GLENN COUNTY

Notice to Bidders

Glenn County Transfer Station Backup Generator Project

Glenn County Transfer Station
5700 County Road 33
Artois, CA 95913

Bids Open: **June 5, 2024**
10:00 a.m.
Pacific Standard Time

GLENN COUNTY
Public Works Agency
777 North Colusa Street
Willows, CA 95988

Mailing Address:
P.O. Box 1070
Willows, CA 95988

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PROJECT DIRECTORY

Owner:
Glenn County Board of Supervisors
525 W. Sycamore Street, Suite B1
Willows, CA 95988
Contact: Scott H. DeMoss, County Administrative Officer
Email: gcboard@countyofglenn.net
Phone: (530) 934-6400

Owner Representative:
Glenn County Public Works Agency
777 N. Colusa Street
Willows, CA 95988
Contact: Talia Richardson, Deputy Director of Public Works
Email: trichardson@countyofglenn.net
Phone: (530) 934-6530

Construction Manager:
Lawrence & Associates
3590 Iron Court
Shasta Lake, CA 96019
Contacts: Darren Langfield
Karl Swanson
Clayton Coles
Emails: dlangfield@lwrnc.com
kswanson@lwrnc.com
ccoles@lwrnc.com
Phone: (530) 275-4800

Design Engineer:
Pace Engineering
5155 Venture Parkway
Redding, CA 96002
Contacts: Bryan Barnes (Electrical Engineer)
Eli Jurisich (Structural Engineer)
Emails: bbarnes@paceengineering.us
ejurisich@paceengineering.us
Phone: (530) 244-0202

SECTION 00 10 00
INVITATION TO BID – NOTICE TO BIDDERS
Glenn County

Transfer Station Backup Generator

BID SUBMISSION. Glenn County will receive sealed Bids no later than **10:00 a.m. on June 5, 2024 at 777 North Colusa Street, Willows, CA 95988**. All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the Glenn County Public Works Agency and shall be identified with the Project name, Glenn County Transfer Station Backup Generator the Bidder's name, the Bidder's Department of Industrial Relations number, and address. 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.
Bids shall be properly and completely executed on bid forms included in the Specifications.

DESCRIPTION OF WORK. The project location is 5700 County Road 33, Artois, CA 95913. Glenn County intends to award a construction contract which includes the furnishing of all labor, materials, equipment, transportation and services necessary for the completion of the project. A summary of the work is included below:

Work of the Contract is summarized as follows: Provide all labor, equipment and materials to purchase and install a new 80 kilowatt (kW) diesel-powered generator, concrete pad, switch gear, trenching, conduit, wire conductors, modifications to existing main electrical panel and provide and install a new fire-pump panel for the Glenn County Transfer Station. Specific details included in the bid package shall further define the description of work.

ADDENDA/BIDDERS LIST. All questions shall be submitted in writing to the County Representative, Design Engineer and Construction Manager by email no later than May 22, 2024 at 5:00 p.m. All questions will be answered via addenda by May 24, 2024.

It is the responsibility of all bidders to contact the County and Construction Manager to have their contact information added to the "Bidders List." Only bidders that are on the Bidders List will be sent addenda.

PUBLIC OPENING. Bids received prior the stated deadline shall be opened and publicly read on June 5, 2024 10:01 a.m. at 777 North Colusa Street, Willows, CA 95988. All interested citizens are invited to attend, and should any citizens require special provisions, such as handicapped modifications or non-English translation personnel, the County of Glenn will provide such provisions as long as the request is made by May 29, 2024 at 5:00 p.m.

AWARD. Award will be made to the lowest, responsive, responsible bidder. The low, responsive, responsible bidder must not be debarred, suspended, or otherwise be excluded from or ineligible for participation in federally assisted programs under Executive Order 12549. The Owner may make such investigations as deemed necessary to determine the ability of the Bidder to perform the work and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such

Bidder is properly qualified to carry out the obligations of the Agreement and to complete the work contemplated therein.

The Owner reserves the right to reject any bid, or all bids and to waive any and all informalities in bidding. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. The Project is anticipated to be awarded by July 9, 2024.

BID DOCUMENTS. Contract Documents may be attained at the Glenn County Public Works Agency, 777 North Colusa Street Willows, CA 95988, between the hours of 8:00 a.m. – 5:00 p.m., Monday through Friday for a fee of $100.00. The project documents are also available free of charge on the County's website at: https://www.countyofglenn.net/govt/bids

CONTACT INFORMATION.
Glenn County Public Works Agency
777 North Colusa Street Willows
Willows, CA 95988
Contact: Talia Richardson
Email: trichardson@countyofglenn.net
Phone: (530) 934-6530

NON-MANDATORY PRE-BID SITE VISIT. A non-mandatory project walk-through will be conducted on **May 15, 2024 at 10:00 a.m.** at the Glenn County Transfer Station, 5700 County Road 33, Artois, CA 95913.

BONDS. Each bid shall be accompanied by a certified check or acceptable bidder's bond made payable to the Owner, in a sum of not less than ten percent (10%) of the total amount of the highest aggregate bid, which check or bond will be held by the Owner as evidence that the bidder will, if awarded the contract, enter into the same with the Owner upon notification from him to do so within ten (10) days of said notification. Approved performance and payment bonds guaranteeing faithful and proper performance of the work and materials, to be executed by an acceptable surety company, will be required of the Contractor at the time of contract execution. The bonds will be in the amount of 100% of the Contract Price and must be in full force and effect throughout the term of the Construction Contract plus a period of twelve (12) months from the date of substantial completion.

PREVAILING WAGE / LABOR COMPLIANCE. This project will be under prevailing wage requirements. Refer to Senate Bill (SB) 854 for recent changes to the laws governing how the Department of Industrial Relations (DIR) monitors compliance with prevailing wage requirements on public works projects. All contractors and subcontractors are required to following these new laws and include all cost as part of the base bid. No contractor or subcontractor may be listed on a bid proposal for public work on a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

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

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations (DIR). The General Contractor must post job site notices prescribed by regulation. [See 8 Calif. Code Reg. §16451(d) for the notice that previously was required for projects monitored by the Compliance Monitoring Unit (CMU).] All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement).

Per Senate Bill 854, the County of Glenn will notify the Department of Industrial Relations that we have awarded a construction contract using the online form PWC-100.

This contract requires compliance with the Davis-Bacon and Related Acts and adherence to the current U.S. Department of Labor Wage Decision. The Contractor must comply with the minimum rates for wages for laborers and mechanics as determined by the Secretary of Labor in accordance with the provisions of the Davis-Bacon and Related Acts. Attention is called to the fact that not less than the minimum salaries and wages set forth in the Contract Documents must be paid on this project. This is a Public Works Project subject to the higher rate of Davis Bacon wages and the prevailing wages as established by the California Department of Industrial Relations. Bidders are notified that the higher of either the Davis-Bacon or the State prevailing wage rate shall apply.

STATE AND FEDERAL REQUIREMENTS: Bidders on this work shall be required to comply with the provisions of the President's Executive Order No. 11246, as amended. The Bidders shall also comply with the requirements of 41 CFR Part 60 - 4 entitled Construction Contractors - Affirmative Action Requirements. A copy of 41 CFR Part 60 - 4 may be found in the Supplemental General Conditions of the Contract Documents and Specifications. The Bidders attention is also called to the "Minority/Women Business Participation" requirements contained in the Project Specifications. The California Department of Housing and Community Development encourages grantees to contract with MBE/WBE businesses when possible. The Contractor must meet guidelines and practices established by the Department of Housing and Community Development and appropriate federal regulations including: 1) Executive Order 11246, 2) Section 3 of the Housing and Community Development Act of 1968, as amended, 3) Certification of Non-Segregated Facilities, 4) OMB Circular A-102, 5) Title VI of the Civil Rights Act of 1964, 6) Section 504, Rehabilitation Act of 1973, 7) Age Discrimination Act of 1975, 8) Executive Order 12138, 9) Conflict of Interest Clause, 10) Retention and Custodial Requirements for Records Clause, 11) Contractors and Subcontractors Certifications, and others that may be appropriate or necessary. Contract procurement is subject to the federal regulations contained in 2 CFR 200. Any contract(s) awarded under this Advertisement for Bids are expected to be funded in part by a grant from the Department of Housing and Urban Development, as administered by the California Department of Housing and Community Development. Neither the United States nor any of its departments, agencies or employees is or will be a party to this Advertisement for Bids or any resulting contract.

PROJECT SITE LOCATION MAP

Glenn County Transfer Station Backup Generator Project
5700 County Road 33, Artois, CA 95913

N

ASSESSOR PARCEL NUMBERS: 024-220-016 and 024-220-005

SECTION 00 21 00
INSTRUCTIONS TO BIDDERS

Owner:
Glenn County Board of Supervisors
525 W. Sycamore Street, Suite B1
Willows, CA 95988
Contact: Scott H. DeMoss, County Administrative Officer
Email: gcboard@countyofglenn.net
Phone: (530) 934-6400

Owner Representative:
Glenn County Public Works Agency
777 N. Colusa Street
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Contact: Talia Richardson, Deputy Director of Public Works
Email: trichardson@countyofglenn.net
Phone: (530) 934-6530

Construction Manager:
Lawrence & Associates
3590 Iron Court
Shasta Lake, CA 96019
Contacts: Darren Langfield
Karl Swanson
Clayton Coles
Emails: dlangfield@lwrnc.com
kswanson@lwrnc.com
ccoles@lwrnc.com
Phone: (530) 275-4800

Design Engineer:
Pace Engineering
5155 Venture Parkway
Redding, CA 96002
Contacts: Bryan Barnes (Electrical Engineer)
Eli Jurisich (Structural Engineer)
Emails: bbarnes@paceengineering.us
ejurisich@paceengineering.us
Phone: (530) 244-0202

TABLE OF ARTICLES

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents, The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

§ 1.2 Definitions set forth in the Contract Documents are applicable to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Construction Manager prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 The Bidder by making a Bid represents that:

§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

§ 2.1.2 The Bid is made in compliance with the Bidding Documents.

§ 2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

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

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 or Invitation to Bid in the number and for the deposit sum, if any, stated therein.

§ 3.1.2 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instructions to bidders.

§ 3.1.3 Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner, Construction Manager nor Engineer assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

§ 3.1.4 The Owner and Construction Manager may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

§ 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

§ 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Construction Manager errors, inconsistencies or ambiguities discovered.

§ 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Construction Manager by the date and time indicated in the Supplementary Instructions to bidders.

§ 3.2.3 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

§ 3.3 SUBSTITUTIONS

§ 3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

§ 3.3.2 No substitution will be considered unless prior to receipt of Bids a written request for approval has been received by the Construction Manager for Engineer and Owner review at least ten (10) days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the

Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Engineer's and Construction Manager's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.3 If the Engineer and Construction Manager approve a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

§ 3.3.4 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 ADDENDA

§ 3.4.1 Addenda will be transmitted to all who are known by the issuing office to have received a complete set of Bidding Documents.

§ 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

§ 3.4.3 Addenda will be issued no later than four (4) days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 PREPARATION OF BIDS

§ 4.1.1 Bids shall be submitted on the forms included with the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

§ 4.1.4 Interlineations, alterations and erasures must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

§ 4.2 BID SECURITY

§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instructions to Bidders. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 If a surety bond is required, it shall be as provided in the Bidding Documents.

§ 4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

§ 4.3 SUBMISSION OF BIDS

§ 4.3.1 All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name, the Bidder’s Department of Industrial Relations number, and address and, if applicable, the designated portion of the Work 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.

§ 4.3.2 Bids shall be deposited at 777 North Colusa Street, Willows, CA 95988 prior to 10:00 a.m. on June 5, 2024. Bids received after the time and date for receipt of Bids may be rejected.

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

§ 4.3.4 Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

§ 4.4 MODIFICATION OR WITHDRAWAL OF BID

§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

§ 4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

§ 4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

§ 4.4.4 Bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 OPENING OF BIDS

Bids will be unsealed and opened in a Public Bid Opening, held at 777 North Colusa Street, Willows, CA 95988 at 10:01 a.m. on June 5, 2024.

§ 5.2 REJECTION OF BIDS

The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

§ 5.3 ACCEPTANCE OF BID (AWARD)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's own best interests.

§ 5.3.2 The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 CONTRACTOR'S QUALIFICATION STATEMENT

Bidders to whom award of a Contract is under consideration shall have completed and submitted all required information from the Bid Documents.

§ 6.2 OWNER'S FINANCIAL CAPABILITY

The Owner shall, at the request of the Bidder to whom award of a Contract is under consideration and no later than seven days prior to the expiration of the time for withdrawal of Bids, furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Unless such reasonable evidence is furnished, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 SUBMITTALS

§ 6.3.1 The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Owner through the Construction Manager in writing:

1. A designation of the Work to be performed with the Bidder's own forces;
2. Names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; and
3. Names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Construction Manager and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Construction Manager will notify the Bidder in writing if either the Owner or Construction Manager, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Construction Manager has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1) withdraw the Bid or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Construction Manager have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Construction Manager.

ARTICLE 7 BID, PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 BOND REQUIREMENTS

§ 7.1.1 As stipulated in Section 00 73 00, Supplemental Conditions, of the Bidding Documents, the Bidder shall furnish bonds covering the bid, faithful performance of the Contract, and payment of all obligations arising thereunder. Bonds may be secured through the Bidder's usual sources.

§ 7.1.2 As the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be included in the Bid.

§ 7.1.3 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

§ 7.2 TIME OF DELIVERY AND FORM OF BONDS

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than ten days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence

satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on the Owner supplied Performance Bond and Payment Bond forms. Both bonds shall be written in the amount of the Contract Sum.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

§ 8.1 The Agreement for the Work will be written on the sample agreement provided in the Bidding Documents.

END OF SECTION

SECTION 00 41 00
BID FORM

FOR: *Glenn County*
Transfer Station Backup Generator
5700 County Road 33
Artois, CA 95913

BID TO: Glenn County Public Works Agency
777 North Colusa Street
Willows, CA 95988
Glenn County, State of California

BID FROM:

Firm Name: _____ Telephone: (_____) _____

Address: _____

Contractor's License Number: _____

License Classification: _____ License Expiration Date: _____

Contractor's Federal Tax I.D. Number: _____

California Department of Industrial Relations Number: _____

SAMS Unique Identifier Number: _____

TYPE OF BUSINESS:

[ ] CORPORATION: STATE OF INCORPORATION: _____
[ ] PARTNERSHIP
[ ] JOINT VENTURE
[ ] PRIVATE INDIVIDUAL
[ ] INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME

I HEREBY SWEAR AND CERTIFY UNDER PENALTY OF PERJURY THAT THE ABOVE STATEMENTS ARE TRUE.

Bid and certification submitted by:

Print Name: _____
Authorized Representative

Signature: _____ Date _____
Authorized Representative

Title: _____

1.0 BIDDER'S REPRESENTATIONS

Bidder, represents that:

A) It has the appropriate active Contractor's license required by the State of California;

B) It shall complete the attached Statement of Experience;

C) It has carefully read and examined the Bidding Documents for the proposed Work on this Project;

D) It has examined the site of the proposed Work and all Information Available to Bidders;

E) It has become familiar with all the conditions related to the proposed Work, including the availability of labor, materials, and equipment.

F) It shall comply with all Labor compliance and regulations in accordance with the Department of Industrial Relations.

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 **Forty-Five** {**45**} days after the Bid Deadline, and that, if it is selected as the apparent lowest responsive and responsible Bidder, that it will, within fourteen {14} days after receipt of notice of selection, sign and deliver to Glenn County the Agreement and furnish to Glenn County all items required by the Bidding Documents. If awarded the contract, Bidder agrees to schedule and execute the Work in accordance with the Construction Documents and agrees to fully complete the Work within the Contract Time.

