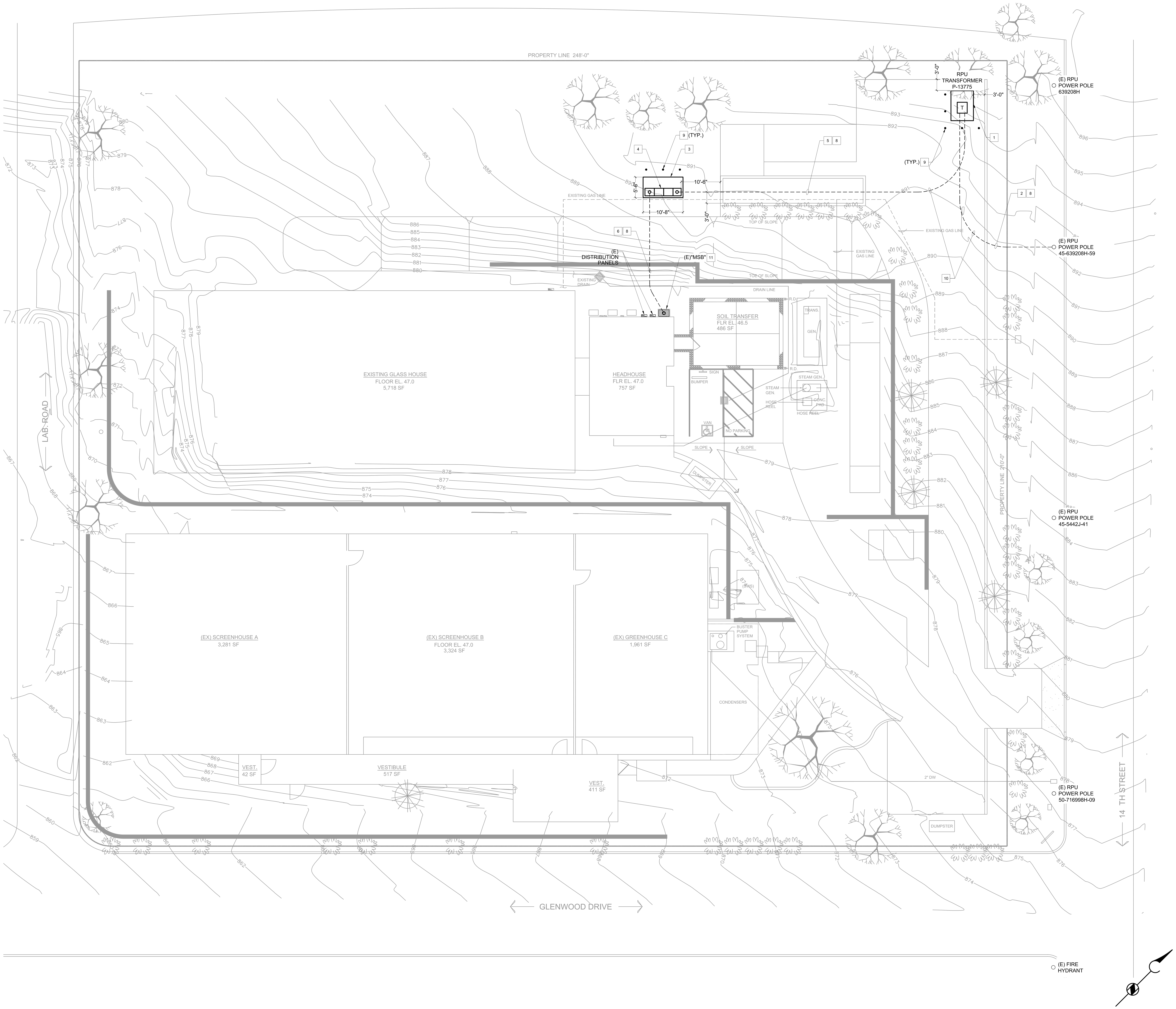
Drawing Title: ELECTRICAL SITE DEMOLITION PLAN

Sheet No. E2.0



ELECTRICAL SITE RECONSTRUCTION PLAN | SCALE 3/32" = 1'-0" | 1

RECONSTRUCTION NOTES:

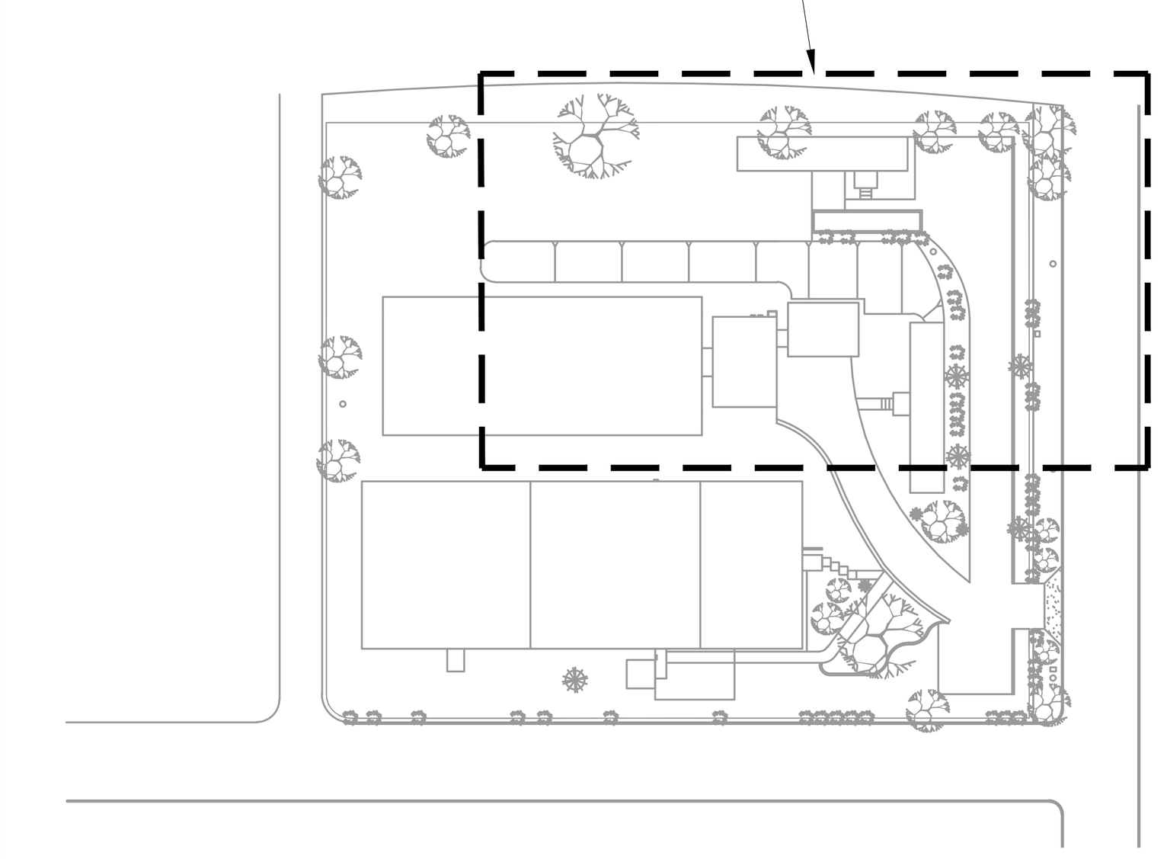
1. PROVIDE A 6'-6" x 8'-0" x 0'-6" THICK CONCRETE TRANSFORMER SLAB BOX WITH EXTENSION. SLAB BOX SHALL ADHERE TO RPU REQUIREMENT/S OR SPECIFICATION/S, SB-3. REFER TO THE LATEST RPU UNDEGROUND STRUCTURE STANDARDS, UGS-010.2. SEE GROUND RING DETAIL 4 ON SHEET E5.0 FOR ADDITIONAL INFORMATION.
2. (2) 4" PVC AND (1) 2" PVC, SCHED. 40 CONDUIT/S ONLY WITH PULL CORD TO RPU POWER POLE. STUB-UP CONDUITS SHALL BE SCHED. 80. SEE CONDUIT DETAIL 1 AND 2 ON SHEET E5.0 FOR ADDITIONAL INFORMATION.
3. PROVIDE A 4" THICK CONCRETE HOUSE KEEPING PAD. ENSURE CONCRETE PAD SHALL EXTEND 3'-0" PAST THE FRONT DOORS OF THE EQUIPMENT OR 0'-6" PAST DOORS AT 90° OPEN POSITION, WHICHEVER SHALL BE GREATER.
4. NEW SWITCHBOARD "MSA". SEE SINGLE LINE DIAGRAM ON SHEET E4.0 FOR ADDITIONAL INFORMATION. SWITCHBOARD CUTSHEET AND SHOP DRAWINGS SHALL BE PROVIDED AND SUBMITTED TO RPU FOR APPROVAL.
5. (3) 5" PVC SCHED. 40 CONDUIT ONLY WITH PULL CORD. SEE CONDUIT BURIAL DETAIL 6 ON SHEET E5.0 FOR ADDITIONAL INFORMATION.
6. (2) 4" PVC C-4# 500 KCMIL & 1 # 1/0 GROUND.
7. (2) 4" PVC AND (1) 2" PVC, SCHED. 80 CONDUIT/S ONLY WITH PULL CORD AND CONDUIT PLUG, RISERS TO RPU POWER POLE. SEE CONDUIT RISER DETAIL 2 ON SHEET E5.0 FOR ADDITIONAL INFORMATION. CONDUIT RISER SHALL ADHERE TO THE LATEST RPU REQUIREMENTS OR SPECIFICATION/S, UGS-115.1.
8. UNDERGROUND CONDUIT INSTALLATION/S SHALL ADHERE TO RPU REQUIREMENT/S OR SPECIFICATION/S. REFER TO THE LATEST RPU UNDEGROUND STRUCTURE STANDARDS, UGS-100.1 AND UGS-100.2
9. 4" DIA. GALVANIZED PROTECTIVE BARRIER. BARRIER QUANTITIES AND PLACEMENTS SHALL ADHERE TO RPU REQUIREMENT/S OR SPECIFICATION/S. REFER TO LATEST RPU UNDEGROUND STRUCTURE STANDARDS, UGS-290.
10. MINIMUM BEND RADIUS OF 12'-6".
11. EXISTING SWITCHBOARD "MDB" SHALL BE RENAMED/RE-LABELED TO SWITCHBOARD "MSB"

LEGEND:

EXISTING	─── (light)
NEW	───
UNDERGROUND	– – – –

CALL 811 BEFORE YOU DIG.

AREA OF WORK



KEY PLAN | SCALE N.T.S. | 0

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Architect's Data:

Architect's Stamp:

Consultant's Stamp:

REGISTERED PROFESSIONAL ENGINEER
No. E17083
ELECTRICAL
STATE OF CALIFORNIA

Project Number: 120-10-10

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CAMPUS BUILDING OFFICIAL

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RUBIDOUX
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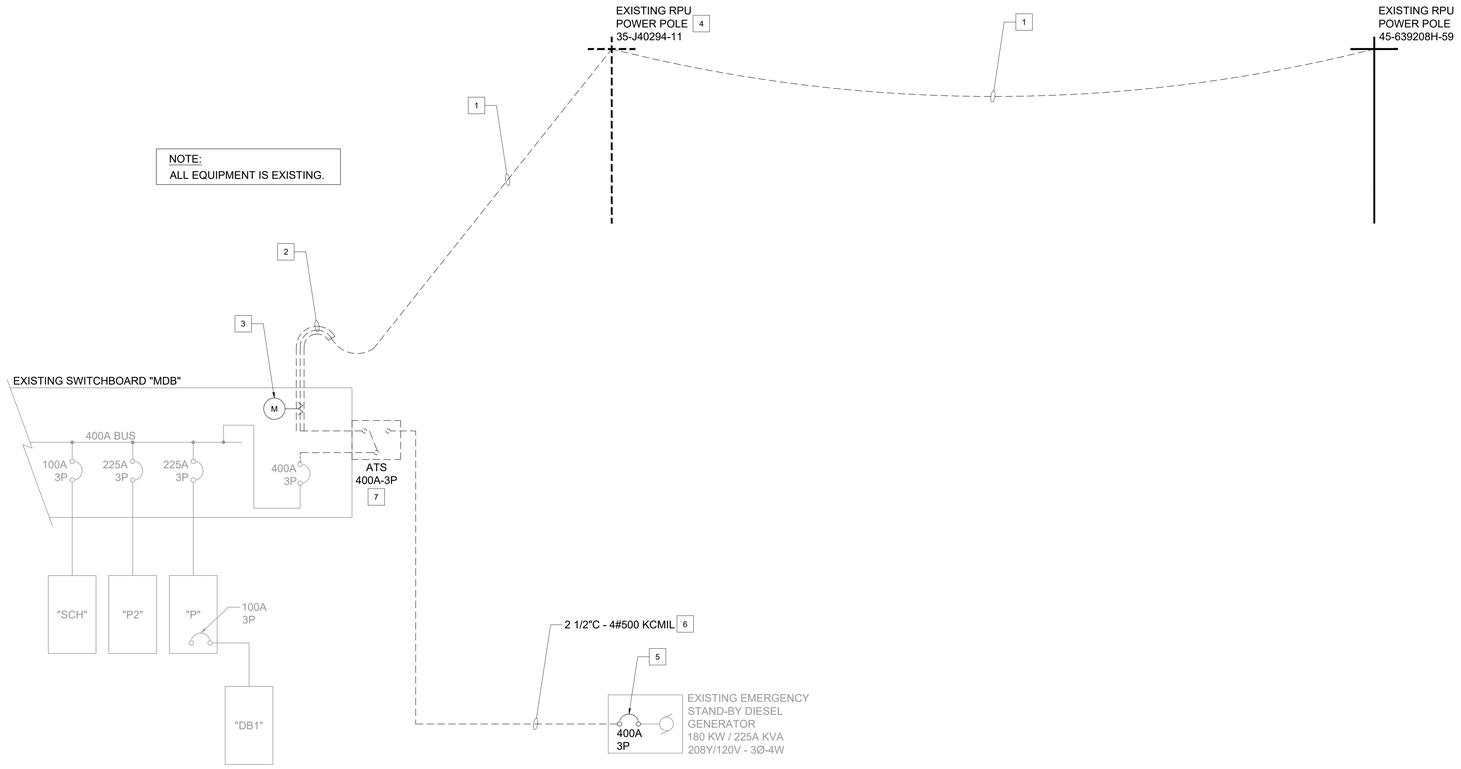
Drawing Title: ELECTRICAL SITE RECONSTRUCTION PLAN

Sheet No. E3.0



SLD DEMOLITION NOTES:

1. DEMOLISH RPU OVERHEAD FEEDERS
2. DEMOLISH (2) GOOSENECKS AND CONDUCTORS TO ATS.
3. DEMOLISH RPU METER COORDINATE WITH RPU REP. METER# 313657333 BLANK OFF METER SOCKET.
4. REMOVE RPU POLE.
5. REMOVE 400A-3P CIRCUIT BREAKER IN EXISTING EMERGENCY GENERATOR.
6. DEMOLISH EXISTING FEEDER FROM GENERATOR TO ATS DEMOLISH EXISTING 400A UNDERGROUND FEEDER FROM GENERATOR TO ATS.
7. DEMOLISH EXISTING 400A ATS SWITCH.

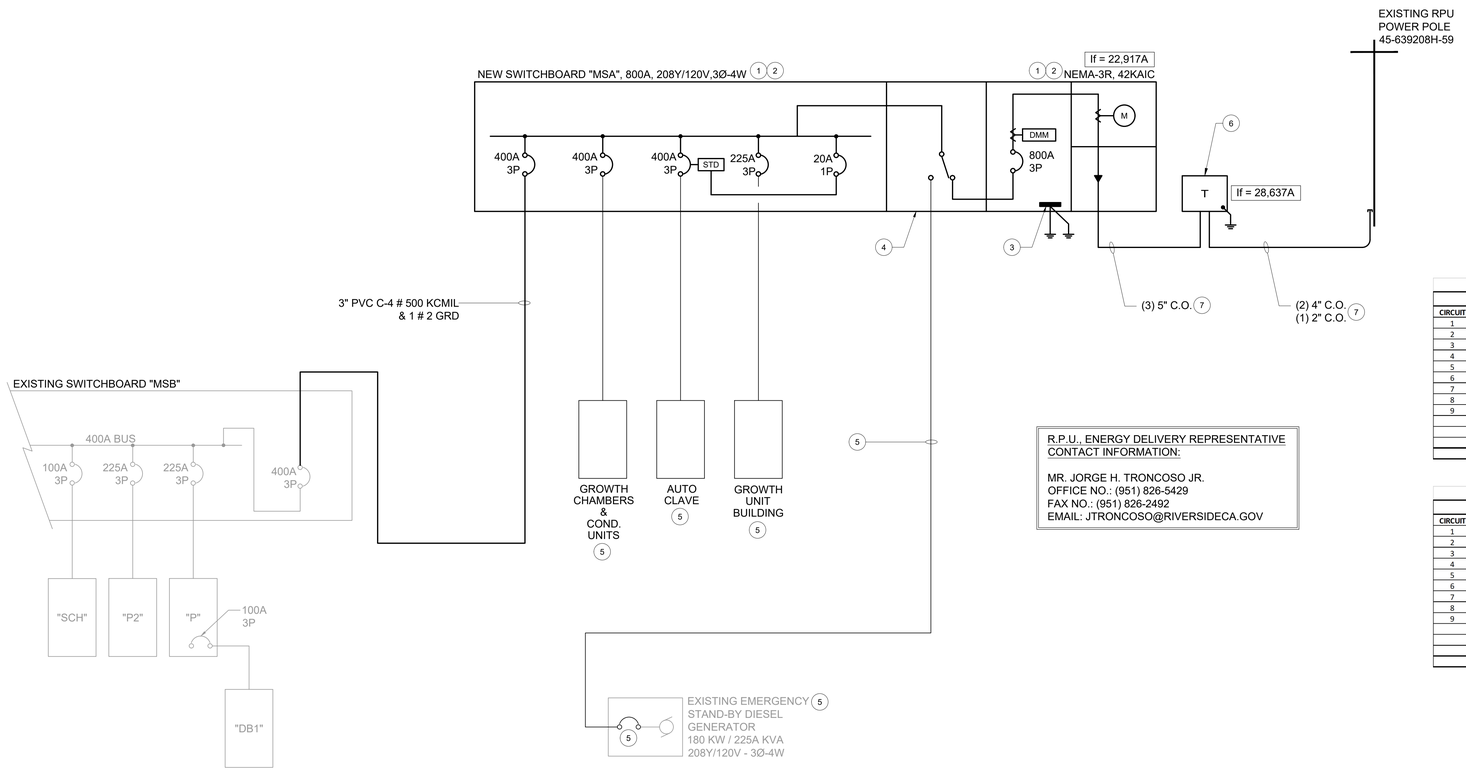
LEGEND:

EXISTING ——————

DEMOLISH - - - - - - - - - - - -

SINGLE LINE DIAGRAM DEMOLITION

SCALE	1
N.T.S.	



SLD RECONSTRUCTION NOTES:

1. SWITCHBOARD SHALL BE LISTED FOR SERVICE ENTRANCE USE.
2. CONTRACTOR SHALL PULL ALL PERMIT AND PAY ALL FEES.
3. SEE GROUNDING BUS BAR DETAIL 3 ON SHEET E5.0.
4. 800-AMP, 4-POLE (ATS) AUTOMATIC TRANSFER SWITCH.
5. FOR ADDITIONAL INFORMATION ON THE TERMINATION AND/OR SPLICING OF EQUIPMENT/DEVICES, REFER TO UCR PROJECT: 957459 - RUBIDOUX MODULAR PLANT GROWTH UNIT INSTALLATION.
6. RPU 4kV - 300kVA, 208Y/120V-3Ø-4W PAD MOUNTED TRANSFORMER. AVAILABLE FAULT (If) AS SHOWN.
7. SEE CONDUIT BURIAL DETAIL 1 AND/OR 6, ON SHEET E5.0.

NORMAL LOAD

'MSA' LOAD SCHEDULE 3 PHASE

CIRCUIT	DESCRIPTION	VA	AMPS
1	Panel P	47,400	132
2	Panel P2	14,400	40
3	Panel SCH	13,500	38
4	Growth Unit Building	30,776	85
5	Autoclave	68,000	189
6	(4) Grouth Chambers	33,120	92
7	(4) Grouth Chambers FUT	33,120	92
8	(4) Chamber Cond Units	15,840	44
9	(4) Chamber Cond Units FUT	15,840	44
	TOTAL	271,996	756

EMERGENCY LOAD

'MSA' LOAD SCHEDULE 3 PHASE

CIRCUIT	DESCRIPTION	VA	AMPS
1	Panel P	47,400	132
2	Panel P2	14,400	40
3	Panel SCH	13,500	38
4	Growth Unit Building	30,776	85
5	Autoclave	0	0
6	(4) Grouth Chambers	33,120	92
7	(4) Grouth Chambers FUT	0	0
8	(4) Chamber Cond Units	15,840	44
9	(4) Chamber Cond Units FUT	0	0
	TOTAL	155,036	431

R.P.U., ENERGY DELIVERY REPRESENTATIVE CONTACT INFORMATION:

MR. JORGE H. TRONCOSO JR.
OFFICE NO.: (951) 826-5429
FAX NO.: (951) 826-2492
EMAIL: JTRONCOSO@RIVERSIDECA.GOV

LEGEND:

EXISTING ——————

NEW ——————

SINGLE LINE DIAGRAM RECONSTRUCTION

SCALE	2
N.T.S.	

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Architect's Data:

Architect's Stamp:

Consultant's Stamp:

PROFESSIONAL ENGINEER — No. E17083 — ELECTRICAL — STATE OF CALIFORNIA

Project Number: 120-10-10

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RUBIDOUX GREENHOUSE ELECTRICAL SERVICE UPGRADE

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Project No.: –	**Construction Release:** –
DSA No.: –	

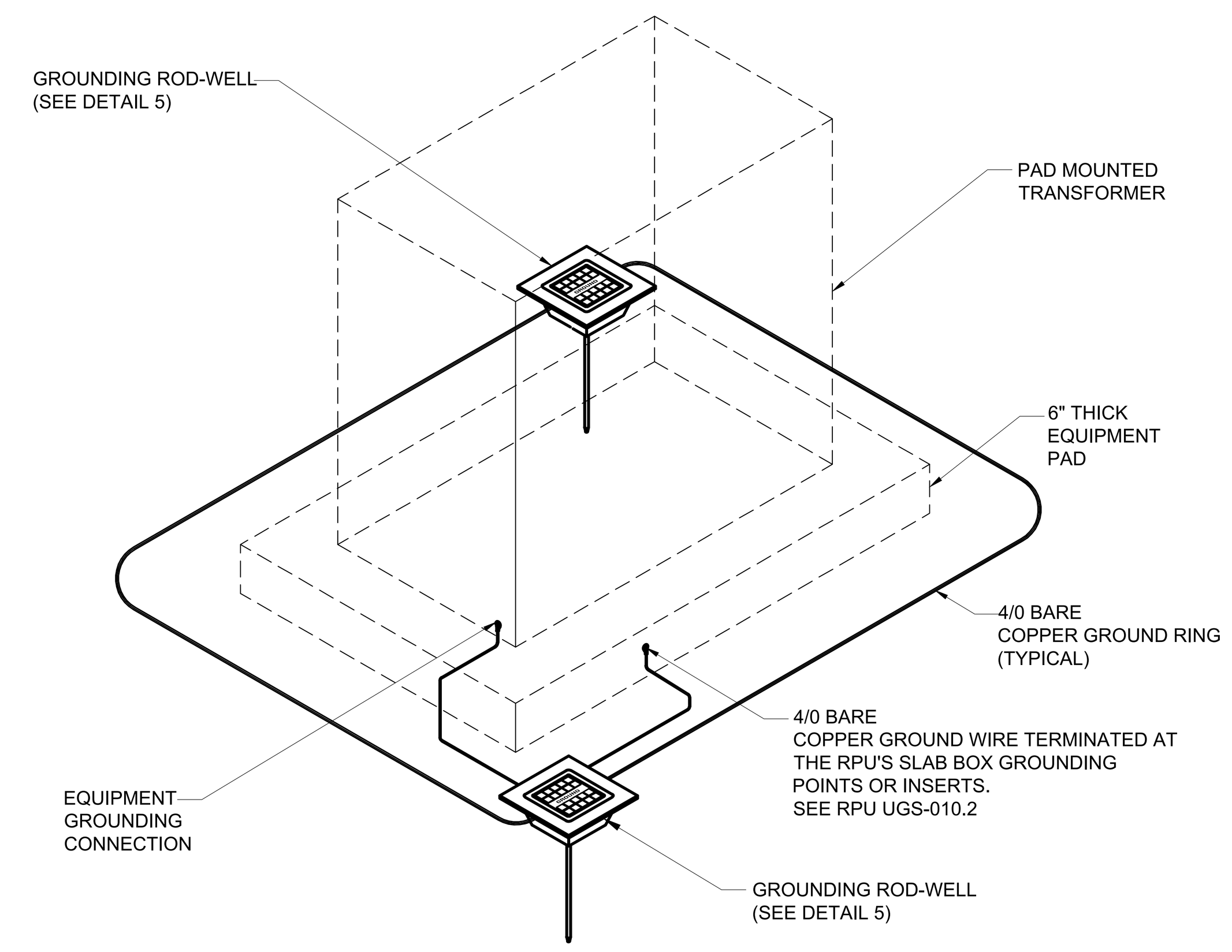
Drawing Title: SINGLE LINE DIAGRAMS

Sheet No. E4.0

Building Permit B21-598

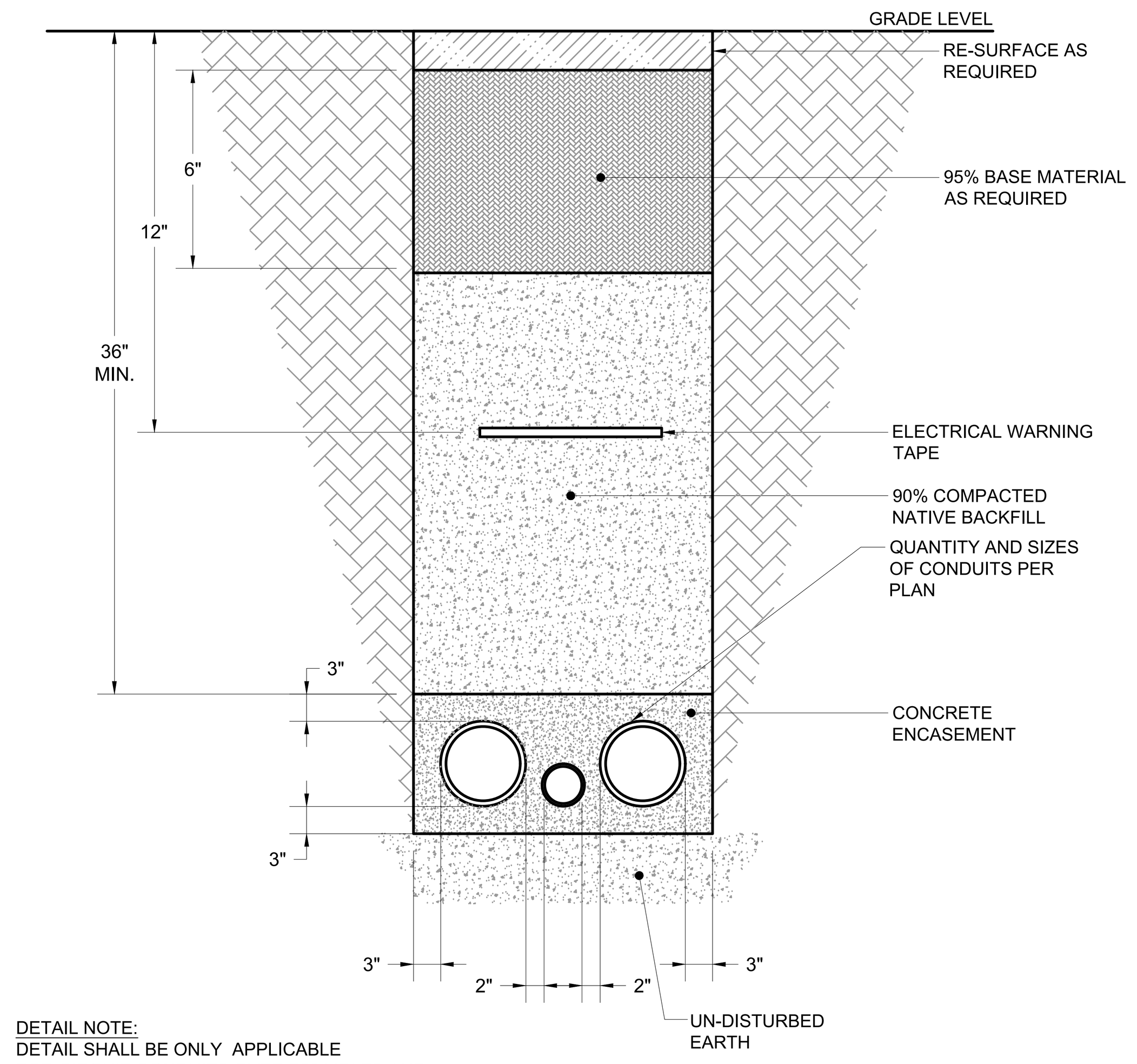
----	SCALE N.T.S.	10

----	SCALE N.T.S.	7



GROUND RING DETAIL

SCALE N.T.S. | 4



DETAIL NOTE:
DETAIL SHALL BE ONLY APPLICABLE FOR CIRCUIT CONDUITS OVER 750-VOLTS AND ADHERE TO RPU, UGS-100.1 AND 100.2

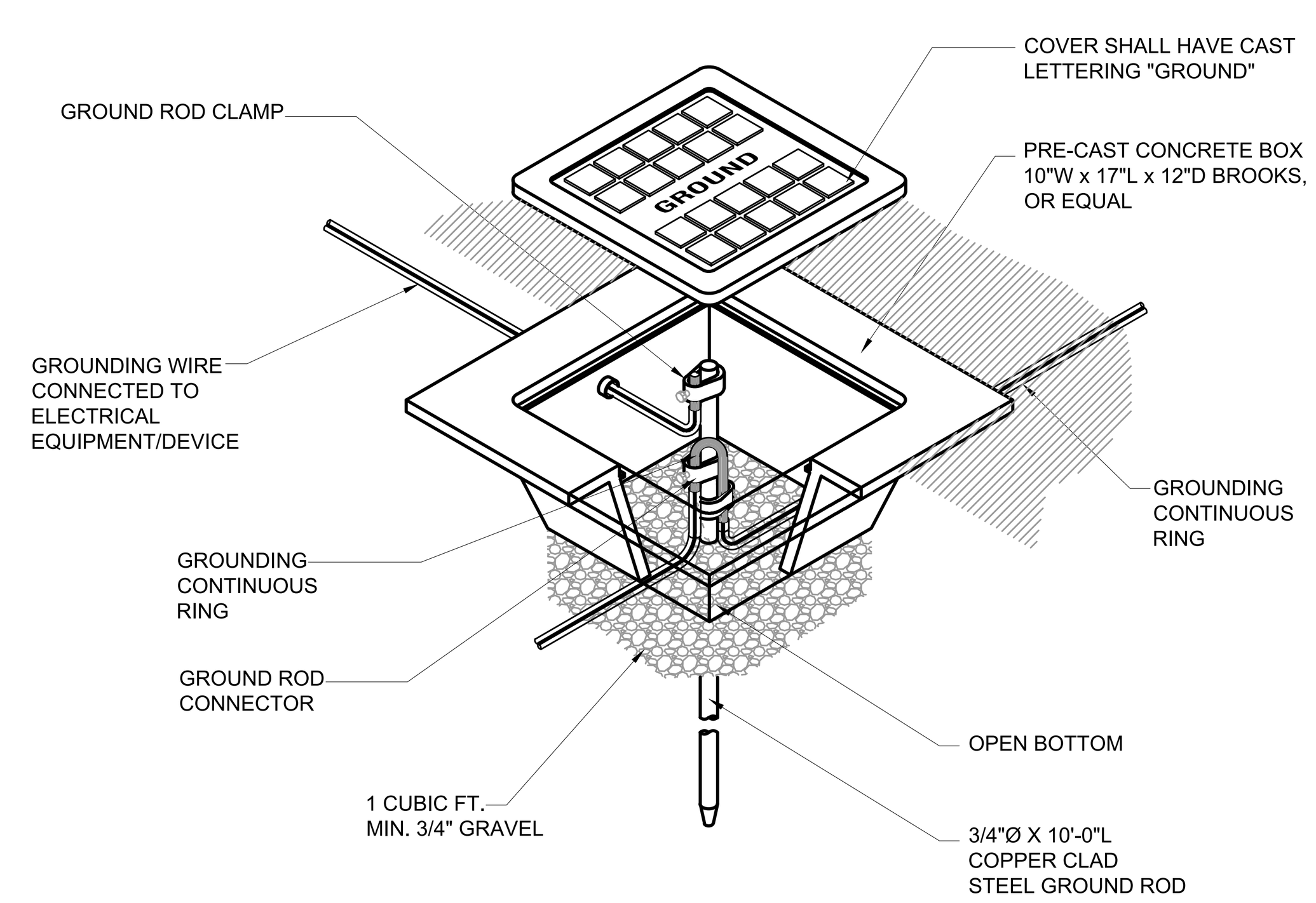
CONDUIT BURIAL DETAIL

SCALE N.T.S. | 1

----	SCALE N.T.S.	11

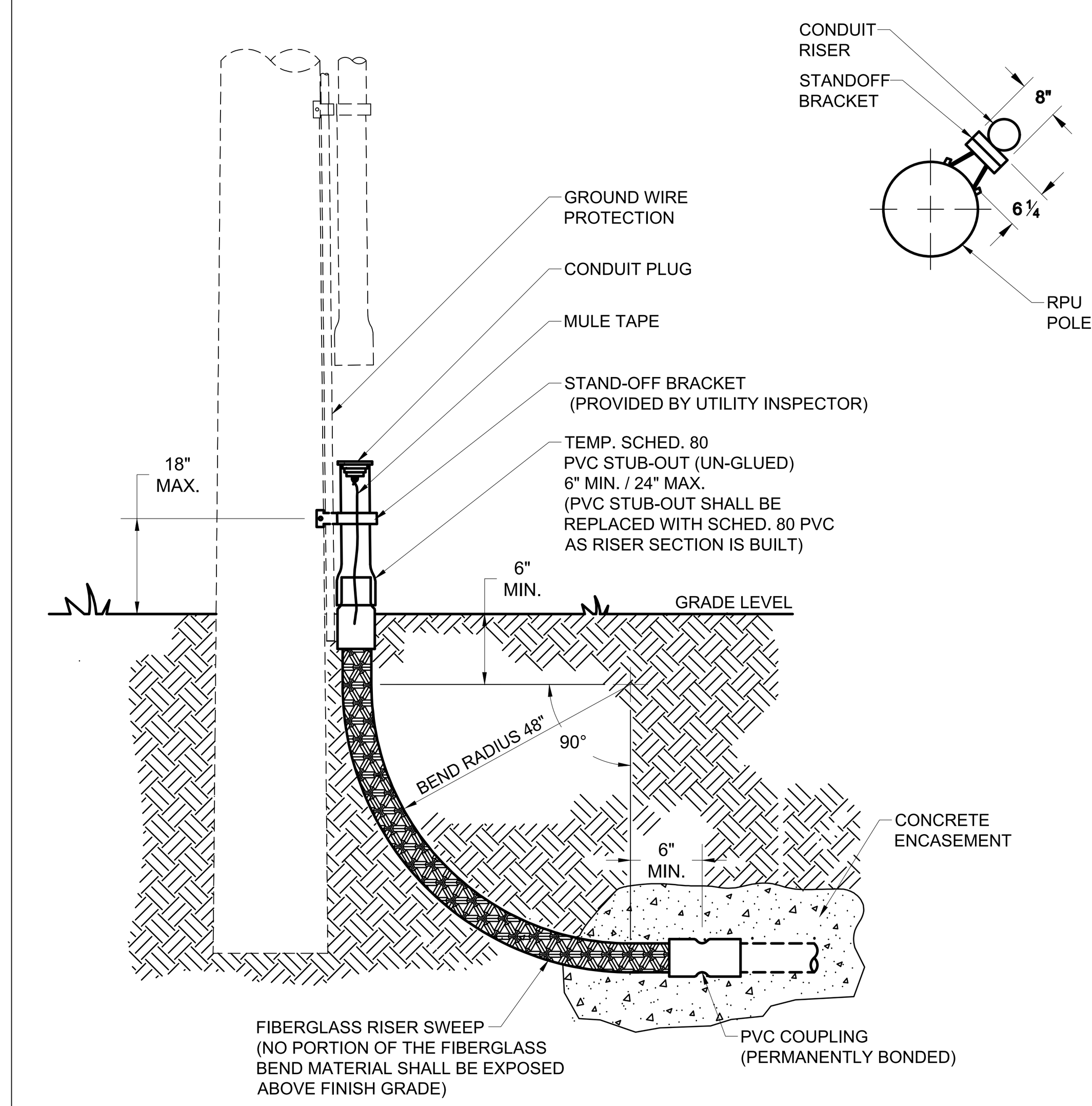
----	SCALE N.T.S.	8

NOTE:
ALL GROUNDING SHALL BE IN ACCORDANCE WITH CALIFORNIA ELECTRICAL CODE, CEC 2019, ARTICLE 250



GROUNDING ROD-WELL DETAIL

SCALE N.T.S. | 5

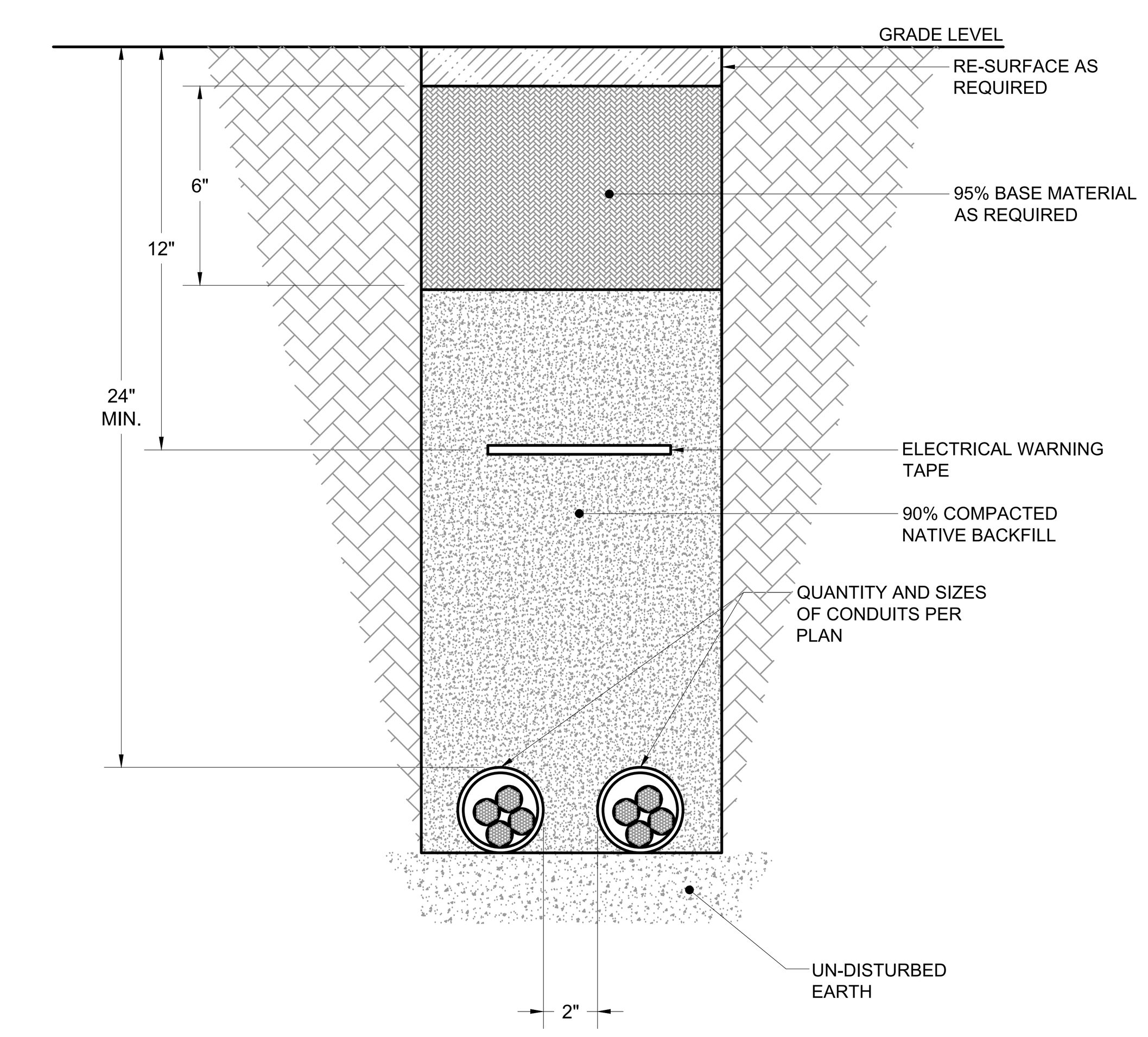


CONDUIT RISER DETAIL

SCALE N.T.S. | 2

----	SCALE N.T.S.	12

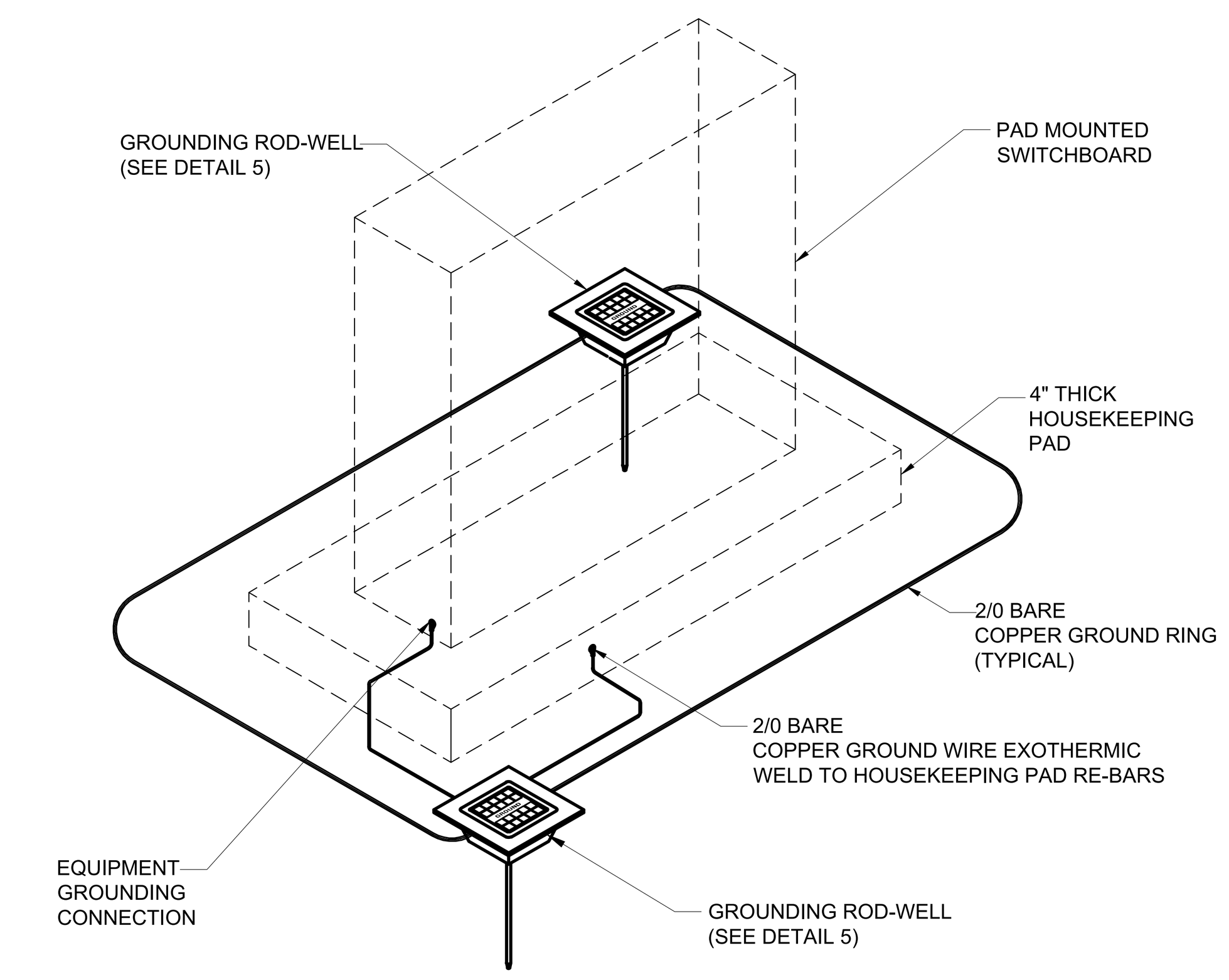
----	SCALE N.T.S.	9



DETAIL NOTE:
DETAIL SHALL BE ONLY APPLICABLE FOR CIRCUIT CONDUITS TO 750-VOLTS AND ADHERE TO RPU, UGS-100.1 AND 100.2

CONDUIT BURIAL DETAIL

SCALE N.T.S. | 6



SWITCHBOARD GROUND RING DETAIL

SCALE N.T.S. | 3

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Drawing Title:
ELECTRICAL DETAILS

Sheet No.
E5.0

Reviewed for Code Compliance
11/01/21

Building Permit B21-598

BUILDING CODE

COMPLY WITH THE 2019 EDITION OF THE CBC.

SPECIAL INSPECTION

SEE SHEET S0.2

STRUCTURAL OBSERVATION

SEE SHEET S0.2

CONCRETE

NOTE: ALL CONCRETE PLACEMENT SHALL CONFORM TO ACI-318-14

1. UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLANS, ALL POURED IN PLACE CONCRETE SHALL HAVE AN ULTIMATE COMPRESSIVE STRENGTH AT 28 DAYS AND AN AIR DRIED DENSITY AS FOLLOWS:

LOCATION	f'_c MIN	DENSITY MAX	WC RATIO
ALL CONCRETE	4,500 PSI	150 PCF	0.45 MAX

2. CEMENT TO BE USED IN THE CONCRETE MIXES SHALL BE TYPE V FOR CONCRETE ABOVE GRADE, AND TYPE V FOR CONCRETE IN CONTACT WITH SOIL. THE CEMENT SHALL BE FROM TESTED STOCK CONFORMING TO ASTM C-150. SUBMIT MIX DESIGN TO ENGINEER FOR REVIEW.
3. CONCRETE DIMENSIONAL TOLERANCES SHALL BE WITHIN THE STANDARDS SET IN ACI 117.
4. ALL REINFORCING STEEL, ANCHOR BOLTS, DOWELS AND OTHER INSERTS SHALL BE SECURED IN POSITION AND INSPECTED BY THE BUILDING DEPARTMENT INSPECTOR PRIOR TO THE PLACEMENT OF CONCRETE.
5. NO PIPES OR DUCTS SHALL BE PLACED IN STRUCTURAL CONCRETE UNLESS SPECIFICALLY DETAILED. REFER TO OTHER PLANS FOR LOCATIONS.
6. ALL CONDUITS IN CONCRETE WALLS TO BE WIRED TO THE WALL REINFORCING.
7. LOCATIONS OF ANY CONSTRUCTION JOINTS NOT SPECIFICALLY SHOWN ON THE PLANS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACING OF REINFORCING STEEL. ALL JOINT SURFACES SHALL BE ROUGHENED AND CLEANED PRIOR TO PLACEMENT OF NEW ADJOINING CONCRETE.
8. CONCRETE FLOOR SLABS SHALL VARY FROM LEVEL NOT MORE THAN 3/16 INCH IN 10-FEET.
9. ALL EXPOSED CORNERS OF CONCRETE SHALL BE CHAMFERED 3/4-INCH UNLESS NOTED OTHERWISE ON THE PLANS.
10. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED, EXCEPT SLABS ON GRADE MAXIMUM SLUMP 5".
11. USE AIR ENTRAINED CONCRETE FOR CONCRETE EXPOSED TO FREEZING TEMPERATURES BELOW 30° F.

BOLT WASHER SCHEDULE

1. WASHERS SHALL BE USED UNDER THE HEADS AND NUTS OF ALL BOLTS BEARING ON WOOD. THE WASHERS LISTED BELOW SHALL BE USED IN THE FOLLOWING LOCATIONS:

   A. WOOD LEDGERS TO CONCRETE AND MASONRY WALLS

   B. AGAINST A 2x MEMBER WHEN 2x IS BOLTED TO A LARGER MEMBER, OR IS USED AS PART OF A BUILT-UP BEAM.

   C. STANDARD CUT WASHERS MAY BE USED ELSEWHERE UNLESS NOTED ON PLANS.

BOLT SIZE (INCH)	SQUARE STEEL (INCH)	ROUND STEEL (INCH)	ROUND MALLIABLE IRON (INCH)
1/2	2 1/2 x 2 1/2 x 3/16	2 1/4 x 3/16	2 1/2 x 1/4
5/8	2 1/2 x 2 1/2 x 1/4	2 3/4 x 1/4	2 1/2 x 7/16
3/4	3 x 3 x 1/4	3 x 5/16	3 x 7/16
7/8	3 1/2 x 3 1/2 x 5/16	3 1/2 x 3/8	3 1/2 x 7/16
1	4 x 4 x 3/8	4 x 7/16	4 x 7/16

2. SEE SHEARWALL SCHEDULE AND DETAILS FOR SILL PLATE WASHERS.

DOWELS/ANCHORS EMBEDDED IN EPOXY

1. DOWELS AND ANCHORS EMBEDDED IN EPOXY SHALL BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.
2. CORRECT IMPLEMENTATION OF THE MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION SHALL BE VERIFIED BY A SPECIAL INSPECTOR.
3. ONLY NON-REBAR-CUTTING DRILL BITS SHALL BE USED TO DRILL HOLES IN EXISTING CONCRETE.
4. DOWEL OR ANCHOR EMBEDMENT SHALL BE VERIFIED AND DOCUMENTED BY THE SPECIAL INSPECTOR.
5. DRILL HOLES SHALL BE CLEANED OF CONCRETE OR MASONRY DUST AND DEBRIS USING OIL-FREE COMPRESSED AIR AND A WIRE BRUSH FOR CONCRETE AND CONCRETE MASONRY UNIT (CMU) SUBSTRATES. A BLOW-OUT BULB MAY NOT BE USED IN LIEU OF COMPRESSED AIR. CLEANLINESS OF DRILL HOLES SHALL BE VERIFIED AND DOCUMENTED BY A SPECIAL INSPECTOR.
6. ACCEPTABLE EPOXY ANCHOR SYSTEM:

MANUFACTURER	CONCRETE	CMU GROUTED	CMU HOLLOW	BRICK MASONRY	URM
SIMPSON SET EPOXY ICC ESR 1772		✓	✓	✓	✓
SIMPSON SET-XP EPOXY ICC ESR 2508	✓				
HILTI RE500-SD (SLOW CURE) ICC ESR 2322	✓				
HILTI HY200 (FAST CURE) ICC ESR 3187	✓				
HILTI HY150MAX ICC ESR 1967		✓			
HILTI HY70 ICC ESR 3342			✓	✓	✓

MASONRY

NOTE: ALL MASONRY PLACEMENT SHALL CONFORM TO ACI 530-16 AND ACI 530.1-16

1. BLOCK MASONRY UNITS SHALL BE SINGLE OPEN END BOND BEAM UNITS CONFORMING TO UBC ASTM C90. LATEST REVISION, GRADE N, TYPE 1.
2. MASONRY UNITS SHALL HAVE A MINIMUM f'_m= 1500 PSI.
3. THE f'_m SHALL BE DETERMINED PER THE CBC SECTION 2105. PROVIDE A MINIMUM OF ONE SET OF PRISMS AT EACH FLOOR LEVEL IF MASONRY PRISMS TESTING IS USED.
4. THE ULTIMATE COMPRESSIVE STRENGTH OF INDIVIDUAL UNITS SHALL EQUAL TO OR EXCEED f'_m.
6. GROUT FOR MASONRY UNITS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 2000 PSI.
7. MORTAR FOR MASONRY UNITS SHALL BE TYPE 'S' AND HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 1800 PSI.
8. THE MAXIMUM GROUT POUR HEIGHT IS 4-FEET. CLEANOUTS SHALL BE PROVIDED FOR ALL GROUT POURS OVER 4 FEET IN HEIGHT. WHERE REQUIRED, CLEANOUTS SHALL BE PROVIDED IN THE BOTTOM COURSE AT EVERY VERTICAL BAR AND SHALL BE SEALED AFTER INSPECTION AND BEFORE GROUTING.
9. VERTICAL REINFORCEMENT: SHALL BE IN THE CENTER OF GROUT AT THE CENTER OF THE WALL, CONTINUOUS FULL HEIGHT OF WALL AS FOLLOWS: 1-#5 AT ALL CORNERS (AND 1ST ADJACENT CELL TO CORNER), INTERSECTIONS, WALL ENDS, JAMBS, AND EACH SIDE OF EXPANSION JOINTS. 1-#5 AT 16" OC ALL WALLS. UNLESS NOTED OTHERWISE ON PLANS/DETAILS.
   HORIZONTAL REINFORCEMENT: 2-#4 AT 24" OC CONTINUOUS FULL HEIGHT OF WALL (PROVIDE CORNER BARS TO MATCH AND LAP WITH HORZONTAL REINFORCEMENT 24" MINIMUM AT ALL CORNERS). 2-#5 AT ROOF AND FLOOR LINES, UNLESS NOTED OTHERWISE ON PLANS AND/OR DETAILS. PLACE BARS AT ROOF AND FLOOR LINES CONTINUOUS THROUGH EXPANSION JOINTS, UNLESS NOTED OTHERWISE ON PLAN AND/OR DETAILS.
10. ALL ISOLATED BOLTS EMBEDDED IN MASONRY SHALL BE GROUTED SOLIDLY IN PLACE WITH NOT LESS THAN 2-INCHES OF GROUT COMPLETELY SURROUNDING EACH BOLT.
11. ALL CONCRETE BLOCK, UNO, SHALL BE MEDIUM WEIGHT.
12. SEE 'REINFORCING STEEL' NOTES FOR MASONRY REINFORCING REQUIREMENTS.
13. UNLESS NOTED OTHERWISE, THE MINIMUM LAP SPLICE FOR REINFORCING SHALL BE 48-BAR DIAMETERS BUT NOT LESS THAN 2-FEET. WHEN 2 BARS OCCUR IN ONE CELL THE SPLICE SHALL BE INCREASED TO 62-BAR DIAMETERS.

REINFORCING STEEL

1. ALL REINFORCING BARS THAT ARE TO BE FASTENED (NOT WELDED) IN POSITION SHALL CONFORM TO ASTM A615 GRADE 60. #2 AND #3 TIES AND STIRRUPS MAY CONFORM TO ASTM A615 GRADE 40.
2. ALL REINFORCING BARS TO BE WELDED SHALL CONFORM TO ASTM A706 GRADE 60.
3. ALL WIRE MESH REINFORCEMENT SHALL CONFORM TO ASTM A185 AND SHALL HAVE A MINIMUM SIDE AND END LAP OF 1 1/2 MESH SPACES OR 9-INCHES WHICHEVER IS GREATER.
4. ALL DETAILING, AND FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL CONFORM TO THE ACI 315, MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES.
5. UNLESS DETAILED OTHERWISE, REINFORCING BARS IN CONTINUOUS CONCRETE BEAMS AND SPANDRELS SHALL HAVE TOP BARS SPLICED AT MID SPAN, AND BOTTOM BARS SPLICED OVER THE SUPPORTS.
6. UNLESS DETAILED OTHERWISE, DOWELS FROM FOOTINGS INTO WALLS AND COLUMNS SHALL BE THE SAME SIZE, SPACING AND NUMBER AS THE REINFORCING TO BE SPLICED IN THE WALLS AND COLUMNS.
7. REINFORCING SHALL HAVE MINIMUM CONCRETE COVER AS FOLLOWS:

   UNFORMED SURFACES EXPOSED TO EARTH: 3"
   FORMED SURFACES EXPOSED TO EARTH OR WEATHER:
   - NO. 5 AND SMALLER 1½"
   - NO. 6 AND LARGER 2"

   FORMED SURFACES NOT EXPOSED TO EARTH OR WEATHER:
   - SLABS, WALLS AND JOISTS:
     - NO. 11 AND SMALLER ¾"
     - NO. 14 AND LARGER 1½"
   - BEAMS, GIRDERS AND COLUMNS:
     - PRIMARY REINFORCEMENT, TIES, STIRRUPS AND SPIRALS 1½"

8. SLABS: PLACE REINFORCEMENT AT MID-HEIGHT OF SLAB. USE CHAIRS FOR REINFORCEMENT SUPPORT. DO NOT ALLOW REINFORCEMENT TO MIGRATE TO BOTTOM OF SLAB. USE #3 BARS AT 16" OC EACH WAY IN LIEU OF FIBERMESH TO BETTER CONTROL CONCRETE CRACKING.
9. CONCRETE: LAP SPLICES SHALL BE IN ACCORDANCE WITH ACI 318-14 SECTION 12.14 AND 12.15 CLASS B SPLICE UNLESS OTHERWISE NOTED, THE FOLLOWING TABLE MAY BE USED FOR LAP SPLICES FOR #6 AND SMALLER BARS WITH f'_c GREATER THAN OR EQUAL TO 2,500 PSI AND MINIMUM ASTM A615 GRADE 60 BARS.

BAR SIZE	MINIMUM TENSION SPLICE
3	32"
4	42"
5	52"
6	62"

STRUCTURAL LUMBER

NOTE: ALL WOOD PLACEMENT SHALL CONFORM TO CBC 2301 AND NDS 2018

1. ALL STRUCTURAL LUMBER SHALL BE DOUGLAS FIR - LARCH COAST REGION AND SHALL BE IDENTIFIED AS REQUIRED BY DOS PS20 BY A GRADE MARK OF A LUMBER GRADING AGENCY APPROVED BY THE BOARD OF REVIEW OF THE AMERICAN LUMBER STANDARDS COMMITTEE.
2. ALL FRAMING MEMBERS SHALL BE AS FOLLOWS EXCEPT AS NOTED ON PLAN:
   HORIZONTAL MEMBERS
   - SUB-PURLINS (STIFFENERS) DF #1
   - JOISTS AND BEAMS DF #1

   VERTICAL MEMBERS
   - POSTS AND COLUMNS DF #1
   - STUDS & SILLS DF #2
3. SILL PLATES AND LEDGERS IN CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE TREATED DOUGLAS FIR. ALL HOLES DRILLED FOR ANCHOR BOLTS SHALL BE NO LARGER THAN 1/16-INCH GREATER THAN THE ANCHOR BOLT DIAMETER- HOLES LARGER THAN THIS SHALL HAVE ALL VOID SPACE BETWEEN THE BOLT AND THE SILL PLATE FILLED WITH EPOXY.
4. FRAMING ANCHORS, HANGERS, STRAPS, COLUMN CAPS, CASES AND HOLD DOWNS SHOWN ARE AS MANUFACTURED BY SIMPSON COMPANY, BREA, CA. DESIGNATIONS SHOWN ON THE DRAWINGS ARE FROM LATEST SIMPSON CATALOG.
5. PLYWOOD SHALL CONFORM TO THE STANDARDS IN DOC PS1 OR DOC PS2. ALL PANELS TO BE IDENTIFIED WITH A GRADE MARK OF AN APPROVED TESTING AND GRADING AGENCY. EXTERIOR GLUE SHALL BE USED. NAILING OF PLYWOOD SHALL BE APPROVED IN WRITING BY GOVERNING JURISDICTION OR ENGINEER PRIOR TO COVERING PLYWOOD.
6. ALL WALLS NOT SOLIDLY SHEATHED OR CONTAINING SHEAR PANELS SHALL HAVE A 1X6 DIAGONAL LET-IN OR APPROVED STEEL X BRACE AT THE ENDS AND AT NO MORE THAN 25' ON CENTER. BRACE SHALL EXTEND FROM BOTTOM OF LOWEST PLATE TO TOP OF UPPER PLATE.
7. ALL STUD PARTITIONS OR WALLS OVER 10-FEET IN HEIGHT SHALL HAVE 2X BLOCKING, SAME WIDTH AS STUDS, PREFERABLY AT MID-HEIGHT BUT NOT TO EXCEED 8-FEET ON CENTER VERTICALLY.
8. DO NOT NOTCH JOISTS, RAFTERS OR BEAMS EXCEPT WHERE SHOWN ON THE DETAILS. HOLES THROUGH SILLS, PLATES, STUDS AND DOUBLE PLATES IN WALLS SHALL NOT EXCEED 1/3 OF THE PLATE WIDTH. USE BORED HOLES LOCATED IN CENTER OF MEMBER OR USE METAL STRAP ON NEAR SIDE. NO HOLES PERMITTED IN STUDS, SILL PLATES OR TOP PLATES OF SHEAR PANELS WITHOUT APPROVAL OF THE ENGINEER.
9. PROVIDE APPROVED X BRIDGING OR SOLID BLOCKING FOR BEAMS, RAFTERS AND JOISTS OF MORE THAN EIGHT INCHES DEPTH AT NO MORE THAN EIGHT FEET ON CENTER.
10. BOLTS IN WOOD SHALL BE NOT LESS THAN 7 BOLT DIAMETERS FROM END AND 4 BOLT DIAMETERS FROM EDGES UNLESS NOTED. BOLT HOLES SHALL BE 1/32" LARGER THAN THE BOLT SIZE. USE ASTM A307 BOLTS.
11. LAG BOLTS SHALL HAVE LEAD HOLES BORED. HOLE DIAMETER TO BE: A. SHANK PORTION: SAME DIAMETER AND LENGTH AS SHANK. B. THREADED PORTION: 0.6-0.75 TIMES DIAMETER OF THREAD.
12. UNLESS NOTED OTHERWISE, ALL NAILS SHALL BE 'COMMON'.
13. HOLES FOR NAILS, THAT ARE NECESSARY TO PREVENT SPLITTING SHALL BE PRE DRILLED AT A SMALLER DIAMETER THAN THE NAIL.
14. FASTENERS AND HARDWARE EXPOSED TO MOISTURE OR PRESSURE/ CHEMICALLY TREATED WOOD SHALL BE HOT-DIPPED GALVANIZED.
15. INSTALL STEEL PLATE WASHERS UNDER BOLT HEADS AND NUTS. WASHERS TO HAVE A MINIMUM SIZE AS INDICATED IN THE ATTACHED BOLT WASHER SCHEDULE.
16. DOUBLE TOP PLATES AT ALL EXTERIOR WALLS AND ALL BEARING PARTITIONS (NOT OTHERWISE DETAILED) SHALL LAP 4'-0" MINIMUM THROUGH EACH SIDE OF SPLICE IN PLATES & HAVE 8-16d NAILS MINIMUM THROUGH BOTH PLATES.
17. UNLESS NOTED OTHERWISE, DOUBLE JOISTS SHALL BE PROVIDED UNDER PARTITION WALLS WHERE WALL IS PARALLEL TO THE FRAMING.
18. LEDGER ANCHOR BOLT SPACING SHALL BEGIN FROM THE END OF A WALL NOT LESS THAN 7-INCHES AND NOT MORE THAN 12-INCHES, AND SHALL NOT EXCEED 4-FEET ON CENTER BETWEEN THE ENDS; AND THERE SHALL BE A MINIMUM OF 2-ANCHOR BOLTS IN EACH SEPARATE PIECE OF LEDGER.
19. GLULAM: SHALL BE DOUGLAS FIR COMBINATION 24F WITH EXTERIOR GLUE ARCHITECTURAL APPEARANCE AND SHALL BEAR THE STAMP OF AN APPROVED INSPECTION AGENCY. COMBINATION SYMBOL AND SPECIES OUTER/CORE LAMINATIONS SHALL BE 24F-V4 DF/DF FOR SIMPLE SUPPORTED BEAMS AND 24F-V8 DF/DF FOR CONTINUOUS AND CANTILEVERED BEAMS. F_b=2,400 PSI, F_v=165 PSI, E=1,800 KSI MINIMUM.
20. PARALAM: 2.0E PARALAM PSL SHALL BE AS MANUFACTURED BY WEYERHAEUSER, ICC (ICC ESR-1387). F_b=2,900 PSI, F_v=290 PSI, E=2,000 KSI. REDLAM BY REDBUILT, ICC (ICC ESR-2993), LARR 25832.
21. FASTENERS IN CONTACT WITH PRESSURE TREATED WOOD SHALL BE HOT DIPPED ZINK - COATED GALVANIZED STEEL.
22. ALL EXPOSED WOOD SHALL BE ROUGH SAWN.
23. OSB OF AN EQUIVALENT EXTERIOR GRADE IS PERMITTED TO BE SUBSTITUTED FOR PLYWOOD. THE CONTRACTOR SHALL NOT ALLOW THE OSB TO BE EXPOSED TO WEATHER.

WOOD I-JOISTS

1. WOOD I-JOISTS SHALL BE IN COMPLIANCE WITH THE FOLLOWING STANDARDS:

MANUFACTURE	ICC NUMBER	LR RR NUMBER
RED-I BY REDBUILT	ESR-2994	RR 25833
RED-L, RED-W, RED-S BY REDBUILT	ESR-1774	RR 22614
TJI BY WEYERHAEUSER	ESR-1153	RR 25538
BCI BY BOISE CASCADE	ESR-1336	RR 24999

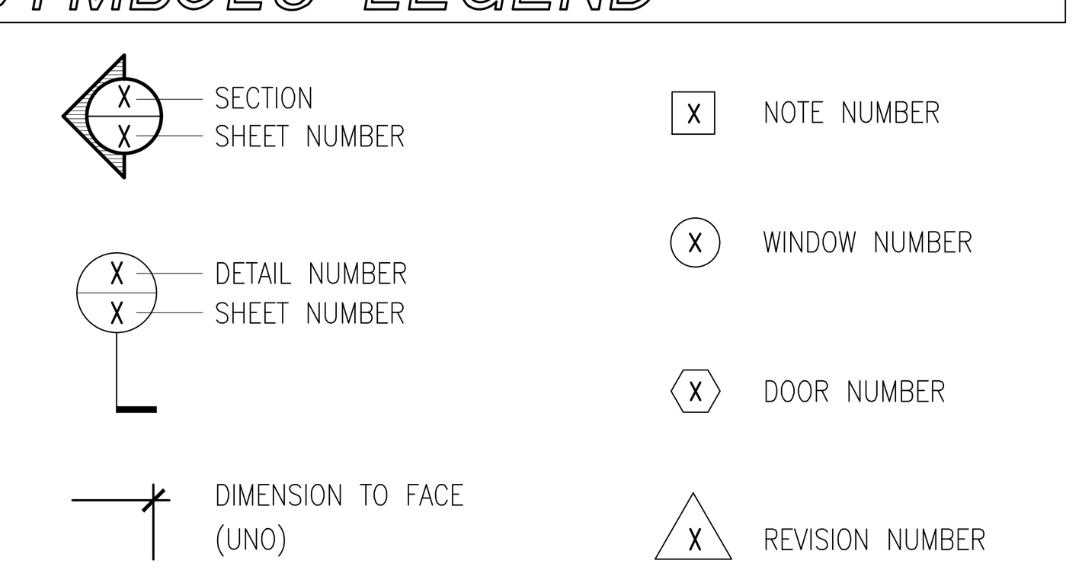
STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL WORK SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) STEEL CONSTRUCTION DESIGN MANUAL-15TH EDITION AND THE SEISMIC DESIGN MANUAL-3RD EDITION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
2. STRUCTURAL STEEL MATERIAL SHALL CONFORM TO THE FOLLOWING:

W SHAPES	ASTM A992 (50 KSI)
C-SHAPES, MC-SHAPES, ANGLES, PLATES AND BARS	ASTM A36 (50 KSI)
HSS ROUND/SQUARE/RECTANGULAR	ASTM A500, GRADE B/C (46 KSI) ASTM A1085 (50 KSI)
PIPE	ASTM A53, GRADE B (46 KSI)
MACHINE BOLTS	ASTM A307 (36 KSI)
ANCHORS BOLTS AND PINS	ASTM A307 OR A36 (36 KSI)

3. LICENSED FABRICATORS APPROVED BY THE CITY OF LOS ANGELES SHALL FURNISH SHOP DRAWINGS FOR APPROVAL OF THE ENGINEER PRIOR TO FABRICATION OF THE STRUCTURAL MEMBERS.
4. ALL CONNECTIONS NOT SPECIFICALLY DETAILED ON THE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR AND SHALL BE SHOWN ON THE SHOP DRAWINGS SUBMITTED TO THE ENGINEER FOR APPROVAL.
5. ALL STEEL EXPOSED TO THE WEATHER OR TO ANY SOURCE OF MOISTURE SHALL BE EITHER HOT DIPPED GALVANIZED OR PROVIDED WITH AT LEAST 2-COATS OF CORROSION INHIBITING PAINT.

SYMBOLS LEGEND



FASTENING SCHEDULE

NAILING SCHEDULE: (IN COMPLIANCE WITH TABLE 2304.10.1 OF THE 2019 CBC)

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION
ROOF		
1. BLOCKING BETWEEN CEILING JOISTS, RAFTERS, OR TRUSSES TO TOP PLATE OR OTHER FRAMING BELOW	3-8d COMMON (2½"x0.131"); OR 3-10d BOX (3"x0.128"); OR 3-3"x0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	EACH END, TOENAIL
BLOCKING BETWEEN RAFTERS OR TRUSS NOT AT THE WALL TOP PLATE, TO RAFTER OR TRUSS.	2-8d COMMON (2½"x0.131") 2-3"X0.131" NAILS 2-3" 14 GAGE STAPLES	EACH END, TOENAIL
	2-16d COMMON (3½"x0.162") 3-3"x0.131" NAILS 3-3" 14 GAGE STAPLES	END NAIL
FLAT BLOCKING TO TRUSS AND WEB FILLER	16d COMMON (3½"x0.162")AT 6" OC 3"x0.131" NAILS AT 6" OC 3" x14 GAGE STAPLES AT 6" OC	FACE NAIL
2. CEILING JOISTS TO TOP PLATE	3-8d COMMON (2½"x0.131"); OR 3-10d BOX (3"x0.128"); OR 3-3"x0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	EACH JOIST, TOENAIL
3. CEILING JOIST NOT ATTACHED TO PARALLEL RAFTER, LAPS OVER PARTITIONS (NO THRUST) (SEE SECTION 2308.7.3.1, TABLE 2308.7.3.1)	3-16d COMMON (3½"x0.162"); OR 4-10d BOX (3"x0.128"); OR 4-3"x0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	FACE NAIL
4. CEILING JOIST ATTACHED TO PARALLEL RAFTER (HEEL JOINT) (SEE SECTION 2308.7.3.1, TABLE 2308.7.3.1)	PER TABLE 2308.7.3.1	FACE NAIL
5. COLLAR TIE TO RAFTER	3-10d COMMON (3"x0.148"); OR 4-10d BOX (3"x0.128"); OR 4-3"x0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	FACE NAIL
6. RAFTER OR ROOF TRUSS TO TOP PLATE (SEE SECTION 2308.7.5, TABLE 2308.7.5)	3-10d COMMON (3"x0.148"); OR 3-16d BOX (3½"x0.135"); OR 4-10d BOX (3"x0.128"); OR 4-3"x0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	TOENAIL[c]
7. ROOF RAFTERS TO RIDGE VALLEY OR HIP RAFTERS; OR ROOF RAFTER TO 2-INCH RIDGE BEAM.	2-16d COMMON (3½"x0.162"); OR 3-10d BOX (3"x0.128"); OR 3-3"x0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	END NAIL
	3-10d COMMON (3"x0.148"); OR 3-16d BOX (3½"x0.135"); OR 4-10d BOX (3"x0.128"); OR 4-3"x0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	TOENAIL
WALL		
8. STUD TO STUD (NOT AT BRACED WALL PANELS)	16d COMMON (3½"x0.162");	24" OC FACE NAIL
	10d BOX (3"x0.128"); OR 3"x0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	16" OC FACE NAIL
9. STUD TO STUD AND ABUTTING STUDS AT INTERSECTING WALL CORNERS (AT BRACED WALL PANELS)	16d COMMON (3½"x0.162"); OR	16" OC FACE NAIL
	16d box (3½"x0.135"); OR	12" OC FACE NAIL
	3"x0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	12" OC FACE NAIL
10. BUILT-UP HEADER (2" TO 2" HEADER)	16d COMMON (3½"x0.162"); OR	16"OC,EACH EDGE, FACE NAIL
	16d box (3½"x0.135")	12"OC,EACH EDGE, FACE NAIL
11. CONTINUOUS HEADER TO STUD	4-8d COMMON (2½"x0.131"); OR 4-10d BOX (3"x0.128")	TOENAIL
12. TOP PLATE TO TOP PLATE	16d COMMON (3½"x0.162"); OR	16" OC FACE NAIL
	10d BOX (3"x0.128"); OR 3"x0.131" NAILS; OR 3" 14 GAGE STAPLES, 7/16" CROWN	12" OC FACE NAIL
13. TOP PLATE TO TOP PLATE, AT END JOINTS	8-16d COMMON (3½"x0.162"); OR 12-10d BOX (3"x0.128"); OR 12-3"x0.131" NAILS; OR 12-3" 14 GAGE STAPLES, 7/16"CROWN	EACH SIDE OF END JOINT, FACE NAIL (MINIMUM 24" LAP SPLICE LENGTH EACH SIDE OF END JOINT)
14. BOTTOM PLATE TO JOIST, RIM JOIST, BAND JOIST OR BLOCKING (NOT AT BRACED WALL PANELS)	16d COMMON (3½"x0.162"); OR	16" OC FACE NAIL
	16d BOX (3½"x0.135"); OR 3"x0.131" NAILS; OR 3" 14 GAGE STAPLES, 7/16" CROWN	12" OC FACE NAIL
15. BOTTOM PLATE TO JOIST, RIM JOIST, BAND JOIST OR BLOCKING AT BRACED WALL PANELS	2-16d COMMON (3½"x0.162"); OR 3-16d BOX (3½"x0.135"); OR 4-3"x0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	16" OC FACE NAIL
16. STUD TO TOP OR BOTTOM PLATE	4-8d COMMON (2½"x0.131"); OR 4-10d BOX (3"x0.128"); OR 4-3"x0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	TOENAIL
	2-16d COMMON (3½"x0.162"); OR 3-10d BOX (3"x0.128"); OR 3-3"x0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	END NAIL
17. TOP PLATES, LAPS AT CORNERS AND INTERSECTIONS	2-16d COMMON (3½"x0.162"); OR 3-10d BOX (3"x0.128"); OR 3-3"x0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	FACE NAIL
18. 1" BRACE TO EACH STUD AND PLATE	2-8d COMMON (2½"x0.131"); OR 2-10d BOX (3"x0.128"); OR 2-3"x0.131" NAILS; OR 2-3" 14 GAGE STAPLES, 7/16" CROWN	FACE NAIL
19. 1"x6" SHEATHING TO EACH BEARING	2-8d COMMON (2½"x0.131"); OR 2-10d BOX (3"x0.128")	FACE NAIL
20. 1"x8" AND WIDER SHEATHING TO EACH BEARING	3-8d COMMON (2½"x0.131"); OR 3-10d BOX (3"x0.128")	FACE NAIL
FLOOR		
21. JOIST TO SILL, TOP PLATE, OR GIRDER	3-8d COMMON (2½"x0.131"); OR 3-10d BOX (3"x0.128"); OR 3-3"x0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	TOENAIL
22. RIM JOIST, BAND JOIST, OR BLOCKING TO TOP PLATE, SILL OR OTHER FRAMING BELOW	8d COMMON (2½"x0.131"); OR 10d BOX (3"x0.128"); OR 3"x0.131" NAILS; OR 3" 14 GAGE STAPLES, 7/16" CROWN	6" OC, TOENAIL
23. 1"x6"SUBFLOOR OR LESS TO EACH JOIST	2-8d COMMON (2½"x0.131"); OR 2-10d BOX (3"x0.128")	FACE NAIL
24. 2" SUBFLOOR TO JOIST OR GIRDER	2-16d COMMON (3½"x0.162")	FACE NAIL
25. 2" PLANKS (PLANK&BEAM-FLOOR&ROOF)	2-16d COMMON (3½"x0.162")	EACH BEARING, FACE NAIL
26. BUILT-UP GIRDERS AND BEAMS, 2" LUMBER LAYERS	20d COMMON (4"x0.192")	32" OC, FACE NAIL AT TOP AND BOTTOM STAGGERED ON OPPOSITE SIDES
	10d BOX (3"x0.128"); OR 3"x0.131" NAILS; OR 3" 14 GAGE STAPLES, 7/16" CROWN	24" OC FACE NAIL AT TOP AND BOTTOM STAGGERED ON OPPOSITE SIDES
	AND: 2-20d COMMON (4"x0.192"); OR 3-10d BOX (3"x0.128"); OR 3-3"x0.131" NAILS; OR 3-3" 14 GAGE STAPLES, 7/16" CROWN	ENDS AND AT EACH SPLICE, FACE NAIL
27. LEDGER STRIP SUPPORTING JOISTS OR RAFTERS	3-16d COMMON (3½"x0.162"); OR 4-10d BOX (3"x0.128"); OR 4-3"x0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	EACH JOIST OR RAFTER, FACE NAIL

FASTENING SCHEDULE

NAILING SCHEDULE: (IN COMPLIANCE WITH TABLE 2304.10.1 OF THE 2019 CBC)

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION
FLOOR		
28. JOIST TO BAND JOIST OR RIM JOIST	3-16d COMMON (3½"x0.162"); OR 4-10d BOX (3"x0.128"); OR 4-3"x0.131" NAILS; OR 4-3" 14 GAGE STAPLES, 7/16" CROWN	END NAIL
29. BRIDGING OR BLOCKING TO JOIST, RAFTER, OR TRUSS	2-8d COMMON (2½"x0.131"); OR 2-10d BOX (3"x0.128"); OR 2-3"x0.131" NAILS; OR 2-3" 14 GAGE STAPLES, 7/16" CROWN	EACH END, TOENAIL

WOOD STRUCTURAL PANELS (WSP), SUBFLOOR, ROOF, AND INTERIOR WALL SHEATHING TO FRAMING AND PARTICLEBOARD WALL SHEATHING TO FRAMING[a]

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	EDGES (INCHES)	INTERMEDIATE SUPPORTS (INCHES)
30. 3/8" - 1/2"	6d COMMON OR DEFORMED (2"x0.113") (SUBFLOOR AND WALL)	6	12
	8d COMMON OR DEFORMED (2½"x0.131")(ROOF) OR RSRS-01 (2⅜"x0.113") NAIL (ROOF)[d]	6	12
	2⅜"x0.113" NAIL (SUBFLOOR AND WALL)	6	12
	1¾" 16 GAGE STAPLE, 7/16" CROWN (SUBFLOOR AND WALL)	4	8
	2⅜"x0.113" NAIL (ROOF)	4	8
	1¾" 16 GAGE STAPLE, 7/16" CROWN (ROOF)	3	6
31. 19/32" - 3/4"	8d COMMON (2½"x0.131"); OR 6d DEFORMED (2"x0.113") (SUBFLOOR AND WALL)	6	12
	8d COMMON OR DEFORMED (2½"x0.131")(ROOF) OR RSRS-01 (2⅜"x0.113") NAIL (ROOF)[d]	6	12
	2⅜"x0.113" NAIL; OR 2" 16 GAGE STAPLE, 7/16" CROWN	4	8
32. 7/8" - 1¼"	10d COMMON (3"x0.148"); OR 8d DEFORMED (2½"x0.131")	6	12
OTHER EXTERIOR WALL SHEATHING			
33. 1/2" FIBERBOARD SHEATHING[b]	1½" GALVANIZED ROOFING NAIL (7/16" HEAD DIAMETER); OR 1¼" 16 GAGE STAPLE WITH 7/16"OR 1" CROWN	3	6
34. 25/32" FIBERBOARD SHEATHING[b]	1¾" GALVANIZED ROOFING NAIL (7/16" HEAD DIAMETER); OR 1½" 16 GAGE STAPLE WITH 7/16"OR 1" CROWN	3	6
WOOD STRUCTURAL PANELS, COMBINATION SUBFLOOR UNDERLAYMENT TO FRAMING			
35. 3/4" AND LESS	8d COMMON (2½"x0.131"); OR 6d DEFORMED (2"x0.113")	6	12
36. 7/8" - 1"	8d COMMON (2½"x0.131"); OR 8d DEFORMED (2½"x0.131")	6	12
37. 1⅛" - 1¼"	10d COMMON (3"x0.148"); OR 8d DEFORMED (2½"x0.131")	6	12
PANEL SIDING TO FRAMING			
38. 1/2" OR LESS	6d CORROSION-RESISTANT SIDING (1⅞"x0.106"); OR 6d CORROSION-RESISTANT CASING (2"x0.099")	6	12
39. 5/8"	8d CORROSION-RESISTANT SIDING (2⅜"x0.128"); OR 8d CORROSION-RESISTANT CASING (2½"x0.113")	6	12
INTERIOR PANELING			
40. 1/4"	4d CASING (1½"x0.080"); OR 4d FINISH (1½"x0.072")	6	12
41. 3/8"	6d CASING (2"x0.099"); OR 6d FINISH(PANEL SUPPORTS AT 24 INCHES)	6	12

FOR SI: 1 INCH = 25.4 MM

A. NAILS SPACED AT 6 INCHES AT INTERMEDIATE SUPPORTS WHERE SPANS ARE 48 INCHES OR MORE. FOR NAILING OF WOOD STRUCTURAL PANELS AND PARTICLEBOARD DIAPHRAGMS AND SHEAR WALLS, REFER TO Section 2305. NAILS FOR WALL SHEATHING ARE PERMITTED TO BE COMMON, BOX OR CASING.
B. SPACING SHALL BE 6 INCHES ON CENTER ON THE EDGES AND 12 INCHES ON CENTER AT INTERMEDIATE SUPPORTS FOR NONSTRUCTURAL APPLICATIONS. PANEL SUPPORTS AT 16 INCHES (20 INCHES IF STRENGTH AXIS IN THE LONG DIRECTION OF THE PANEL, UNLESS OTHERWISE MARKED).
C. WHERE A RAFTER IS FASTENED TO AN ADJACENT PARALLEL CEILING JOIST IN ACCORDANCE WITH THIS SCHEDULE AND THE CEILING JOIST IS FASTENED TO THE TOP PLATE IN ACCORDANCE WITH THE SCHEDULE, THE NUMBER OF TOENAILS IN THE RAFTER SHALL BE PERMITTED TO BE REDUCED BY ONE NAIL.
D. RSRS-01 IS A ROOF SHEATHING RING SHANK NAIL MEETING THE SPECIFICATIONS IN ASTM F1667.

DESIGN DATA

DESIGN CODE	DESIGN LOADS		
2019 CBC	ROOF	DEAD LOAD ROOF:	N/A
		DEAD LOAD CANOPIES:	N/A
		LIVE LOAD:	N/A
WIND CRITERIA	DECK	DEAD LOAD:	N/A
RISK CATEGORY: II		LIVE LOAD:	N/A
WIND SPEED: 100 MPH ULT	~~2ND & 3RD~~ FLOOR	DEAD LOAD:	15 PSF
EXPOSURE: C		LIVE LOAD:	50 PSF

SEISMIC CRITERIA	
RISK CATEGORY:	II
S_S:	1.500
S_1:	0.600
SITE CLASS:	D
S_{DS}:	1.200
S_{D1}:	0.680
SEISMIC DESIGN CATEGORY:	D
IMPORTANCE FACTOR:	1.0
CONTROLLING LATERAL FORCE RESISTING SYSTEM ~~(PLAN EAST-WEST DIRECTION)~~:	BEARING WALL SYSTEM LIGHT FRAME W/ SHEAR PANELS
R ~~(PLAN EAST-WEST DIRECTION)~~:	2 (CONTROLS)
Cs ~~(PLAN EAST-WEST DIRECTION)~~:	0.600
ANALYSIS PROCEDURE USED:	EQUIV LATERAL FORCE PROCEDURE
ALLOWABLE SOIL BEARING:	1,500 PSF

GENERAL NOTES

1. PLANS PROVIDED FOR THIS PROJECT TO BE FOR FOUNDATIONS FOR NEW ELECTRICAL EQUIPMENT.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO STARTING WORK, AND SHALL NOTIFY THE ENGINEER OF DISCREPANCIES OR INCONSISTENCIES.
3. THE STRUCTURAL DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT REPRESENT THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL TAKE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT LIMITED TO, BRACING AND SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, CONSTRUCTION LOADS OF MATERIALS, ETC. THE CONTRACTOR, AT NO EXPENSE TO THE OWNER, SHALL RETAIN QUALIFIED PROFESSIONALS TO DETERMINE FIELD LAYOUT OF THE BUILDING ELEMENTS, AND THE ADEQUACY OF ALL PROPOSED BRACING AND SHORING.
4. OBSERVATION VISITS TO THE SITE BY THE ENGINEER SHALL NOT INCLUDE OBSERVATION OF SAFETY METHODS, BRACING OR SUPPORT.
5. PLAN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON DRAWINGS. DO NOT SCALE PLANS & DETAILS.
6. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND STANDARD DETAILS.
7. CLARIFICATION SHALL BE REQUESTED FROM THE ENGINEER FOR ALL WORK INDICATED ON THE PLANS THAT IS NOT SPECIFICALLY DETAILED, AND IS NOT SIMILAR TO WORK THAT IS DETAILED.
8. SEE EXISTING AND / OR OTHER PLANS FOR SIZE AND LOCATION OF ALL DOOR AND WINDOW OPENINGS, SIZE AND LOCATION OF ALL NON-BEARING PARTITIONS, SIZE AND LOCATION OF ALL CURBS, DRAINS, DEPRESSED AREAS, SLOPES AND ELEVATION CHANGES, CHAMFERS, GROOVES, INSERTS, ALL FINISHES, AND SIZE AND LOCATION OF ALL FLOOR AND ROOF OPENINGS.
9. MECHANICAL, PLUMBING, AND ELECTRICAL SHALL BE CAREFULLY COORDINATED. CONTACT HADLEY ENGINEERING IF VARIATION FROM THESE DRAWINGS.
10. MATERIALS SHALL BE SPREAD OUT IF PLACED ON FRAMED FLOORS OR ROOFS. LOADS SHALL NOT EXCEED DESIGN LOADING FOR SUPPORTING MEMBERS.

CONTRACTOR RESPONSIBILITY

"CONTRACTOR RESPONSIBILITY" EACH CONTRACTOR OR SUB-CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF THE WIND AND /OR SEISMIC RESISTING SYSTEM THAT IS LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK REQUIRING SPECIAL INSPECTION. THE CONTRACTORS STATEMENT OF RESPONSIBILITY SHALL CONTAIN THE FOLLOWING:

1. ACKNOWLEDGEMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE STATEMENT OF SPECIAL INSPECTIONS.
2. ACKNOWLEDGEMENT THAT CONTROL WILL BE EXERCISED TO OBTAIN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS APPROVED BY THE BUILDING OFFICIAL.
3. PROCEDURES FOR EXERCISING CONTROL WITHIN THE CONTRACTOR'S ORGANIZATION, THE METHOD AND FREQUENCY OF REPORTING AND THE DISTRIBUTION OF REPORTS AND SCHEDULE
4. IDENTIFICATION AND QUALIFICATIONS OF THE PERSON(S) EXERCISING SUCH CONTROL AND THEIR POSITION(S) IN THE ORGANIZATION"

CONSTRUCTION NOTES

1. ALL CONTRACTORS AND SUBCONTRACTORS BIDDING ON THIS PROJECT SHALL BECOME FAMILIAR WITH THESE PLANS, AND VISIT THE SITE AND EXAMINE THE EXISTING CONDITIONS PRIOR TO SUBMITTING BIDS. CONTRACTORS AND SUBCONTRACTORS AGREE AND ACKNOWLEDGE THEIR KNOWLEDGE OF THESE PLANS AND THE VISIBLE EXISTING CONDITIONS BY SUBMITTING THEIR BIDS.
2. WHEN THE CONTRACTOR ENCOUNTERS HIDDEN CONDITIONS THAT INTERFERE WITH WORK, HE SHALL CEASE WORK IN THAT AREA AND NOTIFY THE OWNER AND PROJECT ENGINEER. HE SHALL NOT PROCEED AGAIN UNTIL CLARIFICATION IS ISSUED.