2.0 ADDENDA

Bidder acknowledges receipt of the following addenda and has included all work in its Lump Sum Bid amount.

Addendum #	Date
1 _____	_____
2 _____	_____
3 _____	_____
4 _____	_____
5 _____	_____
6 _____	_____

3.0 BID ITEM LIST

Pursuant to your published Notice to Bidders for the above referenced project, and in accordance with the approved Plans and Specifications for that project, the following bid for said project is submitted by the firm indicated on the first page of this Bid Form.

Bid Item No.	Description	Unit	Quan.	Unit Price	Total Price
1	Mobilization	LS	1	$	$
2	Coordination	LS	1	$	$
3	Locate Underground Utilities	LS	1	$	$
4	Trenching, Conduit and Backfill, Complete	LS	1	$	$
5	Wire Conductors, Control Panels, Junction and Electrical Boxes, Complete	LS	1	$	$
6	Generator Pad, Complete	LS	1	$	$
7	Provide and Install 80kW Generator, Complete[1]	LS	1	$	$
8	Bollards	LS	1	$	$
9	Startup and Training	LS	1	$	$
10	All Other[2]	LS	1	$	$

Notes:
1. Submit proposed generator documents as described on the Drawings with the Bid Documents.
2. The Bid Schedule includes a bid item called “All Other”. The purpose for this item is to provide a place for the Contractor to include cost for items not described in any other bid items but is required to complete the project. It is the responsibility of the Contractor to review the Documents thoroughly and identify any work that is not included in a bid item and include it in the “All Other” bid item.

TOTAL PRICE FOR BID ITEMS (Numerical Total Cost of Bid Items 1-10):

_____

TOTAL BASE BID PRICE IN WORDS:

_____

_____

List of “All Other” Bid Items:

_____

_____

4.0 SELECTION OF APPARENT LOW BIDDER

1. The County shall determine the lowest responsible, responsive bidder based on the lowest bid per item.
2. If this proposal shall be accepted and the undersigned shall fail to enter into the contract and furnish the two bonds in the sums to be determined as aforesaid with surety satisfactory to the County of Glenn, within 10 days, not including Saturdays, Sundays, and legal holidays, after the bidder has received notice from the County that the contract has been awarded, the County of Glenn may, at its option, determine that the bidder has abandoned the contract, and thereupon this proposal and the acceptance thereof shall be null and void and the forfeiture of such security accompanying this proposal shall operate and the same shall be the property of the County of Glenn.
3. In the event that the product of a unit price and an estimated quantity does not equal the extended amount stated, the unit price will govern and the correct product of the unit price and the estimated quantity shall be deemed to be the amount bid.
4. The County, if it chooses to award, shall award the contract to the lowest responsible, responsive bidder, however, the County may at its discretion, award the base bid along with any combination of the bid alternates it chooses.

5.0 BID GUARANTY

Bid security must be a bidders bond, a certified check or cashiers check payable to the County of Glenn, or cash. Bids secured by personal checks or personal guarantees will be rejected.

6.0 AFFIDAVIT OF NONCOLLUSION

In accordance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder swears, deposes and says that he or she, as the party making the foregoing bid, declares that the 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 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.

Note: The above Noncollusion Affidavit is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Noncollusion Affidavit. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution. Noncollusion Affidavit (Exhibit 12-E Attachment D, Title 23 United States Code Section 112 and Public Contract Code Section 7106)

7.0

STATEMENT OF EXPERIENCE

The bidder has been engaged in the contracting business, under the present business name for _____ years. Experience in work of a nature similar to that covered in the proposal extends over a period of _____ years.

The bidder, as a Contractor, has never failed to satisfactorily complete a Contract awarded to him, except as follows:_____

The following contracts have been satisfactorily completed in the last three (3) years for the persons, firm or authority indicated, and to whom reference is made:

Year	Type of Work	Contract Amount	Owner/Agency for Whom Work was Performed

8.0 SUBCONTRACTOR LISTING

In accordance with the California Public Contract Code, Division 2, Part 1, Chapter 4, Section 4100, and following, the subcontractors listed on the Bid Form attachment will perform the indicated work of improvement on the project.

The list shall specify the name and the location of the place of business of each subcontractor who will perform work or labor or render service to the contractor in or about the construction of the work or improvement, or a subcontractor licensed by the state of California who, under subcontract to the contractor, specifically fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, (b) the portion of the

work which will be done by each subcontractor. The contractor shall list only one subcontractor for each such portion as is defined by the contractor in its bid. Per 00 20 00 Instructions to Bidders.

The following are the names and locations of places of business of all subcontractors who will perform work or labor or render service to the bidder in or about the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent (0.5%) of the total bid or in the case of bids for the construction of streets and highways, including bridges, in an amount in excess of one-half of one percent (0.5%) of the total bid or ten thousand dollars ($10,000) whichever is greater.

Portion of Work	**Subcontractor Name / Contractor's License #**	**Place of Business/Address**	**DIR Registration #**

SECTION 00 52 00
INDEPENDENT CONTRACTOR AGREEMENT
GLENN COUNTY PUBLIC WORKS

THIS AGREEMENT made and entered into this *Day* day of *Month*, 2024, between the County of Glenn, a political subdivision of the State of California, hereinafter referred to as "County" and *Contractor Name*, hereinafter referred to "Contractor";

WHEREAS, the Governing Board of the County caused plans and specifications for the work hereinafter mentioned to be prepared, and therefore did approve and adopt said plans and specifications; and

WHEREAS, the Governing Board of the County did cause to be published for the time and in the manner required by law, a Notice inviting bids for the performance of said work; and

WHEREAS, the Contractor, in response to such Notice, submitted to the Governing Board of the County within the time specified in said Notice, and in the manner provided for therein, a sealed bid for the performance of the work specified in said plans and specifications, which said bid and proposal, and the other bids and proposals submitted in response to said Notice, the Governing Board of the County publicly opened and canvassed in the manner provided by law; and

WHEREAS, the Contractor was the lowest responsible bidder for the performance of said work, and said Governing Board of the County, as a result of the canvass of said bids, did determine and declare Contractor to be the lowest responsible bidder for said work and award to a contract therefor.

NOW, THEREFORE, in consideration of the promises herein, it is mutually agreed between the parties hereto as follows:

I. CONTRACT DOCUMENTS

The following documents are by this reference incorporated in and made a part of this Agreement: The Notice to Bidders with all addenda; the contract drawings; the contract specifications; the Bid Form of Contractor; all required bonds; and all supplemental Agreements covering alterations, amendments, or extensions to the contract. The documents which describe the work to be performed are sometimes collectively referred to herein as the Plans and Specifications. In the case of conflicting documents, this Agreement takes precedence over all other documents.

II. SCOPE OF WORK

That the Contractor will furnish all labor, materials, services, transportation, appliances, and mechanical workmanship required for Contract No. *PA*, *Transfer Station Backup Generator* Project, as provided for and set forth in said plans and specifications, or in either of them, which said plans and specifications are hereby referred to and by such reference incorporated herein and made a part of this Agreement.

All of the said work done under this Agreement shall be under the supervision of and performed to the satisfaction of County who shall have the right to reject any and all materials and

supplies furnished by the Contractor which do not comply with said plans and specifications, together with the right to require the Contractor to replace any and all work furnished by the Contractor which shall not either in workmanship or material be in strict accordance with said plans and specifications.

III. COMPLETION

Said work shall be completed and ready for acceptance within *sixty (60)* working days following delivery of the generator to the Transfer Station site.

IV. PAYMENT

Attached hereto as Exhibit "A" and by reference made a part hereof, is the bid form of the Contractor. Said bid containing, as required by the terms of said specifications, the full and complete schedule of the different items with the lump sums or unit prices as so specified. The County agrees, in consideration of the work to be performed herein and subject to the terms and conditions thereof, to pay Contractor all sums of money which may become due to Contractor in accordance with the terms of the above mentioned bid, and this Agreement, to wit: *amount in dollars in words* and *cents*/100 dollars ($ *amount in numbers*). Said sum shall be paid in accordance with Section 9 of the Standard Specifications. With respect to that portion of the above sum as is based upon the estimated quantities specified for the general scope of the work to be performed herein, actual payment will be based upon the quantities as measured upon completion. No payment made under this Agreement shall be construed to be an acceptance of defective work or improper materials.

V. PREVAILING WAGES

Pursuant to the provisions of Articles 1 and 2 of Chapter 1, Part 7, Division II, of the Labor Code of the State of California, not less than the general prevailing rate of per diem wages, and not less than the general prevailing rate of per diem wages for holidays and overtime work, for each craft, classification or type of worker needed to execute the work contemplated under this Agreement shall be paid to all workers, laborers and mechanics employed in the execution of said work by Contractor, or by any subcontractor doing or contracting to do any part of said work. The appropriate determination of the Director of the California Department of Industrial Relations is filed with, and available for inspection at, the office of the Clerk of the Governing Board.

Contractor shall post, at each job site, a copy of such prevailing rate of per diem wages as determined by the Director for the California Department of Industrial Relations. The contractor and all subcontractors must furnish electronic certified payroll records to the Labor Commissioner of the Department of Industrial Relations.

VI. INSURANCE

The Contractor shall carry and maintain during the life of this Agreement, such public liability, property damage and contractual liability, auto, workers' compensation and builders' risk insurance as required by Section 00 73 00 Supplemental Conditions.

VII. WORKERS' COMPENSATION CERTIFICATION

By execution of this Agreement, the Contractor certifies as follows:

"I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."

VIII. PERFORMANCE AND PAYMENT BONDS

The Contractor shall, before beginning said work, file two bonds with the County, each made payable to the County. These bonds shall be issued by a surety company authorized to do business in the State of California, and shall be maintained during the entire life of the Agreement at the expense of the Contractor. One bond shall be in the amount of one hundred percent (100%) of the Agreement and shall guarantee the faithful performance of the Agreement.

The second bond shall be the payment bond required by California Civil Code Division 3, Part 4, Title 15, Chapter 7, and shall be in the amount of one hundred percent (100%) of the Agreement. Any alterations made in the specifications which are a part of this Agreement or in any provision of this Agreement shall not operate to release any surety from liability on any bond required hereunder and the consent to make such alterations is hereby given, and any surety on said bonds hereby waives the provisions of California Civil Code Sections 2819 and 2845.

IX. INDEMNIFICATION

The Contractor shall defend, indemnify and save harmless the County (including their officers, agents, members, employees, affiliates, and representatives) as set forth in the following:

To the fullest extent permitted by law, Contractor shall indemnify, defend and hold harmless the County of Glenn, its governing Board, officers, directors, agents, employees, and volunteers from and against any and all claims, demands, actions, losses, liabilities, damages and all costs incidental hereto, including cost of defense, settlement, arbitration, and reasonable attorneys' fees arising out of , pertaining to, or resulting from the acts or ommissions of the Contractor, its officers, agents or employees, or the acts or ommissions of anyone else directly or indirectly acting on behalf of the Contractor, or for which the Contractor is legally liable under the law, regardless of whether caused in part by a party indemnified hereunder.

The indemnities set forth in this section shall not be limited by the insurance requirements set forth in the Contract.

X. MISCELLANEOUS PROVISIONS

This Agreement shall bind and inure to the heirs, devisees, assignees, and successors in interest of Contractor and to the successors in interest of County in the same manner as if such parties had been expressly named herein.

This agreement shall be administered and interpreted under the laws of the State of California and any action brought hereunder shall be brought in the Superior Court in and for the County of Glenn.

A party's failure to insist on strict performance of this contract or to exercise any right or remedy upon breach of this contract shall not constitute a waiver of such performance, right, or remedy. No waiver is binding unless set forth in writing signed by the waiving party.

This agreement, all exhibits attached hereto, all other terms or provisions incorporated herein by reference (including the Plans and Specifications), and any notice to proceed issued in accordance with the terms hereof constitute the entire agreement and understanding between the County and Contractor as to the subject matter hereof. It supersedes all prior agreements and representations whether written and oral.

This agreement reflects the contributions of both parties and accordingly the provisions of Civil Code Section 1654 shall not apply in interpreting this Agreement.

All times stated herein or in the contract documents are of the essence hereof.

As used in this instrument the singular includes the plural, and the masculine includes the feminine and the neuter.

This Agreement may create a possessory interest subject to property taxation, and Contractor may be subject to the payment of property taxes levied on such interest.

IN WITNESS WHEREOF, County and Contractor have caused this Agreement to be executed as of the day and year first above written.

SECTION 00 60 00 – PROJECT FORMS
BIDDER'S BOND

KNOW ALL MEN BY THESE PRESENTS, THAT WE, THE UNDERSIGNED _____ as principal; and _____ as Surety, are hereby held and bound unto the COUNTY OF GLENN, hereinafter called the "County", in the sum of _____ dollars ($_____) which sum is equal to at least ten (10) percent of the total amount of the bid for the work, payment of which sum, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

The condition of the above obligation is such that whereas the Principal has submitted to the County a certain Bid, attached hereto and hereby made a part hereof, to enter into a Contract in writing, for the construction of:

Glenn County Transfer Station Backup Generator

NOW, THEREFORE,

(a) If the Bid is rejected, or in the alternative,

(b) If the Bid is accepted and the Principal shall sign and deliver a Contract, in the form of Contract attached hereto (all completed in accordance with said Bid and Contract), and shall in all other respects perform the agreement created by the acceptance of said Bid;

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all default of the Principal hereunder shall be the amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the County may accept sub bid, and said Surety does hereby waive notice of any such extension.

Should the County file an action in a court of law to enforce this bond, the prevailing party shall be entitled to recover any and all costs and fees associated with the litigation, including but not limited to attorneys' fees and experts' fees. The parties agree that proper venue and jurisdiction for such an action will be the Superior Court of California in Sacramento County; any party's rights to other venue or jurisdiction under law (such as California Code of Civil Procedure sections 392 et seq.) are expressly waived.

IN WITNESS THEREOF, the above-bounden parties have executed this instrument under their several seals this _____ day of _____, 20___, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

IN PRESENCE OF:

Principal Signature _____ (Seal)
Principal Name _____
Business Address _____

Surety Signature _____
Surety Principal Name _____
Surety Name _____ (Seal)
Business Address _____

The rate of premium on this bond is _____ per thousand.
Total amount of premium charged $ _____.

(Note: This bond must be signed and acknowledged by both the Principal and Surety before a Notary Public, and acknowledgments, with Notarial Seals, attached hereto. Surety must be authorized and licensed by the California Insurance Commissioner as an "admitted surety insurer.") 1/05

SUBMIT BOND OR OTHER CASH GUARANTEE AS PART OF YOUR BID

PERFORMANCE BOND

BOND NO:_____

KNOW ALL PERSONS BY THESE PRESENTS, that

WHEREAS, the Governing Board of the COUNTY OF GLENN, a municipal corporation of the State of California, hereinafter designated as the "Obligee", has, on _____, awarded to _____, hereinafter designated as the "Principal", a contract for the construction of the _____ Project hereinafter designated as the "Contract"; and

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

NOW, THEREFORE, WE, the Principal, and _____ _____**,** hereinafter designated as the "Surety," are held and firmly bound unto the Obligee, in the penal sum of _____ lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the above bounden Principal, its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and faithfully perform the covenants, conditions, and agreements in the said contract and any alterations made as therein provided, on their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless, the Obligee, its officers and agents as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and virtue.

As a condition precedent to the satisfactory completion of the said contract, the above obligation in said amount shall hold good for a period of one (1) year after the completion and acceptance of the said work, during which time if the above bounden Principal, its heirs, executors, administrators, successors or assigns shall fail to make full, complete, and satisfactory repair and replacements or totally protect the said Obligee from loss or damage made evident during said period of one (1) year from the date of acceptance of the work, and resulting from or caused by defective materials or faulty workmanship in the prosecution of the work done, the above obligation in the said sum shall remain in full force and effect. However, anything in this paragraph to the contrary notwithstanding, the obligation of the Surety hereunder shall continue so long as any obligation of the Principal remains.