UNIVERSITY OF CALIFORNIA
UC RIVERSIDE
CAPITAL PROGRAMS
ARCHITECTS & ENGINEERS
1223 UNIVERSITY AVENUE, SUITE 240
RIVERSIDE, CA. 92521
TEL:(951) 827-1273 FAX:(951) 827-3890

Architect's Data:

Architect's Stamp:

Consultant's Stamp:

REGISTERED PROFESSIONAL ENGINEER THOMAS W. HADLEY No. S 5697 Exp. 6-30-23 STRUCTURAL STATE OF CALIFORNIA
09.01.21
NOTE: PLANS SHALL BE CONSIDERED PRELIMINARY AND NOT FOR CONSTRUCTION IF SEAL ABOVE IS NOT SIGNED IN WET INK AND IF NOT APPROVED BY LOCAL BUILDING JURISDICTION.

APPROVED
UC RIVERSIDE
Office of Planning, Design & Construction Signed CBO
Building, Safety and Compliance Division
CAMPUS BUILDING OFFICIAL

OFFICE OF THE STATE FIRE MARSHAL
APPROVED FIRE AND PANIC ONLY
09/29/21 UCR 2021-2022-950567
Approval of plans does not authorize or approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

REVISIONS		
REV #	DESCRIPTION	DATE
5	RPU/100% CD SUBMITTAL R2	09/01/21

RUBIDOUX PHASE 2 ELECTRICAL UPGRADE

Consultant's Data:

HADLEY ENGINEERING
P• 909/446-0712
THOMAS W. HADLEY S.E.
34159 YUCAIPA, BLVD. SUITE C
YUCAIPA, CA. 92399
THADLEY@HADLEYENGINEERING.COM

UCR Project Manager: SCOTT DONNELL

Scale: AS SHOWN	SD Approval: –
Drawn By: BJM/PCM	DD Approval: –
Checked By: TWH	CD Approval: –
Project No.: 950567	Construction Release: –
DSA No.: –	

Drawing Title: STRUCTURAL GENERAL NOTES

Sheet No. S0.1

Reviewed for Code Compliance 11/01/21

ABBREVIATIONS

AB	anchor bolt
ABV	above
AC	asphaltic concrete
A/C	air conditioning
ADD	addendum
AGG	aggregate
ALT	alternate
ALUM	aluminum
APPROX	approximate
ARCH	architect,ural
AUTO	automatic
BD	board
BEL	below
BTWN	between
BLDG	building
BLK	block
BLKG	blocking
BM	beam
BOT	bottom
BRG	bearing
BUR	built-up roofing
BW	both ways
C	channel
CAB	cabinet
CB	catch basin
CEM	cement
CFT	cubic foot
CIR	circle
CL, ℄	center line
CLG	ceiling
CLR	clear,ance
CM	centimeter
CMU	concrete masonry unit
COL	column
COMB	combination
CONC	concrete
CONT	continuous OR continue
CONST	construction
CORR	corrugated
DB	drop beam
DBL	double
DEG	degree
DEMO	demolish, demolition
DF	douglas fir, doug-fir larch western sierras
DIAG	diagonal
DIA, ø	diameter
DIM	dimension
DR	door
DTL	detail
DWG	drawing
E	east
(E)	existing
EF	each face
ELEV	elevation
ELEC	electric,al
EMBED	embedded
EN	edge nail,ing
EP	end post
EQ	equal
EQUIP	equipment
EST	estimate
EW	each way
EXIST	existing
EXP	exposed
EXT	exterior
FS	far side
FB	flush beam
FF	finished floor
FIN	finish,ed
FLR	floor,ing
FDN	foundation
FN	field nailing
FTG	footing
GAL	galvanized iron
GD	garbage disposer
GYP	gypsum
GRD	grade, grading
HC	hollow core
HD	heavy duty
HDR	header
HGT	height
HORZ	horizontal
HSS	hollow steel section
HVAC	heating, ventulation, air conditioning
ID	inside diameter
INCL	include,d,ing
INT	interior
JST	joist

MAS	masonry
MAX	maximum
MB	machine bolt
MBR	member
MCJ	masonry control joint
MECH'L	mechanical
MED	medium
MET	metal
MF	moment frame
MFR	manufacture,er
MIN	minimum
MISC	miscellaneous
MTL	material,s
N	north
(N)	new
NA	not applicable
NDBF	not damaged by fire
NO	number
NOM	nominal
NS	near side
NTS	not to scale
OC	on center
OD	outside diameter
OPP	opposite
P	pipe
PAR	parallel
PC	precast concrete
PCF	pounds per cubic foot
PED	pedestal
PERP	perpendicular
PIP	poured in place
PL, ℙ	plate; OR property line
PLF	pounds per linear foot
PLYWD	plywood
PRE FAB	prefabricate,d
PSI	pounds per square inch
PSF	pounds per square foot
PT	point; OR pressure treated
PVC	polyvinyl chloride
RA	return air
RAD	radius
RD	roof drain
REF	refrigerator
REG	register
REINF	reinforcement
RET	return
RH	right hand
RM	room
R&R	remove and replace
S	south
SC	solid core
SCH	schedule
SEC	section
SEOR	structural engineer of record
SHT	sheet
SIM	similar
SIMP	simpson strong-tie connector,s
SOG	slab on grade
SPEC	specification,s
SQ	square
SS	stainless steel
STL	steel
STD	standard
STRUCT'L	structural
SUS	suspended
SYM	symmetry,ical
SYS	system
THK	thick,ness
TOS	top of steel
TP	trimmer post
TRANS	transverse
TS	trimmer stud; OR tube steel
TYP	typical
T&B	top and bottom
T&G	tongue and groove
UNO	unless noted otherwise
VERT	vertical
W	west; OR wide flange
W/	with
WH	water heater
W/O	without
WC	water closet
WD	wood
WIN	window
WP	working point
WWF	welded wire fabric
XS	extra strong
XXS	double-extra strong

STATEMENT OF SPECIAL INSPECTION

PROJECT ADDRESS: 4650 14TH ST, RIVERSIDE, CA 92510

PROJECT DESCRIPTION: RUBIDOUX MODULAR PLANT GROWTH UNIT INSTALLATION

PERMIT APPLICATION NUMBER: ______

APPROVAL OF SPECIAL INSPECTOR

EACH SPECIAL INSPECTION AGENCY, TESTING FACILITY, AND SPECIAL INSPECTOR SHALL BE RECOGNIZED BY THE BUILDING OFFICIAL PRIOR TO PERFORMING ANY DUTIES. EACH SPECIAL INSPECTION AGENCY MUST SUBMIT TO THE BUILDING OFFICIAL, A COMPANY PROFILE INCLUDING RESUMES OF ALL EMPLOYEES, THEIR CERTIFICATIONS, AND A LIST OF THE TYPES OF WORK FOR WHICH RECOGNITION IS REQUESTED. SPECIAL INSPECTORS SHALL CARRY APPROVED IDENTIFICATION WHEN PERFORMING THE FUNCTIONS OF A SPECIAL INSPECTOR. IDENTIFICATION CARDS SHALL FOLLOW THE CRITERIA SET BY THE CALIFORNIA COUNCIL OF TESTING AND INSPECTION AGENCIES. NO PERSONNEL CHANGES SHALL BE MADE WITHOUT FIRST OBTAINING THE APPROVAL OF THE BUILDING OFFICIAL.

APPROVED FABRICATORS

EACH FABRICATOR SHALL BE APPROVED BY THE BUILDING OFFICIAL. QUALIFICATIONS OF APPROVED FABRICATORS SHALL BE IN COMPLIANCE WITH 1704.2.5.1 OF THE CALIFORNIA BUILDING CODE. THE APPROVED FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS TO THE BUILDING OFFICIAL AND THE ENGINEER OF RECORD.

CONTRACTOR RESPONSIBILITIES

A. QUALITY CONTROL AND CODE COMPLIANCE: THE CONTRACTOR IS RESPONSIBLE FOR THE QUALITY OF THE WORK PERFORMED AND COMPLIANCE WITH CODE REQUIREMENTS.
B. INSPECTOR NOTIFICATIONS: THE CONTRACTOR SHALL NOTIFY THE SPECIAL INSPECTOR AT LEAST 24 HOURS PRIOR TO PERFORMING ANY WORK THAT REQUIRES SPECIAL INSPECTION AND SHALL PROVIDE SUFFICIENT LEAD TIME FOR SPECIAL INSPECTOR AT THE JOB SITE TO REVIEW THE CONSTRUCTION DOCUMENTS.
C. PROVIDE ACCESS TO PLANS: THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE SPECIAL INSPECTOR ACCESS TO THE APPROVED PLANS AND SPECIFICATIONS AT THE JOB SITE.
D. RETAIN SPECIAL INSPECTION RECORDS: THE CONTRACTOR IS RESPONSIBLE FOR RETAINING AT THE JOB SITE ALL SPECIAL INSPECTION RECORDS SUBMITTED BY THE SPECIAL INSPECTOR AND PROVIDE A COPY TO THE BUILDING INSPECTOR UPON THEIR ARRIVAL.
E. CONSTRUCTION INSPECTIONS: APPROVAL OF WORK BY THE SPECIAL INSPECTOR DOES NOT RELIEVE THE CONTRACTOR FROM OBTAINING INSPECTIONS BY THE BUILDING DEPARTMENT.
F. FINAL INSPECTION: THE FINAL INSPECTION MAY NOT BE SCHEDULED UNTIL THE FINAL REPORT DOCUMENTING THE SPECIAL INSPECTION OR STRUCTURAL OBSERVATION HAVE BEEN SUBMITTED AND APPROVED BY THE BUILDING OFFICIAL.

OWNER'S RESPONSIBILITY

A. SPECIAL INSPECTOR EMPLOYMENT: THE OWNER OR THEIR AGENT SHALL EMPLOY A QUALIFIED SPECIAL INSPECTOR.
B. INSPECTION CONTINUITY: IT IS RECOMMENDED THAT THE OWNER EMPLOY THE SAME SPECIAL INSPECTION AGENCY THROUGHOUT THE JOB TO ASSURE CONTINUITY. ALL SUBSTITUTIONS OF SPECIAL INSPECTION AGENCIES MUST HAVE PRIOR APPROVAL OF THE BUILDING OFFICIAL.
C. FINAL REPORT: THE OWNER OR THEIR AGENT IS RESPONSIBLE FOR SUBMITTAL OF A FINAL SIGNED REPORT TO THE BUILDING OFFICIAL BEFORE A FINAL INSPECTION BY THE BUILDING DEPARTMENT CAN BE SCHEDULED.

ENGINEER OF RECORD RESPONSIBILITIES

A. IDENTIFY ALL CONSTRUCTION ELEMENTS THAT REQUIRE SPECIAL INSPECTION OR STRUCTURAL OBSERVATION.
B. PROVIDE STRUCTURAL OBSERVATION IF REQUIRED BY THE BUILDING OFFICIAL OR THE ENGINEER OF RECORD.

SPECIAL INSPECTOR FIRM RESPONSIBILITIES

A. THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK ASSIGNED FOR CONFORMANCE TO THE APPROVED DESIGN DRAWINGS, SPECIFICATIONS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CODE.
B. THE SPECIAL INSPECTOR SHALL BRING NON-CONFORMANCE ITEMS TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR AND NOTE ALL SUCH ITEMS IN THE DAILY REPORT. IF ANY ITEM IS NOT RESOLVED IN A TIMELY MANNER OR IS ABOUT TO BE INCORPORATED IN THE WORK, THE SPECIAL INSPECTOR SHALL IMMEDIATELY NOTIFY THE BUILDING OFFICIAL BY TELEPHONE OR IN PERSON AND NOTIFY THE ENGINEER OF RECORD.
C. EVERY SPECIAL INSPECTOR SHALL COMPLETE A DAILY INSPECTION REPORT FORM. THESE REPORTS SHALL BE PROVIDED TO THE CONTRACTOR PRIOR TO LEAVING THE JOB SITE EACH DAY.
D. THE SPECIAL INSPECTOR SHALL SUBMIT A SIGNED FINAL REPORT TO THE BUILDING OFFICIAL, PURSUANT TO SECTION 1704. ITEMS IN CONFORMANCE, UNRESOLVED ITEMS, OR ANY DISCREPANCIES IN INSPECTION COVERAGE SHALL BE SPECIALLY ITEMIZED IN THIS REPORT. ANY UNRESOLVED ITEMS MUST BE APPROVED BY THE BUILDING OFFICIAL. THE REPORT MUST BE SIGNED AND STAMPED BY APPROPRIATE PROFESSIONAL(S), LICENSED BY THE STATE OF CALIFORNIA. FINAL INSPECTION OF THE STRUCTURE SHALL NOT BE SCHEDULED UNTIL THE FINAL REPORT HAS BEEN REVIEWED AND APPROVED BY THE BUILDING OFFICIAL.

STEEL CONSTRUCTION: PER CBC 1705.2 AISC 360

2019 CBC SECTIONS UNO	REQUIRED (X)	TYPE OF SPECIAL INSPECTION	CONTINUOUS (X)	PERIODIC (X)
AISC 360, SECTION N3		FABRICATOR AND ERECTOR DOCUMENTS.		X
		MATERIAL VERIFICATION OF STRUCTURAL STEEL		X
		VERIFY MEMBER LOCATIONS WITH CONSTRUCTION DOCUMENTS		X
		STRUCTURAL STEEL WELDING:		
ASIC 360, TABLE N5.4-1		PRIOR TO WELDING		X
ASIC 360, TABLE N5.4-2		DURING WELDING	WELDS GREATER THAN 5/16"	X
ASIC 360, TABLE N5.4-3		AFTER WELDING		X
		STRUCTURAL STEEL BOLTING:		
ASIC 360, TABLE N5.6-1		PRIOR TO BOLTING		X
ASIC 360, TABLE N5.6-2		DURING BOLTING		X
ASIC 360, TABLE N5.6-3		AFTER BOLTING		X
		INSPECTION OF STEEL ELEMENTS OF COMPOSITE CONSTRUCTION AISC 360, TABLE N6.1		X

STEEL CONSTRUCTION SPECIAL MOMENT FRAMES: PER CBC 1705.2 AISC 341

2019 CBC SECTIONS UNO	REQUIRED (X)	TYPE OF SPECIAL INSPECTION	CONTINUOUS (X)	PERIODIC (X)
		STRUCTURAL STEEL WELDING:		
ASIC 341, TABLE J6-1		INSPECTION TASKS PRIOR TO WELDING	X	
ASIC 341, TABLE J6-2		VISUAL INSPECTION TASKS DURING WELDING	X	
ASIC 341, TABLE J6-3		INSPECTION TASKS AFTER WELDING	X	
		STRUCTURAL STEEL BOLTING:		
ASIC 341, TABLE J7-1		INSPECTION TASKS PRIOR TO BOLTING	X	
ASIC 341, TABLE J7-2		INSPECTION TASKS DURING BOLTING	X	
ASIC 341, TABLE J7-3		INSPECTION TASKS AFTER BOLTING	X	
ASIC 341, TABLE J8-1		OTHER INSPECTION TASKS	X	

CONCRETE CONSTRUCTION PER CBC 1705.3

2019 CBC SECTIONS UNO	REQUIRED (X)	TYPE OF SPECIAL INSPECTION	CONTINUOUS (X)	PERIODIC (X)
ACI 318 26.13.3.3	X	REINFORCEMENT PLACEMENT AND EMBEDMENT		X
AWS D1.4 ACI 318: SECTION 26.6.4	X	REINFORCING BAR WELDING	WELDS GREATER THAN 5/16"	X
ACI 318: 17.8.2	X	INSPECT ANCHORS CAST IN CONCRETE		X
ACI 318: 17.8.2.4, 17.8.2	X	ANCHORS POST-INSTALLED IN HARDENED CONCRETE	ADHESIVE X	MECH'L X
ACI 318: CH. 19, 26.4.3, 26.4.4 CBC 1904.1, 910.2, 1908.2, 1908.3	X	VERIFY USE OF REQUIRED DESIGN MIX, SLUMP, AIR AND TEMP.		X
ASTM C 172: ASTM C 31: ACI 318: 26.13.3.2, 26.12, CBC 1908.10	X	AIR CONTENT, COMPRESSION TESTING, SLUMP TEST, CONCRETE TEMPERATURE	X	
ACI 318: 26.13.3.2: CBC 1908.6, 1908.7, 1908.8	X	CONCRETE AND ~~SHOTCRETE~~ PLACEMENT	X	
ACI 318: 26.13.3.3; CBC 1910.9		MAINTENANCE OF CURING TEMPERATURE AND TECHNIQUES		X
ACI 318: 26.9.2.1 26.9.2.3		PRESTRESSED CONCRETE, PRESTRESSING FORCES AND GROUTING		
ACI 318: 26.8		INSTALLING OF PRECAST CONCRETE MEMBERS		
ACI 318: 26.10.2		STRESSING OF TENDONS ON POST-TENSIONED CONCRETE		
ACI 318: 26.10.1(b)		FORMWORK SHAPE, LOCATION AND DIMENSIONS		

MASONRY CONSTRUCTION PER CBC 1705.4

2019 CBC SECTIONS UNO	REQUIRED (X)	TYPE OF SPECIAL INSPECTION	CONTINUOUS (X)	PERIODIC (X)
TMS 602: ART. 1.5		VERIFY COMPLIANCE WITH APPROVED SUBMITTALS		X
TMS 602: ART. 1.4B		VERIFICATION OF fm AND AAC		X
TMS 602: ART. 1.5B.1.b.3		VERIFICATION OF SLUMP FLOW AND VSI OF GROUT	X	
		MASONRY VERIFIED:		
TMS 602: ART. 2.6A		PREPARED MORTAR		X
TMS 602: ART. 3.3B		MORTAR JOINTS		X
TMS 602: ART. 3.4, 13.6A		LOCATION OF REINFORCEMENT		X
		DURING CONSTRUCTION VERIFY:		
		COMPLIANCE WITH CONSTRUCTION DOCUMENTS		X
TMS 602: ART. 3.3F		SIZE AND LOCATION OF STRUCTURAL ELEMENTS		X
TMS 402: 1.16.4.3, 1.17.1		TYPE, SIZE, AND LOCATION OF ANCHORS		X
TMS 402: SEC. 21.7.7.2, 3.3.3.4(c), 8.3.3.4(b)		WELDING OF REINFORCEMENT	X	
CBC 2014.3, 2104.4, TMS 602; ART. 1.8C, 1.8D		PROTECTION OF MASONRY DURING COLD WEATHER OR HOT WEATHER		X
		PRIOR TO GROUTING VERIFY THE FOLLOWING:		
TMS 602: ART. 3.2B		GROUT SPACE IS CLEAN		X
TMS 602: ART. 2.4, 3.4		SIZE, GRADE, AND TYPE OF REINFORCEMENT		X
TMS 402; SEC 1.16; TMS 602; ART. 3.4		PLACEMENT OF REINFORCEMENT		X
TMS 602: ART. 2.6B		SITE-PREPARED GROUT		X
TMS 602: ART. 3.3B		CONSTRUCTION OF MORTAR JOINTS		X
TMS 602: ART. 3.5		VERIFY GROUT PLACEMENT	X	
CBC 2015.2.2, 2015.3; TMS 602; ART. 1.4		OBSERVE PREPARATION OF REQUIRED GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS	X	

WOOD CONSTRUCTION PER CBC 1705.5

2019 CBC SECTIONS UNO	REQUIRED (X)	TYPE OF SPECIAL INSPECTION	CONTINUOUS (X)	PERIODIC (X)
1705.5.1		HIGH-LOAD DIAPHRAGMS		X
1705.5.2		METAL-PLATE-CONNECTED TRUSSES TALLER THAN 60"		
1705.5.2		METAL-PLATE-CONNECTED TRUSSES SPANNING MORE THAN 60"		

SOILS PER CBC 1705.6

2019 CBC SECTIONS UNO	REQUIRED (X)	TYPE OF SPECIAL INSPECTION	CONTINUOUS (X)	PERIODIC (X)
T1705.6		VERIFY MATERIAL BELOW FOUNDATION IS ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY		X
T1705.6	X	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL		X
T1705.6		PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS		X
T1705.6		VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF FILL	X	
T1705.6		PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X
T1705.6		BACKFILL OF RETAINING STRUCTURES. VERIFY DRAINAGE & PIPE BEHIND WALL		

FABRICATED ITEMS PER CBC 1705.10

2019 CBC SECTIONS UNO	REQUIRED (X)	TYPE OF SPECIAL INSPECTION	CONTINUOUS (X)	PERIODIC (X)
1704.2.5		PRE-FABRICATED MOMENT FRAMES	X	

WIND RESISTANCE PER CBC 1705.11

2019 CBC SECTIONS UNO	REQUIRED (X)	TYPE OF SPECIAL INSPECTION	CONTINUOUS (X)	PERIODIC (X)
1705.11.1		STRUCTURAL WOOD		X
1705.11.2		COLD-FORMED STEEL LIGHT FRAMED CONSTRUCTION		X
1705.11.3		WIND-RESISTANING COMPONENTS		X

SEISMIC RESISTANCE PER CBC 1705.12

2019 CBC SECTIONS UNO	REQUIRED (X)	TYPE OF SPECIAL INSPECTION	CONTINUOUS (X)	PERIODIC (X)
1705.12.1		STRUCTURAL STEEL		X
1705.12.1.1		SEISMIC FORCE-RESISTING SYSTEMS		X
1705.12.1.2		STRUCTURAL STEEL ELEMENTS		X
1705.12.2		STRUCTURAL WOOD		X
1705.12.3		COLD-FORMED STEEL LIGHT-FRAMED CONSTRUCTION		X
1705.12.4		DESIGNATED SEISMIC SYSTEMS		X
1705.12.5		ARCHITECTURAL COMPONENTS		X
1705.12.5.1		ACCESS FLOORS		X
1705.12.6		PLUMBING, MECHANICAL, AND ELECTRICAL COMPONENTS		X
1705.12.7		STORAGE RACKS		X
1705.12.8		SEISMIC ISOLATION SYSTEMS		X
1705.12.9		COLD-FORMED STEEL SPECIAL BOLTED MOMENT FRAMES		X
		OTHER		

TESTING FOR SEISMIC RESISTANCE PER CBC 1705.13

2019 CBC SECTIONS UNO	REQUIRED (X)	TYPE OF SPECIAL INSPECTION	CONTINUOUS (X)	PERIODIC (X)
1705.13.1		STRUCTURAL STEEL		X
1705.13.2		NONSTRUCTURAL COMPONENTS		X
1705.13.3		DESIGNATES SEISMIC SYSTEMS		X
1705.13.4		SEISMIC ISOLATION SYSTEMS		X

STRUCTURAL OBSERVATION

THE ENGINEER OF RECORD SHALL PROVIDE STRUCTURAL OBSERVATION PER SECTION 1704.6 OF THE CALIFORNIA BUILDING CODE. THIS OBSERVATION IS IN ADDITION TO OTHER REQUIRED SPECIAL INSPECTIONS AND IS NOT INTENDED AS A SUBSTITUTION OF OTHER REQUIRED INSPECTIONS. THE STRUCTURAL OBSERVER SHALL SUBMIT TO THE BUILDING OFFICIAL A WRITTEN STATEMENT THAT THE SITE VISITS HAVE BEEN MADE AND IDENTIFY ANY REPORTED DEFICIENCIES THAT, TO THE BEST OF THE STRUCTURAL OBSERVER'S KNOWLEDGE, HAVE NOT BEEN RESOLVED.

STRUCTURAL OBSERVATIONS SHALL BE SCHEDULED IN ADVANCE AND CONFIRMED (2)-WORKING DAYS PRIOR TO THE OBSERVATION. ALL SPECIAL INSPECTION REPORTS SHALL BE FORWARDED TO THE ENGINEER OF RECORD PRIOR TO THE SCHEDULED OBSERVATION. STRUCTURAL OBSERVATION DOES NOT RELIEVE THE CONTRACTOR/SUBCONTRACTOR FROM PERFORMING ALL ASPECTS OF THE APPROVED PLANS NOR DOES IT RELIEVE THE BUILDING INSPECTOR FROM PERFORMING ALL INSPECTIONS TO ENSURE CONFORMANCE WITH APPROVED PLANS.

2019 CBC SECTIONS UNO	REQUIRED (X)	STRUCTURAL OBSERVATION
1704.6.1	X	STRUCTURAL OBSERVATIONS FOR STRUCTURES
1704.6.2		STRUCTURAL OBSERVATIONS FOR SEISMIC RESISTANCE (RISK CAT III OR IV OR II SDC E)
1704.6.3		STRUCTURAL OBSERVATIONS FOR WIND RESISTANCE (RISK CAT III OR IV & V = 130)

REQUIRED STRUCTURAL OBSERVATIONS PER CBC 1704.6.1

OBSERVATION ITEM	WHEN OBSERVED
1. PLACEMENT OF REINFORCEMENT IN CONCRETE FOUNDATION	PRIOR TO CONCRETE PLACEMENT
~~2. PLACEMENT OF ALL STRUCTURAL STEEL~~	~~IMMEDIATELY AFTER ERECTION~~
~~3. PLACEMENT OF MASONRY SHEARWALLS FIRST LIFT~~	~~PRIOR TO GROUT PLACEMENT~~
~~4. PLACEMENT OF ALL PLYWOOD SHEARWALLS, DRAG STRUTS, AND DIAPHRAGMS~~	~~IMMEDIATELY AFTER ALL PLACED~~
~~5. PLACEMENT OF GEOMESH~~	~~PRIOR TO BACKFILL~~

INSPECTION, TESTING, OBSERVER

THE FOLLOWING ARE THE TESTING AND SPECIAL INSPECTION AGENCIES THAT WILL BE RETAINED TO CONDUCT TESTS AND INSPECTION ON THIS PROJECT. OWNER SHALL PROVIDE INFORMATION IF BLANK.

EXPERTISE	FIRM INSPECTION INFORMATION
1. SPECIAL INSPECTION (EXCEPT FOR GEOTECHNICAL)	NAME: ADDRESS: CITY, STATE, ZIP: PER UCR PHONE: EMAIL:
2. MATERIAL TESTING	NAME: ADDRESS: CITY, STATE, ZIP: PER UCR PHONE: EMAIL:
3. GEOTECHNICAL INSPECTION	NAME: ADDRESS: CITY, STATE, ZIP: PER UCR PHONE: EMAIL:
4. STRUCTURAL OBSERVER	NAME: HADLEY ENGINEERING ADDRESS: 34159 YUCAIPA BLVD, SUITE C. CITY, STATE, ZIP: YUCAIPA, CA 92399 PHONE: 909-790-9100 EMAIL: projectmanagement@hadleyengineering.com

AUTHORIZATION

I HAVE READ AND AGREE TO COMPLY WITH THE TERMS AND CONDITIONS OF THE STATEMENT OF SPECIAL INSPECTION

ENGINEER OF RECORD	SIGNATURE	LIC # S5697	DATE
OWNER AUTHORIZATION	SIGNATURE		DATE
INSPECTION AGENCY (SPECIAL INSPECTORS)	SIGNATURE	LIC #	DATE
CONTRACTOR	SIGNATURE	LIC #	DATE

OFFICE OF THE STATE FIRE MARSHAL
APPROVED FIRE AND PANIC ONLY
09/29/2021 UCR 2021-2022-950567
approve any omission or deviation from applicable regulations. Final approval is subject to field inspection. One set of approved plans shall be available on the project site at all times.

APPROVED
UC RIVERSIDE
Office of Planning, Design & Construction Signed CBO: Gilbert Cervantes
Building, Safety and Compliance Division
CAMPUS BUILDING PERMIT

[illegible]

UNIVERSITY OF CALIFORNIA
UC RIVERSIDE
CAPITAL PROGRAMS
ARCHITECTS & ENGINEERS
1223 UNIVERSITY AVENUE, SUITE 240
RIVERSIDE, CA. 92521
TEL:(951) 827-1273 FAX:(951) 827-3890

Architect's Data:

Architect's Stamp:

Consultant's Stamp:

REGISTERED PROFESSIONAL ENGINEER
THOMAS W. HADLEY
No. S 5697
Exp. 6-30-23
STRUCTURAL
STATE OF CALIFORNIA

09.01.21

NOTE: PLANS SHALL BE CONSIDERED PRELIMINARY AND NOT FOR CONSTRUCTION IF SEAL ABOVE IS NOT SIGNED IN WET INK AND IF NOT APPROVED BY LOCAL BUILDING JURISDICTION.

REVISIONS

REV #	DESCRIPTION	DATE
5	RPU/100% CD SUBMITTAL R2	09/01/21

RUBIDOUX
PHASE 2
ELECTRICAL
UPGRADE

Consultant's Data:

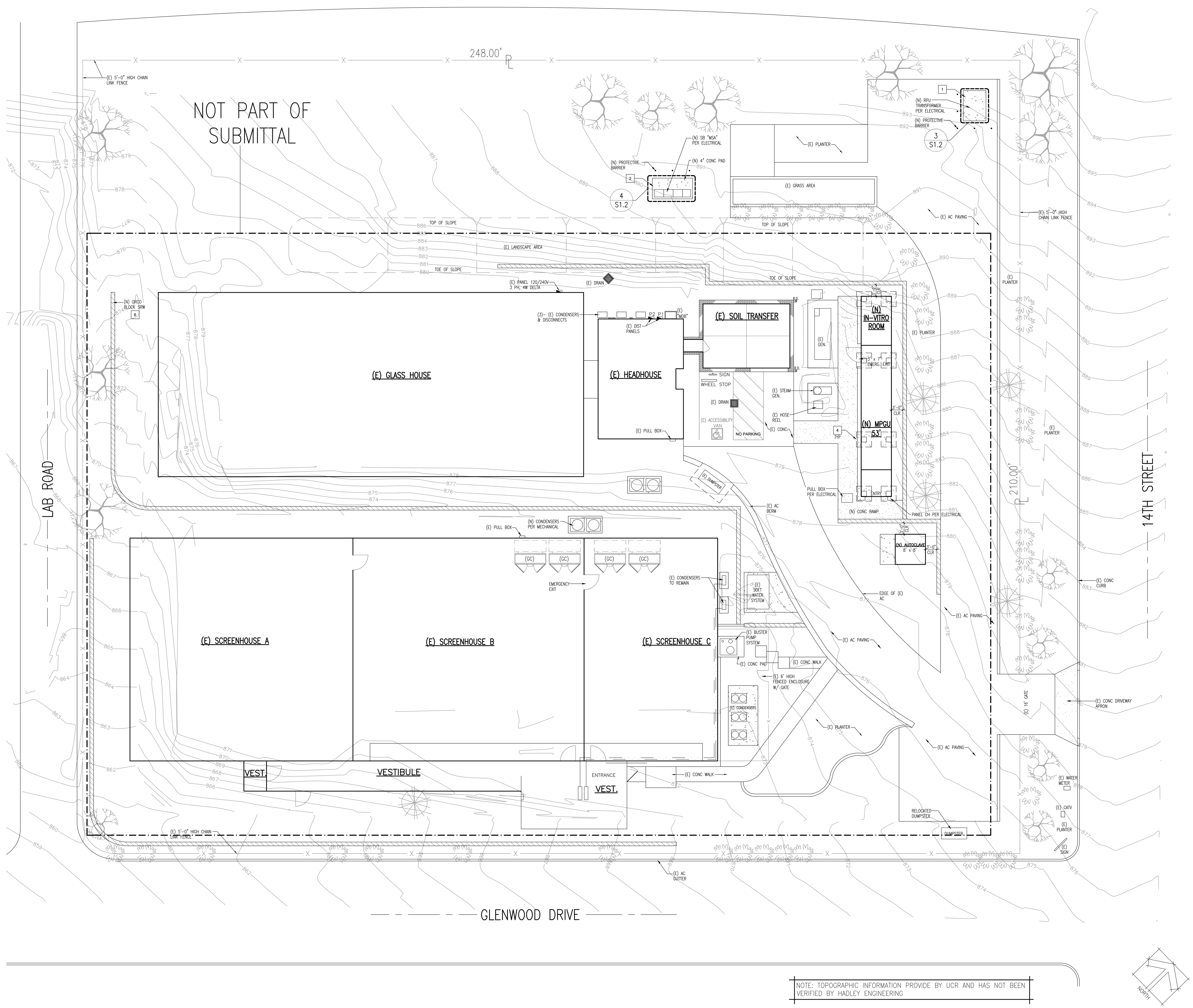
HADLEY ENGINEERING
P• 909/446-0712
THOMAS W. HADLEY S.E.
34159 YUCAIPA, BLVD. SUITE C
YUCAIPA, CA. 92399
THADLEY@HADLEYENGINEERING.COM

UCR Project Manager:
SCOTT DONNELL

Scale: AS SHOWN	SD Approval: –
Drawn By: BJM/PCM	DD Approval: –
Checked By: TWH	CD Approval: –
Project No.: 950567	Construction Release: –
DSA No.: –	

Drawing Title: STRUCTURAL OBSERVATION

Sheet No. S0.2



NOTE: TOPOGRAPHIC INFORMATION PROVIDE BY UCR AND HAS NOT BEEN VERIFIED BY HADLEY ENGINEERING

STRUCTURAL SITE PLAN — SCALE 3/32"=1'-0" — 1

PLAN NOTES

1. NEW TRANSFORMER SLAB MAX WEIGHT = 1,000#.
2. NEW CONCRETE SLAB AT PANELS.

DIGALERT
CALL 811 BEFORE YOU DIG.

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Building, Safety and Compliance Division
CAMPUS BUILDING PERMIT

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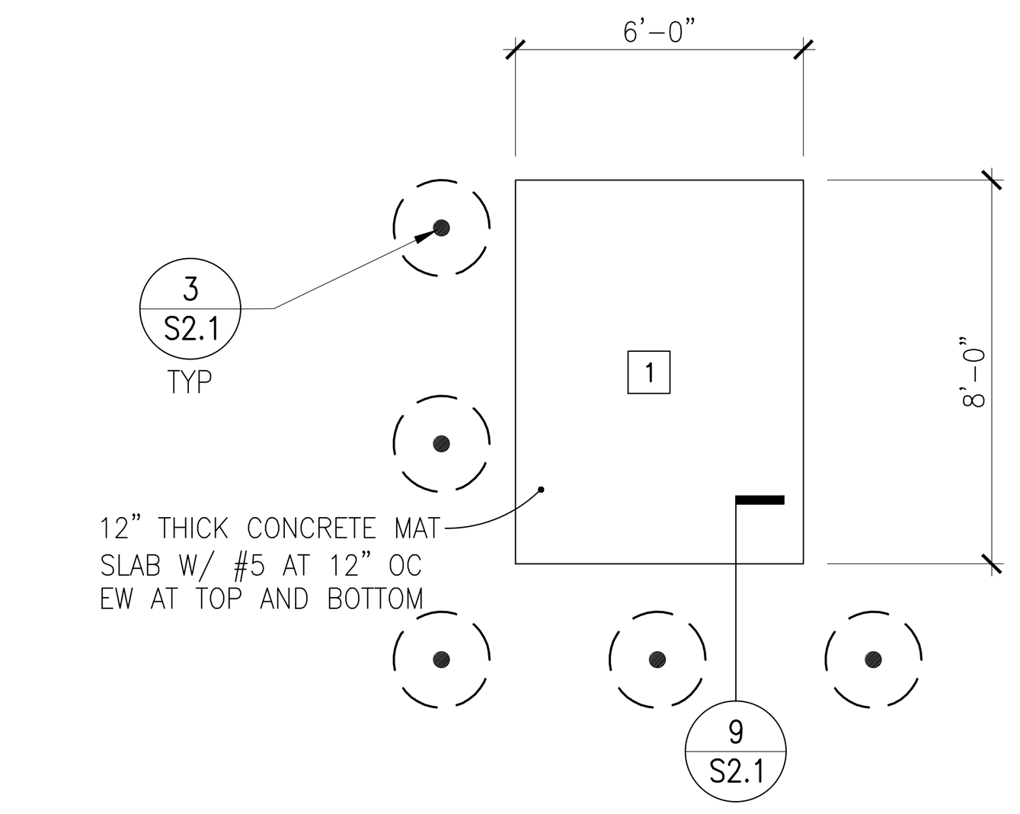
Checked By:	TWH	CD Approval:	–
Project No.:	950567	Construction Release:	–
DSA No.:	–		

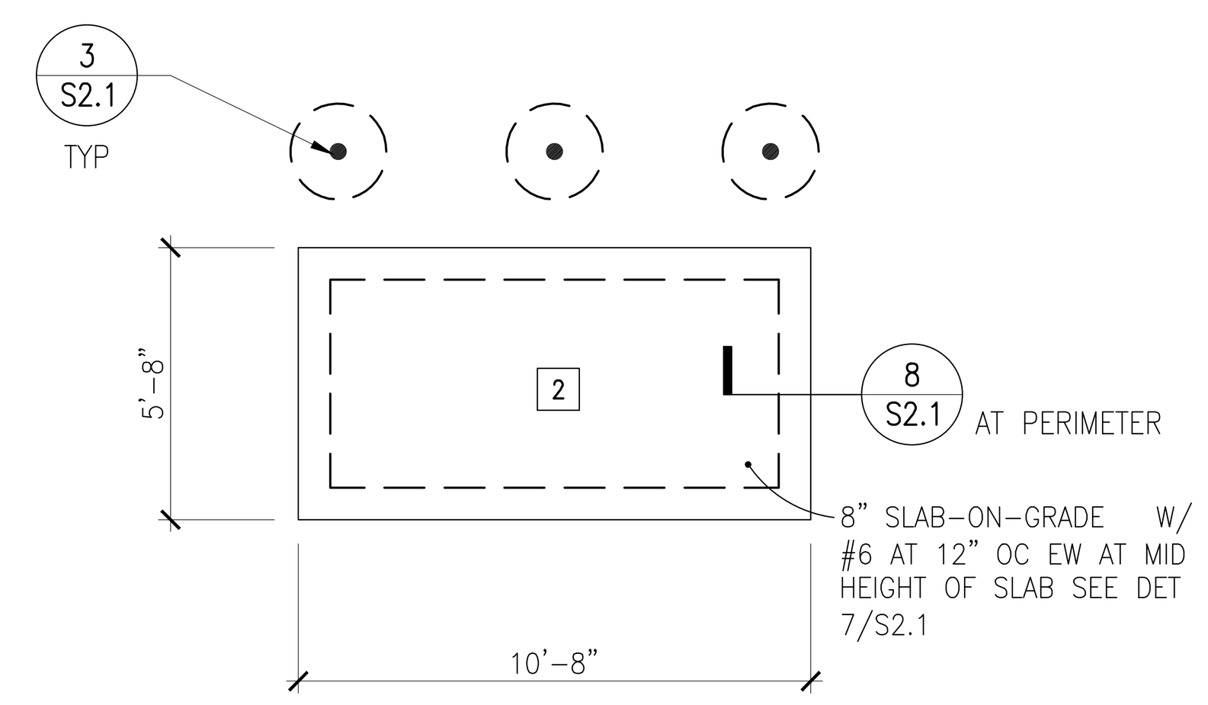
Drawing Title: STRUCTURAL SITE PLAN

Sheet No. S1.1

Building Permit B21-598



NOT USED	SCALE 1/4"=1'-0"	6
CONCRETE SLAB AT TRANSFORMER	SCALE 1/4"=1'-0"	3



NOT USED	SCALE 1"=1'-0"	7
CONCRETE SLAB AT PANELS	SCALE 1/4"=1'-0"	4
NOT USED	SCALE 1/4"=1'-0"	1
NOT USED	SCALE NONE	8
NOT USED	SCALE 1/4"=1'-0"	5
NOT USED	SCALE 1/4"=1'-0"	2

FOUNDATION NOTES

1. NEW TRANSFORMER SLAB MAX WEIGHT = 1,000#.
2. NEW CONCRETE SLAB AT PANELS.
3. SEE S2.1 FOR TYPICAL CONCRETE DETAILS

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REVISIONS

REV #	DESCRIPTION	DATE
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RUBIDOUX
PHASE 2
ELECTRICAL
UPGRADE

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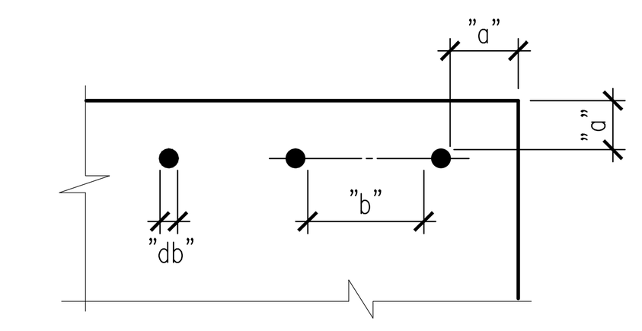
Project No.:	950567	Construction Release:	–
DSA No.:	–		

Drawing Title: FOUNDATION PLAN

Sheet No. S1.2

Reviewed for Code Comopliance
11/01/21

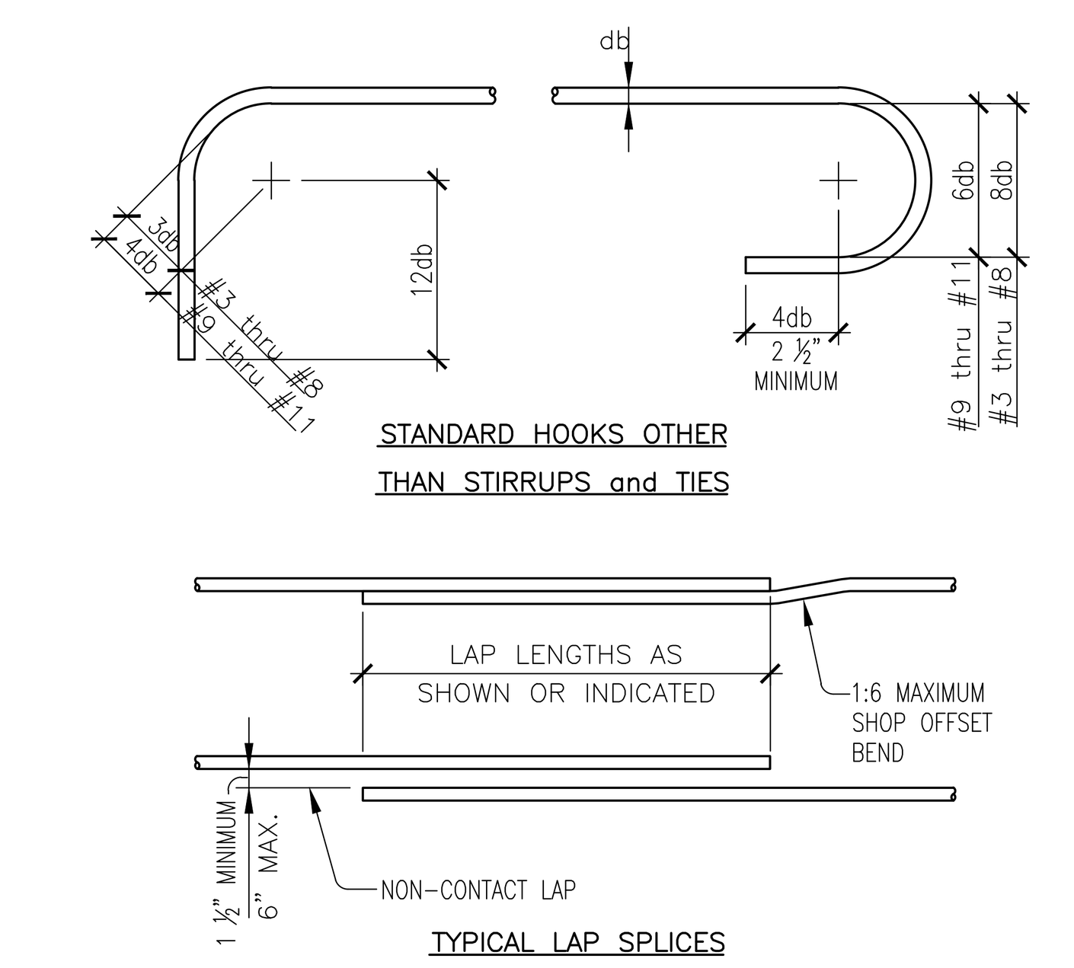
TENSION LAP SPLICE LENGTH (INCHES)							DEVELOPMENT LENGTH "ld" (INCHES)					
	3000 PSI CONC. f'c		4000 PSI CONC. f'c		5000 PSI CONC. f'c		3000 PSI CONC. f'c		4000 PSI CONC. f'c		5000 PSI CONC. f'c	
BAR SIZE	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER	TOP	OTHER
#3	28	22	24	19	22	17	22	17	19	19	17	13
#4	37	29	32	25	29	22	29	22	25	19	22	17
#5	47	36	40	31	36	28	36	28	31	24	28	22
#6	56	43	48	37	43	33	43	33	37	29	33	26
#7	81	63	70	54	63	49	63	48	54	42	49	37
#8	93	72	80	62	72	55	72	55	62	48	55	43
#9	105	81	91	70	81	63	81	62	70	54	63	48
#10	118	91	102	79	91	70	91	70	79	61	70	54
#11	131	101	113	87	101	78	101	78	87	67	78	60



WHERE: "a" IS THE CLEAR COVER
"b" IS THE CLEAR SPACING
"db" IS THE BAR DIAMETER

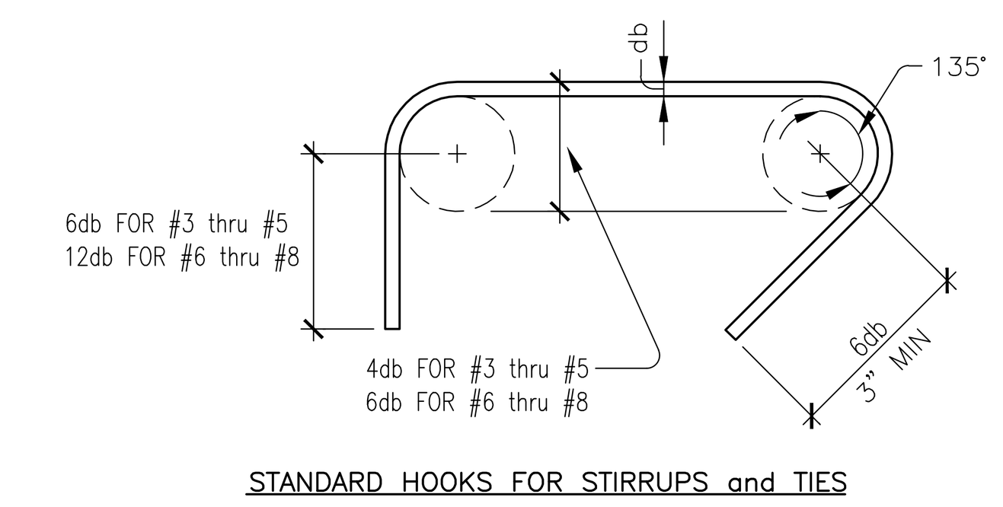
NOTES:
1. ALL SPLICES SHALL BE TENSION LAP SPLICES UNO
2. LENGTHS SHOWN ARE FOR GRADE 60 UNCOATED BARS.
3. LENGTHS SHOWN ARE IN INCHES.
4. INCREASE LENGTHS 30% FOR LIGHT WEIGHT CONCRETE AND AT FOUR BAR BUNDLES (WHERE (2) BARS LAP WITH (2) OTHER BARS)
5. TOP BARS – HORIZONTAL BARS PLACED WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW THEM.
6. INCREASE LENGTHS 50% WHERE a < db OR WHERE b < db FOR BEAMS AND COLUMNS OR WHERE b < 2db FOR OTHER ELEMENTS.
7. FOR #14 AND #18 BARS, USE MECHANICAL SPLICE IN ACCORDANCE WITH IBC REQUIREMENTS.