The said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or to the work to be performed thereunder or the specification accompanying the same shall, in any way, affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the contract or to the work or to the specifications. Said Surety hereby waives the provisions of Sections 2819 and 2845 of the Civil Code of the State of California.

Should the Obligee file an action in a court of law to enforce this bond, the prevailing party shall be entitled to recover any and all costs and fees associated with the litigation, including but not limited to attorneys' fees and experts' fees. The parties agree that proper venue and jurisdiction for such an action will be the Superior Court of California in Sacramento County; any party's rights to other venue or jurisdiction under law (such as California Code of Civil Procedure sections 392 et seq.) are expressly waived.

After default by Principal on its obligations under the Contract, Surety's obligation under this bond to completely perform the Principal's remaining obligations under the Contract is not contingent in any manner upon execution of an agreement between Surety and Obligee (such as a takeover agreement). Surety must commence performance of Principal's remaining obligations immediately upon notice of the Principal's default.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their seals this _____ day of _____, 20___, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____	_____
Principal	Surety
By_____	By_____
Signature for Principal	Signature for Surety
_____	_____
Title of Signatory	Title of Signatory / (SEAL)

(This bond must be submitted in sets of four, each bearing original signatures. The signature of the Attorney-In-Fact for the Surety must be acknowledged by a Notary Public. These bonds must be accompanied by a current power of attorney appointing such Attorney-In-Fact.) 1/05

SUBMIT BOND WITHIN 10 DAYS OF AWARD OF CONTRACT

PAYMENT BOND

BOND NO:_____

KNOW ALL PERSONS BY THESE PRESENTS, that

WHEREAS, the Governing Board of the COUNTY OF GLENN, a political subdivision of the State of California, hereinafter designated as the "Obligee", has on _____, awarded to _____, hereinafter designated as "Principal", a contract for the construction of _____ Project; and

WHEREAS, said Principal is required to furnish a bond in connection and with said contract, providing that if said Principal, or any of its subcontractors, shall fail to pay for any materials, provisions, or other supplies used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, the Surety on this bond will pay the same to the extent hereinafter set forth:

NOW, THEREFORE, WE, the Principal and _____ as Surety, are held and firmly bound unto the Obligee in the penal sum of _____ lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, or any of its subcontractors shall fail to pay any of the persons named in Section 3818 of the Civil Code of the State of California, or any amounts due under the Unemployment Insurance Code with respect to such work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department of the State of California, from the wages of employees of the Principal and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code of the State of California with respect to such work or labor, as required by the provisions of Section 3225 and following of the Civil Code of the State of California, then said Surety will pay the same in or to an amount not exceeding the amount herein above set forth.

This bond is issued pursuant to Civil Code Sections 3247 through 3252 of the State of California and shall insure to the benefit of any and all persons, companies, and corporations named in Section 3181 of said Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

The said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or to the work to be performed thereunder or the specification accompanying the same shall, in any way, affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the contract or to the work or to the specifications. Said Surety hereby waives the provisions of Sections 2819 and 2845 of the Civil Code of the State of California.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their seals this _____ day of _____, 20___, the name and corporate seal of each corporate party being affixed hereto and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____	_____
Principal	Surety
By_____	By_____
Signature for Principal	Signature for Surety
_____	_____
Title of Signatory	Title of Signatory (SEAL)

(This bond must be submitted in sets of four, each bearing original signatures. The signature of the Attorney-In-Fact for the Surety must be acknowledged by a Notary Public. These bonds must be accompanied by a current power of attorney appointing such Attorney-In-Fact.) 1/05

SUBMIT BOND WITHIN 10 DAYS OF AWARD OF CONTRACT

COUNTY OF GLENN
Department of General Services- Facilities
453 E. County Road 49 ½
Willows, CA 95988
Phone: 530-934-6545
Facilities2@countyofglenn.net
www.countyofglenn.net

SCOTT H. DEMOSS
County Administrative Officer
525 W. Sycamore St. Suite B1
Willows, CA 95988
Phone: 530-934-6400
Fax: 530-934-6419
gcboard@countyofglenn.net

CHANGE ORDER No. *XX*

Project: ***Project Title*** **Date:** ***date***

To: ***Contractor Name*** **Attn:** ***Contractor Contact***
address
address

Contractor: You are hereby directed to make the herein described changes to the plans and specifications or do the following described work not included in the plans and specifications of this contract. All new work herein described shall be done in accordance with the applicable provisions of the plans and specifications, except as modified by this contract change order.

Description of Change:

Method of Payment:

Estimated or Total) Cost: $ **XX.XX**

Contract Time Adjustment:

Authorization to Proceed with Work: This change order constitutes full and complete compensation for all labor, equipment, materials, overhead, profit, any and all indirect costs, and time adjustment to perform the described change. Other costs are non-compensable.

Recommended By: Date: Approved by: Date:

Talia Richardson
Deputy Director of Public Work

Scott H. De Moss
County Administrative Officer

Contractor's Acceptance:

Signature Printed Name Date

SECTION 00 72 00
GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

Project:
Glenn County
Glenn County Transfer Station Backup Generator
821 E. South St.
Orland, CA 95963

Owner:
Glenn County Board of Supervisors
525 W. Sycamore Street, Suite B1
Willows, CA 95988
Contact: Scott H. De Moss, County Administrative Officer
Email: gcboard@countyofglenn.net
Phone: (530) 934-6400

Owner Representative:
Glenn County Public Works Agency
777 N. Colusa Street
Willows, CA 95988
Contact: Talia Richardson, Deputy Director of Public Works
Email: trichardson@countyofglenn.net
Phone: (530) 934-6530

Construction Manager:
Lawrence & Associates
3590 Iron Court
Shasta Lake, CA 96019
Contacts: Darren Langfield
Karl Swanson
Clayton Coles
Emails: dlangfield@lwrnc.com
kswanson@lwrnc.com
ccoles@lwrnc.com
Phone: (530) 275-4800

Design Engineer:
Pace Engineering
5155 Venture Parkway
Redding, CA 96002
Contacts: Bryan Barnes (Electrical Engineer)
Eli Jurisich (Structural Engineer)
Emails: bbarnes@paceengineering.us
ejurisich@paceengineering.us
Phone: (530) 244-0202

TABLE OF ARTICLES

ARTICLE 1 GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Construction Manager. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind between persons or entities other than the Owner and Contractor. The Construction Manager shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.

1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, tools and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

1.1.5 THE DRAWINGS

The Drawings are 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.

1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Construction Manager and the Construction Manager's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

1.1.8 INITIAL DECISION MAKER

Owner is the Initial Decision Maker that renders initial decisions on Claims in accordance with Section 15.2.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. In the case of conflict between terms of the Contract Documents, the following order of precedence shall apply:

1. Modifications
2. The Agreement
3. The Supplementary Conditions, if any
4. The General Conditions
5. The Specifications
6. The Drawings

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

1.2.3 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

1.2.4 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

1.2.5 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.

1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined or (2) the titles of numbered articles.

1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently 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.

1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENT OF SERVICE; BOOKS AND RECORDS

1.5.1 The Construction Manager and the Construction Manager’s consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Construction Manager’s or Construction Manager’s consultants’ reserved rights.

1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Construction Manager and the Construction Manager’s consultants.

1.5.3 The Contractor shall keep and maintain the following (the "Books and Records"):

.1 copies of all documents of any kind prepared, issued, or received by Contractor in connection with the Work or the Project including all Contract Documents, bulletins, requests for information, bonds, subcontracts, purchase orders, correspondence, claims, anticipated cost reports, Shop Drawings, Change Orders, Change Order logs, project budgets (and all revisions thereof), estimates of the Contract Sum, handbooks, warranties, guarantees, operating manuals, rate manuals, technical standards and specifications, instructions, permits, licenses, certificates, test reports, notices of lien, documents served in legal proceedings, and insurance documentation;

.2 samples received;

.3 construction schedules (and all revisions thereof);

.4 photographs and/or a video record of the Work, as required by the Contract Documents; and

.5 one complete set of the Drawings and Specifications marked to record all changes during the construction and specifying the applicable Change Orders.

1.5.4 All samples, Shop Drawings, other submittals, or other documents of any kind prepared by Contractor or any Subcontractor in connection with the work or the Project, and all rights in the foregoing (including rights of use, copyright, and trademark), shall be and remain the sole and

confidential property of Owner (whether or not Owner undertakes, terminates, or completes the Work, or this Agreement is terminated for any reason whatsoever). Submission or description of any document described in the foregoing sentence to any person or entity for purposes of, or in connection with, the Work or the Project shall not be construed as publication in derogation of Owner's rights under this Agreement.

1.5.5 As part of final completion, Contractor shall be responsible for collecting from its Subcontractors a complete set of their "as-built" (i.e., as actually constructed) Drawings and Specifications indicating differences and changes from the original (with copies of all Change Orders and Shop Drawings). Contractor shall prepare a coordinated set of such Subcontractor "as-builts" (with Change Orders and Shop Drawings) and deliver one complete copy to Owner and Construction Manager shall then be responsible for reviewing the same, for further coordination (if any), and for converting the same into a digital format if needed. As a part of and condition to final completion (or any earlier termination of this Agreement by either Owner or Contractor for any reason whatsoever), Contractor shall deliver to Owner a complete set of the Books and Records. Upon prior notice to Owner from time to time, Contractor shall have access for six (6) years to the Books and Records which are stored by the Owner after final completion. Subject to the requirements of this Article, Contractor shall be entitled to retain one complete set of the Books and Records for its permanent records.

1.5.6 Contractor agrees that Owner has not made, and shall not be deemed to have made, any representations or warranties whatsoever with respect to the Drawings, Specifications, or any other Contract Documents, whether as to design or other adequacy or sufficiency thereof, or otherwise.

1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

2.1 GENERAL

2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner’s approval or authorization. Except as otherwise provided in Section 4.2.1, the Construction Manager do not have such authority. The term “Owner” means the Owner or the Owner’s authorized representative.

2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic’s lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner’s interest therein.

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

2.2.2 The Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. While Owner makes no representations or warranties regarding the accuracy or completeness of such information, the Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services. Owner's failure to be timely in furnishing information may be a Compensable Delay, but not a breach of contract.

2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

2.2.6 The Owner shall copy or involve the Construction Manager on all communications with Contractor.

2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or fails to carry out Work in accordance with the Contract Documents, the Owner or Construction Manager may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity. Contractor shall not be entitled to any adjustment of Contract Time or Sum as a result of such order.

2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents, fails to provide sufficient labor, materials, equipment, tools, and services to maintain the Master Project Schedule, fails to start any activity by its start date as directed by the Construction Manager which will be no earlier than the early start date nor later than the late start date reflected in the Master Project Schedule, or fails to complete any activity by its completion date as directed by the Construction Manager which will be no earlier than the early completion date nor later than the late completion date as reflected in the Master Project Schedule, and then fails within a 10-day period after receipt of written notice from the Owner or Construction Manager to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies including supplying additional workers to the Contractor in such quantity and for such period as deemed necessary by the Construction Manager, all at the Contractor's expense. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Construction Manager's additional services made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

2.5 OWNER'S RIGHT TO ACCELERATE THE WORK

2.5.1 The Owner may direct the acceleration of the Work by the Contractor to meet schedule requirements when the Work has been delayed by a Permitted or Compensable Delay. The Owner will compensate the Contractor for the additional costs incurred by such acceleration to the extent that such costs are directly attributable to the acceleration and are incurred through no fault or negligence of the Contractor.

2.5.2 Any acceleration directed by the Owner pursuant to the foregoing provision will be by a Change Order. The Owner will not be obligated, under any circumstances, to direct such acceleration and may elect, at its option, not to accelerate the Work of the Contractor.

2.5.3 The Owner may accelerate the work of one or more Separate Contractors to meet schedule requirements when the Work of Contractor does not adhere to the Master Project Schedule and said failure to adhere causes, in whole or in part, a delay in the work of such Separate Contractors and if such delay would otherwise give rise to a time extension. The Owner may reduce the Contract Sum by the amounts incurred due to such acceleration to Separate Contractors.

2.5.4 Owner may also require Contractor to accelerate the Work due to delays which are not Permitted or Compensable Delays - see Section 3.10.11 below.

ARTICLE 3 CONTRACTOR

3.1 GENERAL

3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall

designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term “Contractor” means the Contractor or the Contractor’s authorized representative.

3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Owner, Construction Manager in the administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

3.1.4 The term "Separate Contractors" or the plural term "Contractors" refers to persons or entities who perform construction under General Conditions of the Contract that are administered by the Construction Manager, and that are identical or substantially similar to these General Conditions.

3.1.5 The “Contractor” is also referred to as the “Prime Trade Contractor” or “General Contractor” in the Contract Documents.

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction Manager any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Construction Manager may require. It is recognized that the Contractor’s review is made in the Contractor’s capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

3.2.3 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 the Construction Manager in writing and request interpretation, clarification, or furnishing of additional detailed instructions.

3.2.4 If Contractor performs any construction activity which it knows or should know involves an error, inconsistency, or omission referred to in this Section 3.2, without notifying and

obtaining the written consent of Construction Manager, Contractor shall be responsible for the resultant losses, including, without limitation, the costs of correcting defective Work.

3.2.5 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Construction Manager any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Construction Manager may require.

3.2.6 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Construction Manager issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2, 3.2.3 or 3.2.5, the Contractor shall submit a Change Order Request as provided in Section 7.5 or shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2, 3.2.3 or 3.2.5, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Construction Manager for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

3.3.1 The Contractor shall supervise, coordinate and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner, Construction Manager and shall not proceed with that portion of the Work without further written instructions from the Construction Manager. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

3.3.3 The Contractor shall be responsible for inspection of all portions of Work already performed including work by others to determine that such portions are in proper condition to receive subsequent Work.

3.3.4 The Contractor shall inspect portions of the Project related to the Contractor's Work in order to determine that such portions are in proper condition to receive subsequent Work.

3.4 LABOR AND MATERIALS

3.4.1 Unless otherwise provided in the Contract Documents, the 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 completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

3.4.2 Except in the case of minor changes in the Work authorized by the Construction Manager in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Construction Manager in accordance with a Change Order or Construction Change Directive.

3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor’s employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

3.5 WARRANTY

The Contractor warrants to the Owner, Construction Manager that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor’s warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Construction Manager, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

3.6 TAXES

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS

3.7.1 Owner shall secure and pay permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work.

3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall immediately provide notice to the Owner, the Construction Manager before conditions are disturbed and in no event later than 3 days after first observance of the conditions. The Construction Manager will promptly investigate such conditions and, if the Construction Manager determine that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will request Contractor to submit a Change Order Request within 7 days for an adjustment in the Contract Sum or Contract Time, or both, per Section 7.5. If the Construction Manager determine that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Construction Manager shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Construction Manager's determination or recommendation that party may proceed as provided in Article 15.

3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents or other documents provided to Contractor, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner, Construction Manager. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain any governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Any critical path delays directly resulting from such remains or features will be Compensable Delays subject to the requirements of Article 15.

3.8 ALLOWANCES

3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

3.9 NOT USED

3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

3.10.1 The Construction Manager has developed an overall "Preliminary Master Project Schedule" indicating major milestones and construction sequences for the Project, showing the general timing for the work of Contractor. This Preliminary Master Project Schedule is for

bidder information and guidance only, and is not intended to serve as the Master Project Schedule that will be utilized for construction. However, the construction milestones and sequences shall be the basis for the Master Project Schedule, unless the Construction Manager modifies them to improve the overall progress and completion by utilizing revised logic and revised schedule. The "Project Time" is the allowed time to perform the construction of the entire Project.

3.10.2 Using the schedules submitted by each of the Contractors, the Construction Manager will develop and issue the "Master Project Schedule" showing completion of the Project within the Project Time. The Construction Manager may require additional information from the Contractor during development of the Master Project Schedule.

3.10.3 The Construction Manager may impose upon the Contractor, in the initial Master Project Schedule, whatever scheduling requirements are deemed appropriate, consistent with the Preliminary Master Project Schedule, and the Contractor shall comply with any such requirements, at no additional cost to Owner, and reflect same in a "Contractor's Schedule."

3.10.4 The Contractor shall develop the Contractor's Schedule and submit updated schedule information to the Construction Manager within the time limits required by the Specifications and in form acceptable to the Construction Manager. The Construction Manager may, at any time, make reasonable adjustments, at no cost to the Owner, to the Master Project Schedule so that the Project may be completed within the Project Time, or if completion within the Project Time is impracticable, to mitigate damages to the Owner resulting from late completion of the Project.

3.10.5 The Master Project Schedule shall represent a practical plan to complete the work of the entire Project so that the entire Project can be fully completed within the Project Time. Likewise, the Contractor's Schedule shall represent a practical plan to fully complete the Work within the Contract Time and Master Project Schedule.

3.10.6 The Contractor shall prepare and keep current, to the satisfaction of the Construction Manager, 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 Master Project Schedule.

3.10.7 Contractor shall plan, develop, supervise, control, and coordinate the performance of the Work so that its progress and the sequence and timing of Work activities conform to the current Master Project Schedule. Contractor shall continuously obtain from Subcontractors updated information and data about the planning for and progress of the Work and the delivery of equipment, shall coordinate, and monitor the progress of the Work and the delivery of equipment. Contractor shall act as the expeditor to avoid or mitigate potential and actual delays, interruptions, hindrances, or disruptions for its own forces and those forces of Subcontractors, regardless of tier. Contractor shall cooperate with the Construction Manager in the development of the Contractor's Schedule, the Master Project Schedule, and their updates.

Construction Manager’s acceptance of, or its review comments about, the Contractor's Schedule

or scheduling data provided by Contractor shall not relieve Contractor of its sole responsibility to plan for, perform, and fully complete its Work within the Contract Time. Acceptance of, or review comments about, the Contractor's Schedule shall not imply the Owner's agreement with (1) any assumption upon which the Contractor's Schedule is based, or (2) any matter underlying or contained in the Contractor's Schedule.

Failure of the Construction Manager to discover errors or omissions in the Contractor's Schedule, or to inform Contractor that Contractor is behind schedule, or to direct or enforce procedures for complying with the Master Project Schedule shall not relieve Contractor from its sole responsibility to perform and complete the Work and shall not be a cause for an adjustment of the Contract Time or the Contract Sum.

3.10.8 The Work may require performance in several areas of the project simultaneously in order to fully complete the Project within the Project Time. As each area becomes available, Contractor shall begin work in those respective areas with additional crews if necessary to avoid a reduction of effort in other areas already under construction.

3.10.9 Subject to Owner's rights under the Contract or at law, time is of the essence in the Contractor's performance of this Contract. Contractor agrees to promptly commence work when directed by the Construction Manager.

3.10.10 In addition to any completion dates required under the Contract, the Contractor agrees to perform the work in accordance with the Construction Manager's Master Project Schedule, including all subsequent modifications to the Master Project Schedule by the Construction Manager. Contractor agrees to perform the work in a way that will not delay the Owner, the Construction Manager, or the progress of the Project, all at Contractor's cost and without additional cost or liability to Owner.

3.10.11 If, at any time during Contractor's performance of the work, the actual progress of the Contractor's Work falls behind the Master Project Schedule, then Contractor agrees to immediately take any steps necessary per the Construction Manager's sole discretion to improve progress in the Work or the Project. All these steps will be taken at Contractor's cost and without additional cost or liability to the Owner. If for any reason the Contractor's progress is not in accord with the Construction Manager's current Master Project Schedule, including remedial schedules, or any dates or intervals required elsewhere by the Contract, the Construction Manager may require Contractor to increase its labor force, its supervision force, the number of work shifts, overtime, work on weekends and holidays, the equipment on the Project, revise or modify its construction procedures and sequences and any other measures which the Construction Manager considers necessary, all without additional cost or liability to Owner. Neither notice by the Construction Manager nor the failure to issue notice that Contractor's progress is inadequate shall relieve Contractor from its obligation to achieve the quality of work and rate of progress required by the Construction Manager.

If the Owner incurs expense or loss or it appears that Owner may sustain expense or loss due to Contractor's failure to comply with the above provisions, the Owner or the Construction Manager may either deduct that amount from any progress payment or retention payable to

Contractor and/or delay payment of any sums otherwise owing to Contractor until the situation is remedied or adjusted to the Owner's or the Construction Manager's satisfaction.

3.10.12 The Construction Manager will schedule and coordinate the activities of the Contractor in accordance with the latest approved Master Project Schedule. The Contractor shall cooperate with the Construction Manager in the reasonable determinations of scheduling and performing the Contractor's work to avoid conflict, delay in or interference with the Work or other Contractors, or Separate Contractors, regardless of their float shown on the Master Project Schedule.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of reviewed Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Construction Manager and shall be delivered to the Construction Manager for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Construction Manager is subject to the limitations of Section 4.2.8. Informational submittals upon which the Construction Manager is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager without action.

3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Construction Manager Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Construction Manager or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

3.12.6 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner, Construction Manager that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been reviewed and accepted by the Construction Manager.

3.12.8 The Work shall be in accordance with reviewed and accepted submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Construction Manager's review of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Construction Manager in writing of such deviation at the time of submittal and (1) the Construction Manager has given written acceptance to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Construction Manager's review thereof.

3.12.9 The 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 the Construction Manager on previous submittals. In the absence of such written notice, the Construction Manager's review of a resubmission shall not apply to such revisions.

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

3.12.11 The Contractor shall not be required to provide professional services that constitute the practice of engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner, Construction Manager and the will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Construction Manager. The Owner and the Construction Manager shall be entitled to rely upon the adequacy, accuracy

and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner or Construction Manager have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.11, the Construction Manager will review, accept or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

3.14 CUTTING 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. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a Separate Contractor except with written consent of the Owner and of such Separate Contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a Separate Contractor the Contractor’s consent to cutting or otherwise altering the Work.

3.15 CLEANING UP

3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor’s tools, construction equipment, machinery and surplus materials from and about the Project.

3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

3.15.3 Personnel of Contractor and its 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.

3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Construction Manager, their consultants and other persons authorized by the Owner access to the Work in preparation and progress wherever

located. The Contractor shall provide safe and proper facilities for such access and for inspection.

3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Construction Manager harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Construction Manager. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Construction Manager.

3.18 INDEMNIFICATION

3.18.1 Subject to Section 3.18.7, Contractor agrees to comply with the Indemnity Requirements listed in the Construction Agreement. Additionally, the Contractor shall indemnify and hold harmless each and every Indemnitee (as defined below) from and against (and to pay) all Loss-And-Expense which any Indemnitee may suffer, incur or pay out, or which may be asserted against any Indemnitee in whole or in part, by reason of, or in connection with, the following:

1. Any bodily injury, sickness, disease or death of or to any person or persons occurring in connection with (or arising out of or resulting from) the Work (including any corrective or warranty Work), whether on the Site or elsewhere, to the extent caused by or resulting from the negligence or willful misconduct of Contractor or those for whom it is responsible;

2. Any damage to or destruction of any property, including any utilities or any property of Owner other than the Work (which is intended to be covered by builders' risk insurance pursuant to Article 11) or any other person or entity, occurring in connection with (or arising out of, or resulting from) the Work, whether on the Site or elsewhere, to the extent caused by or resulting from the negligence or willful misconduct of Contractor or those for whom it is responsible (except for Loss-and-Expense arising as a result of damage to or destruction of property which is covered by Owner's builder's risk insurance);

3. Any loss of benefits under any manufacturer's guarantee or service agreement resulting from the fault, inaccuracy, error, or omission of Contractor or any Subcontractor;

4. Any materially untrue or incorrect statement or representation of Contractor in any Application for Payment, or in any other document submitted by Contractor with respect to the Work, the Project, or the Contract (or for purposes of securing the Contract);

5. Any failure of Contractor to pay Subcontractors or suppliers, provided that Owner is not in default of its payment obligations under the Contract;

6. Any failure of Contractor to comply with all applicable laws, rules or regulations of governmental entities; or

7. Any failure of Contractor to secure and maintain the insurance required by Article 11.

3.18.2 Contractor shall defend any legal proceedings commenced against any Indemnitee concerning any matter covered by any indemnity or obligation under this Article 3. Contractor shall give Owner copies of documents served in any such legal proceeding and, whenever requested by Owner, shall advise promptly as to the status of such legal proceeding. If Contractor fails to defend diligently any such legal proceeding, Owner shall have the right (but no obligation) to defend the same at Contractor's expense. Contractor shall not settle any such legal proceeding without Owner's prior written consent (unless the effect of such settlement shall be to release every Indemnitee against whom liability has been asserted from all liability whatsoever with respect to such legal proceeding, without cost or contribution from any Indemnitee).

3.18.3 Contractor shall notify Owner promptly of every legal proceeding or claim of which Contractor has actual knowledge which may be covered by any indemnity or obligation under this Article 3 and/or which may be covered by any insurance policy required under Article 11. Contractor shall also give timely notice of such legal proceedings and claims to each insurer which has issued an applicable policy.

3.18.4 Contractor's indemnities and obligations under this Contract shall not be limited or defined in any fashion whatsoever by the amount of insurance required under the Contract Documents or by any limitations or restrictions on the amount or type of damages, compensation or benefits payable to, by or for Contractor under workers' compensation acts, disability benefit acts or any other laws relating to employee benefits (although actual recoveries of insurance proceeds by an Indemnitee, net of reasonable fees and costs—including attorney's fees—of collection, shall be applied to reduce Contractor's obligation to such Indemnitee with respect to the subject matter of such recovery). No Indemnitee's right to indemnity under this Contract shall be diminished, waived, or discharged by the exercise of any other remedy allowed under this Contract or by law.

3.18.5 This Article 3 and the obligations of Contractor hereunder shall survive Substantial Completion, final completion, all payments (including final payment) to Contractor, and any termination of this Contract.

3.18.6 Contractor's obligations under this Article 3 shall be construed as protecting the Indemnitees to the fullest extent permitted by law, subject to Section 3.18.7.

3.18.7 Notwithstanding anything to the contrary in this Article 3 (but subject to Section 3.18.2), Contractor shall <u>not</u> be required to indemnify against any claims, damages, losses or expenses: (a) as to Construction Manager, to the extent that such loss and expense is the result of

Construction Manager's professional malpractice or professional negligence; or (b) as to any Indemnitee, to the extent that such Loss-and-Expense is the result of the negligence or willful misconduct of such Indemnitee. (This Section shall not excuse any insurer providing policies of insurance required by the Contract Documents from defending any such Indemnitee as required under Section 3.18.2.)

3.18.8 "Indemnitee" means Owner, Owner's affiliates, Construction Manager, Construction Manager's consultants, Construction Manager, and the members, managers, and the directors, shareholders, agents, officers and employees of the foregoing. "Loss-And-Expense" means loss, liability, obligation, damage, delay, penalty, judgment, cost, fee, claim, charge, tax, or expense of every kind (including related reasonable fees and costs of attorneys or otherwise).

3.18.9 The obligations of the Contractor under this Section 3.18 shall not extend to the liability of the Construction Manager, their consultants, and agents and employees of any of them arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Construction Manager, their consultants, and agents and employees of any of them provided such giving or failure to give is the primary cause of the injury or damage.

3.19 LIABILITY FOR AND REPAIR OF DAMAGED WORK

3.19.1 The Contractor shall be liable for any and all damages and losses to the Project (whether by fire, theft, vandalism, earthquake, flood or otherwise) prior to Owner’s acceptance of the Project as fully completed except that the Contractor shall not be liable for:

1. Losses covered by the builder’s risk property insurance provided by the Owner pursuant to Article 11 of the General Conditions, except that the Contractor shall be liable for any deductible(s) and any amounts exceeding policy limits.

2. Earthquake, tidal wave, or flood, provided that the loss was 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.

ARTICLE 4 ADMINISTRATION OF THE CONTRACT

4.1 CONSTRUCTION MANAGER

4.1.1 NOT USED

4.1.2 If the employment of the Construction Manager is terminated, the Owner shall employ a successor Construction Manager whose status under the Contract Documents shall be that of the Construction Manager.

4.1.3 The Owner shall retain qualified and licensed professionals to prepare the construction documents and assist with the administration of their construction.

4.2 ADMINISTRATION OF THE CONTRACT

4.2.1 The Construction Manager will provide administration of the Contract as described in the Contract Documents, and will be the Owner's representatives (1) during construction, (2) until final payment is due and (3) with the Owner's concurrence, from time to time during the

correction period described in Section 12.2. The Construction Manager will advise and consult with the Owner and will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified by written instrument in accordance with other provisions of the Contract.

4.2.2 NOT USED

4.2.3 NOT USED

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

4.2.5 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION
Owner shall copy or involve Construction Manager on all communications with Contractor. the Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Construction Manager and shall be contemporaneously provided to the Owner.

4.2.6 NOT USED

4.2.7 The Construction Manager has authority to reject Work that does not conform to the Contract Documents, and to require additional inspection or testing, in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed, but will take such action only after notifying the Owner. Subject to review by the Owner, the Construction Manager will have the authority to reject Work which does not conform to the Contract Documents. Whenever the Construction Manager considers it necessary or advisable for implementation of the intent of the Contract Documents, the Construction Manager has authority to require additional inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.2.13 through 4.2.15 inclusive.

4.2.8 The Construction Manager will review and accept or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Construction Manager's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Construction Manager's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Construction Manager, of any construction means, methods, techniques, sequences or procedures. The Construction Manager's acceptance of a specific item shall not indicate acceptance of an assembly of which the item is a component.

4.2.9 The Construction Manager will prepare Change Orders and Construction Change Directives, and the Construction Manager may authorize minor changes in the Work as provided

in Section 7.4. The Construction Manager will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

4.2.10 NOT USED

4.2.11 If the Owner and Construction Manager agree, the Construction Manager will provide one or more project representatives to assist in carrying out the Construction Manager's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

4.2.12 The Construction Manager will interpret matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner, Construction Manager or Contractor. The Construction Manager's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

4.2.13 Interpretations and decisions of the Construction Manager will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings.

4.2.14 NOT USED

4.2.15 The Construction Manager will review and respond to requests for information about the Contract Documents. The Construction Manager's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Construction Manager will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

4.2.16 The Construction Manager will determine in general that the Work is being performed in accordance with the requirements of the Contract Documents, will keep the Owner informed of the progress of the Work, and will endeavor to guard the Owner against defects and deficiencies in the Work.

4.2.17 The Construction Manager will provide for coordination of the activities of Separate Contractors and of the Owner's own forces with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with Separate Contractors and the Construction Manager and Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the Contractor's Schedule deemed necessary after a joint review and mutual agreement.

4.2.18 The Construction Manager will schedule and coordinate the activities of the Contractors in accordance with the latest approved Master Project schedule.

4.2.19 The Construction Manager will review and certify all Applications for Payment by the Contractor, including final payment. The Construction Manager will assemble each of the Contractor's Applications for Payment with similar Applications from other Contractors into a Project Application and Project Certificate for Payment.

4.3 CONSTRUCTION MANAGER

4.3.1 The Construction Manager is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Construction Manager" means the Construction Manager identified on the cover page or the Construction Manager's authorized representative, or their successors when designated by written notice to Contractor.

4.3.2 NOT USED.

4.3.3 In case of termination of employment of the Construction Manager, the Owner shall appoint a new construction manager whose status under the Contract Documents shall be that of the former construction manager.