TENSION LAP SPICE SCHEDULE — SCALE NONE — 10

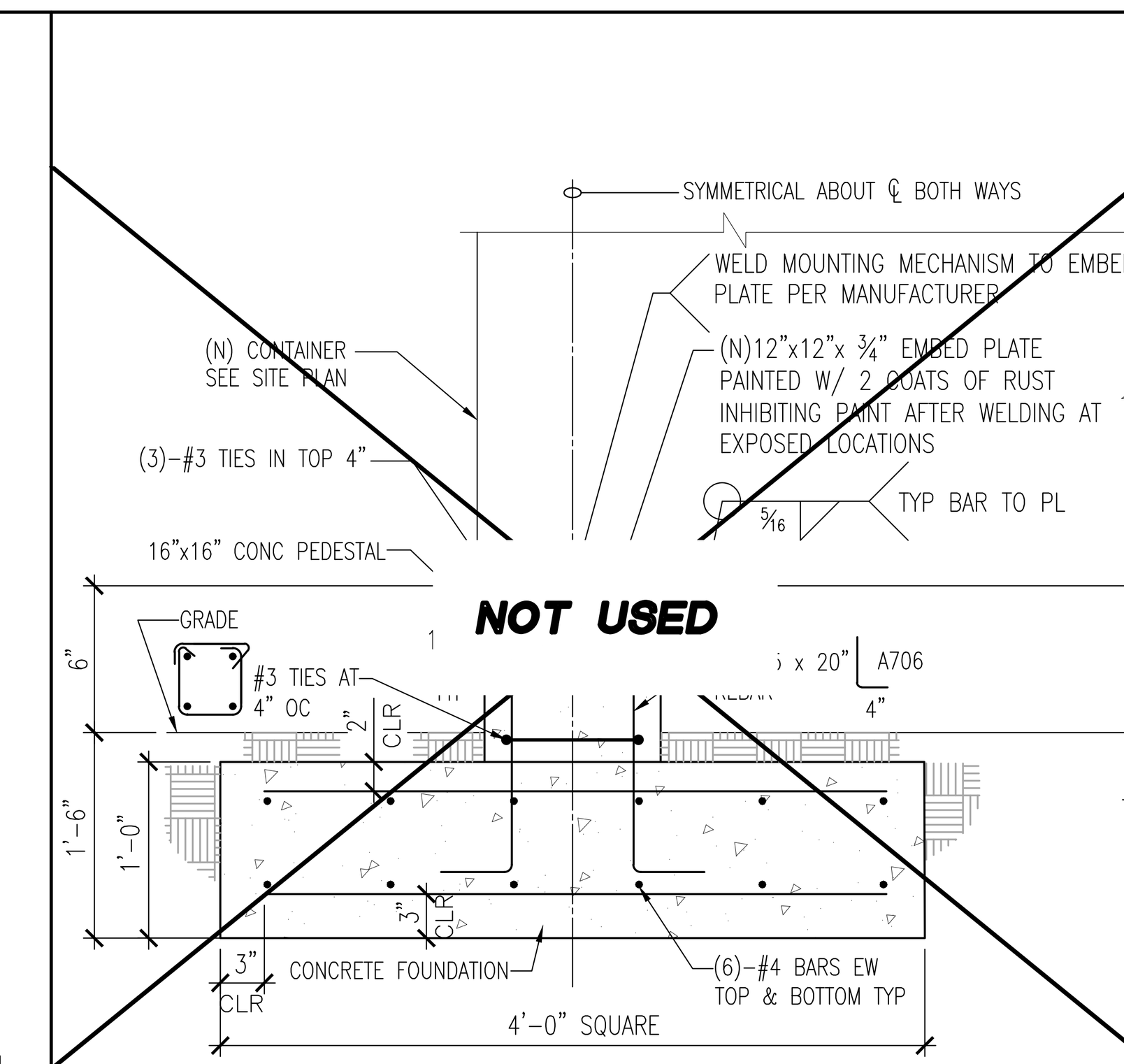


BAR DIAMETER DISTANCES									
BAR DIAMETERS	BAR SIZE								
	#3	#4	#5	#6	#7	#8	#9	#10	#11
3db	1 1/8"	1 1/2"	1 7/8"	2 1/4"	2 5/8"	3"	–	–	–
4db	1 1/2"*	2"*	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"
6db	2 1/4"*	3"	3 3/4"	4 1/2"	5 1/4"	6"	–	–	–
8db	–	–	–	–	–	–	9"	10"	11"
12db	4 1/2"	6"	7 1/2"	9"	10 1/2"	12"	13 1/2"	15"	16 1/2"

* INDICATES MINIMUM DIMENSIONS MAY GOVERN



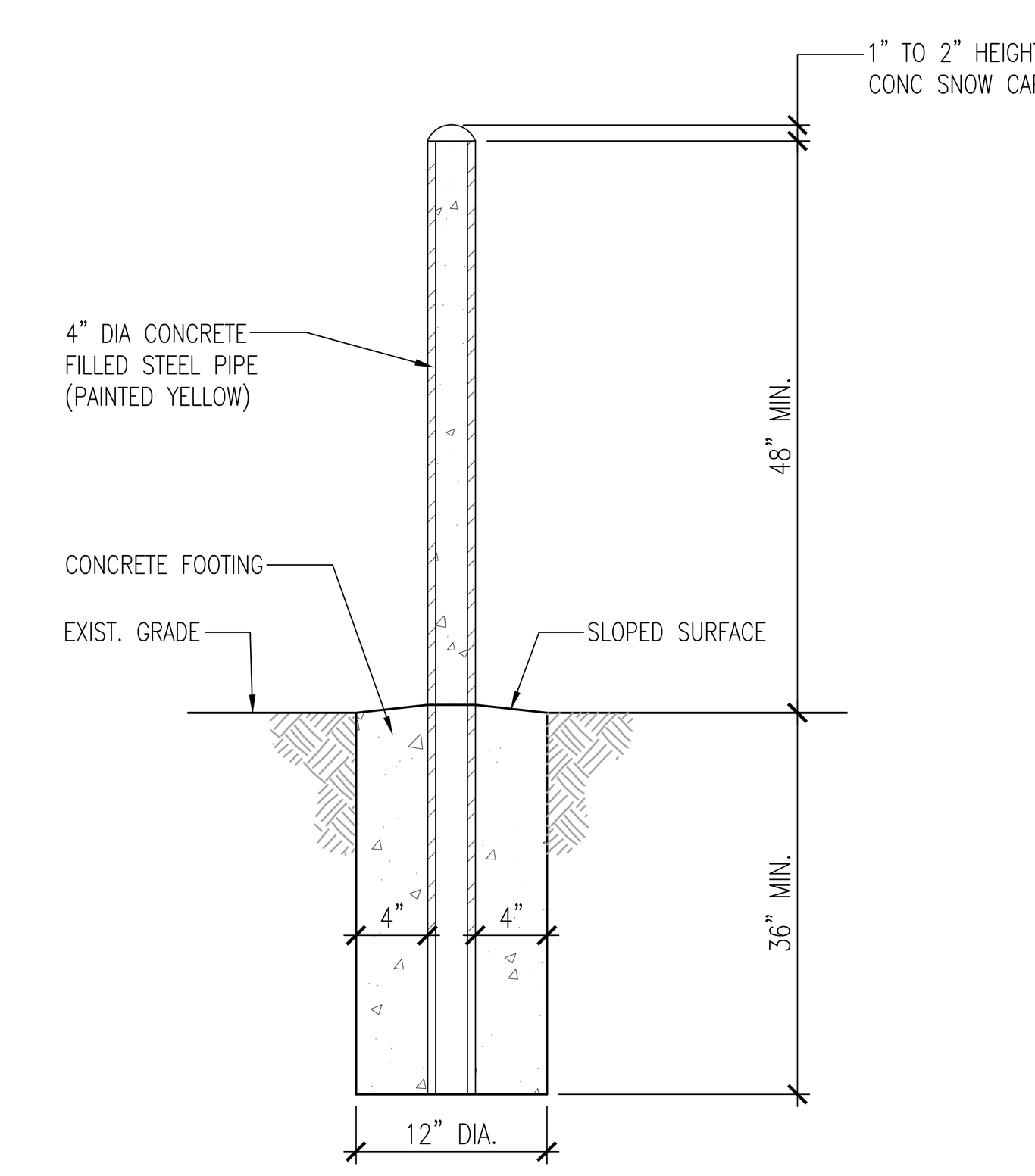
TYPICAL REINFORCING STEEL HOOKS, BENDS, AND LAPS — SCALE NONE — 5



CONTAINER SUPPORT PEDESTAL — SCALE NONE — 1

NOT USED — SCALE NONE — 17

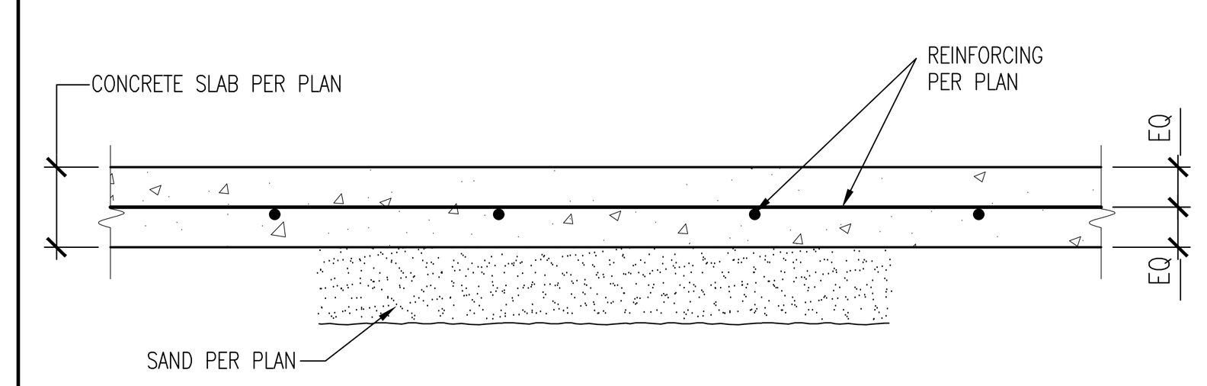
NOT USED — SCALE NONE — 18



NOTES:
1. BARRIERS REQUIRED FOR ALL ABOVE GROUND FACILITIES INSTALLED IN AREAS SUBJECT TO VEHICULAR TRAFFIC (OR REQUIRED BY BY RPU INSPECTOR).
2. BARRIER IN PROXIMITY OF DOOR SWING SHALL BE REMOVABLE TO FACILITATE "HOTSTICK" OPERATION OF PAD MOUNTED TRANSFORMER / SWITCH GEAR AND CONVENIENT EQUIPMENT REMOVAL.
3. ADEQUATE CLEARANCE MUST BE PROVIDED FOR DOORS AND COOLING COILS, ECT.
4. TYPICAL INSTALLATION REQUIREMENTS ARE SHOWN. FIELD CHARGES MAY BE NECESSARY FOR ADEQUATE PROTECTION OF THE EQUIPMENT. ALL INSTALLATIONS REQUIRED APPROVAL BY THE RPU INSPECTOR.
5. BARRIER POST (STEEL PIPE) SHALL BE PAINTED HIGH VISIBILITY YELLOW AFTER RPU INSPECTOR HAS APPROVED INSTALLATION.
6. STEEL PIPE SHALL BE FILLED WITH CONCRETE AND HAVE SNOW CAP FORMED TOP.

APPROVED MATERIALS
- 4" DIA x 7'-0" GALV STEEL PIPE (¼" MIN WALL).
- 12" x 12" x 3'-0" REINFORCED (AGGREGATE) CONCRETE FOUNDATION.
- PROTECTIVE WALL PER USG-291.
- SPECIAL BARRIER BY PRIOR DEPARTMENT APPROVAL.

BARRIER POST DETAIL — SCALE NONE — 3

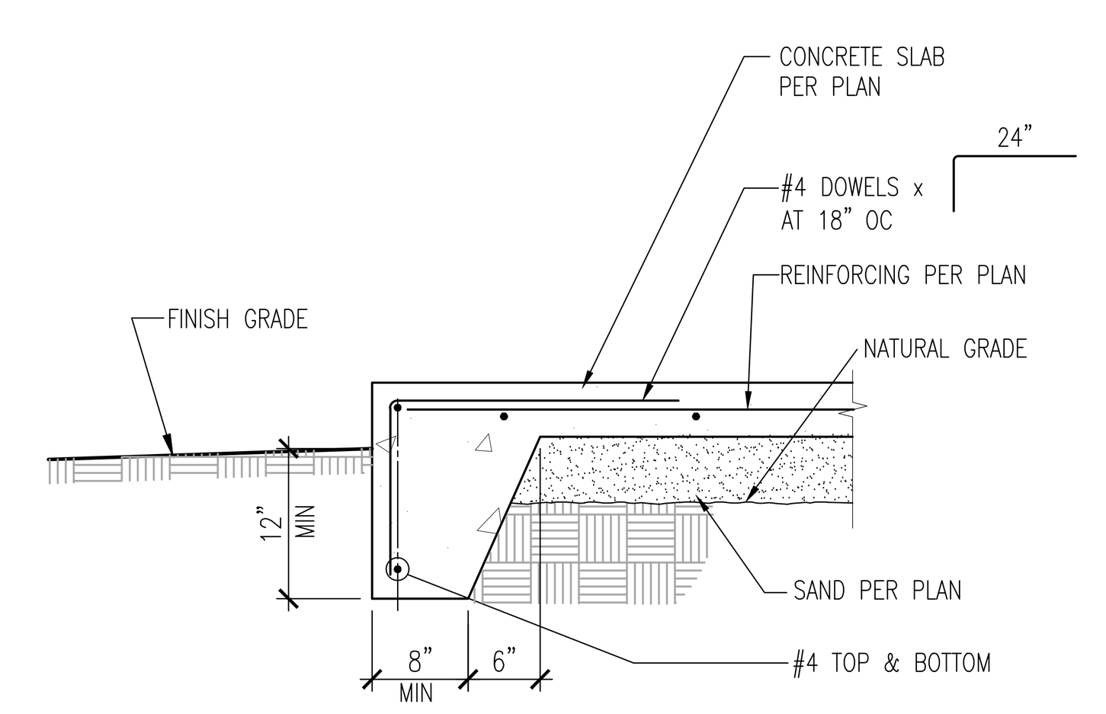


NOT USED — SCALE NONE — 19

NOT USED — SCALE NONE — 14

SCALE NONE — 11

TYPICAL SLAB ON GRADE — SCALE NONE — 7

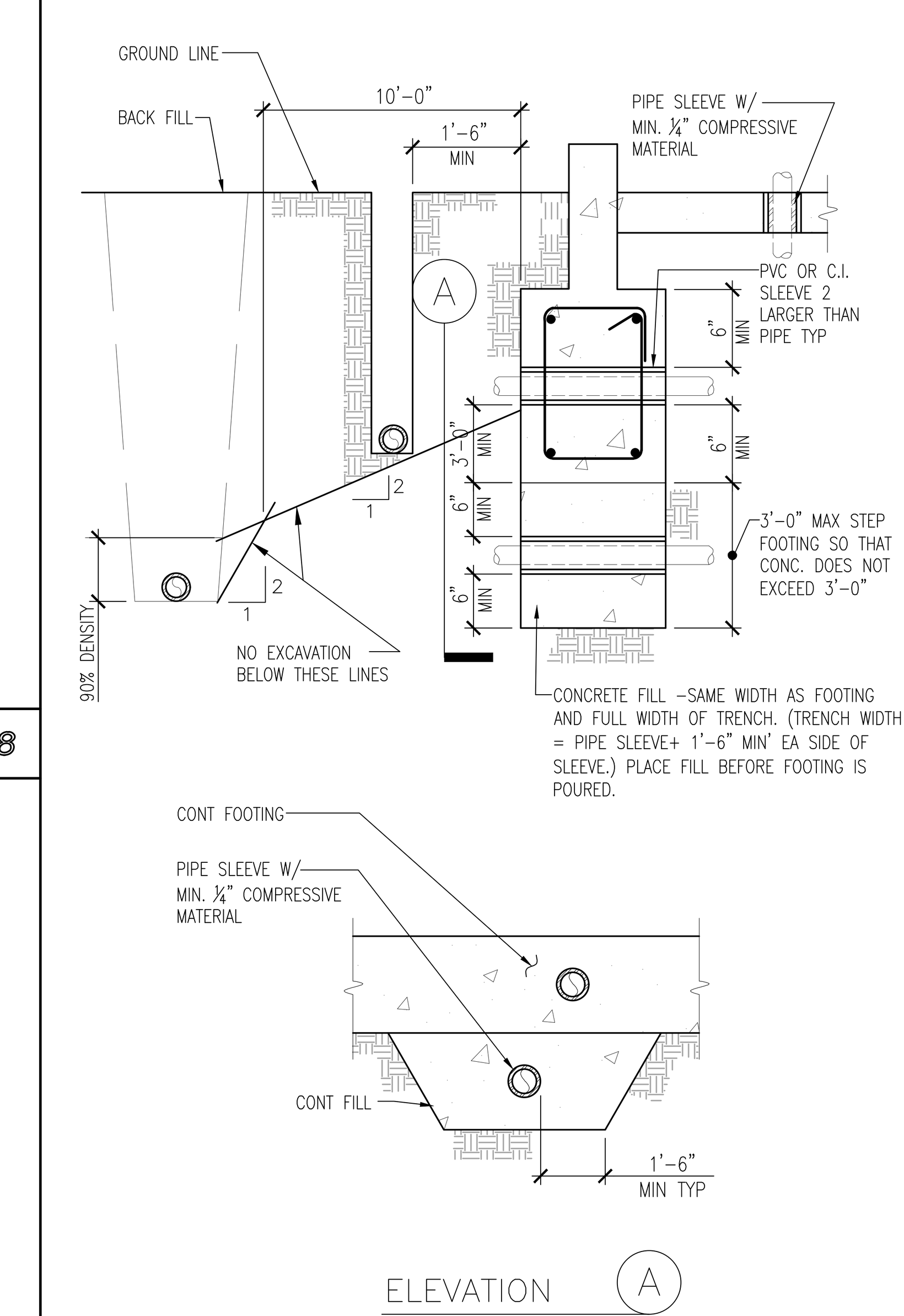


NOT USED — SCALE NONE — 20

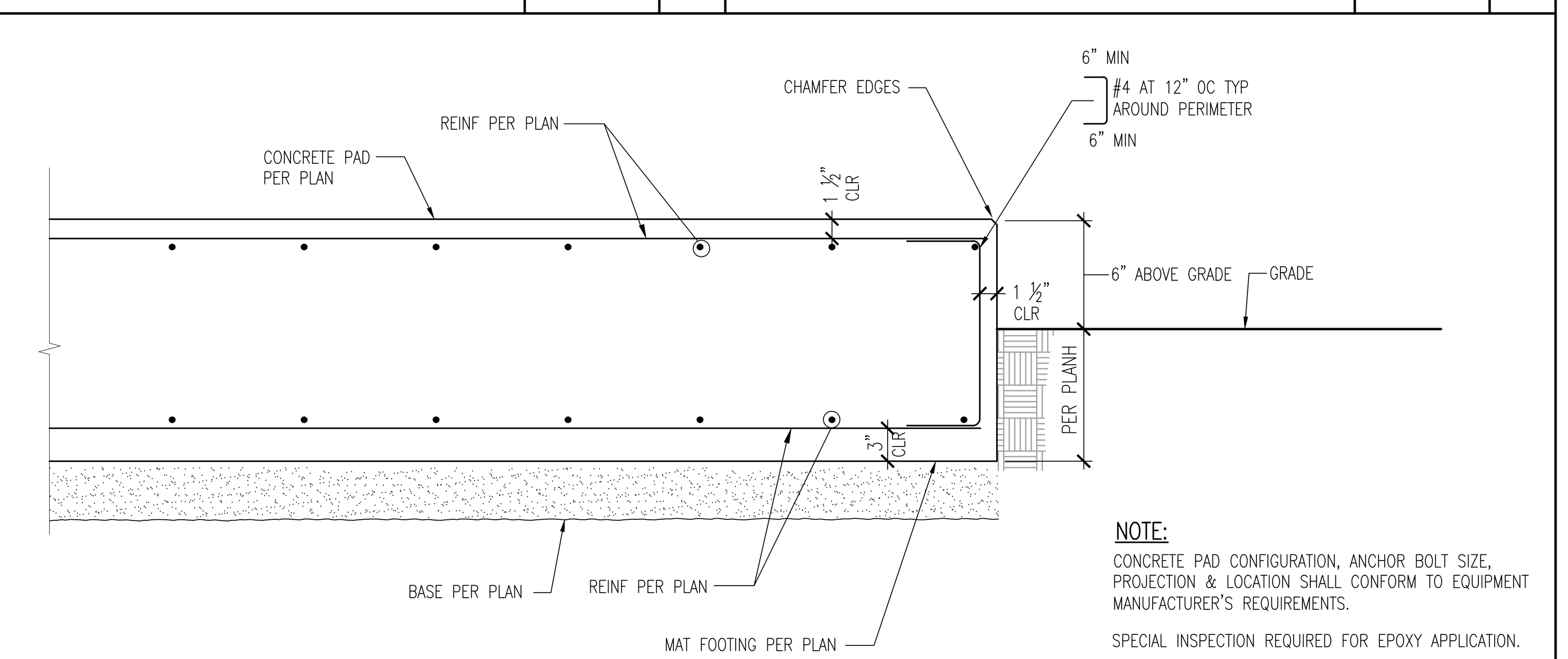
NOT USED — SCALE NONE — 15

NOT USED — SCALE NONE — 12

TYP. SLAB ON GRADE EDGE DETAIL — SCALE NONE — 8



NOTE: FOR PIPES MORE THAN 3'-0" BELOW BOTTOM OF FOOTING, TRENCH MAYBE BACKFILLED WITH CONTROLLED, COMPACTED FILL PER SPECIFICATION LEAN CONCRETE.



NOTE:
CONCRETE PAD CONFIGURATION, ANCHOR BOLT SIZE, PROJECTION & LOCATION SHALL CONFORM TO EQUIPMENT MANUFACTURER'S REQUIREMENTS.

SPECIAL INSPECTION REQUIRED FOR EPOXY APPLICATION.

NOT USED — SCALE NONE — 21

NOT USED — SCALE NONE — 16

MECHANICAL FOUNDATION — SCALE NONE — 9

PIPE THRU FOOTING/SLAB — SCALE NONE — 4

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DSA No.:	–		

Drawing Title: CONCRETE DETAILS

Sheet No. S2.1

Reviewed for Code Compliance 11/01/21

HADLEY ENGINEERING

STRUCTURAL CALCULATIONS FOR:

Job Name: UC Riverside
950567 Rubidoux Phase 2
Electrical Upgrade
RPU Plan Check Submittal

Site Address: 4650 14th St.
Riverside, CA 92510

09/01/2021

Job No: 21-027 **By:** TWH

Design Criteria:

Code:	**2019 CBC, ASCE 7-16**
Latitude and Longitude:	33.98156 and -117.39017
Max. Short T Spectral Resp. Acceleration:	S_S = 1.5g
Max. 1 Sec. Spectral Resp. Acceleration:	S_1 = 0.6g
Soil Site Class:	D
Risk Category:	II
Seismic Design Category:	D
Wind:	100 mph, Exposure C

Calculation Index:

Calculations: 1 - 4

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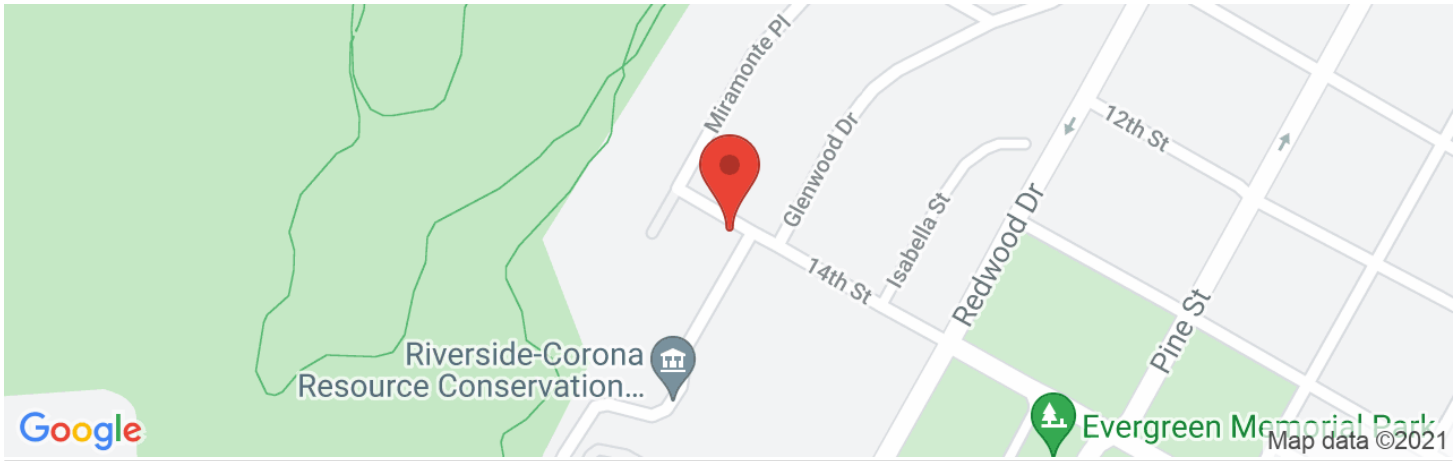
P. (909) 446-0712
www.hadleyengineering.com

4650 14th St, Riverside, CA 92501, USA

Latitude, Longitude: 33.9815651, -117.3901729



Date	8/31/2021, 10:57:21 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	1.5	MCE_R ground motion. (for 0.2 second period)
S_1	0.6	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.8	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.2	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.508	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.61	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.686	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.791	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.623	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.682	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.508	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.941	Mapped value of the risk coefficient at short periods
C_{R1}	0.914	Mapped value of the risk coefficient at a period of 1 s

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FOOTING DESIGN (at soil interface)

Footing:	**At Transformer**	
Vs or Vw =	**0.8**	K, STRENGTH LEVEL FORCE USED FOR SHEARWALL OR FRAME DESIGN
Load Factor (0.7 for Vs and 0.6 for Vw) =	**0.7**	CONVERT TO SERVICE LEVEL FORCE
Lateral Load at top =	**0.56**	K, SERVICE LEVEL FORCE
Height of CofM =	**2**	FT (at application of load-include concrete curb height if any)
Height of footing =	**1**	FT
Footing Length (L) =	**6.0**	FT Centered on transformer
Footing Width (B) =	**8.0**	FT Centered on transformer
DL on Ftg =	**1.0**	K, SERVICE LEVEL, Centered on transformer
Footing Weight =	**7.2**	K

Check Overturning

S_{DS} =	**1.2**		
0.6 - 0.14 S_{DS} =	**0.43**	Use for resistance to OT	
OTM =	**1.68**	K-FT	
RM =	**10.6**	K-FT	**OK**

Check Sliding

Coef of Friction =	**0.35**		
Passive Pressure =	**200**	PCF (ok to combine w/ friction)	
DL factor for resistance =	**0.6**		
LAT FORCE =	**0.56**	K	
RESISTANCE =	**2.2**	K	**OK**

Check Bearing

Allowable Bearing =	**1500**	PSF	
M_{OT} =	**1.68**	K-FT	
P =	**8.2**	K	
e = M/P =	**0.20**	FT	
L/6 (kern) =	**1**	FT	
q = (P/BL)* (1+(6e/L)) =	206	PSF	Choose one or the other based on kern
q = (2/3)* (P/(B*(L/2-e))) =	245	PSF	
q =	**206**	PSF	Within Kern
Allowable w/ 1/3 increase =	**2000**	PSF	**OK**

HADLEY ENGINEERING
34159 Yucaipa Blvd., Suite C
Yucaipa, CA 92399
P: 909.446.0712
www.hadleyengineering.com

Sheet No: _____

Job No: _____

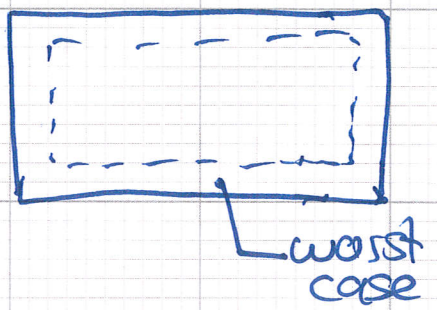
Date: _____ By: _____

PAD AT NEW PANELS

ASSUME 500# MAX WT PER PANEL

WORSTCASE IS FOOTING ALONG REAR UNDER PANELS

ASSUME 2' trib length of continuous footing foreach panel.



$q_{all} = 1500$ psf

$A_b = 0.67 \times 2' = 1.34$ sf

$q = \frac{500\#}{1.34sf} = 373$ psf $< q_{all}$, OK

SPECIFICATIONS

INDEX TO SPECIFICATIONS

DIVISION 1 – GENERAL REQUIREMENTS

SECTION 01010
GENERAL REQUIREMENTS

1. GENERAL

1.1 Section Includes

1.1.1 Summary of Work
1.1.2 Coordination and Meetings
1.1.3 Submittals
1.1.4 Quality Control
1.1.5 Construction Facilities and Temporary Controls
1.1.6 Material and Equipment
1.1.7 Contract Closeout

2. SUMMARY OF WORK

2.1 Scope of Work Description

Installation of a new Riverside public utility transformer and concrete pad fed from the existing utility pole with new underground feeders. Also install a new 800amp switchboard, 208/120V, 3P, 4-wire service meter and main. The transformer will feed the switchboard and provide power to existing switchboard "MSB"

2.2 Allowances- Not Applicable

2.3 Unit Prices- Not Applicable

2.4 Alternates

2.4.1 General

2.4.1.1 This Section identifies each Alternate and describes basic changes to the Work only when that Alternate is made a part of the Work by specific provision in the Agreement.

2.4.1.2 The Lump Sum Base Bid and Alternate(s) shall include the costs of all supporting elements required, so that the combination of the Lump Sum Base Bid and any Alternate shall be complete. The scope of Work for all Alternates shall be in accordance with applicable Drawings and Specifications.

2.4.1.3 Except as otherwise specifically provided by University, the Work described in an Alternate shall be completed with no increase in Contract Time.

2.4.1.4 This Section includes only the non-technical descriptions of the Alternate(s). Refer to the specific Sections of the Specifications Divisions 2-16, as applicable, for technical descriptions of the Alternate(s).

2.4.1.5 Contractor shall coordinate related Work and modify surrounding Work as required to properly and completely integrate the Alternates into the Work.

2.4.2 Description of Alternate(s)

2.4.2.1 **Alternate 1:** Provide Labor & Materials for Block wall between Glasshouse & Greenhouses.

2.4.2.2 **Alternate 2:** Provide labor & materials between for Block wall shown along Glenwood Drive.

3. COORDINATION AND MEETINGS

3.1 Project Coordination

3.1.1 The Contractor shall coordinate the Work.

3.1.2 Contractor shall verify that utility requirement characteristics of operating equipment are compatible with building utilities.

3.1.3 Contractor shall coordinate space requirements and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practicable. In finished areas, conceal pipes, ducts, and wiring within the construction.

3.2 Project Meetings

3.2.1 University will schedule a preconstruction meeting either concurrently with or after issuing the Notice to Proceed, but prior to the commencement of the Work.

3.2.2 University's Representative will schedule and administer meetings throughout the progress of the Work.

3.2.3 University's Representative will preside at the meetings, record minutes, and distribute copies within 3 days to Contractors, Design Professional, and to University.

4. SUBMITTALS

4.1 Schedules

4.1.1 Preliminary Contract Schedule

4.1.1.1 Submit the Preliminary Contract Schedule to University's Representative within the time specified in the Instructions to Bidders and Supplementary Instructions to bidders.

4.1.1.2 Submit 1 hardcopy and 1 electronic copy in MS Excel, MS Word, Microsoft Project, or other software format approved by University's Representative. Use the form of a bar chart, GANT chart, or other system approved by University's Representative showing the start date and final completion date of the Project, with the various work activities involved and other information relative to the progress of the Work, in a continuous flow from left to right.

4.1.1.3 Show sufficient detail to demonstrate adequate planning for the Work, represent a practical plan to complete the Work within the Contract Time, and suitable for monitoring progress of the Work.

4.1.1.4 Identify the milestone events and Work activities for completion of the Project. At a minimum, identify the following:

Commencement Date
Submittals (Receipt through Approval)
Lead Times (e.g., materials, etc.)
Demolition
As-Builts
M&O Manuals
Substantial Completion
Punchlist
Final Cleaning
Final Inspection
Final Completion

4.1.1.5 Identify all Work activities that constitute the critical path.

4.1.1.6 A minimum of 7 days shall be allotted for University's Representative to review each submittal.

4.1.1.7 Identify all holidays and non-working days. Note the following University Holidays and Campus Closure Days:

New Year's Day: Holiday
Martin Luther King, Jr. Day (3rd Monday in January): Holiday
Presidents' Day (3rd Monday in February): Holiday
Cesar Chavez Day (Last Friday in March): Holiday
Memorial Day (Last Monday in May): Holiday
Independence Day (July 4): Holiday
Labor Day (1st Monday in September): Holiday
Veterans' Day (November 11): Holiday
Thanksgiving Day (4th Thursday in November): Holiday
Friday following Thanksgiving Day: Holiday
Christmas Eve: Holiday
Christmas Day: Holiday
December 28 – 29, 2010: Campus Closure
New Year's Eve: Holiday

Exception: A University Holiday that falls on a Saturday is observed on the preceding Friday, and a University Holiday that falls on a Sunday is observed on the following Monday, unless an alternate day to observe the University Holiday is designated.

4.1.2 Contract Schedule

4.1.2.1 Submit the Contract Schedule within 15 days prior to submitting an Application For Payment. No Application For Payment will be processed nor shall any progress payment become due until the Contract Schedule is accepted by University's Representative per 4.1.2.

.1 The accepted, updated Contract Schedule shall be the Contract Schedule of record for the period it is current and shall be the basis for payment during that period.

4.1.2.2 Submit 1 hardcopy and 1 electronic copy in MS Excel, MS Word, Microsoft Project, or other software format approved by University's Representative.

4.1.2.3 Within 5 days after receipt of the Contract Schedule, University's Representative will notify Contractor of its acceptance or return with comments for resubmittal so that appropriate adjustments can be made by Contractor in the development of the Contract Schedule.

4.1.2.4 Submit the Contract Schedule in the same form as required in subsection 4.1.1.

4.1.2.5 Identify all Work activities in correct sequence for the completion of the Work. Work activities shall include the following:

.1 All Work activities that constitute the critical path.

.2 Major Contractor-furnished equipment, materials, and building elements, and scheduled activities requiring submittals or University's prior approval.

.3 Show dates for the submission, review, and approval of each submittal. Dates shall be shown for the procurement, fabrication, delivery, and installation of major equipment, materials, and building elements, and for scheduled activities designated by University.

.4 A minimum of 7 days shall be allotted for University's Representative to review each submittal.

.5 System test dates.

.6 Scheduled overtime Work if required by Contract Documents.

.7 Dates Contractor requests designated working spaces, storage areas, access, and other facilities to be provided by University.

.8 Dates Contractor requests orders and decisions from University on designated items.

.9 Dates Contractor requests University-furnished equipment.

.10 Dates Contractor requests University-furnished utilities.

.11 Connection and relocation of existing utilities.

.12 Connecting to or penetrating existing structures.

.13 Scheduled inspections as required by Codes, or as otherwise specified.

4.1.2.6 Critical Work activities are defined as Work activities which, if delayed or extended, will delay the scheduled completion of one or more of the milestones specified in this Section or the scheduled completion of the Work, or both. All other Work activities are defined as non-critical Work activities and are considered to have float.

4.1.2.7 Float is defined as the time that a non-critical Work activity can be delayed or extended without delaying the scheduled completion of milestones specified in this Section or the scheduled completion of the Work, or both. Neither Contractor nor University shall have an exclusive right to the use of float. The party using float shall document the effect on the updated Contract Schedule.

4.1.2.8 Delays of any non-critical Work activity shall not be the basis for an extension of Contract Time until the delays consume the float associated with that non-critical Work activity and cause the Work activity to become critical.

4.1.2.9 The presentation of each Work activity on the Contract Schedule shall include a brief description of the Work activity, the duration of the Work activity in days, and a responsibility code identifying the organization or trades performing the Work activity.

4.1.2.10 Updating

.1 Review the Contract Schedule with University's Representative once each week to incorporate in the Contract Schedule all changes in the progress, sequences, and scope of Work activities.

.2 The updated Contract Schedule shall accurately represent the as-built condition of all completed and in-progress Work activities as of the date of the updated Contract Schedule.

.3 Contractor shall perform the Work in accordance with the updated Contract Schedule approved by University's Representative.

4.2 Proposed Products List

4.2.1 Within 7 days after the commencement date specified in the Notice to Proceed, Contractor shall submit a complete list of major Products proposed for use, with the name of the manufacturer, trade name, and model number of each Product.

4.2.2 For product substitutions, see 7.3 of this Section.

4.3 Shop Drawings

4.3.1 Contractor shall submit in the form of one reproducible transparency.

4.4 Product Data

4.4.1 Contractor shall submit 3 copies. Mark each copy to identify applicable models, options and other data for each Product.

4.5 Samples

4.5.1 Contractor shall submit samples to illustrate functional and aesthetic characteristics of the Products.

5. QUALITY CONTROL

5.1 University's Testing Laboratory

5.1.1 If applicable to the Work of this Project, University will appoint, employ, and pay for services of an independent firm (University's Testing Laboratory) to perform inspection and testing. University's Testing Laboratory will perform inspections, tests, and other services as required by the University.

5.1.2 Contractor shall cooperate with University's Testing Laboratory and furnish samples as requested.

5.1.3 Any cost of re-testing, required because of non-conformance to specified requirements, will be charged to Contractor.

5.2 Not Used

6. CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

6.1 Staging Area

The staging area to be used by Contractor shall be located onsite at 4650 14th Street, Riverside CA 92501.

6.2 Work Hours

6.2.1 The University's normal business hours are: 7:00 AM – 4:30 PM.

6.2.2 The University is closed on the following Holidays: see 4.1.1.7 above.

6.2.3 Special provisions: None.

6.3 Health and Safety

6.3.1 Contractor is responsible for the safety and health of employees and the public, and shall comply with *OSHA* regulations and perform in accordance with all applicable Local, State and Federal Regulations; including CFR-29 (*Code of Federal Regulations*), Part 1910; *Occupational Safety and Health Standards*, Part 1925; *Safety and Health Standards for Federal Service Contracts*; and Part 1926 Safety *and Health Regulations for Construction.* Contractor shall maintain current injury and illness prevention plan (IIPP) that complies with Local, State and Federal requirements and shall submit a copy of the IIPP to the University Representative for review upon request. Contractor shall follow the IIPP closely throughout the Work and will be solely responsible for any and all fines or citations resulting from non-compliance with all applicable Local, State and Federal laws and regulations. Any contractor work-related accident, which results in injury or property damage, shall be reported as soon as possible to the UCR Department of Environmental Health & Safety at (951) 827-5528. For all accidents, the Contractor shall be required to complete any reports deemed necessary and within the time-frame specified by the University's Representative. Work may be stopped at the discretion of the University's Representative subsequent to review by the Head of Industrial Hygiene, UCR Department of Environmental Health & Safety, if an unsafe or non-compliant condition is found to exist, and at no additional cost or adjustment to the Contract Sum.