ARTICLE 5 SUBCONTRACTORS

5.1 DEFINITIONS

5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term “Subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term “Subcontractor” does not include a Separate Contractor or subcontractors of a Separate Contractor.

5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term “Sub-subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor. Unless otherwise noted or inapplicable in a particular context, the term Subcontractor includes Subcontractors at all tiers and the term Contractor includes all Subcontractors.

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

5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Construction Manager the names of persons or entities for review by the Owner, Construction Manager (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Construction Manager may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Construction Manager has reasonable objection to any such proposed person or entity or (2) that the Owner or Construction Manager requires additional time for review. Failure of the Owner or Construction Manager to reply within the 14 day period shall constitute notice of no reasonable objection.

5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Construction Manager has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

5.2.3 If the Owner or Construction Manager has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Construction Manager has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Construction Manager makes reasonable objection to such substitution.

5.3 SUBCONTRACTUAL RELATIONS

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Construction Manager. Each subcontract agreement shall preserve and protect the rights of the Owner and Construction Manager under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. The Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

1. Assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

2. Assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract from the date of assignment.

5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be adjusted for the documented increases in cost resulting from the suspension.

5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, which include persons or entities under separate contracts not administered by the Construction Manager. The Owner further reserves the right to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation.

6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

6.1.3 See Section 4.2.17.

6.1.4 Not Used.

6.1.5 The Project, of which the Work is a part, will involve other contracts for work to be performed and also work to be performed by the Owner on the same site. By entering into this Contract, Contractor acknowledges that Owner has the right to enter into such other contracts and to perform work, and that the work of said contracts or the Owner may (i) be in close proximity to and/or performed contemporaneously with the work of this Contract, and (ii) result in delays in or disruptions to Contractor's Work. The Contractor further agrees as follows:

1. The Owner shall cause Separate Contractors to afford the Contractor reasonable opportunity for the introduction and storage of its materials and the execution of its work. The Contractor shall properly connect and coordinate its construction and operations with the construction and operations of Separate Contractors and Owner forces, as required by the Contract Documents.

2. The Contractor shall cooperate with Separate Contractors and the Owner on the project site and will do nothing to delay, hinder, disrupt, or interfere with the work of Separate Contractors, or the Owner. Contractor shall coordinate its work with the work of any Separate Contractor and agrees to attend any coordination meetings scheduled for this purpose by the Owner's Representative. Any dispute between the Contractor and any Separate Contractor over how the work of the various trades should be coordinated, shall be promptly submitted by Contractor to the Owner's Representative. The

Contractor agrees to cooperate with the development of, and to be bound by, any reasonable coordination plan directed by Owner's Representative to address the dispute, even if Contractor does not agree with the coordination plan so developed. The Contractor agrees that if its work is delayed, hindered, disrupted or interfered with by a Separate Contractor to the extent such delays, hindrances, disruptions, and interferences result in Contractor working beyond the Contract Time, through no fault of the Contractor, the Contract shall be subject to a time extension, but no compensation from the Owner, provided the Contractor complies with the requirements of the Contract for seeking a time extension, including without limitation, the requirements set forth in Articles 4, 7 and 8 of the General Conditions.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford the Owner, its forces, Construction Manager and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Construction Manager apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractors as provided in Section 10.2.5.

6.2.5 Each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, Separate Contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and allocate the cost among those responsible as the Construction Manager.

ARTICLE 7 CHANGES IN THE WORK

7.1 GENERAL

7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

7.1.2 A Change Order shall be based upon agreement among the Owner and Contractor; a Construction Change Directive by the Owner may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Construction Manager alone.

7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

7.1.4 In the Contract Documents, "changes in the Work" means any Work in addition to the original Work under this Contract which adds scope or program to the original Work under this Contract. For the avoidance of doubt, "changes in the Work" does not include (a) development of details reasonably inferable from or implied by, but not explicit in, Drawings or Specifications; (b) the inclusion or exclusion of any item which should be included or excluded in accordance with good construction practice, whether or not shown or set forth in a drawing or specification; and (c) any matters resulting from, or attributable to, mistake, error, omission, delay, or negligence of Contractor or any Subcontractor.

7.2 CHANGE ORDERS

7.2.1 A Change Order is a written instrument signed by the Owner and Contractor stating their agreement upon all of the following:

1. The change in the Work;
2. The amount of the adjustment, if any, in the Contract Sum; and
3. The extent of the adjustment, if any, in the Contract Time.

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.1 A Construction Change Directive is a written order prepared by the Construction Manager and signed by the Owner directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

1. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

2. Unit prices stated in the Contract Documents or subsequently agreed upon;
3. Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
4. Costs as provided in Section 7.3.7 plus the Contractor Fee on such costs.

7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time within 7 calendar days after receipt of the Construction Change Directive.

7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, Contractor shall nonetheless proceed with the Work if so directed by Owner, and the Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data of Contractor's costs for the changed or disputed work. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall mean actual costs incurred or to be incurred by Contractor and each Subcontractor regardless of tier, and shall be limited to the following categories:

1. Straight-time wages or salaries for employees employed at the Project site, or at fabrication sites off the Project site, in the direct performance of the applicable Work.

2. Fringe benefits and payroll taxes for employees employed at the Project site, or at fabrication sites off the Project site, in the direct performance of the applicable Work.

3. Overtime wages or salaries for overtime Work specifically authorized in writing by Owner for employees employed at the Project site, or at fabrication sites off the Project site, in the direct performance of the applicable Work.

4. Fringe benefits and payroll taxes for overtime Work specifically authorized in writing by Owner for employees employed at the Project site, or at fabrication sites off the Project site, in the direct performance of the applicable Work.

5. Costs (including sales tax) of materials and consumable items which are furnished and incorporated into the applicable Work. 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 Owner and Contractor shall make provisions so that they may be obtained.

6. Rental charges for necessary machinery and equipment, whether owned or hired, as authorized in writing by Construction Manager, exclusive of hand tools, used directly in the performance of the applicable Work. Such rental charges shall not exceed the current U. S. Army Corp of Engineers scheduled charges for the area in which the work is performed. Contractor shall attach a schedule of rental charges to the Cost Proposal. The charges for any machinery and equipment shall cease when the use thereof is no longer necessary for the applicable Work.

7. Additional costs of royalties and permits due to the performance of the applicable Work.

8. Cost for additional premiums for insurance and bonds, which may not exceed in aggregate 1.5% of items .1 through .7 above.

7.3.8 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager determines, in the Construction Manager's judgment, to be reasonably justified. Construction Manager's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

7.3.9 When the Owner and Contractor agree with a determination made by the Construction Manager concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Construction Manager will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

7.3.10 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 pursuant to a Change Order or Construction Change Directive, for all costs and expenses not included in paragraphs 7.3.7.1, .2,. 3, and .4 above. The Contractor Fee shall not be compounded. The Contractor Fee shall be computed as follows:

1. Fifteen percent (15%) for the cost of that portion of the Work to be performed by the Contractor with its own forces.

2. Fifteen percent (15%) of the cost of that portion of the Work to be performed by a Subcontractor, regardless of tier, with its own forces, plus five percent (5%) of such cost for the Contractor. Total combined Contractor and Subcontractor's mark-up shall not exceed twenty percent (20%).

7.3.11 Cost of Work for purposes of this Section 7.3 shall not include any of the following:

1. Superintendent(s).
2. Assistant Superintendent(s.)
3. Project Engineer(s).
4. Project Manger(s).
5. Scheduler(s).
6. Estimator(s).
7. Drafting or Detailing
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. Data processing personnel and equipment.
13. Utilities including gas, electric, sewer, water, telephone, facsimile, copier 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 7.3.7 above.

7.4 MINOR CHANGES IN THE WORK

The Construction Manager has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Construction Manager and delivered by the Construction Manager and shall be binding on the Contractor.

7.5 CONTRACTOR CHANGE ORDER REQUEST

7.5.1 Contractor may request changes to the Contract Sum and/or Contract Time for those reasons specifically allowed under the Contract.

7.5.2 Contractor entitlement to an adjustment of the Contract Sum and/or Contract Time is conditioned upon Contractor submitting a timely Change Order Request.

7.5.3 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 Owner for submission of the Change Order Request.

7.5.4 A Change Order Request must state that it is a Change Order Request, state the reason for the request, cite contractual justification for the request, and specify the amount of any requested adjustment of the Contract Sum or Contract Time. If the Contractor requests an adjustment to the Contract Sum, the Contractor shall submit a cost proposal with the Change Order Request that includes a complete and itemized breakdown of all costs allowed in Section 7.3.7 and Contractor's Fee under Section 7.3.10 that substantiates the Contractor's cost proposal. Quantities, description of work items, unit costs for each work items, tabulations, mark-ups, etc. shall be clearly indicated and described in the cost proposal.

7.5.5 Upon request of Construction Manager, Contractor shall submit such additional information as may be requested by Construction Manager for the purpose of evaluating the Change Order Request. Such additional information may include:

1. 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 Construction Manager, who may require such actual cost records to be submitted and reviewed, on a daily basis, by the Construction Manager.

2. Daily time and material sheets which shall be signed by the Construction Manager.

3. Any other information requested by the Construction Manager or Owner for the purpose of evaluating the Change Order Request, which shall be submitted by the deadline established by the Construction Manager.

ARTICLE 8 TIME

8.1 DEFINITIONS

8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

8.1.2 The date of commencement of the Work is the date established in the Agreement.

8.1.3 The date of Substantial Completion is the date certified by the Construction Manager in accordance with Section 9.8.

8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

8.2 PROGRESS AND COMPLETION

8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of

insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

8.2.3 The Contractor agrees that the Owner is purchasing the right to have the Contractor fully mobilized on the site from the earliest date for commencement of the Work shown on the Preliminary Master Project Schedule to the date shown for full completion of the Project as shown in the bidding documents.

8.2.4 The Contractor agrees that the Owner is purchasing the right to have Contractor work on the Project site shared by the Contractor and Separate Contractors. The Contractor recognizes that as a result of working at a shared Project site there will be a loss of productivity and disruption commensurate with a project of the type, size and complexity of the Project. The Contractor agrees that the Contract Sum includes full compensation for such loss of productivity and disruption.

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

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 The Contract Time and Contractor's Schedule will be extended for Permitted Delays and Compensable Delays only in compliance with the applicable provisions of these General Conditions. If Contractor experiences a Permitted Delay, then Contractor will be entitled to request a Change Order pursuant to Section 7.5 and Article 15 for an extension of the Contract Time for the number of days the critical path to Substantial Completion was delayed. Notwithstanding the above, Contractor will not be entitled to any such extension of time unless Contractor (1) notifies Owner and Construction Manager in writing of the cause or causes of the delay in accordance with Article 15 and (2) demonstrates that it could not have anticipated or avoided the delay and has used all available means to minimize the consequences of the delay.

8.3.1.1 "Permitted Delay" means any critical path delay in Substantial Completion of the Work beyond the expiration of the Contract Time for Substantial Completion caused by conditions or events beyond the reasonable control of, and without the fault or neglect of, Contractor, its Subcontractors and those for whom they are responsible, and which delay was not and could not in the exercise of reasonable diligence have been avoided. Force Majeure Events (defined below) are Permitted Delays. However, the financial inability of Contractor, a Subcontractor or supplier or any default of any of them, without limitation, will not be deemed a Permitted Delay. Contractor's sole remedy for a Permitted Delay is an extension of the Contract Time, in

accordance with the procedures of the Contract Documents. Permitted Delays will not entitle Contractor to any adjustment of the Contract Sum (unless such delay also qualifies as a Compensable Delay).

8.3.1.2 "Force Majeure Events" are natural disasters, union labor strikes that cannot be resolved through use of a dual gate or other measures in Contractor's reasonable control, delays or disruptions in utility service and/or connections due to acts or omissions of Owner or Separate Contractors, civil disobedience, an act of terror or war, or unavoidable casualties or catastrophic events, beyond the control of Contractor and its Subcontractors, and not due to any act or omission of them, that necessarily extends the Contract Time.

8.3.2 "Compensable Delay" means any Permitted Delay to the extent caused by (a) the wrongful or negligent acts or omissions of Owner, Construction Manager, or Separate Contractors; (b) changes in the scope of Work directed by Owner for reasons other than a mistake, error or problem resulting from the act or omission of Contractor or any of its Subcontractors; (c) events or conditions that provide for an adjustment of the Contract Sum pursuant to Sections 2.5.1, 3.7.4, 3.7.5, 3.19.1, 9.7 or 14.3; or (d) any other item that is specified as a Compensable Delay elsewhere in the Contract; provided that any such delay is unreasonable under the circumstances involved and not within the contemplation of Contractor on the effective date of this Contract. Contractor's sole remedy for a Compensable Delay is an extension of the Contract Time under Section 8.3.1 and an adjustment of the Contract Sum in accordance with Articles 7 and 15 to the extent that Contractor incurs additional cost allowed under Section 7.3.7 as a result of the Compensable Delay extending the completion of the Work beyond the Contract Time.

8.3.3 Contractor expressly agrees that neither Contractor nor any Subcontractor shall have any right to claim or assert a right to an extension of the Contract Time, an adjustment of the Contract Sum or any other legal or equitable relief or damages for any Project delay that is not a Permitted Delay or a Compensable Delay (an "Inexcusable Delay").

8.3.4 Any Claim for an extension of the Contract Time due to a Permitted Delay or a Compensable Delay is subject to the following:

1. If more than one Permitted Delay occurs concurrently, or if a Permitted Delay and a Compensable Delay occur concurrently, the maximum extension of the Contract Time is the number of days from the commencement of the first delay to the cessation of the delay which ends last, and Contractor will not be entitled to any adjustment in the Contract Sum;

2. If an Inexcusable Delay occurs concurrently with either a Permitted Delay or a Compensable Delay, the maximum extension of the Contract Time is the number of days during which the delays are concurrent, and Contractor will not be entitled to any adjustment in the Contract Sum; and

3. Delays in the prosecution of parts or classes of the Work which do not prevent or delay Substantial Completion of the whole Work within the Contract Time are not Permitted or Compensable Delays.

8.3.5 A "delay" means any and every kind of delay, obstruction, hindrance, interference, loss of productivity, or inefficiency of any kind.

ARTICLE 9 PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Construction Manager, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Construction Manager may require. This schedule, unless objected to by the Construction Manager shall be used as a basis for reviewing the Contractor's Applications for Payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Construction Manager an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2., for completed portions of the Work. Such application and supported by such data substantiating the Contractor's right to payment as the Owner or Construction Manager may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

9.3.1.1 As provided in Section 7.3.8, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Construction Manager, but not yet included in Change Orders.

9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

9.3.1.3 Each Application for Payment shall also include the following: (a) Contractor's affidavit covering all payments by Owner pursuant to previous Applications for Payment; (b) statutory conditional waivers and releases of lien upon progress payment from Contractor and each Subcontractor submitting 20-day preliminary notices; (c) statutory unconditional waivers and releases for the previous progress payment from Contractor and each Subcontractor submitting 20-day preliminary notices; (d) Contractor's updated schedule of values; and (e) an updated Contractor's Schedule showing progress towards major milestones. Contractor acknowledges that failure to provide all the required documentation shall result in a delay in the next progress payment to Contractor.

9.3.1.4 Contractor will notify Construction Manager of all 20-day preliminary notices receives from Subcontractors or suppliers. Construction Manager will maintain a written record of all 20-day preliminary notices received by it including the manner of receipt, date of receipt, and name and address of person or entity serving the notice.

9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

9.4 CERTIFICATES FOR PAYMENT

9.4.1 In accordance with Section 4.2.19, the Construction Manager will, within seven days after receipt of the Contractor's Application for Payment, review and certificate of amount due. The Construction Manager will, within seven days after receipt of the Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Construction Manager determines is properly due, or notify the Contractor and Owner in writing of the Construction Manager's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

9.4.2 The issuance of a Certificate for Payment will constitute representations made separately by the Construction Manager to the Owner, based on the Construction Manager's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Construction Manager's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Construction Manager. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Construction Manager has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods,

techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

9.5.1 The Construction Manager may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Construction Manager is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor, Construction Manager cannot agree on a revised amount, the Construction Manager will promptly issue a Certificate for Payment for the amount for which the Construction Manager is able to make such representations to the Owner. The Construction Manager may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

1. Defective Work not remedied;

2. Third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

3. Failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
4. Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

5. Damage to the Owner or a Separate Contractor;

6. Reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

7. Repeated failure to carry out the Work in accordance with the Contract Documents.

9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld with no interest due on withheld amounts.

9.5.3 If the Construction Manager withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Construction Manager and Construction Manager will reflect such payment on the next Certificate for Payment.

9.6 PROGRESS PAYMENTS

9.6.1 After the Construction Manager have issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Construction Manager.

9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

9.6.3 The Construction Manager will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Owner, Construction Manager on account of portions of the Work done by such Subcontractor.

9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers' amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Construction Manager shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

9.6.8 If any Subcontractor or any other person or entity claiming to have been employed (directly or indirectly) by or through Contractor or any Subcontractor files a lien affecting Owner or the Project (unless as a result of Owner's failure to pay an amount properly due under this Agreement), Contractor shall satisfy, remove or discharge such lien at Contractor's expense by

bonding, payment or otherwise within 15 days after notice to Contractor of the filing thereof. If Contractor fails to do so, Owner may satisfy, remove or discharge such lien; and, at Owner's election:

1. Owner may deduct the cost thereof (including all applicable fees and costs) from Contractor's next succeeding Application for Payment (or may invalidate any previously-approved but unpaid applications for payment) until Owner recoups the total thereof; or

2. Contractor shall pay the same to Owner upon demand.

9.7 FAILURE OF PAYMENT

If the Construction Manager does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within 15 business days after the date established in the Contract Documents the amount certified by the Construction Manager or awarded by binding dispute resolution, then the Contractor may, upon 10 additional business days' written notice to the Owner, Construction Manager, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

9.8 SUBSTANTIAL COMPLETION

9.8.1 "Substantial Completion" shall occur (and the Work shall be "substantially complete") when all of the following conditions have been completed to Owner's full satisfaction:

(a) All Work, excepting minor punch list work and the Close-Out Requirements, has been completed in compliance with the Contract Documents, and the Work is in a condition ready for final inspection by all governmental entities having jurisdiction (although such inspection may not occur until the rest of the Project is ready for occupancy);

(b) All equipment specified or required under the Contract Documents for Contractor to install are connected and functioning properly;

(c) Completion of Contractor's punch list items and the Close-Out Requirements will cause minimal interference to the rest of the Project;

(d) Contractor and Construction Manager have agreed in writing upon the final punch list;

(e) Contractor has delivered to Owner a claim statement setting forth in detail all Contractor's claims against Owner or any Indemnitee connected with, or arising out of, this Contract or the Work and arising out of or based on events prior to the date when Contractor gives such statement to Owner;

(f) Contractor has agreed in writing that Contractor will achieve final completion on a specified date; and

(g) Contractor has delivered to Owner all required manufacturer's (or Subcontractor's) warranties.

Alternatively, Substantial Completion shall occur on any date reasonably certified by Owner, who shall have discretion to reasonably waive any of the foregoing conditions.

9.8.1.1 "Close-Out Requirements" means Contractor's obligations for closing out the Work and completing and furnishing to Owner documentation of the Work as required under the Contract Documents (including such matters as submittal of record drawings and operating and other manuals; clean-up and removal from the construction site; and all other matters which the Contract Documents require Contractor to do and perform as part of the completion of Contractor's obligations).

9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor and Construction Manager shall jointly prepare and submit to the Construction Manager a comprehensive list of items to be completed or corrected prior to final payment ("punch list"). Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

9.8.3 Upon receipt of the punch list, the Construction Manager will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Construction Manager’s inspection discloses any item, whether or not included on the punch list, which is not sufficiently complete in accordance with the Contract Documents so that the Work as a whole is not substantially complete, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Construction Manager. In such case, the Contractor shall then submit a request for another inspection by the Construction Manager to determine Substantial Completion.

9.8.4 When the Work or designated portion thereof is substantially complete, the Construction Manager will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer, if required, and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Construction Manager and Contractor shall jointly prepare and submit a punch list as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor.

9.9.2 Immediately prior to such partial occupancy or use, the Owner and Construction Manager, Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

9.10 FINAL COMPLETION AND FINAL PAYMENT

9.10.1 Upon completion of the Work, the Contractor shall forward to the Construction Manager a written notice that the Work is ready for final inspection and acceptance and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt of the Contractor’s written notice that the Work is ready for final inspection and acceptance and receipt of a final Application for Payment, the Construction Manager will promptly make such inspection. When the Construction Manager finds the Work acceptable under the Contract Documents and the Contract fully performed and the Construction Manager will promptly issue a final Certificate for Payment stating that to the best of the their knowledge, information and belief, and on the basis of the their on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager’s final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor’s being entitled to final payment have been fulfilled.

9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Construction Manager (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner’s property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the

Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) statutory waiver and release upon final payment, and (6), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Construction Manager so confirm, the Owner shall, upon application by the Contractor and certification by the Construction Manager, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Construction Manager prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

9.10.4 Not used.

9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor is solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit one (1) copy of its written safety program to Construction Manager prior to starting work on site. The Contractor shall coordinate its safety program with the safety programs of Separate Contractors so as to provide for a safe project for all involved. The Contractor understands and agrees that Construction Manager is only responsible for the safety of Construction Manager's own employees, subcontractors and agents, and that Construction Manager has no other control nor responsibility for the safety of any other person at the Project site whatsoever.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

1. Employees on the Work and other persons who may be affected thereby;

2. The Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors;

3. Other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction; and

4. Construction or operations by the Owner or Separate Contractors.

10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

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

10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4, except damage or loss attributable to acts or omissions of the Owner or Construction Manager or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Construction Manager.

10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such

injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

10.3 HAZARDOUS MATERIALS

10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner, Construction Manager in writing.

10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Construction Manager the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Construction Manager will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If the Contractor or Construction Manager has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Construction Manager have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Construction Manager, their consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

1. Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
2. Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
4. Claims for damages insured by usual personal injury liability coverage;
5. Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
6. Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
7. Claims for bodily injury or property damage arising out of completed operations; and
8. Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Supplementary Conditions or required by law, whichever coverage is greater. Commercial general liability and automobile liability insurance coverages must be written on the occurrence basis. Coverages, whether written on an occurrence or claims-made

basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. The insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness and prior to the effectiveness of any reduced limits. Failure to so notify is a material breach of this Contract.

11.1.4 The Contractor shall cause the commercial liability coverage and automobile liability coverage required by the Contract Documents to include (1) the Owner, the Owner's consultants, the Construction Manager, the Construction Manager's consultants and the employees, officers and affiliates of the foregoing as additional insureds for claims arising from the Contractor's operations; and (2) the Owner as an additional insured for claims arising from the Contractor's completed operations.

11.2 OWNER'S LIABILITY INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

11.3 BUILDER'S RISK PROPERTY INSURANCE

11.3.1 The Owner will provide builder's risk property insurance, with a $25,000 deductible as required by the General Conditions if the requirements of the Project are not excluded by such coverage. Bidder agrees that the Owner's provision of builder's risk property insurance containing said provisions meets the Owner'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 Owner's obligation to provide such insurance. See also, Section 3.19.1.1.

11.3.2 A copy of the Owner's builder's risk property insurance policy for the Project will be provided to the bidder awarded the Contract.

11.3.3 A loss insured under the Owner's property insurance shall be adjusted solely by the Owner and made payable to the Owner, subject to requirements of any applicable mortgagee clause. Owner shall apply proceeds to paying Contractor for damaged Work pursuant to Article

7. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate written agreements shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

11.3.4 WAIVERS OF SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Construction Manager, Construction Manager's consultants, Separate Contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require of the Construction Manager, Construction Manager's consultants, Separate Contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate written agreements, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

11.4 PERFORMANCE BOND AND PAYMENT BOND

11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

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 the Construction Manager‘s request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Construction Manager, be uncovered for the Construction Manager examination and be replaced at the Contractor's expense without change in the Contract Time.

12.1.2 If a portion of the Work has been covered that the Construction Manager has not specifically requested to examine prior to it's being covered, the Construction Manager may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense

unless the condition was caused by the Owner or a Separate Contractor in which event the Owner shall be responsible for payment of such costs.

12.2 CORRECTION OF WORK

12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Construction Manager or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Construction Manager's services and expenses made necessary thereby, shall be at the Contractor's expense. Contractor shall replace, repair, or restore to Owner'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.

12.2.2 AFTER SUBSTANTIAL COMPLETION

12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. If the Contractor fails to correct nonconforming Work within a reasonable time after receipt of notice from the Owner or Construction Manager, the Owner may correct it in accordance with Section 2.4.

12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or Separate Contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2

relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

13.2 SUCCESSORS AND ASSIGNS

13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

13.2.2 The Owner may, upon advance written notice to Contractor, assign this Agreement to an affiliated entity (as defined in California Corporations Code Section 150) or merger partners of Owner, and such assignment will not require Contractor's consent. Also, the Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project. The Contractor shall execute all consents reasonably required to facilitate any such assignment.

13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

13.4 RIGHTS AND REMEDIES

3.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

13.4.2 No action or failure to act by the Owner, Construction Manager or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

13.5 TESTS AND INSPECTIONS

13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Construction Manager timely notice of when and where tests and inspections are to be made so that the Construction Manager may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

13.5.2 If the Construction Manager, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Construction Manager will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Construction Manager of when and where tests and inspections are to be made so that the Construction Manager may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Construction Manager's services and expenses shall be at the Contractor's expense.

13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Construction Manager.

13.5.5 If the Construction Manager is to observe tests, inspections or approvals required by the Contract Documents, the Construction Manager will do so promptly and, where practicable, at the normal place of testing.

13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

13.6 INTEREST
Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

13.7 TIME LIMITS ON CLAIMS
The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

13.7 MEDICARE AUDIT
Pursuant to Section 952 of P.L. 96-499, which governs access to books and records of contractors and subcontractors to Medicare providers where the cost or value of the Work under the contract exceeds $10,000 over a 12-month period, each Contractor and its Subcontractors agree to permit representatives of the Secretary of the Department of Health and Human Services and the Comptroller General, in accordance with criteria and procedures contained in applicable Federal regulations, to have access to their books, documents and records as necessary to verify the nature and extent of the cost of the Work for a period of 4 years from Final Completion.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT
14.1 TERMINATION BY THE CONTRACTOR
14.1.1 The Contractor may terminate the Contract upon 7 days prior notice to Owner if the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons. If underlying cause of the Work suspension is removed prior to the end of the 7 day notice period, then the Contract is not terminated.

1. Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
2. An act of government, such as a declaration of national emergency that requires all Work to be stopped;
3. Because the Construction Manager not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents, and Contractor has duly suspended the Work per the terms of Section 9.7; or
4. The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section

14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

14.1.3 If Contractor terminates the Contract under Sections 14.1.1 or 14.1.2, then the Contractor may recover from the Owner payment for Work executed and reasonable costs incurred due to termination, but no more than the Contract Sum in total.

14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner, Construction, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1 The Owner may terminate the Contract if the Contractor

1. Repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
2. Fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
3. Repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
4. Otherwise is guilty of substantial breach of a provision of the Contract Documents.

14.2.2 When any of the above reasons exist, the Owner may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may subject to any prior rights of the surety:

1. Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
2. Accept assignment of subcontracts pursuant to Section 5.4; and
3. Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Construction Manager's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall promptly pay the difference to the Owner upon demand. The obligations in this paragraph shall survive termination of the Contract.

14.2.5 If a court of competent jurisdiction determines that termination of Contractor was wrongful or otherwise improper, the termination will be deemed a termination for convenience under Section 14.4.

14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine. Such suspension will be a Compensable Delay; however, Owner's suspension pursuant to another provision of the Contract is not a suspension under this Section 14.3.

14.3.2 No adjustment of the Contract Sum or Contract Time for Owner's suspension under Section 14.3.1 shall be made to the extent

1. That performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
2. That an adjustment of the Contract Sum or Contract Time is made or denied under another provision of the Contract.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

14.4.1 The Owner may, at any time, upon written notice terminate the Contract for the Owner’s convenience and without cause.

14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner’s convenience, the Contractor shall

1. Cease operations as directed by the Owner in the notice;
2. Take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
3. Except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all subcontracts and purchase orders that Owner is not taking by assignment, and enter into no further subcontracts and purchase orders.

14.4.3 In case of such termination for the Owner’s convenience, the Contractor shall be entitled to receive payment for Work executed and reasonable costs incurred due to termination, but no more than the Contract Sum in total.

ARTICLE 15 CLAIMS AND DISPUTES

15.1 CLAIMS

15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term “Claim” also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

15.1.2 NOTICE OF CLAIMS
Claims by either the Owner or Contractor must be initiated by written notice to the other party with a copy sent to the Construction Manager. Claims by either party must be initiated within 7 days after the later of the occurrence of the event giving rise to such Claim or when the claimant first recognizes (or reasonably should have recognized) the condition giving rise to the Claim. Any claim by Contractor for (a) an adjustment in the Contract Sum for changes in the Work or (b) for an increase in the Contract Time shall be waived if not provided to Construction Manager and Owner in writing within the time specified in this Section 15.1.2. Contractor acknowledges that Owner's receipt of any notices for Claims within the time period specified in this Section 15.1.2 is of the essence of this Contract.

15.1.3 CONTINUING CONTRACT PERFORMANCE
Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments of undisputed amounts in accordance with the Contract Documents.

15.1.4 CLAIMS FOR ADDITIONAL COST
If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

15.1.5 CLAIMS FOR ADDITIONAL TIME
15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor’s Claim shall include an estimate of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, had an adverse effect on the scheduled construction and exceeded the number of weather delays built into the schedule and shown therein.

15.1.5.3 CONTRACTOR CLAIM DOCUMENTATION REQUIREMENTS
A Claim must include the following:

1. 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.

2. A statement demonstrating that a Change Order Request was timely submitted as required by
Section 7.5.3 of the General Conditions.

3. A detailed justification for any remedy or relief sought by the Claim including an explanation of the contractual provisions allowing the Claim, and a detailed cost breakdown of the amounts claimed, including the items specified in Section 7.3.7 of the General Conditions. The cost breakdown must be provided even if the costs claimed have not been incurred when the Claim is submitted.

15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

1. Damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

2. Damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except profit included in the Contract Sum on account of completed Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

15.2 INITIAL DECISION

15.2.1 Claims by the Contractor (for itself or on a pass-through basis) shall be referred to the Initial Decision Maker for initial decision. An initial decision shall be required as a condition precedent to litigation of any Claim by the Contractor arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered.

15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, or (4) suggest a compromise.

15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision, at the Owner's expense.

15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or

supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim or suggesting a compromise. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties, and the Construction Manager of any change in the Contract Sum or Contract Time or both. The initial decision shall stand for the duration of the Project, but may be overturned by a legal proceeding after Final Completion or termination of this Agreement, in which the court need not give any deference to the Initial Decision Maker's decision.

15.2.6 Not used.

15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

15.2.8 Without limiting Section 9.6.8, if a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

15.3 LITIGATION
15.3.1 If the parties are unable to resolve a dispute under Section 15.2, then after Final Completion or termination of this Agreement either party may pursue any legal or equitable relief afforded them under the Contract.

15.3.1 Both parties agree that any claim or enforcement of a judgment or alternative dispute award will be filed with the appropriate court in Glenn County.