6.4 Waste Management

6.4.1 Collection and Disposal of Waste: Contractor shall furnish all labor, equipment, containers, transportation, materials, supplies and related expenses to provide the University with comprehensive waste collection and waste recycling services for the Project. Contractor shall collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 degrees F (27 degrees C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly.

.1 Do not burn waste materials. Do not bury debris or excess materials on the University's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems or streams. Remove waste materials from the site and dispose of lawfully.

.2 Where extra materials of value remain after completion of associated Work, they become the University's property. Dispose of these materials as directed by the University's Representative.

.3 Provide on-site containers for collection of waste materials, debris, and rubbish, and empty at least weekly. Maintain containers in such condition so as to ensure they are clean and sanitary, to prevent odor and insect infestation, and ensure no unsightly presentation. Perform maintenance on the containers as required to ensure proper function for the intended purpose.

.4 Handle waste materials in a controlled manner. Do not drop or throw materials from heights.

.5 Remove combustible debris from the building daily and store in covered, non-combustible containers located not less than 40 feet from any building.

6.4.2 Cleaning During Construction Period: Comply with regulations of the University and safety standards for cleaning.

.1 Schedule cleaning operations so that dust and other contaminants resulting from cleaning operations will not settle on wet paint, or other coatings or finishes during their cure period.

.2 Comply with manufacturer's instructions for cleaning the surfaces and parts of finishes and equipment. Use only those cleaning materials and procedures recommended by the manufacturer of the item to be cleaned.

.3 Provide cleaning during construction as necessary to ensure operations can proceed on schedule and that finish materials can be installed properly and viewed for determination of aesthetic characteristics.

6.4.3 Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

6.4.4 Environmental Requirements: Conduct cleaning and waste-disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and antipollution regulations.

.1 Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in streams, storm or sanitary drains.

.2 Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

.3 Comply with requirements of Southern California Air Quality Management District in effect at the time of construction.

.4 Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of lawfully.

6.4.5 Submittal: Prior to requesting inspection for Substantial Completion and Final Completion, submit written certification to the University's Representative that final cleaning has been performed in accordance with the Contract Documents.

6.4.6 The University has established that this Project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible shall be employed to enable the University to meet a minimum 95% percent diversion of construction waste from the landfill.

6.4.7 Contractor shall be responsible for monitoring and maintaining a written log using the C&D Waste Management Form, a copy of which is attached at the end of this Section, to report when actual container deliveries and waste pickups occur, the kinds of C&D waste material included, and for submitting the data to University's Representative, or designee, **with each Application for Payment**. Such written information shall be used as backup to support payment of Contractor's scheduled value for Division 1, General Requirements.

6.4.8 C&D waste is a combination of concrete, lumber, plaster, cardboard, glass, various metals, paper, PVC, ABS, HDPE, PP, PDPE, PET, white foam, paint buckets, carpet and dirt. C&D waste accepted for recycling:

.1 Card Board
.2 Mixed metals
.3 PVC Pipe
.4 ABS Pipe
.5 H.D.P.E. Pipe
.6 Carpet
.7 Carpet Pad
.8 Mixed Plastics
.9 Glass
.10 Bottles & Cans – CRV
.11 H.D.P.E Plastics
.12 H.D.P.E Pipe
.13 Foam – White
.14 Paper – Mixed
.15 Plastic Buckets – Paint (empty) & Landscapers
.16 Drywall
.17 Wood
.18 Particle Board
.19 Green Waste – No Grass Clippings – All tree trunks/branches need to me cut up into 4' x 10" pieces
.20 Enerts – Soil, Asphalt, Brick, Concrete..

6.5 Hazardous Materials

6.5.1 Refer all questions to the University's Representative.

6.6 Temporary Electricity

6.6.1 All Electrical Utility service shall confirm to NEC Code.

6.6.2 Contractor shall connect to existing power service without modification. Modifications to existing infrastructure shall be made only with prior approval of the University's Representative. Power consumption shall not disrupt or jeopardize the University's requirement for uninterrupted service.

6.6.3 Contractor shall provide power for construction operations utilizing rated/certified branch wiring, distribution boxes, flexible power cords, and receptacles as required.

6.6.4 University will pay the cost of the power used.

6.7 Temporary Lighting

6.7.1 All temporary lighting shall conform to NEC Code.

6.7.2 Contractor shall provide and maintain lighting for construction operations. Provide rated/certified branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

6.7.3 Disconnection of existing building lighting shall be made only with prior approval of University's Representative.

6.8 Temporary Heat

6.8.1 Contractor shall utilize University's existing heat plant. Contractor shall not rig, alter or modify existing HVAC without prior approval of University's Representative.

6.8.2 Contractor shall provide temporary supplemental HVAC as required to maintain specified conditions during construction operations.

6.8.3 Contractor shall provide and pay for delivery, setup, operation, maintenance, and regular replacement of such equipment, filters, and worn or consumed parts as a part of the Project.

6.8.4 University will pay the cost of the energy used.

6.9 Temporary Ventilation

6.9.1 All ventilation remedies shall be approved by University's Representative before implementation by Contractor.

6.9.2 Contractor shall ventilate enclosed areas to assist the cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, and gases.

6.9.3 As required to maintain clean air during construction operations, Contractor shall provide ventilation equipment or supplement existing ventilation equipment.

6.9.4 Hazardous materials presence and remediation shall be strictly covered under 6.3 of this Section.

6.10 Telephone Service

6.10.1 Contractor shall provide cellular, mobile, or two-way communication, or provide, maintain, and pay for telephone service to a field office location as identified by University's Representative, commencing at the time of mobilization and terminated upon Final Completion.

6.11 Temporary Water Service

6.11.1 Contractor shall connect to existing water source for construction operations.

6.11.2 Disruption of existing domestic hot and cold, de-ionized, chilled, industrial or irrigation water sources shall be made only with prior approval of University's Representative.

6.12 Temporary Sanitary Facilities

6.12.1 Contractor shall provide and maintain required sanitary facilities and enclosures.

6.12.2 University's existing sanitary facilities may be used only with the prior approval of University's Representative. Contractor shall maintain sanitary facilities in a clean and sanitary condition.

6.12.3 Do not flush construction materials down toilets or sinks.

6.13 Site Access and Public Safety

6.13.1 Contractor shall provide prudent signage, barriers or fencing to prevent unauthorized access to construction areas and to protect existing facilities and adjacent properties from damage.

6.13.2 Contractor shall provide oversight by Contractor's personnel to direct pedestrian and vehicular traffic away from the Project site or areas that University reasonably expects to remain secure during construction per University's Representative.

6.13.3 To the extent reasonably possible, Contractor shall implement such precautions and coordinate through University's Representative to allow normal University business to continue.

6.14 Site Control – Progress Cleaning

6.14.1 Contractor shall maintain the Project site in a clean and orderly condition at all times free of waste, materials, debris, and rubbish.

6.14.2 University's dumpsters and trash receptacles shall not be used for construction waste.

6.14.3 Contractor shall provide for collection, removal and transportation of all waste materials from the site in accordance with 6.2 of this Section.

6.15 Water Control

6.15.1 Contractor shall maintain Project site and adjacent areas free of water. Provide, operate and maintain pumping equipment.

6.15.2 Do not allow excess water to run in streets or gutters.

6.16 Dust Control

6.16.1 Contractor shall maintain Project site and adjacent areas free of accumulated dirt and dust from construction on a daily basis. As approved by University's Representative, provide sweeping and/or vacuuming, wipe down and/or wash down procedures to be used by Contractor's personnel and Contractor's subcontractors.

6.17 Interior Enclosures

6.17.1 All interior demarcations shall be approved by the Campus Fire Marshal before construction/installation.

6.17.2 Contractors shall provide temporary partitions and/or coverings as required to separate Work area from University occupied area(s), to prevent penetration of dust and moisture into University occupied area(s), and to prevent damage to existing materials and equipment.

6.18 Protection of Installed Work

6.18.1 Contractor shall protect installed Work and provide special protection where specified in individual Specification Sections.

6.19 Security

6.19.1 Contractor shall provide security and facilities to protect Work, existing facilities, and University's operations from unauthorized entry, vandalism, or theft.

6.20 Access Roads

6.20.1 Designated University access roads may be used by construction traffic for the purposes of reaching the Project site, delivery of materials and removal of waste, with the prior approval of University's Representative. Otherwise, use of and parking on University access roads is strictly prohibited.

6.21 Parking

6.21.1 Contractor shall be responsible for obtaining required permits for all vehicles parked on University property.

6.21.2 Arrangements for access, lay-down and parking shall be approved by University's Representative.

6.21.3 For parking permit information, contact University's Transportation & Parking Services (TAPS) located at 683 Linden Street, Riverside, California 92521, or by calling at (951) 827-8277. Notify TAPS at the time you purchase your permit(s) that you are contracted through Facilities – Design & Construction, Contracts Administration. All contractors, subcontractors, suppliers, etc. are responsible for properly displaying parking permits and for following all parking codes and regulations. Gate passes are required for certain areas and are available from

TAPS for a refundable fee or at additional cost. All fees are subject to change without notice.

6.21.4 It is the Contractor's responsibility to determine and include all costs associated with doing business with the University in its bid.

6.22 Removal of Temporary Utilities, Facilities, and Controls

6.22.1 Contractor shall remove temporary above grade or buried utilities, equipment, facilities, materials, and controls before Final Inspection.

6.22.2 Contractor shall clean and repair/restore to original condition damage caused by installation, removal, or use of temporary utilities, facilities or controls.

7. MATERIALS AND EQUIPMENT

7.1 Products

7.1.1 The term "Product" or "Products" means new material, machinery, components, equipment, fixtures, and systems forming the Work.

7.2 Transportation, Handling, Storage, and Protection

7.2.1 Transport, handle, store, and protect Products in accordance with manufacturer's instructions.

7.3 Substitutions

7.3.1 When a product, material or equipment specified by brand or trade name is followed by the words "or equal," a substitution may be permitted if the substitution is equal to or superior to the first-named product, material or equipment in quality, utility and appearance and if the substitution complies with all other requirements of the plans and specifications.

7.3.2 A request for substitution must be submitted in writing to the University's Representative not later than **35 days** after the date of commencement specified in the Notice to Proceed. No requests for substitutions of products, material or equipment subject to the **35-day** deadline shall be considered unless the request and supporting data is submitted on or before the deadline, except those deemed, in University's Representative's sole opinion, to be necessary because (i) previously specified or approved manufactured products, material or equipment are no longer manufactured, (ii) of University initiated change orders, or (iii) it is in the best interest of University to accept such substitution. The **35-day** submittal period does not excuse the Contractor from completing the Work within the Contract Time.

7.3.3 Substitutions are not allowed unless approved in writing by the University's Representative. Any such approval shall not relieve Contractor from the requirements of the Contract Documents. In addition to complying with all other submittal requirements of the Contract, submit written data demonstrating that the proposed substitution is equal to or superior to the first-named product, material or equipment in quality, utility and appearance and otherwise complies with all requirements of the plans and specifications.

7.3.4 The first-named product, material or equipment specified by brand or trade name and model number is the basis for the Project design and the use of any item other

than the first-named one may require modifications of that design. If Contractor uses any product, material or equipment other than the first-named one, Contractor shall, at its sole cost, make all revisions and modifications to the design and construction of the Work necessitated by the use the product, material or equipment. If such revisions or modifications are necessary, the product, material or equipment may be used only if the revisions or modifications are approved in writing by the University's Representative.

7.3.5 Other products, material or equipment that are specified by brand or trade name and model number are approved for use, provided that Contractor complies with all Contract requirements. Specification of a product, material or equipment by brand or trade name and model number is not a representation or warranty that the product, material or equipment is available or that it can be used without modification, to meet the requirements of the plans and specifications; Contractor shall confirm, prior submitting a bid the availability of any product, material, or equipment. If modifications are necessary, Contractor shall, at its sole cost, modify such products, material, or equipment so that they comply with all requirements of the plans and specifications.

8. CONTRACT CLOSEOUT

8.1 Final Cleaning

8.1.1 Contract shall execute final cleaning before Final Inspection.

8.1.2 Contractor shall clean interior and exterior surfaces exposed to view.

8.1.3 Contractor shall vacuum carpeted and soft surfaces, and wipe down hard floors and walls as needed.

8.1.4 Contractor shall clean light fixtures as needed.

8.1.5 Contractor shall replace filters in operating equipment.

8.1.6 Contractor shall remove all waste, rubbish, and construction equipment from the Project site.

8.1.7 Contractor shall remove all surplus materials from the Project site, and shall deliver them to University's Representative.

8.2 As-Built Documents

8.2.1 Contractor shall maintain and keep current on a daily basis, one set of Contract Documents to be used for As-Built ("red-lined" drawings and specifications) documents.

8.2.2 Unless otherwise approved by University's Representative, Contractor shall keep and maintain the As-Built documents on the Project site.

8.2.3 Contractor shall deliver the As-Built documents to University's Representative before Final Inspection.

8.3 Operations and Maintenance Data

8.3.1 Contractor shall submit 2 sets before Final Inspection, printed on 8-1/2 x 11 inch text pages, bound in D-sided three-ring binders with durable plastic covers.

8.3.2 Contractor shall prepare the binder cover with the printed title, "OPERATION AND MAINTENANCE INSTRUCTIONS," along with the Project Name and Project Number.

8.3.3 Contractor shall include in the binder as contents:

8.3.3.1 Directory listing the names, addresses, telephone numbers, facsimile numbers and email addresses of:

.1 Design Professional
.2 Contractor
.3 All subcontractors
.4 Major equipment suppliers.

8.3.3.2 Operation and maintenance instructions arranged by system.

8.3.3.3 Project documents and certificates.

8.4 Guarantees

8.4.1 Article 10 of the General Conditions requires all items to be guaranteed for a period of at least 1 year. Guarantees for more than 1 year where indicated in various Specification Sections shall be written on the letterhead of the Contractor, subcontractor, or supplier doing the Work and/or supplying the item to be guaranteed and shall be in the form of the guarantee contained on the following page of this Section.

GUARANTEE

Date: _____

Project Name: _____ Project No.: _____

Project Location: University of California, Riverside, _____

_____ (City) _____ (County)

GUARANTEE FOR _____ (Specification Section), Contract No. _____

(the "Contract"), between The Regents of the University of California ("University") and

_____ (Name of Prime Contractor) ("Contractor").

_____ (Name of Subcontractor) ("Subcontractor") hereby guarantees to University that the portion of the Work described as follows:

_____

_____

which it has provided for the above referenced Project, is of good quality; free from defects; free from any liens, claims, and security interests; and has been completed in accordance with the Specification Section specified above and the other requirements of the Contract.

The undersigned further agrees that, if at any time within _____ months after the date of the guarantee the undersigned receives notice from University that the aforesaid portion of the Work is unsatisfactory, faulty, deficient, incomplete, or not in conformance with the requirements of the Contract, the undersigned will, within 10 days after receipt of such notice, correct, repair, or replace such portion of the Work, together with any other parts of the Work and any other property which is damaged or destroyed as a result of such defective portion of the Work or the correction, repair, or replacement thereof; and that it shall diligently and continuously prosecute such correction, repair, or replacement to completion.

In the event the undersigned fails to commence such correction, repair, or replacement within 10 days after such notice, or to diligently and continuously prosecute the same to completion, the undersigned, collectively and separately, do hereby authorize University to undertake such correction, repair, or replacement at the expense of the undersigned; and Contractor will pay to University promptly upon demand all costs and expenses incurred by University in connection therewith.

SUBCONTRACTOR:	**CONTRACTOR:**
_____ (Signature & Date)	_____ (Signature & Date)
_____ (Print Name & Title)	_____ (Print Name & Title)
_____ (License Classification) _____ (License No.)	_____ (License Classification) _____ (License No.)
_____ (Street Address)	_____ (Street Address)
_____ (City, State & Zip Code)	_____ (City, State & Zip Code)
_____ (Phone Number(s))	_____ (Phone Number(s))

MATERIAL/PRODUCT SUBSTITUTION REQUEST FORM

Date: _____ Material/Product Substitution Request No. _____

TO:	University's Representative	**FROM:**	

A. We hereby submit for your consideration the following product instead of the specified item:

1. Section: _____ Sub-Article: _____
2. Specified Item: _____
3. Proposed Substitution: (Mfg., Type, Model, etc. Attach a separate sheet if necessary.)

B. Complete all of the following:

1. Does this Substitution offer The Regents a cost credit (including costs for changes by other trades)? ☐ Yes ☐ No
   If "Yes," state how much and attach an itemized breakdown of all costs: $ _____
2. Does this Substitution offer earlier delivery or less construction time? ☐ Yes ☐ No
   If "Yes," state the effect on the Contract Time: (Attach a separate sheet if necessary.)
3. Does this substitution affect any dimensions, layout, or details of other trades as shown on the drawings? ☐ Yes ☐ No
   If "Yes," explain in the space below: (Attach a separate sheet if necessary.)
4. Describe the specific differences between this Substitution and the specified item in the space below: (Attach a separate sheet if necessary.)

C. Attach the following items as applicable: (Check if attached.)

1. Manufacturer's technical data. ☐
2. Laboratory test or performance results. ☐
3. Drawings and wiring diagrams of the proposed product. ☐
4. Drawings and description of changes required by other trades. ☐
5. Samples. ☐
6. Manufacturer's guarantee and maintenance instructions. ☐
7. Documentation of code compliance for all specific uses. ☐

D. The undersigned agrees to pay for all additional review, design, testing, changes in the contract documents, and construction as a result of the acceptance of this substitution, at no cost to The Regents.

E. Submitted by Contractor: _____
(Signed)

_____
(Printed Name & Title)

UNIVERSITY'S REPRESENTATIVE'S USE ONLY:

☐Accepted ☐Revise and Resubmit ☐Rejected ☐See attachment dated _____

UC RIVERSIDE | Planning, Design & Construction

REQUEST FOR INFORMATION

DATE: mm/dd/yy **RFI #:** _____

TO: **FROM:**

Cc:

Subject/Title:

☐ Electrical

☐Architectural ☐ Civil ☐ Mechanical ☐ Plumbing ☐ Structural
☐Fire Protection ☐ Landscape ☐ Other: _____

Reason(s) for RFI:

☐ Clarification/Interpretation
☐ Coordination Issue
☐ Cost Impact: _____
☐ Conflict in CD's
☐ Information Not Shown on CD's
☐ Safety
☐ Work/Time Impact: _____

Issue/Question:
(Reference Attachments)

Specification #: _____ Paragraph #: _____ Sheet #: _____ Detail #: _____
Other Reference: _____ Schedule Activity: _____

Proposed Solution:
(Reference Attachments)

Signed by Contractor: _____ **Response Required by Date:** mm/dd/yy

---

RESPONSE TO CONTRACTOR:

From Design Professional:
(Reference Attachments)

Date Received RFI: mm/dd/yy **Response Date:** mm/dd/yy **Signed:** _____

From University's Rep.:
(Reference Attachments)

Date Received RFI: mm/dd/yy **Response Date:** mm/dd/yy **Signed:** _____

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Standard Specification

SECTION 01 33 29.08 BUY CLEAN CALIFORNIA REPORTING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Section includes general requirements and procedures for compliance with Buy Clean California Act per California Public Contract Code, Sections 3500-3505.

B. Contractor is requested to submit current facility-specific environmental product declaration for each eligible material proposed to be used on the Project.

1.2 DEFINITIONS

A. Environmental Product Declaration (EPD): Type III environmental impact label, as defined by the International Organization for Standardization (ISO) standard 14025, or similarly robust life cycle assessment methods that have uniform standards in data collection consistent with ISO standard 14025, industry acceptance, and integrity.

B. Eligible Materials: Any of the following:

1. Carbon steel rebar.
2. Flat glass.
3. Mineral wool board insulation.
4. Structural steel.

1.3 SUBMITTALS

A. General: Buy Clean California submittals are requested to be submitted along with other required submittal items for eligible materials as described in the Specifications.

B. Facility-specific Environmental Product Declaration: For each eligible material proposed to be used on the Project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 33 29.08

SECTION 01 4300
INSPECTION OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes, without limitation, the following:

1. Access to the Work
2. Testing and Approval
3. University's Inspectors
4. Inspection Requests
5. Inspection Request Form
6. Nonconforming Work Notice

B. The University will provide a Project Inspector or Inspector of Record (IOR) for this project. Contractor shall not cover any work requiring inspection until the IOR has inspected and approved the subject work. For uncovering of work, refer to General Conditions, Article 12.

1.2 ACCESS TO THE WORK

A In addition to the requirements of the General Conditions, University, University's Representative, IOR's and their respective representatives shall at all times have access to the Work wherever it is in preparation or progress and Contractor shall provide safe and proper facilities for such access and for inspection. The inspection and written acceptance of material and workmanship, unless otherwise stated in these Specifications, shall be final except as provided in Article 12.2 of the General Conditions.

1.3 TESTING AND APPROVAL

A. In addition to the requirements of the General Conditions, if any law, ordinance or public authority or the Specifications or University's Representative's instructions require any work to be specially tested or approved (including use of ionizing radiation for radiography), Contractor shall give University's Representative timely notice of its readiness for inspection, and if the inspection is by another authority, other than University's Representative, of the date fixed for such inspection.

B. Re-examination of questioned work may be ordered by University's Representative.

1.4 UNIVERSITY'S INSPECTORS

A. The IOR shall work in close coordination with the University's Representative, and shall report all findings of completed inspections to the University Representative. The IOR is a direct report to the Director of Building, Safety and Emergency Management. The IOR shall observe construction in progress and shall have the following responsibilities and limitations on authority.

1. Act in close coordination with the University's Representative on each project.

2. Observe installation and work in progress as a basis for determining conformance of the work, materials and equipment with the Contract Documents. IOR will document and report any discrepancies observed to University's Representative and Contractor. Only University's Representative has the final authority to make approvals or rejections.

3. Only University's Representative shall interpret the requirements of the Contract Documents. If any item is ambiguous, University's Representative shall make a

written interpretation. If Contractor requests changes or modifications to the Contract Documents, University's Representative shall make a written determination on the requested changes or modifications.

4. Upon receipt of an inspection request, and after conducting the requested inspection, IOR shall prepare and provide an electronic inspection disposition report to University's Representative for each inspection performed using the UC Riverside Inspection request software.

5. Review application for payments.

6. Assist University's Representative in reviewing the test and special inspection results, and any reporting documents of testing laboratories prepared for this project.

7. The IOR is not authorized to permit deviations from the requirements of the Contract Documents unless such deviation has been approved by University's Representative in writing. IOR shall not approve any changes that are not in compliance with the California Building Standards Code.

8. The IOR shall not supervise, coordinate, or direct the Work. The IOR has no responsibility or control over Contractor's construction means, methods, techniques, sequences, procedures, or coordination of any portions of the Work, or over any safety programs in connection with the Project.

B. The failure of University, University's Representative and its representatives and consultants, or University's IOR to observe or inspect the Work, or to detect deficiencies in the Work, or to inform Contractor of any deficiencies which may be discovered, shall not relieve Contractor, its subcontractors regardless of tier, or suppliers from their responsibility for construction means, methods, techniques, sequences and procedures, construction safety, nor from their responsibilities to carry out the work in accordance with the Contract Documents and/or minimum California Building Standards Code requirements to detect and correct defective work as defined in the General Conditions.

1.5 INSPECTION REQUESTS

A. Contractor shall request inspection of completed portions of the Work through University's Representative, using the UC Riverside Department of Building and Safety, Inspection Request Software. Contractor shall submit a request for inspection using University's Inspection Request Software, with instructions for using that software attached to the end of this Section.

1. Contractor shall submit an Inspection Request **at least 3 working days prior** to the time the work will be ready for inspection.

2. For work to be inspected by a third-party testing laboratory, whether Contractor's or University's, Contractor shall first submit an Inspection Request **at least 3 working days prior** to the time the work will be ready for inspection.

3. For work not in conformance with the Contract Documents, the IOR shall document and submit to the University Representative and the Contractor a Nonconforming Work Notice.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

2.1 Refer to the Inspection Request Software instructions attached at the end of this Section.

2.2 Refer to the Nonconforming Work Notice form attached at the end of this Section.

END OF SECTION

INSPECTION REQUEST SOFTWARE INSTRUCTIONS

INSPECTION REQUEST INSTRUCTIONS USING THE ***CFORMS*** **and/or new** ***Campus Building Permit Citizenserve Inspection Request Process.***

NOTE: The CForms Inspection Request Process is to be used only for Campus Building Permit numbers B21-510 and lower. The new Campus Building Permit Citizenserve Portal is required to be used for all Campus Building Permit numbers B21-511 and above.

1. **CForms-**For inspection requests using the older CForms Inspection Request System, log into http://ucr.cforms.net. Follow instructions.

2 **Citizenserve-**For newer Campus Permit Inspection Requests, Create an account and log into the new Campus Building Permit Citizenserve System. This can now be found on the PD&C website or “Copy and paste” https://citizenserve.com/ucr and then follow the instructions provided.

3 Complete Automated Inspection Request Form

4 Select your Permit # from the drop-down menu and request the inspection you need.

5 In either system, a notification will go out to the inspector on the project., advising them that there is an inspection request pending their review.

6 Once requested inspection is conducted, the IOR will input the disposition into Inspection Request system (approved, disapproved, corrections, etc.). There may be other attachments such as reports, photos, notes, etc., added to the inspection request disposition as well.

7 Results of the inspection is input after the inspection in real-time and it can be viewed by all parties in real-time. Inspectors may also upload photos and other documents and attach them to the inspection file in the Inspection Request System

8 Completed "As-Built" plans of project shall be provided to Inspector of Record (IOR) prior to final inspection signature is allowed.

9 Once the work is completed, request a final inspection and a final inspection will be conducted. If approved, the permit will be signed as approved and complete., and a Certificate of Occupancy will be prepared for signature by the Campus Fire Marshal and Campus Building Official

NOTE: If you are not already associated with a permit, a request to be added to that specific permit must be completed prior to an inspection request being submitted. *Access to Specific Permits must be granted by the Building and Safety Division. Contact Lezlie Howard at the Building and Safety Division for authorization and assistance in gaining access to these specific permits.

NONCONFORMING WORK NOTICE
NUMBER: _____
DATE: _____

TO: **FROM:**

SPEC. SEC. REF.:_____ PARA:_____ DWG REF:_____ DETAIL:_____

DESCRIPTION OF DEFECTIVE CONDITION (IOR):_____

REPORTED BY (IOR): _____

CORRECTIVE ACTION SHOULD BE TAKEN AS SOON AS POSSIBLE AND COORDINATED WITH THE INSPECTOR OF RECORD (IOR). IF FURTHER INFORMATION IS NEEDED, ADVISE THE UNIVERSITY'S REPRESENTATIVE IMMEDIATELY.

DESCRIPTION OF CORRECTIVE ACTION TAKEN (CONTRACTOR): _____

ACCEPTED BY (CONTRACTOR):_____**DATE:**_____

UCR USE ONLY

ACCEPTANCE OF CORRECTED DEFECTIVE CONDITION (IOR): _____

ACCEPTED BY (IOR):_____ **DATE:**_____

COPIES: ☐ UNIVERSITY ☐ CONSULTANT ☐ CONTRACTOR

INSPECTION REQUEST

INSPECTION REQUEST INSTRUCTIONS FOR NEW UCR PROJECTS **EFFECTIVE JAN. 18, 2021:**

1. *Log into https://pdc.ucr.edu/building-safety-division
2. Click on “Apply for Campus Permit”
3. If you are a **new user to the online portal**, select My Account and register to create a login and password.
4. Under Registration Type select User, only enter the mandatory fields & click submit.
5. You will need to know and enter the Permit number (e.g. B21-0000021) and request to be added to an existing permit in order to request inspections.
6. Go to your My Account tab and select “Apply for Permit”. The application type is, “Request to be Updated on a Permit” and the Sub Type is “Request to be Assigned to a Permit.
7. Complete mandatory fields, reference the project name for the work description and click submit.
8. You will receive an e-mail confirming your request to be assigned to a permit.
9. Once Building & Safety staff completes your request you are now ready to submit an inspection request.

NONCONFORMING WORK NOTICE
NUMBER: _____
DATE: _____

TO: **FROM:**

SPEC. SEC. REF.:_____ PARA:_____ DWG REF:_____ DETAIL:_____

DESCRIPTION OF DEFECTIVE CONDITION (IOR):_____

REPORTED BY (IOR): _____

CORRECTIVE ACTION SHOULD BE TAKEN AS SOON AS POSSIBLE AND COORDINATED WITH THE INSPECTOR OF RECORD (IOR). IF FURTHER INFORMATION IS NEEDED, ADVISE THE UNIVERSITY'S REPRESENTATIVE IMMEDIATELY.

DESCRIPTION OF CORRECTIVE ACTION TAKEN (CONTRACTOR): _____

ACCEPTED BY (CONTRACTOR):_____**DATE:**_____

UCR USE ONLY

ACCEPTANCE OF CORRECTED DEFECTIVE CONDITION (IOR): _____

ACCEPTED BY (IOR):_____ **DATE:**_____

COPIES: ☐ UNIVERSITY ☐ CONSULTANT ☐ CONTRACTOR

SPECIAL WARRANTY FORM

When required in Sections of the Specifications, Special Warranties shall be in the following form and written on Contractor's own letterhead:

"Warrant _____
(portion of work warranted)

Project:_____

Address:_____

Date: _____

We, the undersigned hereby warrant to the Regents of the University of California ("Regents") that the portion of the work identified, which we have installed in the above-named Project has been performed in accordance with the Contract Documents and that the work, as installed, will fulfill the requirements of the warranty included in this Specification. We agree to repair or replace any or all of our work, together with any other work which may be damaged or displaced by so doing, that may prove to be defective in its workmanship, materials, operation, or failure to conform to Contract provisions and requirements within a period of year(s) from date of Substantial Completion of the stipulated below for the above-named Project, without any expense whatever to the said Regents, ordinary wear and tear and unusual abuse or neglect excepted. In the event of our failure to comply with the above-mentioned conditions within ten (10) calendar days after being notified in writing by the Regents, we collectively or separately do hereby authorize the Regents to proceed to have said defects repaired and made good at our expense, including all collection cost and reasonable attorney fees, and we will honor and pay the costs and charges therefore upon demand."

WARRANTY PERIOD: _____ STARTING: _____ TERMINATING _____

Name of General Contractor	Name of Subcontractor
_____	_____
_____ Signature of General Contractor	_____ Signature of Subcontractor
_____ Address	_____ Address
_____ Phone Number	_____ Phone Number
_____ State License Number	_____ State License Number
_____ Name of Manufacturer	_____ Manufacturer Phone Number
_____ Signature of Manufacturer	

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Division	Section Title	Pages

SPECIFICATIONS GROUP

Facility Construction Subgroup

DIVISION 26 - ELECTRICAL

DIVISION 32 – SITE IMPROVEMENT – RETAINING WALLS

*****END OF TABLE OF CONTENTS*****

Table ofContents

SECTION 26 0500

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes the following:

1. Supporting devices for electrical components.
2. Concrete equipment bases.
3. Electrical demolition.
4. Cutting and patching for electrical construction.

1.02 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC (NFPA 70), Article 100, by a testing agency acceptable to the University, and marked for intended use.

B. Comply with CEC (NFPA 70).

1.03 COORDINATION

A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.

1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.

B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning before closing in the building.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
2. Or Equal: Where products are specified by manufacturers name and accompanied by the term "or equal", comply with provisions in Division 01 Section “Product Options and Substitutions”. Specific procedures must be followed before use of an unnamed product or manufacturer.

2.02 SUPPORTING DEVICES

A. Material: Cold-formed steel, with corrosion-resistant coating acceptable to the University.

B. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.

C. Slotted-Steel Channel Supports: Flange edges turned toward web, and 9/16-inch- diameter slotted holes at a maximum of 2 inches O.C., in webs.

1. Channel Thickness: Selected to suit structural loading.
2. Fittings and Accessories: Products of the same manufacturer as channel supports.

D. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.

E. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.

F. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.

G. Expansion Anchors: Carbon-steel wedge or sleeve type.

H. Toggle Bolts: All-steel springhead type.

I. Powder-Driven Threaded Studs: Heat-treated steel. Not allowed within building with occupants except by prior approval, before installation, with the University‘s Representative.

2.03 CONCRETE BASES

A. Concrete Forms and Reinforcement Materials: As specified in Division 03 Section "Cast-in-Place Concrete."

B. Concrete: Minimum 3000-psi, 28-day compressive strength as specified in Division 03 Section "Cast-in-Place Concrete."

2.04 TOUCHUP PAINT

A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.

B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

PART 3 - EXECUTION

3.01 ELECTRICAL EQUIPMENT INSTALLATION

A. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.

B. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.

D. Right of Way: Give to raceways and piping systems installed at a required slope.

3.02 WIRING INSTALLATION

A. Install splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

B. Install wiring at outlets with at least 12 inches of slack conductor at each outlet.

C. Connect outlet and component connections to wiring systems and to ground. Tighten electrical connectors and terminals, according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

3.03 ELECTRICAL SUPPORTING DEVICE APPLICATION

A. Damp Locations and Outdoors: Hot-dip galvanized materials, U-channel system components.

B. Dry Locations: Steel materials.

C. Support Clamps for PVC Raceways: Click-type clamp system.

D. Selection of Supports: Comply with manufacturer's written instructions.

E. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb design load.

3.04 SUPPORT INSTALLATION

A. Install support devices to securely and permanently fasten and support electrical components.

B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.

C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.

E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.

F. Install 1/4-inch diameter or larger threaded steel hanger rods.

G. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.

H. Simultaneously install vertical conductor supports with conductors.

I. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches from the box.

J. Install metal channel racks for mounting cabinets, panel boards; disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.

K. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

L. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:

1. Wood: Fasten with wood screws or screw-type nails.
2. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.
3. New Concrete: Concrete inserts with machine screws and bolts.
4. Existing Concrete: Expansion bolts.
5. Instead of expansion bolts, threaded studs driven by a powder charge and provided with lock washers may be used in existing concrete when prior approval is received from the University's Representative.
6. Steel: Welded threaded studs or spring-tension clamps on steel.

    a. Field Welding: Comply with AWS D1.1.

7. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.
8. Light Steel: Sheet-metal screws.
9. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

3.05 FIRESTOPPING

A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly.

3.06 CONCRETE BASES

A. Construct concrete bases of dimensions not less than 8 inches larger, in both directions, than supported unit unless larger is required to comply with seismic restraint requirements. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations. Use minimum 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section "Cast-in-Place Concrete."

3.07 DEMOLITION

A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.

B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.

C. Abandoned Work: Cut and remove buried raceway and wiring. When approval by the University's Representative raceway can be abandoned in place a minimum of 4 inches below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.

D. Remove demolished material from Project site.

E. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

3.08 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.

B. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing fire stopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

3.09 FIELD QUALITY CONTROL

A. Inspect installed components for damage and faulty work, including the following:

1. Supporting devices for electrical components.
2. Concrete bases.
3. Electrical demolition.
4. Cutting and patching for electrical construction.
5. Touchup painting.

3.10 REFINISHING AND TOUCHUP PAINTING

A. Refinish and touch up paint.

1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.11 CLEANING AND PROTECTION

A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.

B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

***** END OF SECTION *****

SECTION 26 0501

MINOR ELECTRICAL DEMOLITION

PART 4 - GENERAL

1.01 SUMMARY

A. Section includes the following:

1. Electrical demolition.

A. B. Related sections include the following:

B. Section 26 0553 - Identification for Electrical Systems.

PART 5 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual sections.

PART 6 - EXECUTION

3.01 EXAMINATION

A. Verify field measurements and circuiting arrangements are as shown on Drawings.

B. Verify that abandoned wiring and equipment serve only abandoned facilities.

C. Demolition drawings are based on casual field observation and existing record documents.

D. Report discrepancies to Owner before disturbing existing installation.

E. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings to be removed.

B. Coordinate utility service outages with Owner.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use qualified personnel in such operations.

D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.

1. Obtain permission from Owner at least 72 hours before partially or completely disabling system.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Remove, relocate, and extend existing installations to accommodate new construction.

B. Remove abandoned wiring to source of supply. Install pull rope and cap conduit ends.

C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

D. Remove abandoned wiring from underground conduits and install pull rope and conduit caps. Label abandoned conduits with "from and to" identifiers.

E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.

F. Repair adjacent construction and finishes damaged during demolition and extension work. Repair of themed finishes shall match existing finish.

G. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

H. Protect adjacent equipment during demolition.

I. Maintain existing emergency circuits and equipment to maintain power continuity.

3.04 CLEANING AND REPAIR

A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.

B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

*****END OF SECTION*****

SECTION 26 0519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 7 - GENERAL

7.01 SUMMARY

A. Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

7.02 SUBMITTALS

A. Product Data: For each type of product indicated.

7.03 QUALITY ASSURANCE

A. Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the InterNational Electrical Testing Association and that is acceptable to the University.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC (NFPA 70), Article 100, by a testing agency acceptable to the University, and marked for intended use.

C. Comply with CEC (NFPA 70).

D. Pre-Installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section “Project Meetings”.

PART 8 - PRODUCTS

8.01 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.
2. Or Equal: Where products are specified by manufacturers name and accompanied by the term "or equal", comply with provisions in Division 01 Section “Product Options and Substitutions”. Specific procedures must be followed before use of an unnamed product or manufacturer.

8.02 CONDUCTORS AND CABLES

A. Manufacturers (Building Wire and Cable):

1. American Insulated Wire Corp.; a Leviton Company.
2. General Cable Corporation.
3. Southwire Company.
4. Or equal

B. Manufacturers (Control Cable):

1. Alpha.
2. Belden.
3. Or equal.

C. Manufacturers (MC cable):

1. AFC Cable Systems.
2. Southwire Company.
3. Or equal.

D. Refer to Part 3 "Conductor and Insulation Applications" Article for insulation type, cable construction, and ratings.

E. Conductor Material: Copper complying with ICEA S-95-658 / NEMA WC 70 Non-Shielded 0-2 kV Cables.

F. Conductor Insulation Types: Type THW, THHN-THWN, XHHW, UF, USE, and SO complying with NEMA WC 70.

8.03 CONNECTORS AND SPLICES

A. Manufacturers:

1. AFC Cable Systems, Inc.
2. AMP Incorporated/Tyco International.
3. Hubbell/Anderson.
4. O-Z/Gedney; EGS Electrical Group LLC.
5. 3M Company; Electrical Products Division.
6. Or equal.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 9 - EXECUTION

9.01 CONDUCTOR AND INSULATION APPLICATIONS

A. Service Entrance: Type THHN-THWN, single conductors in raceway or XHHW, single conductors in raceway. Exposed Feeders: Type THHN-THWN, single conductors in raceway.

B. Feeders Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

C. Feeders Concealed in Concrete, below Slabs-on-Grade, and in Crawlspaces: Type THHN-THWN, single conductors in raceway.

D. Exposed Branch Circuits, including in Crawlspaces: Type THHN-THWN, single conductors in raceway.

E. Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type THHN-THWN, single conductors in raceway.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

G. Lighting Circuits Concealed in Ceiling, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

H. Outdoors and below grade: Compression types with heat shrink style watertight splice covers. Raychem CTE series, T&B “Shrink-Kon” series or equal. Cables with multiple conductors shall include a waterproof housing with a non-hardening encapsulating material.

I. Fire Alarm Circuits: Lightweight steel Metal-clad cable, Type MC with red strip or Type THHN-THWN, in raceway, Power-limited, fire-protective, signaling circuit cable.

J. Class 1 Control Circuits: Type THHN-THWN, in raceway.

K. Class 2 Control Circuits: Type THHN-THWN, in raceway.

9.02 INSTALLATION

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not use oil, grease, graphite or similar substances. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means; including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway. Pulling of large conductors in raceways shall be done with an approved cable pulling machine. Other methods such as block and tackle to install conductors are not acceptable.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.

E. Support cables according to Division 26 Section "Common Work Results for Electrical."

F. Seal around cables penetrating fire-rated elements. Provide separate sleeves and/or fire barriers for cable fire wall penetration, unless cable is UL listed for the application.

G. Identify and color-code conductors and cables according to Division 26 Section "Common Work Results for Electrical”. Identification for Electrical System. Color-coded conductor sleeves are not permitted."

H. Metal Clad (MC) Cable Installation Requirements:

1. Provide j–box above ceiling before running MC cable down with partitions or walls.
2. Overhead MC cable runs shall generally follow building lines to provide a neat and workmanlike installation.
3. Oversize j-box to accommodate MC cable splicing.
4. MC cable may be run down directly into panelboards to avoid extra splice into j-box above panelboard as long as concealed. Installed in a neat orderly manner using Unistrut or equal to space and hold MC cable in place

5. MC cable runs shall not rest on ceiling structures. Do not support MC cable on hung ceiling or ceiling support wires. Do not support cables or allow contact with mechanical piping. The use of cable ties to support MC Cable is not allowed.
6. Use lock or spring nut fittings.
7. Securely support all MC cable with cable hangers, individual spring steel support clips, steel trapeze hangers, threaded rods or dedicated No. 8 AWG drop wire. Cable supports shall be fastened to concrete slabs, beams, joists or other structural members of the building.
8. MC cable shall be supported every 6 feet and secured within 12 inches from termination.
9. Limit #12 wire homeruns to code voltage drop requirements.
10. Do not make splices in home run circuits, except directly above the panelboard.
11. Cable runs shall be continuous from outlet to outlet.
12. When terminating or splicing at a junction, outlet, or switch box, cut the cable such that 6-inches of free conductors remain for connections or splices. Use screw-in or spring lock connector and ensure a proper bonding by firmly tightening the connector to both the box and cable.
13. MC cable shall be cut with an armored cable rotary cutter.
14. Insert an anti-short bushing at cable ends to protect conductors from abrasion or use insulated connectors.
15. Bend radius shall be less than 7 times the external diameter of the cable.
16. MC cables passing through fire-rated walls or electrical /telecommunication room walls shall be provided with a UL listed, fire rated penetration assembly.
17. Provide #10 neutral wire, or one neutral per phase for three-phase, four wire power supply systems to computers, office machines, programmable controls, electronic discharge equipment.
18. Do not exceed code requirements for total current carrying conductors in multiple MC cable runs bundled together into a single MC cable hanger or strap, unless support device is specifically listed for such purpose. Neutrals shall be counted as current carrying conductors.
19. Maintain a clearance of at least 6 inches from hot water and other high temperature pipes. Maintain at least 12-inches from telecommunication conduits and unshielded twisted-pair telecommunication cables.

9.03 CONNECTIONS

A. Provide steel with insulated throat cable connectors, OZ/Gedney AMC series or equivalent. Die cast or pressure cast fittings are not permitted.

B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

C. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

D. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

9.04 FIELD QUALITY CONTROL

A. Testing: Perform the following field quality-control testing:

1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.

B. Test Reports: Prepare a written report to record the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

***** END OF SECTION *****

SECTION 26 0526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 10 - GENERAL

10.01 SUMMARY

A. Section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

B. Related Sections include the following:

1. Division 26 Section "Underground Ducts and Raceways for Electrical Systems".

10.02 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Data: For the following:

1. Ground rods.
2. Chemical rods.

C. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

D. Field Test Reports: Submit written test reports to include the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

10.03 QUALITY ASSURANCE

A. Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the InterNational Electrical Testing Association and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association to supervise on-site testing specified in Part 3.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC (NFPA 70), Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1. Comply with UL 467.

C. Comply with CEC (NFPA 70); for medium-voltage underground construction, comply with IEEE C2.

D. Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system.

PART 11 - PRODUCTS

11.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Grounding Conductors, Cables, Connectors, and Rods:

a. Boggs, Inc.
b. Chance/Hubbell.
c. Copperweld Corp.
d. Dossert Corp.
e. Erico Inc.; Electrical Products Group.
f. Framatome Connectors/Burndy Electrical.
g. Ideal Industries, Inc.
h. Lightning Master Corp.
i. Lyncole XIT Grounding.
j. O-Z/Gedney Co.; a business of the EGS Electrical Group.
k. Raco, Inc.; Division of Hubbell.
l. Thomas & Betts, Electrical.
m. Or equal.