ARTICLE 16 STATUTORY AND OTHER REQUIREMENTS

16.1 Not Used

16.2 NONDISCRIMINATION
16.2.1 For purposes of this Article 16.2, the term Subcontractor shall not include suppliers, manufacturers, or distributors.

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

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

1. Contractor shall not willfully discriminate against any employee or applicant for employment because of race, color, religion, sex, age, ancestry, national origin, sexual orientation, handicap, veteran's status, medical condition (as defined in

Section 12926 of the State of California Government Code), marital status, or citizenship (within the limits imposed by law) because of habit, local custom, or otherwise. All applicants for employment and employees are to be treated without regard to their race, color, religion, sex, age, ancestry, national origin, sexual orientation, handicap, veteran's status, medical condition (as defined in Section 12926 of the State of California Government Code), marital status, or citizenship (within the limits imposed by law). Such equal treatment shall apply, but not be limited to, employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

2. Contractor and all Subcontractors will permit access to their records of employment, employment advertisements, application forms, and other pertinent data and records by Owner or any appropriate agency of the State of California designated by Owner for the purposes of investigation to ascertain compliance with this Article 16.2. The outcome of the investigation may result in the following:

A. A finding of willful violation of the provisions of this Contract or of the Fair Employment Practices Act may be regarded by Owner 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.

B. Owner 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.

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

D. Contractor agrees that, should Owner determine that Contractor has not complied with this Article 16.2, Contractor shall forfeit to Owner, 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 16.3 below for violation of prevailing wage rates. Such penalty amounts may be recovered from Contractor; and Owner may deduct any such penalty amounts from the Contract Sum.

E. Nothing contained in this Article 16.2 shall be construed in any manner so as to prevent Owner from pursuing any other remedies that may be available at law.

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

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

ii) 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).

iii) 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, non-minority women, and minority men shall be available and given an equal opportunity for employment.

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

G. Contractor shall include the provisions of the foregoing Articles 16.2.3.1 through 16.2.3.6 in all subcontracts with Subcontractors, so that such provisions will be binding upon each such Subcontractor.

16.3 PREVAILING WAGE RATES

16.3.1 For purposes of this Article 16.3, the term Subcontractor shall not include suppliers, manufacturers, or distributors.

16.3.2 Contractor shall comply and shall ensure that all Subcontractors comply with Sections 1770, 1771, 1772, 1773, 1774, and 1775 of the State of California Labor Code. Compliance with these sections is required by this Contract.

16.3.3 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 Owner'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 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 Owner, as a penalty, not more than $50 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 17420 of the California Labor Code.

16.4 PAYROLL RECORDS

16.4.1 For purposes of this Article 16.4, the term Subcontractor shall not include suppliers, manufacturers, or distributors.

16.4.2 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 journey worker, 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 Owner, 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 Owner, 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 Owner 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.

16.4.3 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 Owner 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 16.4 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 Owner, as a penalty, $25 for each day, or portion thereof, for each worker, until strict compliance is accomplished. Such forfeiture amounts may be deducted from the Contract Sum.

16.5 APPRENTICES

16.5.1 For purposes of this Article 16.5, the term Subcontractor shall not include suppliers, manufacturers, and distributors.

16.5.2 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.

16.5.3 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.

16.5.4 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.

16.5.5 "Apprenticeship craft or trade," as used in this Article 16.5, shall mean a craft or trade determined as an apprenticeship occupation in accordance with rules and regulations prescribed by the Apprenticeship Council.

16.5.6 If Contractor or Subcontractors employ journey-workers 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 journey-workers 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 Owner.

16.5.7 In the event Contractor willfully fails to comply with this Article 16.5, it will be considered in violation of the requirements of the Contract.

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

16.6 WORK DAY

16.6.1 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 Owner, 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 16.6 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 Owner, its officers and agents, and to the inspection of the appropriate enforcement agency of the State of California.

END OF SECTION

SECTION 00 73 00
SUPPLEMENTARY CONDITIONS

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

A. Contractor's Liability Insurance

The Contractor shall procure, maintain, and keep in force at all times during the term of the Contract, at the Contractor's sole expense, the following insurance:

General Liability Insurance including, but not limited to, protection for claims of bodily injury and property damage liability, personal and advertising injury liability, and products and completed operations liability. Coverage shall be at least as broad as "Insurance Services Office Commercial General Liability Coverage Form CG 0001" (occurrence). The limits of liability shall be not less than:

Each Occurrence	One Million Dollars ($1,000,000)
General Aggregate	Two Million Dollars ($2,000,000)

The policy shall cover contractual liability applicable to the Contractor's assumed liability under this Contract. The policy shall provide coverage for claims arising out of subsidence. The Products and Completed Operations coverage shall be maintained for at least two years after completion of the Contract.

Automobile Liability Insurance providing protection against claims of bodily injury and property damage arising out of ownership, operation, maintenance, or use of owned, hired, and nonowned automobiles. Coverage shall be at least as broad as "Insurance Services Office Business Auto Coverage Form CA 0001," symbol 1 (any auto). The limits of liability shall not be less than:

Bodily Injury and Property Damage	
Combined Single Limit	One Million Dollars ($1,000,000)

The Workers' Compensation policy required hereunder shall be endorsed to state that the Workers' Compensation carrier waives its right of subrogation against the County, its officers, officials, employees, agents or volunteers.

In the event the Contractor is self-insured, the Contractor shall furnish a Certificate of Permission to Self-Insure by the Department of Industrial Relations Administration of Self-Insurance, Sacramento. No Workers' Compensation insurance is required for contractors that do not have employees.

Excess or Umbrella Liability Insurance. If the Special Provisions require limits of general liability insurance of more than one million dollars ($1,000,000) per occurrence, the Contractor shall carry excess or umbrella liability insurance providing excess coverage at least as broad as the underlying coverage for general, automobile and employer's liability with a limit equal to the amount stated in the Special Provisions per occurrence and aggregate.

Contractor's Equipment Insurance. The Contractor, and each of its Subcontractors, shall separately insure its own equipment for loss and damage. The Contractor's Property and Inland Marine policies shall include, or be endorsed to include, a waiver of subrogation against the County, its officers, officials, employees, agents, and volunteers which might arise by reason of damage to the Contractor's property or equipment (owned, leased or borrowed) in connection with work performed under this Contract by the Contractor.

Other Provisions

1. The Contractor's General Liability, Automobile Liability, and any Excess or Umbrella Liability, shall contain the following provisions:
    a. The County, its officers, officials, employees, agents, and volunteers shall be covered as additional insureds as respects liability arising out of the activities performed by or on behalf of the Contractor, products and completed operations of the Contractor, premises owned, occupied, or used by the Contractor, or automobiles owned, leased, hired, or borrowed by the Contractor. The policy shall contain no special limitations on the scope of coverage afforded to the County, its officers, officials, employees, agents, or volunteers.

    b. For any claims related to this Contract, the Contractor's insurance coverage shall be primary insurance as respects the County, its officers, officials, employees, agents, or volunteers. Any insurance or self-insurance maintained by the County, its officers, officials, employees, agents, or volunteers shall be not be excess of the Contractor's insurance and shall not contribute with it.

    c. Any failure to comply with reporting or other provisions of the policies on the part of the Contractor, including breaches of warranties, shall not affect coverage provided to the County, its officers, officials, employees, agents, or volunteers.

2. The Contractor's General Liability and any Excess or Umbrella Liability insurance policies shall contain an endorsement stating that any aggregate limits shall apply separately to the work.

3. The Contractor’s insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer’s liability.

4. Each insurance policy shall state that coverage shall not be suspended, voided, cancelled by the Contractor or the County, reduced in scope of coverage or in limits, non-renewed, or materially changed unless the insurer(s) provide thirty (30) days written notice by certified mail to the County prior to such change. Ten (10) days prior written notice by certified mail shall be given to the County in the event of cancellation due to nonpayment of premium.

5. All of the Contractor's insurance coverage, except as noted below, shall be placed with insurance companies with a current A.M. Best rating of at least A-:VII. Exceptions:

    a. Underwriters at Lloyd's of London, which are not rated by A.M. Best.

    b. Workers' Compensation which is provided through a State Compensation Insurance Fund or a qualified self-insurer for Workers' Compensation under California law.

    c. For liability insurance required under Environmental Liability insurance, insurance requirements shall be placed with insurance companies with a current A.M. Best rating of at least B+:VII.

6. The Contractor shall sign and file with the County the following certification prior to commencing performance of the work of the Contract:

    “I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for worker’s compensation or to undertake self-

insurance in accordance with the provisions of the Code, and I will comply with such provisions before commencing the performance of the work of this Contract."

Said certification is included in the Contract and the signing and returning the Contract shall constitute signing and filing of the said certification.

7. The County, at its discretion, may require new types of insurance coverage or increase the limits of insurance coverage required hereunder at any time during the term of the Contract by giving thirty (30) days written notice to the Contractor. Contractor shall immediately procure such insurance or increase the limits of coverage and provide certificates of insurance, including copies of all required endorsements, to the County within thirty (30) days of receipt of the County's request.

8. The required insurance coverage shall be subject to the approval of the County, but any acceptance of insurance certificates by the County shall in no way limit or relieve the Contractor of its duties and responsibilities in this Contract.

9. If the Contractor fails to procure or maintain insurance as required by this Chapter and any Special Provisions, or fails to furnish the County with proof of such insurance, the County, at its discretion, may procure any or all such insurance. Premiums for such insurance procured by the County shall be deducted and retained from any sums due the Contractor under the Contract. Failure of the County to obtain such insurance shall in no way relieve the Contractor from any of the Contractor's responsibilities under the Contract. Any failure of the Contractor to maintain any item of the required insurance is sufficient cause for termination of the Contract.

10. The making of progress payments to the Contractor shall not be construed as relieving the Contractor of responsibility for loss or damage, or destruction occurring prior to final acceptance by the County.

11. The County is authorized to execute amendments and waivers, with or without conditions, to the insurance requirements of the Contract. The County will provide such amendments or waivers in writing to the Contractor.

The failure of the County to enforce in a timely manner any of the provisions of this Section shall not act as a waiver to enforcement of any of these provisions at any time during the term of the Contract.

Notification of Accident or Occurrence

The Contractor shall report by telephone to the County within twenty-four (24) hours and also report in writing to the County within fifteen (15) days after the Contractor or any subcontractors or agents have knowledge of any accident or occurrence involving death of or injury to any person or persons, or damage in excess of ten thousand dollars ($10,000) to the work, property of the County or others, arising out of any work done by or on behalf of the Contractor as part of the Contract. Such report shall contain:

1. The date and time of the occurrence.

2. The names and addresses of all persons involved, and a description of the accident or occurrence and the nature and extent of injury or damage.

II. Small Construction Projects.
For projects less than $125,000, the County may, at their discretion, decrease the required limits of coverage for General Liability and/or Automobile Liability insurance appropriately with regard to the lesser risk involved. Unless stated otherwise Contractor's Equipment Insurance is not required.

B. Professional Liability Insurance

If Contractor is providing design services beyond preparation of shop drawings for this Project, then Contractor shall carry professional liability insurance coverage with limits of [$1,000,000] per claim and annual aggregate. The services provided for the Project will not be excluded from coverage under such policy and the retroactive date on such policy will be prior to the first date upon which Contractor provided services for this Project. If, prior to four years following Final Completion, the retroactive date changes in subsequent policy years or if the policy is replaced, CM/GC will furnish evidence that it has purchased the supplemental "Extended Reporting Period Endorsement" under the previous policy extending for at least three years the period during which a claim may first be made.

C. Bid, Performance and Payment Bonds, Paragraph 11.4

Contractor shall furnish bonds covering the well and truly to be made (Bid Bond), faithful performance of the Contract (Performance Bond) and payment of obligations arising thereunder (Payment Bond) on the forms contained in Exhibits 1 and 2.

The Bid Bond shall be in the amount of ten (10) percent of the total amount of the bid.

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

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

Contractor shall promptly furnish such additional security as may be required by Owner 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 Owner.

Surety companies used by Contractor shall be, on the date the Contract is signed by Owner, an admitted surety insurer.

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

2. CODE OF CONDUCT

A. Any deliveries to the project site by common carrier must be marked to the Contractor only with the official project title clearly identified. A representative of the contractor must be on-site and equipped to receive the delivery. Owner will not receive any shipment on behalf of the Contractor.

B. You are reminded to comply with CALOSHA requirements for job safety. Designate a site safety representative for the work place as required by OSHA and conduct a regular program of safety**.**

C. You will be responsible for your employees conduct while on the job site, i.e. whistling, profanity, garbage, dress code, etc. You are required to inform your employees working at the construction site that Owner is strongly opposed to sexual harassment and that such behavior is prohibited both by law. It is the intention of the Owner to take whatever action may be needed to prevent, correct, and, if necessary, discipline behavior which violates this policy.

D. For the health and safety of staff, visitors, volunteers, and inmates, smoking is not permitted inside any facility. Smoking is also not permitted within 20 feet of any entrance at any building entrance.

E. You are required to establish a policy of non-discriminatory practice in all personnel actions.

F. Identification badges are required inside and/or next to the existing jail.

G. Owner strives to maintain worksites free from the illegal use, possession, or distribution of alcohol or of controlled substances, as defined in schedules I through V of the Controlled Substances Act, 21 United States Code section 812, and by regulation at 21 Code of Federal Regulations section 1308. Unlawful manufacture, distribution, dispensing, possession, use, or sale of alcohol or of controlled substances on Owner property is prohibited.

H. Owner prohibits and has zero tolerance for workplace violence. Any disruptive behavior, act of intimidation, threat of violence or act of violence committed against any person and or property is prohibited.

3.

A. Standard of Care. Contractor will perform its services using that skill and care used by other competent licensed design professionals skilled in designing scopes of Work similar in size, scope, and complexity in jail facilities in California.

B. Notwithstanding anything to the contrary in the Contract Documents, Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time due to errors, omissions or inconsistencies in the Contract Documents that are prepared by Contractor or are reviewed by Contractor in its capacity as a licensed design professional.

C. Ownership and Use of Documents

(i) *Definition*. Provided Owner is in compliance with all payment provisions under the Agreement (except as may be subject to a good-faith dispute), Owner shall own all title and copyright privileges to all drawings, plans, specifications, calculations, physical or electronic models, other electronic data, and other documents, materials or information prepared by Contractor or its subcontractors or suppliers in connection with the Project (and any portable electronic media upon which they were prepared or stored) (the "Project Documents"), subject only to the use provisions set forth below.

(ii) *Possession*. The originals of all Project Documents shall be held by Contractor or its subcontractors for the benefit of Owner. At Owner's request and without charge,

copies of any or all Project Documents shall be immediately delivered to Owner in their original form, or in clear, reproducible form, regardless of whether the Project is completed, suspended or terminated.

(iii) *Owner's Use*. Owner shall have the right, regardless of whether the Project is completed, suspended or terminated, in whole or in part, to use and reuse the Project Documents for any purpose and without royalty or charge. If Owner uses or reuses the Project Documents to have work performed on its behalf for which Contractor is not retained, Owner shall indemnify, defend, and hold Contractor free and harmless from any resulting liability to third parties for personal injury, death, or property damage.

(iv) *Limited Use by Constructors*. Contractor and its subcontractors and suppliers are granted a limited license to use and reproduce applicable portions of the Project Documents appropriate to, and for use in, the execution of their Work under the Contract Documents. The drawings, specifications and other Project Documents furnished to Contractor or any subcontractor or supplier are for use solely with respect to the Project.

END OF SECTION

Glenn County Transfer Station Backup Generator Project

ATTACHMENTS:

Overall Facility and Site Related Specifications:

Technical Specification Cover Page and Table of Contents

01010 Summary of Work

01020 Site Safety

01025 Measurement and Payment

01039 Coordination and Meetings

01300 Submittals

01700 Contract Closeout

01900 Mobilization

Electrical and Structural Specifications:

Electrical and Structural Specifications shown on Drawings.