B. Or Equal: Where products are specified by manufacturers name and accompanied by the term "or equal", comply with provisions in Division 01 Section “Product Options and Substitutions”. Specific procedures must be followed before use of an unnamed product or manufacturer.

11.02 GROUNDING CONDUCTORS

A. For insulated conductors, comply with Division 26 Section "Low-Voltage Electrical Power Conductors and Cables.”

B. Material: Copper.

C. Equipment Grounding Conductors: Insulated with green-colored insulation.

D. Isolated Ground Conductors: Insulated with green-colored insulation with yellow stripe. On feeders with isolated ground, use colored tape, alternating bands of green and yellow tape to provide a minimum of three bands of green and two bands of yellow.

E. Grounding Electrode Conductors: Stranded cable.

F. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.

G. Bare Copper Conductors: Comply with the following:

1. Solid Conductors: ASTM B 3.
2. Assembly of Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.

H. Copper Bonding Conductors: As follows:

1. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG copper conductor, 1/4 inch in diameter.
2. Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.
3. Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
4. Tinned Bonding Jumper: Tinned-copper tape, braided copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

I. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulators.

11.03 CONNECTOR PRODUCTS

A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.

B. Bolted Connectors: Bolted-pressure-type connectors, or compression type.

C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

11.04 GROUNDING ELECTRODES

A. Ground Rods: Sectional type; copper-clad steel.

1. Size: 3/4 in diameter, by 120 inches in length.

B. Chemical Electrodes: Copper tube, straight or L-shaped, filled with nonhazardous chemical salts, terminated with a 4/0 bare conductor. Provide backfill material recommended by manufacturer.

C. Test Wells: Provide handholes as specified in Division 26 Section "Underground Ducts and Raceways for Electrical Systems."

PART 12 - EXECUTION

12.01 APPLICATION

A. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.

B. In raceways, use insulated equipment grounding conductors.

C. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells.

D. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.

E. Ground Rod Clamps at Test Wells: Use bolted pressure clamps with at least two bolts.

F. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Use insulated spacer; space 1 inch from wall and support from wall 6 inches above finished floor, unless otherwise indicated.
2. At doors, route the bus up to the top of the door frame, across the top of the doorway, and down to the specified height above the floor.

G. Underground Grounding Conductors: Use copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches below grade or bury 12 inches above duct bank when installed as part of the duct bank.

12.02 EQUIPMENT GROUNDING CONDUCTORS

A. Comply with CEC (NFPA 70), Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by CEC (NFPA 70) are indicated.

B. Install equipment grounding conductors in all feeders and circuits.

C. Install insulated equipment grounding conductor with circuit conductors for the following items, in addition to those required by NEC:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.
7. Armored and metal-clad cable runs.

D. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate equipment grounding conductor. Isolate equipment grounding conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

E. Air-Duct Equipment Circuits: Install an equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners and heaters. Bond conductor to each unit and to air duct.

F. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate equipment grounding conductor to each electric water heater, heat-tracing, and antifrost heating cable. Bond conductor to heater units, piping, connected equipment, and components.

G. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide No. 2 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch grounding bus.
2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

H. Metal Poles Supporting Outdoor Lighting Fixtures: Provide a grounding electrode in addition to installing a separate equipment grounding conductor with supply branch-circuit conductors.

I. Common Ground Bonding with Lightning Protection System: Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

12.03 COUNTERPOISE

A. Ground the steel framework of the building with a driven ground rod at the base of every corner column and at intermediate exterior columns at distances not more than 60 feet

apart. Provide a grounding conductor (counterpoise), electrically connected to each ground rod and to each steel column, extending around the perimeter of the building. Use copper conductor not less than No. 4/0 AWG for counterpoise and for tap to building steel. Bury counterpoise not less than 18 inches below grade and 24 inches from building foundation.

12.04 INSTALLATION

A. Ground Rods: Install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes.

Drive ground rods until tops are 6 inches below finished floor or final grade, unless otherwise indicated. Rod top shall be protected with a driving tool while being driven to protect the top from deformation or other damage.

B. Interconnect ground rods with grounding electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make connections without exposing steel or damaging copper coating.

C. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

D. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

E. Metal Water Service Pipe: Provide insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

F. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding clamp connectors.

G. Bond interior metal piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.

H. Bond each aboveground portion of gas piping system upstream from equipment shutoff valve.

I. Install one test well for each service at the ground rod electrically closest to the service entrance. Set top of well flush with finished grade or floor.

J. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to CEC (NFPA) 70, Paragraph 250-81(c), using a minimum of 40 feet of bare copper conductor not smaller than No. 4/0 AWG. If concrete foundation is less than 20 feet long, coil excess conductor within the base of the foundation. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building grounding grid or to a grounding electrode external to concrete.

K. A 3' x 4" x ¼" copper ground bus shall be installed in electrical rooms. All equipment shall be bonded to the ground bus in addition to NEC required grounds.

L. Made electrodes shall have a measured earth resistance of 10 ohms or less and systems shall be 5 ohms or less.

12.05 CONNECTIONS

A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically non-continuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.

E. Connections at Test Wells: Use compression-type connectors on conductors and make bolted- and clamped-type connections between conductors and ground rods.

F. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

G. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by

connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

H. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

I. Ground bus connections: Shall be one hole, pressure indented copper cable termination, type Burndy Hylug, T&B blue, or equal. Install with ½" galvanized or cadmium-plated steel machine bolts with beveled washer each side.

12.06 UNDERGROUND DISTRIBUTION SYSTEM GROUNDING

A. Duct Banks: Install a grounding conductor with at least 50 percent ampacity of the largest phase conductor in the duct bank.

B. Pad-Mounted Transformers and Switches: Install two ground rods and counterpoise circling pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Use tinned-copper conductor not less than No. 2 AWG for counterpoise and for taps to equipment ground pad. Bury counterpoise not less than 18 inches below grade and 6 inches from the foundation.

12.07 FIELD QUALITY CONTROL

A. Testing: Perform the following field quality-control testing:

1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Measure ground resistance not less than two full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests, by the fall-of-potential method according to IEEE 81.
3. A ground resistance test shall be conducted at each new electrical equipment or vault site without the benefit of connections to other sites. That is, all incoming duct bank grounding system conductors shall be disconnected during the test. Grounding electrodes shall be bonded together using the appropriate size grounding electrode conductors and UL listed connections. Connections shall be torque tightened to manufacturer's specifications.
4. Provide drawings locating each ground rod and ground rod assembly and other grounding electrodes, identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

a. Equipment Rated 500 kVA and Less: 10 ohms.
b. Equipment Rated 500 to 1000 kVA: 5 ohms.
c. Equipment Rated More Than 1000 kVA: 3 ohms.
d. Substations and Pad-Mounted Switching Equipment: 5 ohms.
e. Manhole Grounds: 10 ohms.

5. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify the University's Representative promptly and include recommendations to reduce ground resistance.

12.08 GRADING AND PLANTING

A. Restore surface features, including vegetation, at areas disturbed by Work of this Section. Reestablish original grades, unless otherwise indicated. If sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition. Include application of topsoil, fertilizer, lime, seed, sod, sprig, and mulch. Comply with Division 32 Section "Turf and Grasses." Maintain restored surfaces. Restore disturbed paving as indicated.

***** END OF SECTION *****

SECTION 26 0529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 13 - GENERAL

13.01 SUMMARY

A. Section includes the following:

1. Hangers and supports for electrical equipment and systems.
2. Seismic restraints for electrical equipment and systems.
3. Construction requirements for concrete bases.

13.02 DEFINITIONS

A. CBC: California Building Code

B. EMT: Electrical metallic tubing.

C. IMC: Intermediate metal conduit.

D. RMC: Rigid metal conduit.

E. Seismic Restraint: A structural support element such as a metal framing member, a cable, an anchor bolt or stud, a fastening device, or an assembly of these items used to transmit seismic forces from an item of equipment or system to building structure and to limit movement of item during a seismic event.

13.03 SUBMITTALS

A. Product Data: Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of electrical support and seismic-restraint component used.

1. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an agency acceptable to the University.
2. Annotate to indicate application of each product submitted and compliance with requirements.

B. Shop Drawings: Indicate materials and dimensions and identify hardware, including attachment and anchorage devices, signed and sealed by a qualified professional engineer. Professional engineer qualification requirements are specified in Division 01 Section "Quality Control". Include the following:

1. Seismic Restraints: Detail anchorage and bracing not defined by details or charts on Drawings. Include the following:

   a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
   b. Details: Detail fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacing. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events.
   c. Preapproval and Evaluation Documentation: By an agency acceptable to the University**,** showing maximum ratings of restraint items and the basis for approval (tests or calculations).

C. Coordination Drawings: Show coordination of seismic bracing for electrical components with other systems and equipment in the vicinity, including other supports and seismic restraints.

D. Welding certificates.

E. Qualification Data: For professional engineer and testing agency.

F. Field quality-control test reports.

13.04 QUALITY ASSURANCE

A. Comply with seismic-restraint requirements in the California Building Code

B. Testing of Seismic Anchorage Devices: Comply with testing requirements in Part 3 and in Division 26 Section "Common Work Results for Electrical."

C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

13.05 PROJECT CONDITIONS

A. Project Seismic Zone as Defined in the CBC: Zone 4.

B. Project Seismic Zone Factor as Defined in the CBC: Zone Factor 0.40.

PART 14 - PRODUCTS

14.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
2. Or Equal: Where products are specified by manufacturers name and accompanied by the term "or equal", comply with provisions in Division 01 Section “Product Options and Substitutions”. Specific procedures must be followed before use of an unnamed product or manufacturer.

14.02 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed under this Project, with a minimum structural safety factor of five times the applied force.

B. Steel Slotted Support Systems: Comply with MFMA-3, factory-fabricated components for field assembly.

1. Manufacturers:

a. Cooper B-Line; a division of Cooper Industries.
b. ERICO International Corporation.
c. Allied Support Systems; Power-Strut Unit.
d. GS Metals Corp.
e. Michigan Hanger Co., Inc.; O-Strut Div.
f. National Pipe Hanger Corp.
g. Thomas & Betts Corporation.
h. Unistrut; Tyco International, Ltd.
i. Wesanco, Inc.
j. Or equal.

2. Finishes:

a. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-3.
b. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-3.
c. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-3.

3. Channel Dimensions: Selected for structural loading and applicable seismic forces.

C. Raceway and Cable Supports: As described in NECA 1.

D. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

F. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Shall not be used in University occupied areas and then only for non-seismic restraints.
2. Threaded-steel stud, for use in hardened Portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

a. Manufacturers:

1) Hilti, Inc.
2) ITW Construction Products.
3) MKT Fastening, LLC.
4) Simpson Strong-Tie Co. Inc.
5) Or equal.

3. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened Portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.

a. Manufacturers:

1) Cooper B-Line; a division of Cooper Industries.
2) Empire Tool and Manufacturing Co., Inc.
3) Hilti, Inc.

4) ITW Construction Products.
5) MKT Fastening, LLC.
6) Powers Fasteners.
7) Or equal.

4. Concrete Inserts: Steel or malleable-iron slotted-support-system units similar to MSS Type 18; complying with MFMA-3 or MSS SP-58.
5. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
6. Through Bolts: Structural type, hex head, high strength. Comply with ASTM A 325.
7. Toggle Bolts: All-steel springhead type.
8. Hanger Rods: Threaded steel.

14.03 SEISMIC-RESTRAINT COMPONENTS

A. Rated Strength, Features, and Application Requirements for Restraint Components: As defined in reports by an agency acceptable to the University.

1. Structural Safety Factor: Strength in tension, shear, and pullout force of components used shall be at least five times the maximum seismic forces to which they will be subjected.

B. Angle and Channel-Type Brace Assemblies: Steel angles or steel slotted-support-system components; with accessories for attachment to braced component at one end and to building structure at the other end.

C. Cable Restraints: ASTM A 603, zinc-coated, steel wire rope attached to steel or stainless-steel thimbles, brackets, swivels, and bolts designed for restraining cable service.

1. Manufacturers:

a. Amber/Booth Company, Inc.
b. Loos & Co., Inc.
c. Mason Industries, Inc.
d. Or equal.

2. Seismic Mountings, Anchors, and Attachments: Devices as specified in Part 2 "Support, Anchorage, and Attachment Components" Article, selected to resist seismic forces.
3. Hanger Rod Stiffener: Reinforcing steel angle clamped to hanger rod, of design recognized by an agency acceptable to the University**.** Retain both subparagraphs below for projects subject to seismic design requirements; delete if bushing requirements are included in details or charts on Drawings.
4. Bushings for Floor-Mounted Equipment Anchors: Neoprene units designed for seismically rated rigid equipment mountings, and matched to type and size of anchor bolts and studs used.
5. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for seismically rated rigid equipment mountings, and matched to type and size of attachment devices used.

14.04 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 15 - EXECUTION

15.01 APPLICATION

A. Comply with NECA 1 for application of hangers and supports for electrical equipment and systems, except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, and RMC as scheduled in NECA 1, where Table 1 lists maximum spacing less than stated in. Minimum rod size shall be 1/4 inch in diameter.

C. For individual conduit runs not directly fastened to the structure, use rod hangers.

D. Arrange conduit supports to prevent distortion of alignment by wire pulling operations. Fasten conduit using galvanized straps, lay-in adjustable hangers, clevis hangers, or bolted split galvanized hangers.

E. Do not fasten conduit with wire or perforated pipe straps. Remove wire used for temporary conduit support during construction before conductors are pulled. Do not use ceiling wire to support conduit.

F. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits. Supports should be spaced for maximum deflection of conduit not greater than 1/8".

1. Secure raceways and cables to trapeze member with clamps approved for application by an agency acceptable to the University.

15.02 SUPPORT AND SEISMIC-RESTRAINT INSTALLATION

A. Comply with NECA 1 for installation requirements, except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, RMC may be supported by openings through structure members, as permitted in CEC (NFPA 70).

C. Install seismic-restraint components using methods approved by the evaluation service providing required submittals for component.

D. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

15.03 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

B. Field Welding: Comply with AWS D1.1/D1.1M.

15.04 CONCRETE BASES

A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and seismic criteria.

B. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so expansion anchors will be a minimum of 10 bolt diameters from edge of the base.

1. Install dowel rods to connect concrete base to concrete floor. Install dowel rods on 18-inch centers minimum around full perimeter of the base.
2. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
3. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
4. Install anchor bolts to elevations required for proper attachment to supported equipment.
5. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
6. Use minimum 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 03 Section "Cast-in-Place Concrete."

15.05 INSTALLATION OF SEISMIC-RESTRAINT COMPONENTS

A. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolts and mounting hole in concrete base.

B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

C. Restraint Cables: Provide slack within maximums recommended by manufacturer.

D. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, upper truss chords of bar joists, or at concrete members.

E. Provide raceway fixtures and equipment systems with appropriate longitudinal and cross bracing to satisfy Seismic Zone 4 requirements.

***** END OF SECTION *****

SECTION 26 0533

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 16 - GENERAL

16.01 SUMMARY

A. Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

B. Related Sections include the following:

1. Division 26 Section "Underground Ducts and Raceways for Electrical Systems" for exterior duct banks, manholes, and underground utility construction.
2. Division 26 Section "Hangers and Supports for Electrical Systems" for seismic restraints and bracing of raceways, boxes, enclosures, and cabinets.
3. Division 26 Section "Wiring Devices" for devices installed in boxes.

16.02 DEFINITIONS

A. EMT: Electrical Metallic Tubing.

B. ENT: Electrical Non-metallic Tubing.

C. FMC: Flexible Metal Conduit.

D. IMC: Intermediate Metal Conduit.

E. LFMC: Liquid-Tight Flexible Metal Conduit.

F. LFNC: Liquid-Tight Flexible Non-metallic Conduit.

G. RGS: Rigid Galvanized Steel Conduit.

H. RNC: Rigid Nonmetallic Conduit

16.03 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, hinged-cover enclosures, and cabinets.

16.04 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

16.05 COORDINATION

A. Coordinate layout and installation of raceways, boxes, enclosures, cabinets, and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 17 - PRODUCTS

17.01 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.
2. Or Equal: Where products are specified by manufacturers name and accompanied by the term "or equal", comply with provisions in Division 01 Section “Product Options and Substitutions”. Specific procedures must be followed before use of an unnamed product or manufacturer.

17.02 METAL CONDUIT AND TUBING

A. Manufacturer**s**:

1. AFC Cable Systems, Inc.
2. Alflex Inc.
3. Anamet Electrical, Inc.; Anaconda Metal Hose.
4. Electri-Flex Co.
5. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
6. LTV Steel Tubular Products Company.
7. Manhattan/CDT/Cole-Flex.
8. O-Z Gedney; Unit of General Signal.
9. Wheatland Tube Co.
10. Or equal.

B. Rigid Galvanized Steel Conduit (RGS): ANSI C80.1.

C. Plastic-Coated Steel Conduit and Fittings: NEMA RN 1.

D. EMT and Fittings: ANSI C80.3.

1. Fittings: Compression type, Set Screw not allowed.

E. FMC: Zinc-coated steel.

F. LFMC: Flexible steel conduit with PVC jacket.

G. Fittings: NEMA FB 1; compatible with conduit and tubing materials.

17.03 METAL WIREWAYS

A. Manufacturer**s**:

1. Hoffman.
2. Square D.
3. Or equal.

B. Material and Construction: Sheet metal sized and shaped as indicated, NEMA 1 and 3R.

C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.

E. Wireway Covers: Screw-cover type.

F. Finish: Manufacturer's standard enamel finish.

17.04 NONMETALLIC WIREWAYS

A. Manufacturer:

1. Hoffman.
2. Lamson & Sessions; Carlon Electrical Products.
3. Or equal.

B. Description: Fiberglass polyester, extruded and fabricated to size and shape indicated, with no holes or knockouts. Cover is gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections are flanged, with stainless-steel screws and oil-resistant gaskets.

C. Description: PVC plastic extruded and fabricated to size and shape indicated, with snap-on cover and mechanically coupled connections with plastic fasteners.

D. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

E. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.

17.05 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturer**s**:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. Emerson/General Signal; Appleton Electric Company.
3. Erickson Electrical Equipment Co.
4. Hoffman.
5. Hubbell, Inc.; Killark Electric Manufacturing Co.
6. O-Z/Gedney; Unit of General Signal.
7. RACO; Division of Hubbell, Inc.
8. Robroy Industries, Inc.; Enclosure Division.
9. Scott Fetzer Co.; Adalet-PLM Division.
10. Spring City Electrical Manufacturing Co.
11. Thomas & Betts Corporation.
12. Walker Systems, Inc.; Wiremold Company (The).
13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.
14. Or equal

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.

D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

E. Cast-Metal Pull and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

F. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

G. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.

17.06 FACTORY FINISHES

A. Finish: For raceway, enclosures, or cabinet components, provide manufacturer's standard prime-coat finish ready for field painting.

B. Finish: For raceway, enclosures, or cabinet components, provide manufacturer's standard paint applied to factory-assembled surface raceways, enclosures, and cabinets before shipping.

PART 18 - EXECUTION

18.01 RACEWAY APPLICATION

A. Outdoors: Apply Raceways products as specified below, unless otherwise indicated:

1. Exposed: RGS or IMC is acceptable for 600V or Below.
2. Concealed, Above ground: EMT, RGS or IMC.
3. Underground, Single Run: RNC.
4. Underground, Grouped: RNC.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
6. Boxes and Enclosures: NEMA 250, Type 3R.

B. Indoors: Comply with the following applications, unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT
2. Exposed, Not Subject to Severe Physical Damage: EMT
3. Exposed, Subject to Severe Physical Damage: RGS
4. Exposed, Include Raceways in the following Locations: RGS
    a. Loading Docks.
    b. Corridors used for traffic or mechanized carts, forklifts, and pallet handling Units.
    c. Mechanical Rooms.
    d. Hazardous/Corrosive Locations.
5. Concealed in Ceilings and Interior Walls and Partitions: EMT
6. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
7. Damp or Wet Locations: RGS
8. Raceways for Signal System or Communications Cable in spaces for Environmental Air: Plenum-Type, Signal System/Communications Cable Raceways and/or EMT
9. Raceways for Signal System or Communications Cable Risers in Vertical Shafts: Riser-Type, Signal System/Communications Cable Raceways and/or EMT
10. Boxes and Enclosures: NEMA 250, Type 1, except in damp or wet locations, use NEMA 250, Type 4, Stainless Steel.

C. Minimum Raceway Size Indoors: 3/4-inch trade size.

D. Minimum Raceway Size Underground: 1-inch trade size.

E. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer.

F. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.

G. Do not install aluminum conduits embedded in or in contact with concrete.

18.02 INSTALLATION

A. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

B. Complete raceway installation before starting conductor installation.

C. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."

D. Install temporary closures to prevent foreign matter from entering raceways.

E. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above the finished slab.

F. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.

G. Install NO more than the equivalent of (3) three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.

H. Concealed Raceways:

1. Conceal conduits and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
2. Install concealed raceways with a minimum of bends in the shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.

I. Raceways Embedded in Slabs:

1. Install in middle 1/3 of slab thickness where practical and leave at least 2 inches of concrete cover.
2. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
3. Space raceways laterally to prevent voids in concrete.
4. Run conduit larger than 1-inch trade size parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
5. Change from nonmetallic tubing to Schedule 80 nonmetallic conduit, RGS, or IMC before rising above the floor.

J. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.

1. Run parallel or banked raceways together on common supports.
2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

K. Join raceways with fittings designed and approved for that purpose and make joints tight.

1. Use insulating bushings to protect conductors.

L. Tighten set screws of thread less fittings with suitable tools.

M. Threaded Conduit Joints, exposed to wet, damp, corrosive, or outdoor conditions: Apply compound to threads of raceways and fittings before making up joints. Follow compound's manufacturers written instructions.

N. Terminations:

1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.
3. Where raceway terminations are subjected to moisture or vibration: use insulating bushing to protect conductors, including conductors smaller than No. 4 AWG.

O. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.

P. Signal System or Communications Cable: Install Raceways, metallic and nonmetallic, rigid and flexible, as follows:

1. 2-Inch Trade Size and Smaller: Install raceways in maximum lengths of 150 feet.
2. 1-Inch Trade Size and Smaller: Install raceways in maximum lengths of 75 feet.
3. 3/4-Inch Trade Size and Smaller: Install raceways in maximum lengths of 50 feet.
4. Install with a maximum of two 90-degree bends or equivalent for each length of raceway unless drawing show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

Q. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

R. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.

S. Expansion-Joint Fittings for RNC: Install in each run of aboveground conduit that is located where temperature change may exceed 30 degrees F, and that has a straight-run length that exceeds 25 feet.

1. Install expansion-joint fittings for each of the following locations, and provide type and quantity of fittings that accommodate temperature change listed for location:
    a. Outdoor Locations Not Exposed to Direct Sunlight: 125 degrees F temperature change.
    b. Outdoor Locations Exposed to Direct Sunlight: 155 degrees F temperature change.
    c. Indoor Spaces: Connected with the outdoors without physical separation, 125 degrees F temperature change.
    d. Attics: 135 degrees F temperature change.
2. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per degree F of temperature change.
3. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.

T. Flexible Connections: Use maximum of 72 inches of flexible conduit for recessed and semi recessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Install separate ground conductor across flexible connections.
1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

U. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.

V. Recessed boxes in Masonry walls. Saw-Cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

W. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

18.03 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

18.04 CLEANING

A. After completing installation of exposed, factory-finished raceways and boxes, inspect exposed finishes and repair damaged finishes.

***** END OF SECTION *****

SECTION 26 0543

UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 19 - GENERAL

19.01 SUMMARY

A. Section includes the following:

1. Ducts in concrete-encased duct banks.
2. Handholes and Handhole accessories.

B. Related Sections include the following:

1. Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding electrodes, counterpoise conductors, clamps and connectors for grounding metallic handhole accessories, and testing of grounds.

19.02 SUBMITTALS

A. Product Data: For the following:

1. Handhole hardware.
2. Conduit and ducts, including elbows, bell ends, bends, fittings, and solvent cement.
3. Duct-bank materials, including spacers and miscellaneous components.
4. Warning tape.

19.03 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories Including Ducts for Communications and Telephone Service: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to the University's Representative, and marked for intended use.

B. Comply with ANSI C2.

C. Comply with California Electric Code (NFPA 70).

19.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver ducts to Project site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.

B. Store precast concrete units at Project site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.

19.05 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by the University or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated.

1. Notify the University's Representative fourteen days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without University Representative's written permission.

19.06 COORDINATION

A. Coordinate layout and installation of ducts and handholes with final arrangement of other utilities and site grading, as determined in the field.

B. Coordinate elevations of ducts and duct-bank entrances into handholes with final profiles of conduits as determined by coordination with other utilities and underground obstructions. Revise locations and elevations from those indicated as required to suit field conditions and to ensure duct runs drain to manholes and handholes, and as approved by the University's Representative.

19.07 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish cable-support stanchions, arms, insulators, and associated fasteners in quantities equal to 5 percent of amount installed.

PART 20 - PRODUCTS

20.01 PRODUCTS AND MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Underground Precast Concrete Utility Structures:

a. Carder Concrete Products.

b. Christy Concrete Products, Inc.
c. Elmhurst-Chicago Stone Co.
d. Jensen Precast.
e. Utility Vault Co.
f. Wausau Concrete Co.
g. Or equal.

2. Frames and Covers:

a. Alhambra Foundry
b. Campbell Foundry Co.
c. East Jordan Iron Works, Inc.
d. McKinley Iron Works, Inc.
e. Neenah Foundry Co.
f. Or equal.

B. Or Equal: Where products are specified by manufacturers name and accompanied by the term "or equal", comply with provisions in Division 01 Section “Product Options and Substitutions”. Specific procedures must be followed before use of an unnamed product or manufacturer.

20.02 CONDUIT

A. Conduit and fittings are specified in Division 26 Section "Raceways and Boxes for Electrical Systems."

20.03 DUCTS

A. Rigid Nonmetallic Conduit: NEMA TC 2, Type EPC-40-PVC, UL 651, with matching fittings by the same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B.

20.04 HANDHOLES

A. Cast-Metal Boxes: Cast aluminum, with outside flanges and recessed, gasketed cover for flush mounting and with nonskid finish and legend on cover. Unit, when buried, shall be designed to support AASHTO H10 loading for sidewalk and landscaped areas and HS20 for roadways, parking lots and loading docks.

B. Precast Handholes: Reinforced concrete, monolithically poured walls and bottom, with steel frame and access door assembly as the top of handhole. Duct entrances and windows shall be located near corners to facilitate racking. Pulling-in irons and other built-in items shall be installed before pouring concrete. Cover shall have nonskid finish and legend. Unit, when buried, shall be designed to support AASHTO H10 loading for sidewalk and landscaped areas and HS20 for roadways, parking lots and loading docks.

C. Cover Legend: "ELECTRIC."

D. Grounding Materials: Comply with Division 26 Section "Grounding and Bonding for Electrical Systems."

E. Duct-Sealing Compound: Non-hardening, safe for contact with human skin, not deleterious to cable insulation, and workable at temperatures as low as 35 deg F. Capable of withstanding temperature of 300 deg F without slump and of adhering to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.

F. Warning Tape: Underground-line warning tape specified in Division 26 Section " Identification for Electrical Systems."

PART 21 - EXECUTION

21.01 APPLICATION

A. Underground Ducts for Telephone Utility Service: Type EPC-40-PVC, direct-buried duct bank, except use Type EPC-80-PVC when crossing roads.

B. Underground Ducts for Communication Circuits: Type EPC-40-PVC, direct-buried duct bank, except use Type EPC-80-PVC when crossing roads.

21.02 EARTHWORK

A. Excavation and Backfill: Comply with Division 31 Section "Earth Moving" but do not use heavy-duty, hydraulic-operated, compaction equipment.

B. Restore surface features at areas disturbed by excavation and reestablish original grades, unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

C. Restore all areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary top soiling, fertilizing, liming, seeding, sodding, sprigging, and mulching.

D. Restore disturbed pavement. Refer to Division 01 Section "Cutting and Patching”.

21.03 CONDUIT AND DUCT INSTALLATION

A. Exercise care in excavating, trenching, and working near existing utilities. Locate any existing buried utilities before excavating.

B. Duct bank trench shall be shored, framed and braced for installing ducts. Frames, forms, and braces shall be either wood or steel. Variations in outside dimensions of the installed duct bank shall not exceed 2-inches on the vertical or the horizontal from the design. Remove forms and bracing after 24 hours and before backfilling.

C. Slope: Pitch ducts a minimum slope of 1:300 down toward handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes to drain in both directions. Duct banks shall be laid to a minimum grade slope of 4-inches per 100 feet.

D. Duct banks shall be installed so that the top of the concrete encasement shall be no less than 36-inches below grade or pavement for primary 12K power, and not less 24-inches below finished grade or pavement for campus-wide communications. As a general rule, depths shall be a minimum of three feet, but not more than six feet.

E. Curves and Bends: Use manufactured 60-inches minimum elbows for stub-ups at equipment, communication pull boxes or enclosures and at building entrances. Use manufactured long sweep bends with a minimum radius of 25 feet, both horizontally and vertically, at other locations. Manufactured long radius bends may be used in runs of 100 feet or less on approval from the University's Representative. Vertical feeder sweep into buildings shall be coated steel.

F. Use solvent-cement joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in the same plane.

G. Duct Entrances to Handholes: Space end bells approximately 10 inches O.C. for 5-inch ducts and vary proportionately for other duct sizes. Change from regular spacing to end-bell spacing 10 feet from the end bell without reducing duct line slope and without forming a trap in the line. Grout end bells into handhole walls from both sides to provide watertight entrances. Where connection to bulkhead of duct bank is made to vaults or existing duct banks, the concrete encasement shall be doweled with on No. 4 reinforcement rod 36 inches long per conduit to the existing encasement.

H. Building Entrances: Make a transition from underground duct to conduit at least 10 feet outside the building wall. Use fittings manufactured for this purpose. Follow the appropriate installation instructions below:

1. Concrete-Encased Ducts: Install reinforcement in duct banks passing through disturbed earth near buildings and other excavations. Coordinate duct bank with structural design to support duct bank at wall without reducing structural or watertight integrity of building wall.
2. Direct-Buried, Non-encased Ducts at Non-waterproofed Wall Penetrations: Install a Schedule 40, galvanized steel pipe sleeve for each duct. Calk space between conduit and sleeve with duct-sealing compound on both sides for moisture-tight seal.
3. Waterproofed Wall and Floor Penetrations: Install a watertight entrance-sealing device with sealing gland assembly on the inside. Anchor device into masonry construction with one or more integral flanges. Secure membrane waterproofing to the device to make permanently watertight.

I. Concrete-Encased, Nonmetallic Ducts: Support ducts on duct spacers, spaced as recommended by manufacturer and coordinated with duct size, duct spacing, and outdoor temperature. Install as follows:

1. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts and secure separators to earth and to ducts to prevent floating during concreting. Stagger spacers approximately 6-inches between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.

2. Duct joints in concrete may be placed side by side horizontally, but shall be staggered at least 6-inches vertically. Joints shall be made in accordance with manufacturer's recommendations for the particular type of duct and coupling selected. In the absence of specific recommendations, plastic duct connections shall be made by brushing a plastic solvent cement on the inside of a plastic coupling fitting and on the outside of duct's ends. The duct and fitting shall then be slipped together with a quick one-quarter turn to set the joint.
3. Concreting: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Use a plank to direct concrete down sides of bank assembly to trench bottom. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application. Pour each run of envelope between terminations in one continuous operation. If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch reinforcing rod dowels extending 18 inches into concrete on both sides of joint near corners of envelope. At connection to manholes, dowel concrete encasement with on No. 4 reinforcing bar 36 inches long per duct.
4. Reinforcement: Reinforce duct banks where they cross disturbed earth and where indicated.
5. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
6. Minimum Clearances between Ducts: 3 inches between ducts and exterior envelope wall, 2 inches between ducts for like services, and 4 inches between power and signal ducts.
7. Depth: Install top of duct bank at least 24 inches below finished grade in no traffic areas and at least 30 inches below finished grade in vehicular traffic areas, unless otherwise indicated.

J. Direct-Buried Ducts: Support ducts on duct spacers, spaced as recommended by manufacturer and coordinated with duct size, duct spacing, and outdoor temperature. Install as follows:

1. Separator Installation: Space separators not more than 4 feet center-to-center along entire length of duct bank including top pipes.
2. Install expansion fittings as shown on Shop Drawings.
3. Trench Bottom: Continuous, firm, and uniform support for duct bank. Prepare trench bottoms as specified in Division 31 Section "Earth Moving" for pipes less than 6 inches in nominal diameter.
4. Backfill: Install backfill as specified in Division 31 Section "Earth Moving." After installing first tier of ducts, backfill and compact. Repeat backfilling after placing each tier. After placing last tier, hand-place backfill to 4 inches over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, complete backfilling normally. Do not place backfill for a period of at least 24 hours after pouring of concrete.

5. Minimum Clearances between Ducts: 3 inches between ducts for like services and 6 inches between power and signal ducts.
6. Depth: Install top of duct bank at least 36 inches below finished grade, unless otherwise indicated.

K. Warning Tape: Bury warning tape approximately 12 inches above all concrete-encased duct banks. Align tape parallel to and within 3 inches of the centerline of duct bank.

L. Stub-ups: Use rigid steel conduit for stub-ups to equipment. For equipment mounted on outdoor concrete bases, extend steel conduit a minimum of 5 feet from edge of base. Install insulated grounding bushings on terminations. Couple steel conduits to ducts with adapters designed for this purpose and encase coupling with 3 inches of concrete. Galvanized steel conduits installed below grade shall be painted with two coats of Koppers Bitumastic paint before installing in ground.

M. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.

N. Pulling Cord: Install 100-lbf- test nylon cord in ducts, including spares.

21.04 HANDHOLE INSTALLATION

A. Elevation: Install manholes with rooftop at least 15 inches below finished grade. Install handholes with depth as indicated. Where indicated, cast handhole cover frame directly into roof of handhole and set roof surface 1 inch above grade. Place and align precast manholes to provide horizontal tolerance of 2 inches in any direction and vertical alignment with not greater than 1/8-inch maximum tolerance for 6 foot of depth. Completed manhole shall be rigid, true to dimensions and alignment, and shall be watertight.

B. Drainage: Install drains in bottom of units where indicated. Coordinate with drainage provisions indicated. Sumps shall be knocked out at time of installation.

C. Access: Install cast-iron frame and cover.

1. Install precast collars and rings to support frame and cover and to connect cover with roof opening. Provide moisture-tight masonry joints and waterproof grouting for cast-iron frame to chimney.
2. Set frames in paved areas and traffic ways flush with finished grade. Set other frames 1 inch above finished grade.

D. Waterproofing: Apply waterproofing to exterior surfaces of units after concrete has cured at least three days. Apply according to Division 07 Section "Cold-Fluid Applied Water Proofing." After ducts have been connected and grouted, and before backfilling, waterproof joints and connections and touch up abrasions and scars. Waterproof exterior of manhole and handhole chimneys after brick mortar has cured at least three days. Seal manhole section joints with sealing compound recommended by the manhole manufacturer. Penetration into manholes and/or boxes shall be sealed. Provide conduit duct plugs for

unused terminator openings of spare conduits in manhole. Do not water seal top removable cover until cable pulling has been completed.

E. Damp proofing: Apply damp proofing to exterior surfaces of units after concrete has cured at least three days. Apply according to Division 07 Section "Bituminous Damp proofing." After ducts have been connected and grouted, and before backfilling, damp proof joints and connections and touch up abrasions and scars. Damp proof exterior of manhole and handhole chimneys after brick mortar has cured at least three days.

F. Interior walls and ceiling shall be primed and painted with two coats flat white paint.

G. Hardware: Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated.

H. Field-Installed Bolting Anchors: Do not drill deeper than 3-7/8 inches for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

I. Grounding: Install ground rod through floor in each structure with top protruding 6 inches above floor. Seal floor opening against water penetration with waterproof non-shrink grout. Ground exposed metal components and hardware with bare-copper ground conductors. Train conductors neatly around corners. Use cable clamps secured with expansion anchors to attach ground conductors.

21.05 FIELD QUALITY CONTROL

A. Testing: Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.

B. Grounding: Test manhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Division 26 Section "Grounding and Bonding for Electrical Systems."

C. Duct Integrity: Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to 80 percent fill of the duct. If obstructions are indicated, remove obstructions and retest.

D. Correct installations if possible and retest to demonstrate compliance. Remove and replace defective products and retest.

21.06 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

B. Clean internal surfaces of handholes, including sump. Remove foreign material.

C. After the duct line has been completed, a brush with stiff bristles shall be pulled through each duct to make certain that no particles of earth, sand or gravel have been left in the line. (Mandrels not less than 12 inches long, having a diameter approximately 1/4 inch less than inside diameter of the duct, shall be pulled through each duct). Leave a 3/8"-inch minimum polypropylene pull rope in each duct for future use.

***** END OF SECTION *****

SECTION 26 0548

VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 22 - GENERAL

22.01 SUMMARY

A. Section includes seismic restraints and other earthquake-damage-reduction measures for electrical components. It complements optional seismic construction requirements in the various electrical component Sections.

22.02 DEFINITIONS

A. CBC: California Building Code.

B. Seismic Restraint: A fixed device (a seismic brace, an anchor bolt or stud, or a fastening assembly) used to prevent vertical or horizontal movement, or both vertical and horizontal movement, of an electrical system component during an earthquake.

C. Mobile Structural Element: A part of the building structure such as a slab, floor structure, roof structure, or wall that may move independent of other mobile structural elements during an earthquake.

22.03 SUBMITTALS

A. Product Data: Illustrate and indicate types, styles, materials, strength, fastening provisions, and finish for each type and size of seismic restraint component used.

1. Anchor Bolts and Studs: Tabulate types and sizes, complete with report numbers and rated strength in tension and shear as evaluated by ICBO Evaluation Service.

22.04 QUALITY ASSURANCE

A. Comply with seismic restraint requirements in California Building Code/Code of Regulations, unless requirements in this Section are more stringent.

22.05 PROJECT CONDITIONS

A. Project Seismic Zone and Zone Factor as Defined in CBC: Zone 4, Zone Factor 0.40.

B. Occupancy Category as Defined in CBC: I=1.0 standard occupancy.

C. Acceleration Factor: 8 Km from seismic source B.

D. Soil profile Type SC.

E. For additional criteria, see Structural Drawings.

22.06 COORDINATION

A. Coordinate layout and installation of seismic bracing with building structural system and architectural features, and with mechanical, fire-protection, electrical, and other building features in the vicinity.

B. Coordinate concrete bases with building structural system.

PART 23 - PRODUCTS

23.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. B-Line Systems, Inc.
2. Erico, Inc.
3. Powerstrut.
4. Thomas & Betts Corp.
5. Unistrut Corporation.
6. Or equal.

B. Or Equal: Where products are specified by manufacturers name and accompanied by the term "or equal", comply with provisions in Division 01 Section “Product Options and Substitutions”. Specific procedures must be followed before use of an unnamed product or manufacturer.

23.02 MATERIALS

A. Use the following materials for restraints:

1. Indoor Dry Locations: Steel, zinc plated.
2. Outdoors and Damp Locations: Galvanized steel.
3. Corrosive Locations: Stainless steel.

23.03 ANCHORAGE AND STRUCTURAL ATTACHMENT COMPONENTS

A. Strength: Defined in reports by ICBO Evaluation Service or another agency acceptable to University's Representative.

1. Structural Safety Factor: Strength in tension and shear of components used shall be at least two times the maximum seismic forces to which they will be subjected.

B. Concrete and Masonry Anchor Bolts and Studs: Steel-expansion wedge type.

C. Concrete Inserts: Steel-channel type.

D. Through Bolts: Structural type, hex head, high strength. Comply with ASTM A 325.

E. Welding Lugs: Comply with MSS SP-69, Type 57.

F. Beam Clamps for Steel Beams and Joists: Double sided. Single-sided type is not acceptable.

G. Bushings for Floor-Mounted Equipment Anchors: Neoprene units designed for seismically rated rigid equipment mountings, and matched to the type and size of anchor bolts and studs used.

H. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for seismically rated rigid equipment mountings, and matched to the type and size of attachment devices used.

23.04 SEISMIC BRACING COMPONENTS

A. Slotted Steel Channel: 1-5/8-by-1-5/8-inch cross section, formed from 0.1046-inch- thick steel, with 9/16-by-7/8-inch slots at a maximum of 2-inches O.C. in webs, and flange edges turned toward web.

1. Materials for Channel: ASTM A 570, GR 33.
2. Materials for Fittings and Accessories: ASTM A 575, ASTM A 576, or ASTM A 36.
3. Fittings and Accessories: Products of the same manufacturer as channels and designed for use with that product.
4. Finish: Baked, rust-inhibiting, acrylic-enamel paint applied after cleaning and phosphate treatment, unless otherwise indicated.

B. Channel-Type Bracing Assemblies: Slotted steel channel, with adjustable hinged steel brackets and bolts.

C. Cable-Type Bracing Assemblies: Zinc-coated, high-strength steel wire rope cable attached to steel thimbles, brackets, and bolts designed for cable service.

1. Arrange units for attachment to the braced component at one end and to the structure at the other end.
2. Wire Rope Cable: Comply with ASTM 603. Use 49 or 133-strand cable with a minimum strength of 2 times the calculated maximum seismic force to be resisted.

D. Hanger Rod Stiffeners: Slotted steel channels with internally bolted connections to hanger rod.

PART 24 - EXECUTION

24.01 INSTALLATION

A. Install seismic restraints according to applicable codes and regulations and as approved by the University's Representative, unless more stringent requirements are indicated.

24.02 STRUCTURAL ATTACHMENTS

A. Use bolted connections with steel brackets, slotted channel, and slotted-channel fittings to spread structural loads and reduce stresses in accordance with the structural engineer of record approval.

B. Attachments to New Concrete: Bolt to channel-type concrete inserts or use expansion anchors.

C. Attachments to Existing Concrete: Use expansion anchors.

D. Holes for Expansion Anchors in Concrete: Drill at locations and to depths that avoid reinforcing bars.

E. Attachments to Solid Concrete Masonry Unit Walls: Use expansion anchors.

F. Attachments to Hollow Walls: Bolt to slotted steel channels fastened to wall with expansion anchors.

G. Attachments to Wood Structural Members: Install bolts through members.

H. Attachments to Steel: Bolt to clamps on flanges of beams or on upper truss chords of bar joists.

24.03 ELECTRICAL EQUIPMENT ANCHORAGE

A. Anchor rigidly to a single mobile structural element or to a concrete base that is structurally tied to a single mobile structural element.

B. Anchor panel boards, motor-control centers, motor controls, switchboards, switchgear, transformers, unit substations, fused power-circuit devices, transfer switches, busways, battery racks, static uninterruptible power units, power conditioners, capacitor units, communication system components, and electronic signal processing, control, and distribution units as follows:

1. Size concrete bases so expansion anchors will be a minimum of 10 bolt diameters from the edge of the concrete base.

2. Concrete Bases for Floor-Mounted Equipment: Use female expansion anchors and install studs and nuts after equipment is positioned.
3. Bushings for Floor-Mounted Equipment Anchors: Install to allow for resilient media between anchor bolt or stud and mounting hole in concrete.
4. Anchor Bolt Bushing Assemblies for Wall-Mounted Equipment: Install to allow for resilient media where equipment or equipment-mounting channels are attached to wall.
5. Torque bolts and nuts on studs to values recommended by equipment manufacturer.

24.04 SEISMIC BRACING INSTALLATION

A. Install bracing according to spacing and strengths indicated by approved analysis.

B. Expansion and Contraction: Install to allow for thermal movement of braced components.

C. Cable Braces: Install with maximum cable slack recommended by manufacturer.

D. Attachment to Structure: If specific attachment is not indicated, anchor bracing to the structure at flanges of beams, upper truss chords of bar joists, or at concrete members.

24.05 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Make flexible connections in raceways, cables, wire ways, cable trays, and busways where they cross expansion and seismic control joints, where adjacent sections or branches are supported by different structural elements, and where they terminate at electrical equipment anchored to a different mobile structural element from the one supporting them.

24.06 FIELD QUALITY CONTROL

A. Testing: Test pull-out resistance of seismic anchorage devices.

1. Provide necessary test equipment required for reliable testing.
2. Provide evidence of recent calibration of test equipment by a testing agency acceptable to the University's Representative.
3. Schedule test with the University's Representative before connecting anchorage device to restrained component (unless post-connection testing has been approved), and with at least seven days' advance notice.
4. Obtain Structural Engineer's approval before transmitting test loads to the structure. Provide temporary load-spreading members.
5. Test at least four of each type and size of installed anchors and fasteners selected by the University's Representative.
6. Test to 90 percent of rated proof load of device.
7. If a device fails the test, modify all installations of same type and retest until satisfactory results are achieved.
8. Record test results.

***** END OF SECTION *****

SECTION 26 0553

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 25 - GENERAL

25.01 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels.
8. Miscellaneous identification products.

25.02 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Identification Schedule: An index of electrical equipment and system components used in identification signs and labels.

25.03 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and IEEE C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

25.04 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

PART 26 - PRODUCTS

26.01 MATERIALS

A. For fixture descriptions in other Part 2 articles where the subparagraph titles "Products," and "Manufacturers" introduce a list of manufacturers and their products or manufacturers only, the following requirements apply for product selection:

1. Products: Subject to compliance with requirements, provide one of the products specified in other Part 2 articles.
2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified in other Part 2 articles.
3. Or Equal: Where products are specified by manufacturers name and accompanied by the term "or equal", comply with provisions in Division 01 Section “Product Options and Substitutions”. Specific procedures must be followed before use of an unnamed product or manufacturer.

26.02 POWER RACEWAY IDENTIFICATION MATERIALS

A. Colors for Raceways Carrying Circuits at 600 V or Less:

1. Black letters on an orange field
2. Legend: Indicate voltage and system or service type.

B. Write-On Tags: Polyester tag, 0.015-inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

26.03 ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Colors for Raceways Carrying Circuits at 600 V and Less:

1. Black letters on an orange field
2. Legend: Indicate voltage and system or service type.

C. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2-inches wide; compounded for outdoor use.

26.04 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

C. Snap-Around, Color-Coding Bands: Slit, pre-tensioned, flexible, solid-colored acrylic sleeve, 2-inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

26.05 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

B. Snap-Around, Color-Coding Bands: Slit, pre-tensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

C. Write-On Tags: Polyester tag, 0.015-inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.

1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

26.06 FLOOR MARKING TAPE

A. 2-inch- wide, 5-mil pressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.

26.07 UNDERGROUND-LINE WARNING TAPE

A. Tape:

1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines, but not less than 6-inch wide, 0.004-inch thick polyethylene.

B. Color and Printing:

1. Comply with ANSI Z535.1 through ANSI Z535.5.
2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE,
3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.

C. Tag: Type ID:

1. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core, bright-colored, continuous-printed on one side with the inscription of the utility**,** compounded for direct-burial service.
2. Overall Thickness: 5 mils.
3. Foil Core Thickness: 0.35 mil.
4. Weight: 28 lbs./1000 sq. ft.
5. 3-Inch Tensile According to ASTM D 882: 70 lbf and 4600 psi.

26.08 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Baked-Enamel Warning Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal Size: 7 by 10 inches.

D. Metal-Backed, Butyrate Warning Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 10 by 14 inches.

E. Warning label and sign shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES

26.09 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16-inch thick for signs up to 20 sq. inches and 1/8-inch thick for larger sizes.

1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.
3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.

C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

26.10 EQUIPMENT IDENTIFICATION LABELS

A. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

B. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

26.11 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F According to ASTM D 638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black except where used for color-coding.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F According to ASTM D 638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black.

26.12 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 27 - EXECUTION

27.01 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Secure nameplates to equipment fronts using screws, rivets or adhesive. Secure nameplate to inside face of recessed panel board doors in finished locations. Use weatherproof adhesive for outdoor installation. Do not use tape for nameplates or legend plates.

E. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations. Use consistent designations throughout project.

1. Based on the University's Electrical Equipment Numbering and Identification Scheme included in this section.

F. Self-Adhesive Identification Products: Clean surfaces before applying.

G. Install nameplates and labels parallel to equipment lines.

H. Color Coded Raceways: Junction Boxes for Fire Alarm System shall be red.

I. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install labels identifying system voltage with black letters on orange background. Install on exterior of door or cover.

J. Circuit Identification Labels on Receptacles:

1. Public View Areas (lobbies, atrium, etc.): Stencil circuit information on back of plate.
2. All Other Areas: Engraved or permanently stencil circuit information on front of plate.

K. Conduit installed below grade shall have underground hazard tape (non-adhesive) installed a minimum of 12 inches above the conduit or top layer of conduits in a duct bank. The tape shall be 6-inches wide and 4-millimeters thick yellow polyethylene for low voltage conduits and red for medium voltage conduits. The tape shall be marked "Caution Buried Electric Line" for low voltage and "Danger High Voltage Line" for medium voltage. Tracer wire shall be used for PVD conduits and non-metallic tape for metallic conduits. The tape shall be installed the entire length of conduit below grade.

L. Color-Coding of Secondary Phase Conductors: Use the following colors for service feeder and branch-circuit phase conductors. Wiring shall be color coded, see Division 26 "Low Voltage Electrical Power Conductors and Cables". Low voltage wire markers shall be adhering, preprinted, self-laminating vinyl wrap-around strips. Wire shall be marked with opposite end termination and shall include panel source and circuit numbers. Phasing shall be indicated by colored wire or tape. For other system voltages consult the University:

1. 208/120-V Conductors:

a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.
d. Switch Leg: Pink.

e. Switch Traveler: Same as Hot Leg.

2. 480/277-V Conductors:

a. Phase A: Brown.
b. Phase B: Orange.
c. Phase C: Yellow.
d. Switch Leg: Purple
e. Switch Traveler: Same as Hot Leg.

3. Neutral and Ground Conductors:

a. Neutral: White.
b. Ground: Green.

4. Factory apply color the entire length of conductors, except the following field-applied, color-coding methods may be used instead of factory-coded wire for sizes larger than No. 10 AWG:

a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Use 1-inch- wide tape in colors specified. Adjust tape bands to avoid obscuring cable identification markings.
b. Colored cable ties applied in groups of three ties of specified color to each wire at each terminal or splice point starting 3 inches from the terminal and spaced 3 inches apart. Apply with a special tool or pliers, tighten to a snug fit, and cut off excess length.

M. Power-Circuit Identification: Brass tags wraparound marker bands for cables, feeders, and power circuits in vaults, pull and junction boxes, manholes, and switchboard rooms.

1. Legend: 1/4-inch steel letter and number stamping or embossing with legend corresponding to indicated circuit designations.
2. Tag Fasteners: Nylon cable ties.
3. Band Fasteners: Integral ears.

N. Apply identification to conductors as follows:

1. Multiple Power or Lighting Circuits in the Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color-coding to identify circuits' voltage and phase.
2. Multiple Control and Communication Circuits in the Same Enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color-coding, or cable marking tape.

O. Apply warning, caution, and instruction signs as follows:

1. Warnings, Cautions, and Instructions: Install to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.
2. Emergency Operation: Install engraved laminated signs with white legend on red background with minimum 3/8-inch- high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

P. Equipment Identification Labels: Engraved plastic laminate. Install on each unit of equipment, including central or master unit of each system. This includes power, lighting, communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Unless otherwise indicated, provide a single line of text with 1/2-inch- high lettering on 2" high label. Use black lettering on white field. Use white lettering on red field for emergency circuited equipment. Apply labels for each unit of the following categories of equipment using mechanical fasteners:

1. Panel boards, electrical cabinets, and enclosures.
2. Access doors and panels for concealed electrical items.
3. Electrical switchgear and switchboards.
4. Electrical substations.
5. Emergency system boxes and enclosures.
6. Disconnect switches.
7. Motor starters.
8. Push-button stations.
9. Power transfer equipment.
10. Dimmers.
11. Control devices.
12. Frequency converters.
13. Battery racks.
14. Power-generating units.
15. Telephone switching equipment.
16. TV/audio-monitoring master station.
17. Fire alarm master station or control panel.
18. Security-monitoring master station or control panel.

Q. The numbering scheme provided by the University accomplishes the following:

a. Establishes a unique identifier for all system components and eliminates possible duplication.

R. Low Voltage Identification

1. Equipment nameplates shall be engraved three-layer laminated plastic with white background and black letters. Letters shall be 1/4" minimum size. Identifications shall match plan designations and based upon the University's Numbering Scheme.
2. Legend plates for control panels and indicators shall be provided on disconnect and safety switches and indicating lights. The plates shall be die-stamped metal with mounting hole and positioning key.

3. For panel board directories provide the following:

   a. Provide typewritten directories arranged in numerical order showing number of room in which each device is located.
   b. Verify room numbers to be used with the University's Representative prior to typing, since room numbers will most likely not be those shown on the drawings.
   c. Mount directories under a clear plastic cover inside each panelboard door.

4. The following low voltage equipment numbering scheme shall be followed:

TYPE	DESCRIPTION
DP	208/120V Distribution Panelboard
LP	208/120V Panelboard – Receptacles & Lighting
HDP	480/277V Distribution Panelboard
HLP	480/277 V Panelboard – Lighting
ATS	Automatic Transfer Switch
CB	Circuit Breaker
DS	Disconnect Switch
EDP	Emergency 208/120V Distribution Panelboard
ELP	Emergency 208/120V Panelboard
EHDP	Emergency 480/277V Distribution Panelboard
EMCC	Emergency Motor Control Center
MSB	Main Switchboard

***** END OF SECTION *****

SECTION 26 0563

ELECTRICAL TESTING

PART 28 - GENERAL

28.01 SUMMARY

A. Section includes general requirements for electrical field testing and inspecting. Detailed requirements are specified in each Section containing components that require testing. General requirements include the following:

1. Qualifications of testing agencies and their personnel.
2. Suitability of test equipment.
3. Calibration of test instruments.
4. Coordination requirements for testing and inspecting.
5. Reporting requirements for testing and inspecting.

28.02 QUALITY ASSURANCE

A. Testing Agency Qualifications: As specified in each Section containing electrical testing requirements and in subparagraph and associated subparagraph below.

1. Independent Testing Agencies: Independent of manufacturers, suppliers, and installers of components to be tested or inspected.

a. Testing Agency's Field Supervisor for Power Component Testing: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Division 26 power component Sections.

B. Test Equipment Suitability: Comply with NETA ATS, Section 5.2.

C. Test Equipment Calibration: Comply with NETA ATS, Section 5.3.

PART 29 - NOT USED

PART 30 - EXECUTION

30.01 GENERAL TESTS AND INSPECTIONS

A. If a group of tests are specified to be performed by an independent testing agency, prepare systems, equipment, and components for tests and inspections, and perform preliminary tests to ensure that systems, equipment, and components are ready for independent agency testing. Include the following minimum preparations as appropriate:

1. Perform insulation-resistance tests.
2. Perform continuity tests.
3. Perform rotation test (for motors to be tested).
4. Provide a stable source of single-phase, 208/120-V electrical power for test instrumentation at each test location.

B. Test and Inspection Reports: In addition to requirements specified elsewhere, report the following:

1. Manufacturer's written testing and inspecting instructions.
2. Calibration and adjustment settings of adjustable and interchangeable devices involved in tests.
3. Tabulation of expected measurement results made before measurements.
4. Tabulation of "as-found" and "as-left" measurement and observation results.

***** END OF SECTION *****

SECTION 26 0573

OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

PART 31 - GENERAL

31.01 SUMMARY

A. Section includes computer-based, fault-current and overcurrent protective device coordination studies, and the setting of these devices.

31.02 SUBMITTALS

A. Product Data: For computer software program to be used for studies.

B. Product Certificates: For coordination-study and fault-current-study computer software programs, certifying compliance with IEEE 399.

C. Qualification Data: For coordination-study specialist.

D. Other Action Submittals:

1. Coordination-study input data, including completed computer program input data sheets.
2. Coordination-study report.
3. Equipment evaluation report.
4. Setting report.

31.03 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are not acceptable.

B. Coordination-Study Specialist Qualifications: An organization experienced in the application of computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.

C. Testing Agency Qualifications: Member company of the InterNational Electrical Testing Association.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association to supervise testing specified in Part 3.

D. Comply with IEEE 399 for general study procedures.

E. Comply with IEEE 242 for short-circuit currents and coordination time intervals.

F. Comply with IEEE 141 for recommended practice for electric power distribution for industrial plants.

G. Comply with IEEE 320 for special studies procedure.

PART 32 - PRODUCTS

32.01 COMPUTER SOFTWARE DEVELOPERS

A. Computer Software Developers: Subject to compliance with requirements, provide computer software programs developed by one of the following:

1. SKM Systems Analysis, Inc.
2. OTI.

32.02 COMPUTER SOFTARE PROGRAM REQUIREMENTS

A. Comply with IEEE 399.

B. Analytical features of fault-current-study computer software program shall include "mandatory," "very desirable," and "desirable" features as listed in IEEE 399, Table 7-4.

C. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices.

1. Optional Features: Arcing faults.

PART 33 - EXECUTION

33.01 EXAMINATION

A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. Devices to be coordinated are indicated on Drawings.

B. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices not submitted for approval with coordination study may not be used in study.

33.02 FAULT-CURRENT STUDY

A. Source Impedance: 750 MVA on primary side of utility transformer

B. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project and use approved computer software program to calculate values. Include studies of system-switching configurations and alternate operations that could result in maximum fault conditions.

C. Calculate momentary and interrupting duties on the basis of maximum available fault current.

D. Calculations to verify interrupting ratings of overcurrent protective devices shall comply with the following:

1. Low-Voltage Circuit Breakers: IEEE 1015 and IEEE C37.50.
2. Low-Voltage Fuses: IEEE C37.46.
3. Circuit Breakers: IEEE C37.13.

E. Study Report: Enter calculated X/R ratios and interrupting (5-cycle) fault currents on electrical distribution system diagram of the report. List other output values from computer analysis, including momentary (1/2-cycle), interrupting (5-cycle), and 30-cycle fault-current values for 3-phase, 2-phase, and phase-to-ground faults.

F. Equipment Evaluation Report: Prepare a report on the adequacy of overcurrent protective devices and conductors by comparing fault-current ratings of these devices with calculated fault-current momentary and interrupting duties.

33.03 COORDINATION STUDY

A. Gather and tabulate the following input data to support coordination study:

1. Product Data for overcurrent protective devices specified in other Division 26 Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.

2. Impedance of utility service entrance.

3. Electrical distribution system diagram showing the following:

   a. Load current that is the basis for sizing continuous ratings of circuits for cables and equipment.
   b. Circuit-breaker and fuse-current ratings and types.

c. Relays and associated power and current transformer ratings and ratios.
d. Transformer kilovolt amperes, primary and secondary voltages, connection type, impedance, and X/R ratios.
e. Generator kilovolt amperes, size, voltage, and source impedance.
f. Cables. Indicate conduit material, sizes of conductors, conductor insulation, and length.
g. Busway ampacity and impedance.
h. Motor horsepower and code letter designation according to NEMA MG 1.

4. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram:

a. Special load considerations, including starting inrush currents and frequent starting and stopping.
b. Magnetic inrush current overload capabilities of transformers.
c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.
d. Ratings, types, and settings of utility company's overcurrent protective devices.
e. Special overcurrent protective device settings or types stipulated by utility company.
f. Time-current-characteristic curves of devices indicated to be coordinated.
g. Manufacturer, frame size, interrupting rating in amperes RMS symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
h. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
i. Panel boards, switchboards, motor-control center ampacity, and interrupting rating in amperes RMS symmetrical.

B. Perform coordination study and prepare a written report using the results of fault-current study and approved computer software program. Comply with IEEE 399.

C. Comply with CEC (NFPA 70) for overcurrent protection of circuit elements and devices.

D. Comply with IEEE 141 recommendations for fault currents and time intervals.

E. Transformer Primary Overcurrent Protective Devices:

1. Device shall not operate in response to the following:

a. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
b. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.

2. Device shall protect transformer according to IEEE C57.12.00, for fault currents.

F. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and conductor melting curves in IEEE 242. Verify adequacy of phase conductors at maximum three-phase bolted fault currents, equipment grounding conductors, and grounding electrode conductors at maximum ground-fault currents.

G. Coordination-Study Report: Prepare a written report indicating the following results of coordination study:

1. Tabular Format of Settings Selected for Overcurrent Protective Devices:

   a. Device tag.
   b. Relay-current transformer ratios; and tap, time-dial, and instantaneous-pickup values.
   c. Circuit-breaker sensor rating; and long-time, short-time, and instantaneous settings.
   d. Fuse-current rating and type.
   e. Ground-fault relay-pickup and time-delay settings.

2. Coordination Curves: Prepared to determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between series devices, including power utility company's upstream devices. Show the following specific information:

   a. Device tag.
   b. Voltage and current ratio for curves.
   c. Three-phase and single-phase damage points for each transformer.
   d. No damage, melting, and clearing curves for fuses.
   e. Cable damage curves.
   f. Transformer inrush points.
   g. Maximum fault-current cutoff point.

3. Completed data sheets for setting of overcurrent protective devices.

33.04 OVERCURRENT PROTECTIVE DEVICE SETTING

A. Manufacturer's Field Service: Engage a factory-authorized service representative, of electrical distribution equipment being set and adjusted, to assist in setting of overcurrent protective devices within equipment.

B. Testing: Perform the following device setting and prepare reports:

1. After installing overcurrent protective devices and during energizing process of electrical distribution system, perform the following:

   a. Verify that overcurrent protective devices meet parameters used in studies.
   b. Adjust devices to values listed in study results.

***** END OF SECTION *****

SECTION 26 0574

OVERCURRENT PROTECTIVE DEVICE ARC-FLASH STUDY

PART 34 - GENERAL

1.01 SUMMARY

A. Section includes short circuit, protective device coordination and Arc-Flash studies for the Campus medium voltage (12.47 kV) system and low voltage (208 V, 120 V) systems represented on the project drawings. The studies shall include all portions of the electrical distribution system supplied by normal and alternate sources of power. This includes switchgear, switchboards, panel boards, generators and other required electrical equipment. The analysis will include creation of Arc Flash Hazard Warning Labels, Figure 1. These labels serve as a guide to assist the University employees and others in the selection of proper Personal Protective Equipment when working around exposed and energized conductors. The electrical contractor will install the labels.

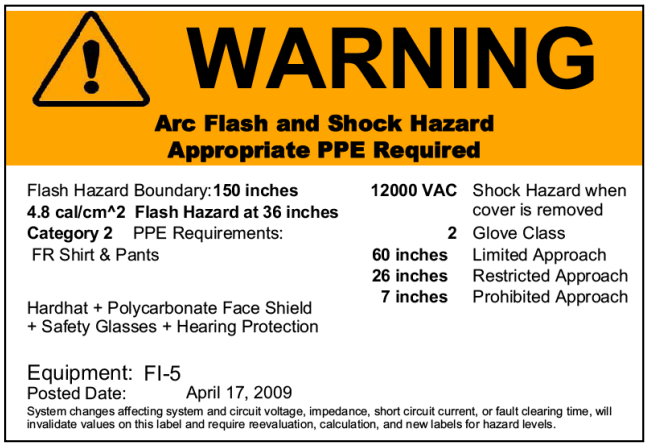

Figure 1 - Example of Arc Flash Warning Label

B. The Arc Flash Hazard Analysis shall include the electrical distribution system equipment shown on the one-line diagram drawings. If existing up-to-date current short-circuit and protective device coordination studies are not available, perform short circuit and protective device coordination studies for the electrical distribution system before performing the Arc Flash Hazard Analysis. The Arc Flash Hazard Analysis shall consider operation during normal conditions, alternate operations, emergency power conditions, and any other operations, which could result in maximum arc flash hazard, and as required.

C. Related Requirements:

1. Division 26 Section "Overcurrent Protective Device Coordination Study" for coordination study.

1.02 REFERENCES

D. California Code of Regulations Title 24, Part 3, California Electrical Code (CEC)

E. IEEE Standard 141 – Electrical Power Distribution for Industrial Plants.

F. IEEE Standard 242 – Protection and Coordination of Industrial and Commercial Power Systems.

G. IEEE Standard 399 – Industrial and Commercial Power System Analysis.

H. IEEE 1584 2002/2004a, Guide for Performing Arc Flash Hazard Analysis.

I. NFPA 70E – Standard for Electrical Safety in the Work Place.

J. Pre-installation Conference: Conduct conference at Project Site.

1.03 ACTION SUBMITTALS

K. Submit short circuit study prior to purchase of the distribution equipment.

L. Submit coordination study prior to completion of shop drawings.

M. Equipment submittals will not be approved without the completion and review of the power systems studies.

N. Submit the Arc Flash Hazard Analysis and arc flash hazard warning labels at least thirty (30) days prior to energizing the electrical equipment.

O. Submit one (1) electronic copy on CD, and one (1) set of warning labels.

1.04 QUALITY ASSURANCE

P. The Contractor shall have the analysis prepared by qualified engineers of an independent consultant. The consultant shall be a Registered Professional Engineer, licensed in California, who has at least ten (10) years of experience and specializes in performing electrical power system studies.

Q. To be compatible with the existing University of California, Irvine Arc Flash analyses, to allow smooth integration of the new data with existing, and to ensure that information can be easily updated as system components change, the Engineer shall complete their analysis using the latest version of Power Tools for Windows (PTW) computer software by SKM Systems Analysis, Inc. designed for the purpose including DAPPER, CAPTOR and Arc-Flash software modules.

R. Studies shall be based on the actual equipment and devices selected for the project.

PART 35 - PRODUCTS

2.01 SHORT CIRCUIT STUDY

A. Provide a current, up-to-date short circuit current study. If one does not exist, then perform a short circuit study in accordance with IEEE 399 Standard (Brown Book), "IEEE Recommended Practice for Industrial and Commercial Power System Analysis," based upon the positive and zero sequence source impedance supplied by the local energy provider.

2.02 PROTECTIVE DECIVE COORDINATION STUDY

B. Provide a current up-to-date protective device coordination study. If one does not exist, then perform a protective device coordination study in accordance with IEEE 242 Standard (Buff Book), "IEEE Recommended Protection and Coordination of Industrial and Commercial Power Systems."

2.03 ARC FLASH HAZARD ANALYSIS

C. Perform an Arc Flash Hazard Analysis after the short circuit and protective device coordination studies have been completed based upon IEEE 1584 Standard, "IEEE Guide for Performing Arc Flash Hazard Calculations."

D. The analysis shall be calculated by means of the SKM Power Tools for Windows computer software package. Pertinent data, rationale employed, and assumptions in developing the calculations shall be incorporated in the introductory remarks of the study.

E. The analysis shall be in accordance with applicable NFPA 70E, OSHA 29-CFR, Part 1910 Subpart S and IEEE 1584 Standards.

F. Incident Energies and Hazard Categories must be calculated. The use of the NFPA "table method" is unacceptable.

G. Determine the following

1. Arc hazard boundary (inches)
2. Working distance (inches)
3. Arc flash incident energy at the working distance (calories/cm2)
4. PPE category and description including the glove rating
5. Voltage rating of the equipment
6. Limited approach distance (inches)
7. Restricted approach distance (inches)
8. Prohibited approach distance (inches)

H. Based on the results of the incident energy study, the selected vendor shall produce and install a warning label (orange <40 cal/cm2) or danger label (red > 40 cal/cm2) approximately 4" x 6" (Brady multi-color or equivalent) for EVERY point in the system as specified system equipment shown on the one-line diagram. Labels will be in accordance with ANSI Z535.4-2002 listing items 1–8 above. Also, include the bus name, system

operating voltage, and date of issue. The label must be readable in both indoor and outdoor environments for at least 3 years. See example Figure 1.

I. To maintain consistency of labeling throughout the Campus, all other electrical panels identified as PPE Category 0 will be labeled with a similar type of warning label containing general electrical safety information.

J. Produce Bus Detail Sheets that lists the items E 1-8 from above and the following additional items.
1. Bus Name
2. Upstream Protective Devices Names, Type and Settings
3. Bus Line-to-Line Voltage

K. Produce Arc Flash Evaluation Summary Sheets listing the following additional items.

1. Bus Name
2. Upstream Protective Device Names, Type and Settings
3. Bus Line-to-Line Voltage
4. Bus Bolted Fault
5. Protective Device Bolted Fault Current
6. Arcing Fault Current
7. Protective Device Trip / Delay Time
8. Breaker Opening Time
9. Solidly Grounded Column
10. Equipment Type
11. Gap
12. Arc Flash Boundary
13. Working Distance
14. Incident Energy
15. Required Protective Fire Rated Clothing Type and Class

PART 36 - EXECUTION

3.01 ANALYSIS

A. Analyze the short circuit, protective device coordination, and arc flash calculations and highlight any equipment that is determined to be underrated or causes an abnormally high incident energy calculation.

B. Propose approaches to reduce the energy levels of Personal Protective Equipment (PPE) Hazard Category 3 and 4 or higher to Category 2 or less. Proposed major corrective modifications will be taken under advisement by the Engineer and the Contractor will be given further instructions.

3.02 WRITTEN REPORT

C. The results of the power system study shall be summarized in a final written report. The report shall include the following sections:

1. Executive Summary - A synopsis of our overall findings, including but not limited to equipment locations with highest incident energy levels, total number of overcurrent protective devices with inadequate short-circuit current interrupting ratings, and identification of equipment protective boundary conflicts.
2. Introduction - A brief paragraph to explain the necessity of performing an Arc-Flash Hazard Analysis and the criteria used during the project
3. Methodology - A brief paragraph to explain the basis for the analyses performed for this project.
4. Assumptions - A list of all valid engineering assumptions made and why they were made during the course of the project.
5. Discussion - A detailed discussion of each of the following power system analysis performed for this project:

    a. Short Circuit Analysis Results
    b. Protective Device Coordination Study Results.
    c. Arc-Flash Hazard Analysis Results

6. Recommendations - Detailed recommendations to reduce existing incident energy levels of Hazard Category 3 or higher to Hazard Category 2 or less and to improve overall future maintenance & operation of the electrical system.
7. Bibliography - Industry references used to complete the arc-flash analysis for this system.

3.03 REPORT BINDER & CD

D. The Arc Flash Hazard Analysis report binder shall contain the written report above plus the additional following sections:

1. Short-Circuit Analysis Results
2. Equipment Evaluation Study Results
3. Time Current Curves Plotted in Color on Log-Log Graph Paper
4. Arc Flash Hazard Analysis Results in MS Excel Format
5. Electrical One-Line Input Data used in Computer Software Model
6. Electrical One-Line Diagram with Incident Energy, Flash Protection Boundary, and Pertinent Equipment and Component Ratings

E. Summarize the results of the power system study in one (1) CD for University records. The CD should include all SKM project libraries and input data necessary for maintaining up-to-date Campus system studies.

***** END OF SECTION *****

SECTION 26 2413

SWITCHBOARDS

PART 37 - GENERAL

37.01 SUMMARY

A. Section includes service and distribution switchboards rated 600 V and less.

B. Related Sections include the following:
1. Division 26 Section "Vibration and Seismic Controls for Electrical Systems."
2. Division 26 Section "Electrical Power Monitoring and Control."

37.02 DEFINITIONS

A. EMI: Electromagnetic interference.

B. RFI: Radio-frequency interference.

37.03 SUBMITTALS

A. Product Data: For each type of switchboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each switchboard and related equipment.

1. Dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings. Include the following:

a. Enclosure types and details for types other than NEMA 250, Type 1.
b. Bus configuration, current, and voltage ratings.
c. Short-circuit current rating of switchboards and overcurrent protective devices.
d. Descriptive documentation of optional barriers specified for electrical insulation and isolation.
e. Utility company's metering provisions with indication of approval by utility company.
f. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

2. Wiring Diagrams: Diagram power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring.

C. Manufacturer Seismic Qualification Certification: Submit certification that switchboards, overcurrent protective devices, accessories, and components will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Work." Include the following:

1. Basis of Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

2. The term "withstand" means "the unit will remain in place without separation of internal and external parts during a seismic event and the unit will be fully operational after the event."
3. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
4. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Qualification Data: Submit data for testing agencies indicating that they comply with qualifications specified in "Quality Assurance" Article.

E. Field Test Reports: Submit written test reports and include the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

F. Manufacturer's field service report.

G. Maintenance Data: For switchboards and components to include in maintenance manuals specified in Division 01. In addition to requirements specified in Division 01 Section " Project Closeout," include the following:

1. Routine maintenance requirements for switchboards and all installed components.
2. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
3. Time-current curves, including selectable ranges for each type of overcurrent protective device.

37.04 QUALITY ASSURANCE

A. Testing Agency Qualifications: Testing agency that is a member company of the InterNational Electrical Testing Association and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC (NFPA 70), Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NEMA PB 2.

D. Comply with CEC (NFPA 70).

E. Product Selection for Restricted Space: Drawings indicate maximum dimensions for switchboards, including clearances between switchboards, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

37.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver in sections of lengths that can be moved past obstructions in delivery path.

B. Store indoors in clean dry space with uniform temperature to prevent condensation. Protect from exposure to dirt, fumes, water, corrosive substances, and physical damage.

C. If stored in areas subjected to weather, cover switchboards to provide protection from weather, dirt, dust, corrosive substances, and physical damage. Remove loose packing and flammable materials from inside switchboards; install electric heating (250-W per section) to prevent condensation, in NEMA 3 or NEMA 3R enclosures.

D. Handle switchboards according to NEMA PB 2.1.

37.06 PROJECT CONDITIONS

A. Installation Pathway: Remove and replace access fencing, doors, lift-out panels, and structures to provide pathway for moving switchboards into place.

B. Existing Utilities: Do not interrupt utilities serving facilities occupied by the University or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify University's Representative not less than fourteen days in advance of proposed utility interruptions. Identify extent and duration of utility interruptions.
2. Indicate method of providing temporary utilities.
3. Proceed with utility interruptions only after receiving University's Representative written authorizations.

C. Environmental Limitations: Rate equipment for continuous operation under the following, unless otherwise indicated:

1. Ambient Temperature: Not exceeding 104 degrees F.
2. Altitude: Not exceeding 6600 feet.

D. Service Conditions: NEMA PB2, usual service conditions, as follows:

1. Altitude not exceeding 6600 feet.
2. Ambient temperatures within limits specified.

37.07 COORDINATION

A. Coordinate layout and installation of switchboards and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain

required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03 Section "Cast-in-Place Concrete."

37.08 EXTRA MATERIALS

A. Spares: For the following:

1. Potential transformer fuses.
2. Control-transformer fuses.

B. Spare Indicating Lights: Six of each type installed.

PART 38 - PRODUCT

38.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Corp.; Cutler-Hammer Products.
2. General Electric Co.; Electrical Distribution & Control Div.
3. Siemens Energy & Automation, Inc.
4. Square D Co.
5. Or equal.

B. Or Equal: Where products are specified by manufacturers name and accompanied by the term "or equal", comply with provisions in Division 01 Section “Product Options and Substitutions”. Specific procedures must be followed before use of an unnamed product or manufacturer.

38.02 MANUFACTURED UNITS

A. Front-Connected, Front-Accessible Switchboard: Fixed, individually mounted main device, panel-mounted branches, and sections rear aligned.

1. Main Devices: Fixed, individually mounted.
2. Branch Devices: Fixed, individually mounted.

B. Nominal System Voltage: 208Y/120 V.

C. Main-Bus Continuous: 800 or as indicated on the drawings.

38.03 FABRICATION AND FEATURES

A. Enclosure: Steel: NEMA 250 type 1, NEMA 250 type 3

B. Enclosure Finish for Outdoor Units: Factory-applied finish in manufacturer's standard color, including undersurfaces treated with corrosion-resistant undercoating, or plated with cadmium or zinc.

C. Enclosure Finish for Indoor Units: Factory-applied finish in manufacturer's standard light gray enamel finish over a rust-inhibiting primer on treated metal surface. Coat internal surfaces with corrosion resistant paint, or plate with cadmium or zinc.

D. Barriers: Between adjacent switchboard sections.

E. Insulation and isolation for main and vertical buses of feeder sections.

1. Space-Heater Control: Thermostats to maintain temperature of each section above expected dew point.
2. Space-Heater Power Source: Transformer factory installed in switchboard.

F. Utility Metering Compartment: Fabricated compartment and section complying with University's requirements. If separate vertical section is required for utility metering, match and align with basic switchboard.

G. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.

H. Pull Box on Top of Switchboard: Include the following features:

1. Adequate ventilation to maintain temperature in pull box within same limits as switchboard.

I. Buses and Connections: Three phase, four wire, unless otherwise indicated. Include the following features:

1. Load Terminals: Insulated, rigidly braced, silver-plated, copper runback bus extensions equipped with pressure connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full ampere rating of circuit-breaker position.
2. Ground Bus: 1/4-by-2-inch minimum size, drawn-temper copper of 98 percent conductivity, equipped with pressure connectors for feeder and branch-circuit ground conductors. For busway feeders, extend insulated equipment grounding cable to busway ground connection and support cable at intervals in vertical run.
3. Contact Surfaces of Buses: Silver plated.
4. Main Phase Buses, Neutral Buses, and Equipment Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
5. Neutral Buses: 100 percent of the ampacity of the phase buses, unless otherwise indicated, equipped with pressure connectors for outgoing circuit neutral cables. Bus extensions for busway feeder neutral bus is braced.

J. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.

38.04 OVERCURRENT PROTECTIVE DEVICES

A. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

B. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.

C. Electronic Trip Unit Circuit Breakers: RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:

1. Instantaneous trip.
2. Long- and short-time pickup levels.
3. Long- and short-time time adjustments.
4. Ground-fault pickup level, time delay, and I^2t response.

D. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.

E. Lugs: Compression style, suitable for number, size, trip ratings, and material of conductors.

F. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.

G. Under-voltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.

H. Enclosed, Insulated-Case Circuit Breaker: Fully rated, encased-power circuit breaker with interrupting capacity rating to meet available fault current.

1. Fixed circuit-breaker mounting Copper lugs.
2. Two-step, stored-energy closing.
3. Microprocessor-based trip units with interchangeable rating plug, LED trip indicators, and the following field-adjustable settings:

    a. Instantaneous trip.
    b. Long- and short-time pickup levels.
    c. Long- and short-time time adjustments with I^2t response.
    d. Ground-fault pickup level, time delay, and I^2t response.

4. Remote trip indication and control.
5. Communication Capability: Integral communication module with functions and features compatible with power monitoring and control system.
6. Control Voltage: 125- V ac.

38.05 INSTRUMENTATION

A. Instrument Transformers: NEMA EI 21.1, IEEE C57.13, and the following:

1. Potential Transformers: Secondary voltage rating of 120 V and NEMA accuracy class of 0.3 with burdens of W, X, and Y.
2. Current Transformers: Ratios shall be as indicated with accuracy class and burden suitable for connected relays, meters, and instruments.
3. Control-Power Transformers: Dry type, mounted in separate compartments for units larger than 3 kV.
4. Current Transformers for Neutral and Ground-Fault Current Sensing: Connect secondaries to ground overcurrent relays to provide selective tripping of main and tie circuit breaker. Coordinate with feeder circuit-breaker ground-fault protection.

B. Multifunction Digital-Metering Monitor: Microprocessor-based unit suitable for three- or four-wire systems and with the following features:

1. Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:

   a. Phase Currents, Each Phase: Plus or minus 1 percent.
   b. Phase-to-Phase Voltages, Three Phase: Plus or minus 1 percent.
   c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 1 percent.

2. Mounting: Display and control unit flush or semi-flush mounted in instrument compartment door.

38.06 CONTROL POWER

A. Control Circuits: 120 V, supplied through secondary disconnecting devices from control-power transformer.

B. Control-Power Fuses: Primary and secondary fuses for current-limiting and overload protection of transformer and fuses for protection of control circuits.

C. Control Wiring: Factory installed, with bundling, lacing, and protection included. Provide flexible conductors for No. 8 AWG and smaller, for conductors across hinges, and for conductors for interconnections between shipping units.

38.07 ACCESSORY COMPONENTS AND FEATURES

A. Accessory Set: Tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

PART 39 - EXECUTION

39.01 PROTECTION

A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer's written instructions.

39.02 EXAMINATION

A. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

39.03 INSTALLATION

A. Install switchboards and accessories according to NEMA PB 2.1.

B. Support switchboards on concrete bases.

C. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration and Seismic Controls for Electrical Work."

D. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from switchboard units and components.

E. Operating Instructions: Frame and mount the printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.

39.04 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Identification for Electrical Systems."

B. Switchboard Nameplates: Label each switchboard compartment with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

39.05 CONNECTIONS

A. Install equipment grounding connections for switchboards with ground continuity to main electrical ground bus.

B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

39.06 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

B. Testing: After installing switchboards and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test indicated in NETA ATS, Sections 7.1, 7.5, 7.6, 7.9, 7.10, 7.11, and 7.14 as appropriate. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

39.07 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

39.08 CLEANING

A. On completion of installation, inspect interior and exterior of switchboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

***** END OF SECTION *****

SECTION 26 2416

PANELBOARDS

PART 40 - GENERAL

40.01 SUMMARY

A. Section includes load centers and panelboards, overcurrent protective devices, and associated auxiliary equipment rated 600 V and less for the following types:

1. Lighting and appliance branch-circuit panelboards.
2. Distribution panelboards.

B. Related Sections include the following:

1. Division 26 Section "Vibration and Seismic Controls for Electrical Work."

40.02 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

40.03 SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:

    a. Enclosure types and details for types other than NEMA 250, Type 1.
    b. Bus configuration, current, and voltage ratings.
    c. Short-circuit current rating of panelboards and overcurrent protective devices.
    d. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

2. Wiring Diagrams: Diagram power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring.

C. Manufacturer Seismic Qualification Certification: Submit certification that panelboards, overcurrent protective devices, accessories, and components will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical Work." Include the following:

1. Basis of Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. The term "withstand" means "the unit will remain in place without separation of internal and external parts during a seismic event and the unit will be fully operational after the event."
3. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
4. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Field Test Reports: Submit written test reports and include the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

E. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

F. Maintenance Data: For panelboards and components to include in maintenance manuals specified in Division 01. In addition to requirements specified in Division 01 Section "Project Closeout," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

40.04 QUALITY ASSURANCE

A. Testing Agency Qualifications: Testing agency that is a member company of the InterNational Electrical Testing Association and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

B. Comply with NEMA PB 1.

C. Comply with CEC (NFPA 70).

40.05 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

40.06 EXTRA MATERIALS

A. Keys: Two spares of each type of panelboard cabinet lock, keyed alike to match the University's standard key requirements.

PART 41 - PRODUCTS

41.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:

a. Eaton Corp.; Cutler-Hammer Products.
b. General Electric Co.; Electrical Distribution & Control Div.
c. Siemens Energy & Automation, Inc.
d. Square D Co.
e. Or equal.

B. Or Equal: Where products are specified by manufacturers name and accompanied by the term "or equal", comply with provisions in Division 01 Section "Product Options and

Substitutions". Specific procedures must be followed before use of an unnamed product or manufacturer.

41.02 FABRICATION AND FEATURES

A. Enclosures: Flush- and surface-mounted cabinets. NEMA PB 1, Type 1, to meet environmental conditions at installed location.

1. Outdoor Locations: NEMA 250, Type 3R.
2. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
3. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.

B. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.

C. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.

D. Directory Card: Typed panel circuit schedule/index with transparent protective cover, mounted inside metal frame, inside panelboard door.

E. Bus: Hard-drawn copper, 98 percent conductivity.

F. Main and Neutral Lugs: Compression type suitable for use with conductor material.

G. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box. When isolated grounds are required, provide ground bus insulated from box.

H. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

41.03 PANELBOARD SHORT-CIRCUIT RATING

A. UL label indicating series-connected rating with integral or remote upstream devices. Include size and type of upstream device allowable, branch devices allowable, and UL series-connected short-circuit rating.

B. Fully rated to interrupt symmetrical short-circuit current available at terminals.

41.04 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

B. Doors: Front mounted with concealed hinges; secured with flush latch with tumbler lock; keyed alike.

41.05 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 225A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic Trip Unit Circuit Breakers: RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:

    a. Instantaneous trip.
    b. Long- and short-time pickup levels.
    c. Long- and short-time time adjustments.
    d. Ground-fault pickup level, time delay, and I^2t response.
4. GFCI Circuit Breakers: Single- and two-pole configurations with 5 -mA trip sensitivity.

B. Molded-Case Circuit-Breaker Features and Accessories. Standard frame sizes, trip ratings, and number of poles.

1. Lugs: Compression style Copper, suitable for number, size, trip ratings, and material of conductors.
2. Application Listing: Appropriate for application; HACR for heating, air-conditioning, and refrigerating equipment.
3. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
4. Communication Capability: Circuit-breaker-mounted communication module with functions and features compatible with power monitoring and control system.
5. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated Voltage.
6. Under-voltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
7. Auxiliary Switch: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
8. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.

PART 42 - EXECUTION

42.01 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration and Seismic Controls for Electrical Work."

C. Mounting Heights: Top of trim 74 inches above finished floor, unless otherwise indicated.

D. Mounting: Plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.

E. Circuit Directory: Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

F. Install filler plates in unused spaces.

G. Provision for Future Circuits at Flush Panelboards: Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.

H. Wiring in Panelboard Gutters: Arrange conductors into groups and bundle and wrap with wire ties after completing load balancing.

42.02 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section Identification for Electrical Systems.

B. Panelboard Nameplates: Label each panelboard with laminated-plastic nameplate mounted with corrosion-resistant screws.

42.03 CONNECTIONS

A. Install equipment grounding connections for panelboards with ground continuity to main electrical ground bus.

B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

42.04 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

B. Testing: After installing panelboards and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test indicated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.

2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

C. Balancing Loads: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes as follows:

1. Measure as directed during period of normal system loading.
2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data-processing, computing, transmitting, and receiving equipment.
3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

42.05 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

42.06 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

***** END OF SECTION *****

SECTION 26 2713

ELECTRICITY METERING

PART 43 - GENERAL

43.01 SUMMARY

A. Section includes equipment for electricity metering by the University.

43.02 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For electricity-metering equipment.

1. Dimensioned plans and sections or elevation layouts.

2. Wiring Diagrams: For power, signal, and control wiring. Identify terminals and wiring designations and color-codes to facilitate installation, operation, and maintenance. Indicate recommended types, wire sizes, and circuiting arrangements for field-installed wiring, and show circuit protection features.

C. Field quality-control reports.

1. Hard copies of manufacturer's operating specifications, design user's guides for software and hardware, and PDF files on CD-ROM of the hard-copy Submittal.

43.03 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

43.04 DELIVERY, STORAGE, AND HANDLING

A. Receive, store, and handle modular meter center according to NECA 400.

43.05 PROJECT CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by the University or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify the University no fewer than 14 days in advance of proposed interruption of electrical service. Proposed interruption shall also be coordinated with Riverside Public Utilities (RPU) Representative.
2. Do not proceed with interruption of electrical service without the University written permission.

43.06 SOFTWARE SERVICE AGREEMENT

A. Technical Support: Beginning with Substantial Completion, provide software support for two years.

B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.

1. Provide 30 days' notice to the University to allow scheduling and access to system and to allow the University to upgrade his computer equipment if necessary.

PART 44 - PRODUCTS

44.01 EQUIPMENT FOR ELECTRICITY METERING BY THE UNIVERSITY

Verify equipment for electricity metering with Riverside Public Utilities (RPU) requirements and that all equipment shall also concur with the requirements listed below and/or shown here in this section.

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:

1. Provide Power Meter #9330DC1000NPZZA – known equal is manufactured by Power Measurement Inc.
2. E-Mon; a division of Hunt Power.

B. General Requirements for University's Meters:

1. Comply with UL 1244.
2. Meters used for billing shall have an accuracy of 0.2 percent of reading, complying with requirements in ANSI C12.20.
3. Meters shall be certified by California Type Evaluation Programs complying with Title 4, California Code of Regulations, Article 2.2.
4. Enclosure: NEMA 250, Type 3R minimum, with hasp for padlocking or sealing.
5. Identification: Comply with requirements in Division 26 Section "Identification for Electrical Systems."
6. Memory Backup: Self-contained to maintain memory throughout power outages of 72 hours, minimum.
7. Sensors: Current-sensing type, with current or voltage output, selected for optimum range and accuracy for meters indicated for this application.

8. Current-Transformer Cabinet: Listed or recommended by metering equipment manufacturer for use with sensors indicated.

C. Kilowatt-hour Meter: Electronic three-phase meters, measuring electricity used.

1. Voltage and Phase Configuration: Meter shall be designed for use on circuits with voltage rating and phase configuration indicated for its application.
2. Display: LCD with characters not less than 0.25-inch high, indicating accumulative kilowatt-hours and current kilowatt load. Retain accumulated kilowatt-hour in a nonvolatile memory, until reset.

D. Kilowatt-hour/Demand Meter: Electronic three-phase meters, measuring electricity use and demand. Demand shall be integrated over a 15-minute interval.

1. Voltage and Phase Configuration: Meter shall be designed for use on circuits with voltage rating and phase configuration indicated for its application.
2. Display: LCD with characters not less than 0.25-inch high, indicating accumulative kilowatt-hours, current time and date, current demand, and historic peak

demand, and time and date of historic peak demand. Retain accumulated kilowatt-hour and historic peak demand in a nonvolatile memory, until reset.

E. Data Transmission Cable: Transmit KY pulse data over Class 1 control-circuit conductors in raceway.

PART 45 - EXECUTION

45.01 INSTALLATION

A. Comply with equipment installation requirements in NECA 1.

B. Install modular meter center according to NECA 400 switchboard installation requirements.

45.02 IDENTIFICATION

A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

1. Series Combination Warning Label: Self-adhesive type, with text as required by NFPA 70.
2. Equipment Identification Labels: Adhesive film labels with clear protective overlay.

45.03 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. Connect a load of known kilowatt rating, 1.5 kW minimum, to a circuit supplied by metered feeder.
2. Turn off circuits supplied by metered feeder and secure them in off condition.
3. Run test load continuously for 8-hours minimum, or longer, to obtain a measurable meter indication. Use test-load placement and setting that ensures continuous, safe operation.
4. Check and record meter reading at end of test period and compare with actual electricity used, based on test-load rating, duration of test, and sample measurements of supply voltage at test-load connection. Record test results.

C. Electricity metering will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

***** END OF SECTION *****

SECTION 26 2726

WIRING DEVICES

PART 46 - GENERAL

46.01 SUMMARY

A. Section includes the following:

1. Duplex receptacles, ground-fault circuit interrupter receptacles.

46.02 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

46.03 SUBMITTALS

A. Product Data: For each type of product indicated.

46.04 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 47 - PRODUCTS

47.01 RECEPTACLES

A. Straight-Blade-Type Receptacles: Comply with NEMA WD 1, NEMA WD 6, DSCC W-C-596G, and UL 498, in white color.

B. Straight-Blade Receptacles: Specification grade/Institutional grade.

C. GFCI Receptacles: Straight blade, feed-through type, specification grade, with integral NEMA WD 6, Configuration 5-20R duplex receptacle; complying with UL 498 and UL 943. Design units for installation in a 2-3/4-inch- deep outlet box without an adapter.

47.02 WALL PLATES

Single and combination types to match corresponding wiring devices.

A. Plate-Securing Screws: Metal with head color to match plate finish. Minimum of two screws per outlet box gang section.

B. Material for Finished Spaces: Smooth, high-impact thermoplastic 0.035-inch-thick, satin-finished stainless steel. When approved by the University cover plates may be non-metallic, shatter resistant nylon in lieu of stainless steel.

C. Material for Unfinished Spaces: Smooth, high-impact thermoplastic.

D. Material for Wet Locations: Cast aluminum with spring-loaded lift cover and listed and labeled for use in "wet locations."

47.03 CONTROL AND SIGNAL TRANSFORMERS

A. Description: 120/24V. Self-cooled, two-winding dry type, rated for continuous duty, complying with NEMA ST 1, and listed and labeled as complying with UL 506.

B. Ratings: Continuous duty. If rating is not indicated, provide at least 50 percent spare capacity above connected peak load.

C. See mechanical Equipment Schedule for exact equipment/device required voltage.

D. Provide (1) low voltage control transformer for each mechanical device/equipment or provide a larger low voltage control transformer for several devices and provide low voltage control wiring to mechanical devices.

47.04 FINISHES

A. Color:

1. Wiring Devices Connected to Normal Power System: White or as selected by the University's Representative, unless otherwise indicated or required by CEC (NFPA 70).
2. Coordinate final cover plate style and color with the University's Representative. The following is a general guide:

    1. White in office areas
    2. Stainless steel in greenhouse and screenhouse and other high use areas.

PART 48 - EXECUTION

48.01 INSTALLATION

A. Install devices and assemblies level, plumb, and square with building lines.

B. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and with grounding terminal of receptacles on top. Group adjacent switches under single, multi-gang wall plates.

C. Remove wall plates and protect devices and assemblies during painting.

48.02 IDENTIFICATION

A. Comply with Division 26 Section “Identification for Electrical Systems”.

1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with black filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.
2. Cover plates for receptacles shall be engraved or permanent stenciled on the front side with the device circuit number and panelboard source name. Use of an engraving on the front of the device plate is not required for housing projects.
3. Cover plates for receptacles in locations of public view such as lobbies and atriums shall have the circuit numbers and source feed point stenciled on the back of the plate.

48.03 CONNECTIONS

A. Ground equipment according to Division 26 Section "Grounding and Bonding for electrical systems."

B. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

48.04 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. After installing wiring devices and after electrical circuitry has been energized, test for proper polarity, ground continuity, and compliance with requirements.
2. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.

B. Remove malfunctioning units, replace with new units, and retest as specified above.

***** END OF SECTION *****

SECTION 26 3600

TRANSFER SWITCHES

PART 49 - GENERAL

49.01 SUMMARY

A. Section includes transfer switches rated 600 V and less, including the following:

1. Automatic closed-transition transfer switches.

49.02 SUBMITTALS

A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories.

B. Shop Drawings: Dimensioned plans, sections, and elevations showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.

1. Wiring Diagrams: Single-line diagram. Show connections between transfer switch, bypass/isolation switch, power sources, and load; and show interlocking provisions for each combined transfer switch and bypass/isolation switch.

C. Manufacturer Seismic Qualification Certification: Submit certification that transfer switches, accessories, and components will withstand seismic forces defined in Division 26 Section "Vibration and Seismic Controls for Electrical systems", Include the following:

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event".

2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Qualification Data: For manufacturer and testing agency.

E. Field quality-control test reports.

F. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Sections "Project Closeout" and “Operation and Maintenance Data", include the following:

1. Features and operating sequences, both automatic and manual.
2. List of all factory settings of relays; provide relay-setting and calibration instructions, including software, where applicable.

49.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Maintain a service center capable of providing training, parts, and emergency maintenance repairs within a response period of less than eight hours from time of notification.

B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

C. Source Limitations: Obtain automatic transfer switches, bypass/isolation switches, and remote annunciators through one source from a single manufacturer.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC (NFPA 70), Article 100, for emergency service under UL 1008, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

E. Comply with NEMA ICS 1- General Standards for Industrial Control and Systems

F. Comply with NEMA IC52 – Standards for Industrial Control Devices

G. Comply with NEMA IC56 – Enclosures for Industrial Controls and Systems; Type 1 -indoors, Type 4 - outdoors.

H. Comply with CEC (NFPA 70).

I. Comply with NFPA 99.

J. Comply with NFPA 110.

K. Comply with UL 1008 unless requirements of these Specifications are stricter.

PART 50 - PRODUCTS

50.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Contactor Transfer Switches:

a. Eaton
b. Caterpillar; Engine Div.
c. Emerson; ASCO Power Technologies, LP.

d. Generac Power Systems, Inc.
e. Kohler Co.; Generator Division.
f. Onan Corp./Cummins Power Generation; Industrial Business Group.
g. Russelectric, Inc.
h. Spectrum Detroit Diesel.
i. Or equal.

B. Or Equal: Where products are specified by manufacturers name and accompanied by the term "or equal", comply with provisions in Division 01 Section “Product Options and Substitutions”. Specific procedures must be followed before use of an unnamed product or manufacturer.

50.02 GENERAL TRANSFER-SWITCH PRODUCT OPTIONS AND SUBSTITUTIONS

A. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.

B. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

C. Annunciation, Control, and Programming Interface Components: Devices at transfer switches for communicating with remote programming devices, annunciators, or annunciator and control panels have communication capability matched with remote device.

D. Solid-State Controls: Repetitive accuracy of all settings is plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 degrees C.

E. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

F. Neutral Terminal: Solid and fully rated, unless otherwise indicated.

G. Oversize Neutral: Ampacity and switch rating of neutral path through units indicated for oversize neutral shall be double the nominal rating of circuit in which switch is installed.

H. Enclosures: General-purpose NEMA 250, Type 3R complying with NEMA ICS 6 and UL 508, unless otherwise indicated.

I. Heater: Equip switches exposed to outdoor temperatures and humidity, and other units indicated, with an internal heater. Provide thermostat within enclosure to control heater.

J. Factory Wiring: Train and bundle factory wiring and label, consistent with Shop Drawings, either by color code or by numbered or lettered wire and cable tape markers at terminations.

1. Designated Terminals: Pressure type suitable for types and sizes of field wiring indicated.
2. Power-Terminal Arrangement and Field-Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
3. Control Wiring: Equipped with lugs suitable for connection to terminal strips.

K. Electrical Operation: Accomplish by a non-fused, momentarily energized solenoid or electric-motor-operated mechanism, mechanically and electrically interlocked in both directions.

L. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.

1. Switch Action: Double throw; mechanically held in both directions.
2. Contacts: Silver composition or silver alloy for load-current switching. Conventional automatic transfer-switch units, rated 225 A and higher, shall have separate arcing contacts.

50.03 AUTOMATIC TRANSFER SWITCHES

A. Comply with Level 1 equipment according to NFPA 110.

B. Switching Arrangement: Double-throw type, incapable of pauses or intermediate position stops during normal functioning, unless otherwise indicated.

C. Manual Switch Operation: Under load, with door closed and with either or both sources energized. Transfer time is same as for electrical operation. Control circuit automatically disconnects from electrical operator during manual operation.

D. Signal-Before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval is adjustable from 1 to 30 seconds.

E. Digital Communication Interface: Matched to capability of remote annunciator or annunciator and control panel.

F. Automatic Closed-Transition Transfer Switches: Include the following functions and characteristics:

1. Fully automatic make-before-break operation.
2. Load transfer without interruption, through momentary interconnection of both power sources not exceeding 100 ms.
3. Initiation of No-Interruption Transfer: Controlled by in-phase monitor and sensors confirming both sources are present and acceptable.

    a. Initiation occurs without active control of generator.
    b. Controls ensure that closed-transition load transfer closure occurs only when the 2 sources are within plus or minus 5 electrical degrees maximum, and plus or minus 5 percent maximum voltage difference.

4. Failure of power source serving load initiates automatic break-before-make transfer.

G. Motor Disconnect and Timing Relay: Controls designate starters so they disconnect motors before transfer and reconnect them selectively at an adjustable time interval after transfer. Control connection to motor starters is through wiring external to automatic transfer switch. Time delay for reconnecting individual motor loads is adjustable between 1 and 60 seconds, and settings are as indicated. Relay contacts handling motor-control circuit inrush and seal currents are rated for actual currents to be encountered.

50.04 AUTOMATIC TRANSFER-SWITCH FEATURES

A. Undervoltage Sensing for Each Phase of Normal Source: Senses low phase-to-ground voltage on each phase. Pickup voltage is adjustable from 85 to 100 percent of nominal, and dropout voltage is adjustable from 75 to 98 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.

B. Time delay for override of normal-source voltage sensing delays transfer and engine start signals. Adjustable from zero to six seconds, and factory set for one second.

C. Voltage/Frequency Lockout Relay: Prevents premature transfer to generator. Pickup voltage is adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency is adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.

D. Time Delay for Retransfer to Normal Source: Adjustable from 0 to 30 minutes, and factory set for 10 minutes. Provides automatic defeat of delay on loss of voltage or sustained under voltage of emergency source, provided normal supply has been restored. Upon permission by normal source monitor by alternative source monitor: 0 to 30 seconds adjustable.

E. Test Switch: Simulates normal-source failure.

F. Switch-Position Pilot Lights: Indicate source to which load is connected.

G. Source-Available Indicating Lights: Supervise sources via transfer-switch normal- and emergency-source sensing circuits.

1. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available".
2. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available".

H. Unassigned Auxiliary Contacts: Two normally open, single-pole, double-throw contacts for each switch position, rated 10 A at 480-V ac.

I. Engine Starting Contacts: One isolated and normally closed, and one isolated and normally open; rated 10 A at 32-V dc minimum.

J. Engine Shutdown Contacts: Instantaneous; shall initiate shutdown sequence at remote engine-generator controls after retransfer of load to normal source.

K. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine generator and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods are adjustable from 10 to 30 minutes. Factory settings are for 7-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:

1. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.
2. Push-button programming control with digital display of settings.
3. Integral battery operation of time switch when normal control power is not available.

50.05 BYPASS/ISOLATION SWITCHES

A. Comply with requirements for Level 1 equipment according to NFPA 110.

B. Description: Manual type, arranged to select and connect either source of power directly to load, isolating transfer switch from load and from both power sources. Include the following features for each combined automatic transfer switch and bypass/isolation switch:

1. Means to lock the bypass/isolation switch in the position that isolates the transfer switch with an arrangement that permits complete electrical testing of transfer switch while isolated. While isolated, interlocks prevent transfer-switch operation, except for testing or maintenance.
2. Drawout Arrangement for Transfer Switch: Provides physical separation from live parts and accessibility for testing and maintenance operations.
3. Bypass/Isolation Switch Current, Voltage, Closing, and Short-Circuit Withstand Ratings: Equal to or greater than those of associated automatic transfer switch, and with same phase arrangement and number of poles.
4. Contact temperatures of bypass/isolation switches do not exceed those of automatic transfer-switch contacts when they are carrying rated load.
5. Operability: Constructed so load bypass and transfer-switch isolation can be performed by 1 person in no more than 2 operations in 15 seconds or less.
6. Legend: Manufacturer's standard legend for control labels and instruction signs give detailed operating instructions.
7. Maintainability: Fabricate to allow convenient removal of major components from front without removing other parts or main power conductors.

C. Interconnection of Bypass/Isolation Switches with Automatic Transfer Switches: Factory-installed copper bus bars; plated at connection points and braced for the indicated available short-circuit current.

50.06 FINISHES

A. Enclosures: Manufacturer's standard enamel over corrosion-resistant pretreatment and primer.

50.07 SOURCE QUALITY CONTROL

A. Factory test and inspect components, assembled switches, and associated equipment. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

PART 51 - EXECUTION

51.01 APPLICATION

A. Four-Pole Switches: Where four-pole switches are indicated, install neutral switching.

51.02 INSTALLATION

A. Comply with mounting and anchoring requirements specified in Division 26 Section "Vibration and Seismic Controls for Electrical System".

1. Concrete Bases: 4 inches high, reinforced, with chamfered edges. Extend base minimum of 4 inches in all directions beyond the maximum dimensions of switch, unless otherwise indicated. Cast anchor-bolt inserts into bases. Comply with Division 03 Section "Cast-in-Place Concrete".

B. Annunciator and Control Panel Mounting: Flush in wall, unless otherwise indicated.

C. Identify components according to Division 26 Section "Common Work Results for Electrical and Electrical Identification".

51.03 CONNECTIONS

A. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems".

B. Connect wiring according to Division 26 Section "Low Voltage Electrical Power Conductors and Cables".

C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

51.04 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:

1. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.
2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.22.3. Certify compliance with test parameters.
3. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.

    a. Check for electrical continuity of circuits and for short circuits.
    b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
    c. Verify that manual transfer warnings are properly placed.
    d. Perform manual transfer operation.

4. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.

    a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
    b. Simulate loss of phase-to-ground voltage for each phase of normal source.
    c. Verify time-delay settings.
    d. Verify pickup and dropout voltages by data readout or inspection of control settings.
    e. Test bypass/isolation unit functional modes and related automatic transfer-switch operations.
    f. Perform contact-resistance test across main contacts and correct values exceeding 500 micro-ohms and values for 1 pole deviating by more than 50 percent from other poles.
    g. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.

C. Coordinate tests with tests of generator and run them concurrently.

D. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

E. Remove and replace malfunctioning units and retest as specified above.

51.05 DEMONSTRATION

A. Engage a factory-authorized service representative to train the University's Maintenance Personnel to adjust, operate, and maintain transfer switches and related equipment as specified below. Refer to Division 01 Sections "Project Closeout" and "Demonstration and Training."

1. Coordinate this training with that for generator equipment.

***** END OF SECTION *****

SECTION 32 3200

ALLAN BLOCK MODULAR RETAINING WALL SYSTEMS

PART 1: GENERAL

1.1 Scope

Work includes furnishing and installing modular concrete block retaining wall units to the lines and grades designated on the construction drawings and as specified herein.

1.2 Applicable Sections of Related Work

Section 2: Geogrid Wall Reinforcement

1.3 Reference Standards

A. ASTM C1372 Standard Specification for Segmental Retaining Wall Units.
B. ASTM C1262 Evaluating the Freeze thaw Durability of Manufactured CMU's and Related concrete Units
C. ASTM D698 Moisture Density Relationship for Soils, Standard Method
D. ASTM D422 Gradation of Soils
E. ASTM C140 Sample and Testing concrete Masonry Units

1.4 Delivery, Storage, and Handling

A. Contractor shall check the materials upon delivery to assure proper material has been received.
B. Contractor shall prevent excessive mud, cementitious material, and like construction debris from coming in contact with the materials.
C. Contractor shall protect the materials from damage. Damaged material shall not be incorporated in the project (ASTM C1372).

1.5 Contractor Requirements

Contractors shall be trained and certified by local manufacturer or equivalent accredited organization.

A. Allan Block and NCMA have certification programs that are accredited. Identify when advanced certification levels are appropriate based on complexity and criticality of project application.
B. Contractors shall provide a list of projects they have completed.

PART 2: MATERIALS

2.1 Modular Wall Units

A. Wall units shall be Allan Block Retaining Wall units as produced by a licensed manufacturer.
B. Wall units shall have minimum 28-day compressive strength of 3000 psi (20.7 MPa) in accordance with ASTM C1372. The concrete units shall have adequate freeze-thaw protection with an average absorption rate in accordance with ASTM C1372 or an average absorption rate of 7.5 lb./ft³ (120 kg/m³) for northern climates and 10 lb./ft³ (160 kg/m³) for southern climates.
C. Exterior dimensions shall be uniform and consistent. Maximum dimensional deviations on the height of any two units shall be 0.125 in. (3 mm).
D. Wall units shall provide a minimum of 110 lbs total weight per square foot of wall face area (555 kg/m²). Hollow cores to be filled with wall rock and compacted by using plate compactor on top of wall units (see section 3.4). Unit weight of wall rock in cores may be less than 100% depending on compaction levels.
E. Exterior face shall be textured. Color as specified by owner.
F. Freeze Thaw Durability: Like all concrete products, dry-cast concrete SRW units are susceptible to freeze-thaw degradation with exposure to de-icing salts and cold temperature. This is a concern in northern tier states or countries that use deicing salts. Based on good performance experience by several agencies, ASTM C1372, or equivalent governing standard or public authority, Standard Specification for Segmental Retaining Wall Units should be used as a model, except that, to increase durability, the compressive strength for the units should be increased to a minimum of 4,000 – 5,800 psi (28 - 40 MPa) unless local requirements dictate higher levels. Also, maximum water absorption should be reduced and requirements for freeze-thaw testing increased.
    a. Require a current passing ASTM C1262 or equivalent governing standard or public authority, test report from material supplier in northern or cold weather climates.
    b. See the Best Practices for SRW Design document for detailed information on freeze thaw durability testing criteria and regional temperature and exposure severity figures and tables to define the appropriate zone and requirements for the project.

2.2 Wall Rock

A. Material must be well-graded compactable aggregate, 0.25 in. to 1.5 in., (6 mm - 38 mm) with no more than 10% passing the #200 sieve. (ASTM D422)
B. Material behind and within the blocks may be the same material.

2.3 Infill Soil

A. Infill material shall be site excavated soils when approved by a soils engineer. Unsuitable soils for backfill (heavy clays or organic soils) shall not be used in the reinforced soil mass. Fine grained cohesive soils (ϕ less than 31° (Ref)) may be used in wall construction, but additional backfilling, compaction and water management efforts are required. Poorly graded sands, expansive clays and/or soils with a plasticity index (PI) greater than 20 or a liquid limit (LL) greater than 40 should not be used in wall construction.
B. The infill soil used must meet or exceed the designed friction angle and description noted on the design cross sections and must be free of debris and consist of one of the following inorganic USCS soil types: GP, GW, SW, SP, GP-GM or SP-SM meeting the following gradation as determined in accordance with ASTM D422.

Sieve Size	Percent Passing
1 inch (25 mm)	100 – 75
No. 4 (4.75 mm)	100 – 20
No. 40 (0.425 mm)	0 - 60
No. 200 (0.075 mm)	0 - 35

C. Where additional fill is required, contractor shall submit sample and specifications to the wall design engineer, or soils engineer for approval and the approving engineer must certify that the soils proposed for use has properties meeting or exceeding original design standards.

PART 3: WALL CONSTRUCTION

3.1 Excavation

A. Contractor shall excavate to the lines and grades shown on the construction drawings. Contractor shall use caution not to over-excavate beyond the lines shown, or to disturb the base elevations beyond those shown.
B. Contractor shall verify locations of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation.

3.2 Foundation Soil Preparation

A. Foundation soil shall be defined as any soils located beneath a wall.
B. Foundation soil shall be excavated as dimensioned on the plans and compacted to a minimum of 95% of Standard Proctor (ASTM D698) prior to placement of the base material.
C. Foundation soil shall be examined by a soils engineer to ensure that the actual foundation soil strength meets or exceeds assumed design strength. Soil not meeting the required strength shall be removed and replaced with acceptable material.

3.3 Base

A. The base material shall be the same as the Wall Rock material (Section 2.2) or a low permeable granular material.
B. Base material shall be placed as shown on the construction drawing. Top of base shall be located to allow bottom wall units to be buried to proper depths as per wall heights and specifications.
C. Base material shall be installed on undisturbed native soils or suitable replacement fills compacted to a minimum of 95% Standard Proctor (ASTM D698).
D. Base shall be compacted at 95% Standard Proctor (ASTM D698) to provide a level hard surface on which to place the first course of blocks. The base shall be constructed to ensure proper wall embedment and the final elevation shown on the plans. Well-graded sand can be used to smooth the top 1/2 in. (13 mm) on the base material.
E. Base material shall be a 4 in. (100 mm) minimum depth for walls under 4 ft. (1.2 m) and a 6 in. (150 mm) minimum depth for walls over 4 ft. (1.2 m).
F. Base material should be installed to allow for a minimum of one buried block to be extended into the slope to prevent erosion.

3.4 Unit Installation

A. Install units in accordance with the manufacturer's instructions and recommendations for the specific concrete retaining wall unit, and as specified herein.
B. Ensure that units are in full contact with base. Proper care shall be taken to develop straight lines and smooth curves on base course as per wall layout.
C. Fill all cores and cavities and a minimum of 12 in. (300 mm) behind the base course with wall rock. Use infill soils behind the wall rock and approved soils in front of the base course to firmly lock in place. Check again for level and alignment. Use a plate compactor to consolidate the area behind the base course. All excess material shall be swept from top of units.
D. Install next course of wall units on top of base course. Position blocks to be offset from seams of blocks below. Perfect "running bond" is not essential, but a 3 in. (75 mm) minimum offset is recommended. Check each block for proper alignment and level. Fill all cavities in and around wall units and to a minimum of 12 in. (300 mm) depth behind block with wall rock. Block, wall rock and infill soil placed in uniform lifts not exceeding 8 in. (200 mm). Compaction requirements for all soils in areas in, around and behind the reinforced mass shall be compacted to 95% of maximum Standard Proctor dry density (ASTM D698) with a moisture content control of +1% to -3% of optimum.
E. For taller wall applications, structural fill should be specified for a minimum bottom 1/3 to 1/2 of the reinforced fill. If structural fill is not utilized in the reinforced mass, the depth of wall rock behind the block should be increased. See the Best Practices for SRW Design document for more information.
F. The consolidation zone shall be defined as 3 ft (0.9 m) behind the wall. Compaction within the consolidation zone shall be accomplished by using a hand operated plate compactor and shall begin by running the plate compactor directly on the block and then compacting in parallel paths from the wall face until the entire consolidation zone has been compacted. A minimum of two passes of the plate compactor are required with maximum lifts of 8 in. (200 mm). Expansive or fine-grained soils may require additional compaction passes and/or specific compaction equipment such as a sheepsfoot roller. Maximum lifts of 4 in. (100 mm) may be required to achieve adequate compaction within the consolidation zone. Employ methods

using lightweight compaction equipment that will not disrupt the stability or batter of the wall. Final compaction requirements in the consolidation zone shall be established by the engineer of record.

G. Install each subsequent course in like manner. Repeat procedure to the extent of wall height. Individual course height may vary due to allowable block manufacturing tolerances per ATSM C1372. Contractor must verify wall height, if noted as being critical, prior to completion of construction to ensure the elevation of the top of the wall or the controlling elevation matches desired plan elevation, if noted as critical. Contractor must follow this method for single walls or walls that branch off into a terraced orientation.

H. As with any construction work, some deviation from construction drawing alignments will occur. Variability in construction of SRWs is approximately equal to that of cast-in-place concrete retaining walls. As opposed to cast-in-place concrete walls, alignment of SRWs can be simply corrected or modified during construction. Based upon examination of numerous completed SRWs, the following recommended minimum tolerances can be achieved with good construction techniques.

Vertical Control - ±1.25 in. (32 mm) max over 10 ft. (3 m) distance

Horizontal Location Control - straight lines ±1.25 in. (32 mm) over a 10 ft. (3 m) distance

Rotation - from established plan wall batter: ±2.0°

3.5 Additional Construction Notes

A. When one wall branches into two terraced walls, it is important to note that the soil behind the lower wall is also the foundation soil beneath the upper wall. This soil shall be compacted to a minimum of 95% of Standard Proctor (ASTM D698) prior to placement of the base material. Achieving proper compaction in the soil beneath an upper terrace prevents settlement and deformation of the upper wall. One way is to replace the soil with wall rock and compact in 8 in. (200 mm) lifts. When using on-site soils, compact in maximum lifts of 4 in. (100 mm) or as required to achieve specified compaction.

B. Vertical filter fabric use is not suggested for use with cohesive soils. Clogging of such fabric creates unacceptable hydrostatic pressures in soil reinforced structures. When filtration is deemed necessary in cohesive soils, use a three-dimensional filtration system of clean sand or filtration aggregate. Vertical filter fabric may be used to separate wall rock zone from fine grained, sandy infill soils if the design engineer deems it necessary based on potential water migration from above or below grade, through the reinforced zone into the wall rock on the project. Horizontal filter fabric should be placed above the wall rock column to prevent soils from above migrating into the wall rock column.

C. Embankment protection fabric is used to stabilize rip rap and foundation soils in water applications and to separate infill materials from the retained soils. This fabric should permit the passage of fines to preclude clogging of the material. Embankment protection fabric shall be a high strength polypropylene monofilament material designed to meet or exceed typical NTPEP specifications; stabilized against ultraviolet (UV) degradation and typically exceeding the values in Section 3, Table 1 in the AB Spec Book.

D. Water management is of extreme concern during and after construction. Steps must be taken to ensure that drainpipes are properly installed and vented to daylight or connected to an underground drainage system and a grading plan has been developed that routes water away

from the retaining wall location. Site water management is required both during construction of the wall and after completion of construction.

Consult the Allan Block Engineering Department for details at 800-899-5309.

Specifications are subject to change without notice; this was last updated on 4/26/2021.

***** END OF SECTION *****

SECTION 32 3201

GEOGRID REINFORCEMENT SYSTEMS

PART 1: GENERAL

1.1 Scope

Work includes furnishings and installing geogrid reinforcement, wall block, and backfill to the lines and grades designated on the construction drawings and as specified herein.

1.2 Applicable Section of Related Work

Section 1: Allan Block Modular Retaining Wall Systems.

1.3 Reference Standards

See specific geogrid manufacturer's reference standards.

Additional Standards:

A. ASTM D4595 - Tensile Properties of Geotextiles by the Wide-Width Strip Method
B. ASTM D5262 - Test Method for Evaluating the Unconfined Creep Behavior of Geogrids
C. ASTM D6638 Grid Connection Strength (SRW-U1)
D. ASTM D6916 SRW Block Shear Strength (SRW-U2)
E. GRI-GG4 - Grid Long Term Allowable Design Strength (LTADS)
F. ASTM D6706 - Grid Pullout of Soil

1.4 Delivery, Storage, and Handling

A. Contractor shall check the geogrid upon delivery to assure that the proper material has been received.
B. Geogrid shall be stored above -10 F (-23 C).
C. Contractor shall prevent excessive mud, cementitious material, or other foreign materials from coming in contact with the geogrid material.

PART 2: MATERIALS

2.1 Definitions

A. Geogrid products shall be of high-density polyethylene or polyester yarns encapsulated in a protective coating specifically fabricated for use as a soil reinforcement material.
B. Concrete retaining wall units are as detailed on the drawings and shall be Allan Block Retaining Wall Units.
C. Drainage material is free draining granular material as defined in Section 1, 2.2 Wall Rock.
D. Infill soil is the soil used as fill for the reinforced soil mass.
E. Foundation soil is the in-situ soil.

2.2 Products

Geogrid shall be the type as shown on the drawings having the property requirements as described within the manufacturer’s specifications.

2.3 Acceptable Manufacturers

A manufacturer's product shall be approved by the wall design engineer.

PART 3: WALL CONSTRUCTION

3.1 Foundation Soil Preparation

A. Foundation soil shall be excavated to the lines and grades as shown on the construction drawings, or as directed by a soils engineer.
B. Foundation soil shall be examined by a soils engineer to assure that the actual foundation soil strength meets or exceeds assumed design strength.
C. Over-excavated areas shall be filled with compacted backfill material approved by a soils engineer.

D. Contractor shall verify locations of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation.

3.2 Wall Construction

Wall construction shall be as specified under Section 1, Part 3; Wall Construction.

3.3 Geogrid Installation

A. Install Allan Block wall to designated height of first geogrid layer. Backfill and compact the wall rock and infill soil in layers not to exceed 8 in. (200 mm) lifts behind wall to depth equal to designed grid length before grid is installed.
B. Cut geogrid to designed embedment length and place on top of the Allan Block units to back edge of the raised front lip or within 1 in. (25 mm) of the concrete retaining wall face when using AB Fieldstone. Extend away from wall approximately 3% above horizontal on compacted infill soils.
C. Lay geogrid at the proper elevation and orientations shown on the construction drawings or as directed by the wall design engineer.
D. Correct orientation of the geogrid shall be verified by the contractor and a soils engineer. Strength direction is typically perpendicular to wall face.
E. Follow manufacturer's guidelines for overlap requirements. In curves and corners, layout shall be as specified in in Design Detail: Using Grid with Corners and Curves, in the AB Spec Book.
F. Place next course of Allan Block on top of grid and fill block cores with wall rock to lock in place. Remove slack and folds in grid and stake to hold in place.
G. Adjacent sheets of geogrid shall be butted against each other at the wall face to achieve 100 percent coverage.
H. Geogrid lengths shall be continuous. Splicing parallel to the wall face is not allowed.

3.4 Fill Placement

A. Infill soil shall be placed in lifts and compacted as specified under Section 1, Part 3.4, Unit Installation.
B. Infill soil shall be placed, spread and compacted in such a manner that minimizes the development of slack or movement of the geogrid.
C. Only hand-operated compaction equipment shall be allowed within 3 ft. (0.9 m) behind the wall. This area shall be defined as the consolidation zone. Compaction in this zone shall begin by running the plate compactor directly on the block and then compacting in parallel paths from the wall face back, until the entire consolidation zone has been compacted. A minimum of two passes of the plate compactor are required with maximum lifts of 8 in. (200 mm). Section 1, Part 3.4 E, Page 3.
D. When fill is placed and compaction cannot be defined in terms of Standard Proctor Density, then compaction shall be performed using ordinary compaction process and compacted so

that no deformation is observed from the compaction equipment or to the satisfaction of the engineer of record or the site soils engineer.

E. Tracked construction equipment shall not be operated directly on the geogrid. A minimum fill thickness of 6 in. (150 mm) is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
F. Rubber-tired equipment may pass over the geogrid reinforcement at slow speeds, less than 10 mph (16 Km/h). Sudden braking and sharp turning shall be avoided.
G. The infill soil shall be compacted to achieve 95% Standard Proctor (ASTM D698). Soil tests of the infill soil shall be submitted to a soils engineer for review and approval prior to the placement of any material. The contractor is responsible for achieving the specified compaction requirements. A soils engineer may direct the contractor to remove, correct or amend any soil found not in compliance with these written specifications.
H. An independent testing firm should be hired by the owner to provide services.
I. Independent firm to keep inspection log and provide written reports at predetermined intervals to the owner.
J. Testing frequency should be set to establish a proper compaction protocol to consistently achieve the minimum compaction requirements set by the design requirements. If full time inspection and testing at 8 inch (20 cm) lifts is not provided, then the following testing frequency should be followed:
    a. One test for every 8 inches (20 cm) of vertical fill placed and compacted, for every 25 lineal feet (7.6 m) of retaining wall length, starting on the first course of block.
    b. Vary compaction test locations to cover the entire area of reinforced zone; including the area compacted by the hand-operated compaction equipment.
    c. Once protocol is deemed acceptable, testing can be conducted randomly at locations and frequencies determined by a soils engineer.
K. Slopes above the wall must be compacted and checked in a similar manner.

3.5 Special Considerations

A. Geogrid can be interrupted by periodic penetration of a column, pier or footing structure.
B. Fence post or railings should be positioned 3 ft. (0.9 m) behind the top course to allow proper overturning design. Fence posts within 3 ft. (0.9 m) need to consider the local overturning forces applied to the wall facing.
C. If site conditions will not allow geogrid embedment length, consider the following alternatives:

- Masonry Reinforced Walls
- Increased Wall Batter
- Double Allan Block Wall
- No-Fines Concrete
- Soil Nailing
- Earth Anchors
- Rock Bolts

See Design Details Page 16 and 17 of the AB Spec Book.

D. Allan Block walls will accept vertical and horizontal reinforcing with rebar and grout. A grouted connection could be used with geogrid reinforcement if needed.
E. For masonry reinforced walls, block modification may be necessary to allow for rebar placement. Masonry wall and parapet design and construction requires site specific analysis for every wall case.
F. Allan Block may be used in a wide variety of water applications as indicated in Water Management, Part 7.8.

Consult the Allan Block Engineering Department for details at 800-899-5309.

Specifications are subject to change without notice; this was last updated on 4/26/2021.

***** END OF SECTION *****

SECTION 32 3202

WATER MANAGEMENT

PART 1: GENERAL DRAINAGE

1.1 Surface Drainage

Rainfall or other water sources such as irrigation activities collected by the ground surface atop the retaining wall can be defined as surface water. Retaining wall design shall take into consideration the management of this water.

A. At the end of each day's construction and at final completion, grade the backfill to avoid water accumulation behind the wall or in the reinforced zone.
B. Surface water must not be allowed to pond or be trapped in the area above the wall or at the toe of the wall.
C. Existing slopes adjacent to retaining wall or slopes created during the grading process shall include drainage details so that surface water will not be allowed to drain over the top of the slope face and/or wall. This may require a combination of berms and surface drainage ditches.
D. Irrigation activities at the site shall be done in a controlled and reasonable manner. If an irrigation system is employed, the design engineer or irrigation manufacturer shall provide details and specification for required equipment to ensure against over irrigation which could damage the structural integrity of the retaining wall system.
E. Surface water that cannot be diverted from the wall must be collected with surface drainage swales and drained laterally in order to disperse the water around the wall structure. Construction of a typical swale system shall be in accordance with Design Detail 5: Swales, of the AB Spec Book.

1.2 Grading

The shaping and re-contouring of land in order to prepare it for site development is grading. Site grading shall be designed to route water around the walls.

A. Establish final grade with a positive gradient away from the wall structure. Concentrations of surface water runoff shall be managed by providing necessary structures, such as paved ditches, drainage swales, catch basins, etc.
B. Grading designs must divert sources of concentrated surface flow, such as parking lots, away from the wall.

1.3 Drainage System

The internal drainage systems of the retaining wall can be described as the means of eliminating the buildup of incidental water which infiltrates the soils behind the wall. Drainage system design will be a function of the water conditions on the site. Possible drainage facilities include Toe and Heel drainage collection pipes and blanket or chimney rock drains or others. Design engineer shall determine the required drainage facilities to completely drain the retaining wall structure for each particular site condition.

A. All walls will be constructed with a minimum of 12 in. (300 mm) of wall rock directly behind the wall facing. The material shall meet or exceed the specification for wall rock outlined in Section 1, 2.2 Wall Rock.
B. The drainage collection pipe, drain pipe, shall be a 4 in. (100 mm) perforated or slotted PVC, or corrugated HDPE pipe as approved by engineer of record.
C. All walls will be constructed with a 4 in. (100 mm) diameter drain pipe placed at the lowest possible elevation within the 12 in. (300 mm) of wall rock. This drain pipe is referred to as a toe drain, Section 3, 1.4 Toe Drain.
D. Geogrid Reinforced Walls shall be constructed with an additional 4 in. (100 mm) drain pipe at the back bottom of the reinforced soil mass. This drain pipe is referred to as a heel drain, Section 3, 1.5 Heel Drain

1.4 Toe Drain

A toe drain pipe should be located at the back of the wall rock behind the wall as close to the bottom of the wall as allowed while still maintaining a positive gradient for drainage to daylight, or a storm water management system. Toe drains are installed for incidental water management not as a primary drainage system.

A. For site configurations with bottoms of the base on a level plane it is recommended that a minimum one percent gradient be maintained on the placement of the pipe with outlets on 50 ft. (15 m) centers, or 100 ft. (30 m) centers if pipe is crowned between the outlets. This would provide for a maximum height above the bottom of the base in a flat configuration of no more than 6 in. (150 mm).

B. For rigid drain pipes with drain holes the pipes should be positioned with the holes located down. Allan Block does not require that toe drain pipes be wrapped when installed into base rock complying with the specified wall rock material.
C. Pipes shall be routed to storm drains where appropriate or through or under the wall at low points when the job site grading and site layout allows for routing. Appropriate details shall be included to prevent pipes from being crushed, plugged, or infested with rodents.
D. On sites where the natural drop in grade exceeds the one percent minimum, drain pipes outlets shall be on 100 foot (30 m) centers maximum. This will provide outlets in the event that excessive water flow exceeds the capacity of pipe over long stretches.
E. Drain pipe must be raised to accommodate outlets through the wall face when daylighting below grade is not possible. Refer to the Design Detail 4: Alternate Drain, of the AB Spec Book.

1.5 Heel Drain

The purpose of the heel drain is to pick up any water that migrates from behind the retaining wall structure at the cut and route the water away from the reinforced mass during the construction process and for incidental water for the life of the structure.

A. The piping used at the back of the reinforced mass shall have a one percent minimum gradient over the length, but it is not critical for it to be positioned at the very bottom of the cut. The heel drain should be vented at 100 ft (30 m) intervals along the entire length of the wall and should not be tied into the toe drain system.
B. The pipe may be a rigid pipe with holes at the bottom with an integral sock encasing the pipe or a corrugated perforated flexible pipe with a sock to filter out fines when required based on soil conditions. For infill soils with a high percentage of sand and/or gravel the heel drain pipe does not need to be surrounded by wall rock. When working with soils containing fine grained cohesive soils having a PI of greater than 6 and LL of 30 or greater, 1 ft^3. (0.03 m^3) of drainage rock is required around the pipe for each 1 ft. (30 cm) of pipe length.

1.6 Ground Water

Ground water can be defined as water that occurs within the soil. It may be present because of surface infiltration or water table fluctuation. Ground water movement must not be allowed to come in contact with the retaining wall.

A. If water is encountered in the area of the wall during excavation or construction, a drainage system (chimney, composite or blanket) must be installed as directed by the wall design engineer.
B. Standard retaining wall designs do not include hydrostatic forces associated with the presence of ground water. If adequate drainage is not provided the retaining wall design must consider the presence of the water.
C. When non-free draining soils (soils with friction angles less than 30 degrees) are used in the reinforced zone, the incorporation of a chimney and blanket drain should be added to minimize the water penetration into the reinforced mass. Refer to Design Detail 6: Chimney and Blanket Drain, of the AB Spec Book.

a. Drain material to be consistent with wall rock material. For more information on wall rock material see Specification Guidelines: Allan Block Modular Retaining Wall Systems, section 2.1.
b. Manufactured chimney and blanket drains to be approved by the geotechnical and/or the local engineer of record prior to use.

1.7 Concentrated Water Sources

All collection devices such as roof downspouts, storm sewers, and curb gutters are concentrated water sources. They must be designed to accommodate maximum flow rates and to vent outside of the wall area.

A. All roof downspouts of nearby structures shall be sized with adequate capacity to carry storm water from the roof away from the wall area. They shall be connected to a drainage system in closed pipe and routed around the retaining wall area.
B. Site layout must take into account locations of retaining wall structures and all site drainage paths. Drainage paths should always be away from retaining wall structures.
C. Storm sewers and catch basins shall be located away from retaining wall structures and designed so as not to introduce any incidental water into the reinforced soil mass.
D. A path to route storm sewer overflow must be incorporated into the site layout to direct water away from the retaining wall structure.

1.8 Water Application

Retaining walls constructed in conditions that allow standing or moving water to come in contact with the wall face are considered water applications. These walls require specific design and construction steps to ensure performance. Refer to Design Detail 7 and 8: Water Applications, of the AB Spec Book.

A. The wall rock should be placed to the limits of the geogrid lengths up to a height equal to 12 inches (30 cm) higher than the determined high water mark. If the high water mark is unknown, the entire infill zone should be constructed with wall rock.
B. The drain pipe should be raised to the low water elevation to aid in the evacuation of water from the reinforced mass as water level fluctuates.
C. Embankment protection fabric should be used under the infill mass and up the back of the infill mass to a height of 12 inches (30 cm) higher than the determined high water mark.
   a. Embankment protection fabric is used to stabilize rip rap and foundation soils in water applications and to separate infill materials from the retained soils. This fabric should permit the passage of fines to preclude clogging of the material. Embankment protection fabric shall be a high strength polypropylene monofilament material designed to meet or exceed typical NTPEP specifications; stabilized against ultraviolet (UV) degradation and typically meets or exceeds the values in Table 1.

Table 1: Embankment Protection Fabric Specifications

Mechanical Property	Determination Method
Tensile Strength = 225 lbs. (39.4 kN/m)	ASTM D-4595
Puncture Strength = 950 lbs. (4228 N)	ASTM D-6241
Apparent Opening Size (AOS) = U.S. Sieve #70 (0.212 mm)	ASTM D-4751
Trapezoidal Tear = 100 lbs. (445 N)	ASTM D-4533
Percent Open Area = 4%	COE-02215
Permeability = 0.01 cm/sec	ASTM D-4491

D. For walls having moving water or wave action, natural or manufactured rip-rap in front of the wall to protect the toe of the wall from scour effects is recommended.

Consult the Allan Block Engineering Department for details at 800-899-5309.

Specifications are subject to change without notice; this was last updated on 4/26/2021.

***** END OF SECTION *****