Site Drawings:

Cover Page

C1 Existing Site Conditions and Area of Work

C2 Site Map Showing Locations of Work

Pace Electrical and Structural Drawings:

Title Sheet

S1 Structural Notes

S2 Generator Pad Details

E1 Electrical Specifications

E2 Generator Specifications

E3 One-Line Diagram and Electrical Schedules

E4 Panel Schedules

E5 Electrical Plans

E6 Title 24 Electrical Compliance Documents

Reference Material:

Holdrege & Kull, July 31, 2017 Geotechnical Engineering Investigation Report.

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LAWRENCE
& ASSOCIATES
ENGINEERS & GEOLOGISTS

ATTACHMENT TO THE CONTRACT DOCUMENTS

TECHNICAL SPECIFICATIONS

FOR CONSTRUCTION OF THE

GLENN COUNTY TRANSFER STATION BACKUP GENERATOR PROJECT

GLENN COUNTY, CA

May 2024

Prepared for:

GLENN COUNTY
Public Works Agency
777 North Colusa Street
Willows, CA 95988

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SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Description of work.

B. Owner responsibility.

1.02 RELATED SECTIONS

A. Standard General Conditions.

B. Supplementary Conditions

1.03 DEFINITIONS

A. **ASTM**: American Society for Testing and Materials.

B. **Contract Documents**: General Provisions, Plans, and Technical Specifications.

C. **Construction Management**: Owner or consultant retained by Owner to coordinate construction activities, meetings, route submittals and requests for information (RFIs) to Design Engineer, review and track invoices, track construction schedule, and coordinate construction quality assurance tasks. All RFIs, invoices, submittals, schedules, etc. shall be routed through the Construction Manager.

D. **Design Engineer:** Electrical engineer or structural engineer registered in the State of California, retained by the Owner to design the construction items, and respond to requests for information (RFIs).

E. **Project Engineer**: Electrical engineer, structural engineer, civil engineer, or engineering geologist registered in the State of California, employed or retained by the Owner to provide engineering services and technical support during the project.

F. **Nonconformance**: When testing, measurement, or visual inspections shows that performance standards for construction are not being met.

G. **Notice of Completion**: Notice provided by Owner to Contractor indicating that all of the tasks in the Technical Specifications have been completed to the satisfaction of the Project/Design Engineer, Construction Management, and Owner.

H. **Owner**: The project and property are owned by the Glenn County Planning & Public Works Agency.

I. **Owner's Representative**: Ms. Talia Richardson, Deputy Director of the Glenn County Planning & Public Works Agency, or Designee.

J. **Performance Audit:** Periodic review of the CQA data to ensure that the intent of the design is being met.

K. **Performance Standard**: A minimum limit set on characteristics of materials and construction.

L. **Plans or Drawings**: A set of plans describing the construction of the project. Plans or drawings are considered part of the Contract Documents.

M. **RFI**: Request for information.

N. **Soil Technician**: Employee of a certified soils testing laboratory responsible for performing field tests and collecting samples for laboratory analyses.

O. **Surveyor**: Land surveyor, licensed in the State of California, retained by the Contractor to set a grid, set elevation control, and perform tasks described in field engineering.

P. **Technical Specifications**: That portion of the Contract Documents which present the construction Specifications, materials, and performance standards for completing the project.

Q. **Testing Laboratory**: A certified soils or materials testing laboratory with experience in the work required for this project.

1.04 DESCRIPTION:

A. Work under this contract consists of the following items of work (in roughly sequential order).

1. Submit the proposed generator documents as described on the Drawings with the Bid Documents and prior to ordering. Proposed generator shall meet emission requirements determined by the Glenn County Air Pollution Control District and Title 17, California Code of Regulations, Section 93115.6 Air Toxic Control Measure for Stationary Compression Ignition (CI) Engines – Emergency Standby Diesel-Fueled CI Engine (>50 bhp) Operating Requirements and Emission Standards: https://ww2.arb.ca.gov/our-work/programs/air-toxics-program/stationary-diesel-atcm/stationary-diesel-atcm-regulation (see *Table 1: Emission Standards for New Stationary Emergency Standby Diesel-Fueled CI Engines g/bhp-hr (g/kW-hr*).

2. Submit an Authority-to-Construct application to the Glenn County Air Pollution Control District based on the information on the purchased generator.

3. Obtain a Glenn County Building permit.

4. Begin installation once the permits are awarded and the generator is delivered.

5. Mobilization.

6. Provide a private underground utility location service to locate and mark all underground utilities within the area of work.

7. Trenching, installation and backfill related to underground utilities, including pull boxes, conduits, conduits fittings, warning tape, and all other electrical device boxes.

8. Backfilling and placement of aggregate base in roadway and structural areas.

9. Prepare generator pad subgrade and construct concrete generator pad.

10. Provide and install 80kW diesel generator.

11. Provide and install electrical distribution boxes, fire pump control panel, and wire conductors.

12. Install bollards.

13. Provide operations training and startup.

14. Finish grading in paved areas, final grading in non-paved areas, concrete apron and sidewalk installation.

1.05 LOCATION:

A. Project is located 6 miles south-west of Artois, California, adjacent to Glenn County Solid Waste Landfill.

B. Project owner is Glenn County.

1.06 COORDINATION AND RESPONSIBILITY:

A. For Bidding, coordination and construction responsibility purposes, the Work has been identified and shown in the Bid Schedule as:

a. Equipment, materials, startup/training, and all associated work to be completed by Contractor.

B. The Glenn County Transfer Station is an active operating solid-waste transfer station and will be operating in the vicinity of the working area. It will be the responsibility of the Contractor to work with the Transfer Station operator to provide access except on days when the Transfer Station is normally closed.

C. Disruption of power to the water well shall be no longer than 24 hours and must be coordinated with the Owner, the Transfer Station operator, and the project contractor.

1.07 SUBMITTALS:

A. Materials. Unless stated otherwise, submittals for materials must be submitted more than ten (10) business days prior to installation.

B. Equipment. Must be submitted no less than ten (10) business days prior to ordering.

1.08 OWNER RESPONSIBILITY:

A. Glenn County's (Owner's) responsibility for project construction includes:

1. Review and approve shop drawings, product data and submittals from the Contractor.

2. Prepare and approve Contractor payment invoices and final payments.

3. Review and authorize contract change orders and/or extra work.

4. Provide project inspection and approval of Contractor's work.

5. Provide access to the site for performance of specified work.

1.09 CONTRACTOR'S USE OF PREMISES:

A. Construction camping within the site will not be allowed.

B. Staging and storage of construction equipment and materials shall be limited to those areas designated and approved by the Owner.

C. The Contractor shall take precautions to locate and protect all existing utility lines. Notify utility companies, Construction Management, the Design Engineer prior to excavations in the vicinity of known utilities.

1. Should damage occur to an unknown utility, repairs shall be performed as directed by the Owner, Construction Management and/or Design Engineer. Equitable adjustments shall be made under the terms of the provisions.

D. The Contractor shall comply with all legal load requirements of the State of California and County Jurisdictions when operating on area access roads. Damage to existing roadways from equipment operation or excessive loads shall be repaired by the Contractor at no additional cost to the Owner.

E. The Contractor shall protect the existing structures indicated to remain at the facility, including the existing water wells, water pipe, electrical facilities, household hazardous waste (HHW) building, and associated paving.

F. Temporary power for Contractors to use during construction, if needed, is available at the HHW building.

G. The Contractor shall legally dispose of waste generated during this project. Waste generated from this project that meets the acceptance may be disposed of at the Transfer Station, HHW building, or ABOP building (as applicable). No tipping fee will be charged for disposed materials generated by this project.

H. The location for Contractor staging shall be coordinated with the Owner prior to start of construction. All construction related activities shall remain within the limits of work as shown on the drawings.

I. The Contractor is permitted to operate earthmoving equipment between the hours of one hour before sunrise to one hour after sunset as defined by the Astronomical Applications Department of the U.S. Naval Observatory (currently online at: http://aa.usno.navy.mil/).

J. The Contractor shall maintain a sign-in list for visitors.

K. The Contractor shall maintain a daily log listing the number and classification of personnel, equipment used, Sub-Contractors present, and weather conditions. The logs shall be submitted weekly to the Engineer at the weekly site meeting.

1.10 FIELD VERIFICATION:

A. The Contractor shall field-verify all new and existing dimensions and field conditions prior to starting work or ordering products.

1.11 CONTRACTOR-FURNISHED ITEMS:

A. The Contractor shall furnish all labor, materials and equipment necessary for the completion of the work, as specified.

1.12 CONSTRUCTION MANAGEMENT AND CHAIN-OF-COMMAND

A. The Owner will retain Construction Management services and a Design Engineer to provide construction management and engineering services during construction and a third-party firm to provide some testing and construction observation services. The Owner may also provide project management services during

construction or incorporate this into the responsibility of the Project and/or Design Engineer.

B. The Contractor shall report to and route all correspondence, RFI's, submittals, and invoices through the Construction Manager unless instructed to do otherwise. The Construction Manager will route correspondence to the Design Engineer, and Owner, as needed.

C. Construction Management will be responsible for day-to-day construction observation, testing, keeping daily logs, holding weekly progress meetings, coordination with the Contractor, and reviewing invoice submittals for quantities completed.

D. Construction Management will be responsible for reviewing test and survey results for compliance with the specifications, preparing weekly meeting minutes, routing paper work, preparing notices of completion, and providing managerial support for the Owner and Design Engineer.

E. The Design Engineer will be responsible for responding to RFIs, submittals, and design modifications during construction.

F. The Owner will be responsible for final review of invoices and performing audits of the Design Engineer and Construction Manager.

1.13 CONTRACTOR QUALITY CONTROL

A. The Contractor is responsible for providing adequate Quality Control during the Work.

B. The Contractor shall not rely on Quality Assurance Testing provided by the Owner as the sole means of assessing quality control.

1.14 QUALITY ASSURANCE

A. The Owner and/or Construction Management may provide an inspection/testing company to perform tests and/or observations to check that the Contractor has adequately implemented the Work. If implemented, the testing company will be under the direction of the Design Engineer or Construction Management on behalf of the Owner.

B. Regardless of the Quality Assurance observation activities or review of submittals, it will be the responsibility of the Contractor to construct the project in compliance with the contract documents.

C. Any Quality Assurance testing which fails to meet the requirements of the Contract Documents shall be retested by the Owner's representatives at the cost of the Contractor.

1.15 BACKGROUND INFORMATION

A. The following are reference materials for this project:

- *Holdrege & Kull, July 31, 2017 Geotechnical Engineering Investigation Report.* Attached to these Contract Documents.

The Contractor shall consider these documents as "Reference Materials" as described in the Contract Documents and are not part of the Contract Documents.

1.16 PRECEDENCE OF DOCUMENTS

A. See "Greenbook" Section 2-5.2 Precedence of Contract Documents as follows:

- Permits issued by jurisdictional regulatory agencies.
- Change Orders and/or Supplemental Agreements, whichever occurs last.
- Contract/Agreement
- Addenda
- Bid/Proposal
- Special Provisions
- Plans [Drawings]
- Standard Plans
- Standard Specifications
- Reference Specifications

Detail Drawings shall take precedence of general drawings. When in doubt, contact the Design Engineer for clarification.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

PART 4 – MEASUREMENT AND PAYMENT

4.1 Unless stated otherwise, the proposed price shall include all labor, superintendence, materials, shipping, sales tax, profit, overhead, and incidentals, complete in place.

4.2 Mobilization shall be lump sum for the entire project under the Bid Schedule item "Mobilization" pertaining to the construction item and as indicated and shown on the Bid Schedule.

Payment for Mobilization Progress payments shall be made as follows:

A. 25% of mobilization will be paid during the first monthly pay request but shall not exceed 50% of the first invoice.

B. Up to 50% of mobilization will be paid during the subsequent two monthly pay requests.

C. The last 25% will be paid upon successful completion of the project and demobilization.

4.3 Coordination shall be measured and paid on a lump-sum basis as listed under "Coordination" on the Bid Schedule. It is assumed that Coordination includes providing generator information to the Engineer and the Air Pollution Control District (APCD) for permitting the generator, obtaining a building permit for the generator installation, procuring all miscellaneous equipment and materials for the associated work. Assume that the County will pay directly for the building and APCD fees.

4.4 Location and marking of the existing underground utilities shall be measured and paid on a lump-sum basis as listed under "Locate Underground Utilities" on the Bid Schedule.

4.5 Trenching, providing and installing electrical conduit, backfilling and compaction, and providing and installing all backfill materials (bedding sand, gravel, asphalt and concrete) shall be measured and paid on a lump-sum basis as listed under "Trenching, Conduit and Backfill, Complete" on the Bid Schedule.

4.6 Providing and installing wire conductors, control panels, junction boxes, and electrical boxes shall be measured and paid on a lump-sum basis as listed under "Wire Conductors, Control Panels, Junction and Electrical Boxes, Complete" on the Bid Schedule.

4.7 Construction of the generator pad, including excavation, compaction, backfill materials, conduit, structural anchors, rebar and concrete shall be measured and paid on a lump-sum basis as listed under "Generator Pad, Complete" on the Bid Schedule.

4.8 Ordering, purchase, delivery, coordination, and installation of the diesel generator shall be measured and paid on a lump-sum basis as listed under "Provide and Install 80kW Generator, Complete" on the Bid Schedule.

4.9 Providing and installing the bollards shall be measured and paid on a lump-sum basis as listed under "Bollards" on the Bid Schedule.

4.10 Generator and associated fires pump interface, startup testing and training for Transfer Station staff shall be measured and paid on a lump-sum basis as listed under "Startup and Training" on the Bid Schedule.

4.11 All other costs not otherwise described under the other bid items shall be measured and paid for on a lump-sum basis as listed under "All Other" on the Bid Schedule. It is the

responsibility of the Contractor to review the Project Documents thoroughly and identify any work that is not included in the other bid items and include it in the "All Other" bid item. Contractor is responsible to list "All Other" bid items on the Bid Proposal Forms.

4.12 No additional payment will be made for the items described in this Section. All costs to complete the project as specified in the Contract Documents shall be included under bid items one (1) through ten (10).

END OF SECTION

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SECTION 01020

SITE SAFETY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements for site-safety plans.

B. Data on potential contaminants.

1.02 RELATED DRAWINGS AND SPECIFICATIONS

A. Drawings C1.0 & C2.0 – Site Drawings.

B. Drawings S1 & S2 – Structural and Building Design Criteria.

C. Drawings E1 through E6 – Electrical Design Criteria.

1.03 SITE-SAFETY PLANS

A. The Contractor shall prepare a site-specific safety plan detailing the methods to ensure the safety of employees from the following:

1. Accident and injury from operations of equipment and other work related to earthwork, trenching, and other construction activities.
2. Accident and injury from construction of a building.
3. Accident and injury from use of cranes installing mechanical equipment.

B. The site-safety plan shall include emergency response plans for fire and injury, including emergency telephone numbers, and a map and directions to the nearest hospital.

1.04 PRESCRIPTIVE STANDARDS

A. No employee shall enter a trench categorized as an enclosed space by Cal OSHA without first obtaining an enclosed space/entry permit.

B. Conduct a safety orientation prior to beginning work and for new employees. Conduct weekly safety meetings and document attendance. The Contractor shall maintain a copy of the site-safety plan and all material safety-data sheets for chemicals, fuel or lubricants used on the site, in an unlocked location available to all employees, visitors, Owner, and Engineer.

C. The Contractor shall comply with all applicable OSHA safety standards.

D. These prescriptive standards are minimum and do not relieve the Contractor of responsibility to ensure employees' safety and that of site visitors.

1.05 SUBMITTALS

A. The Contractor shall submit a copy of the site-safety plan within 14 calendar days of signed contract.

B. The Contractor shall submit a copy of the site-safety meeting minutes to the Construction Manager on a biweekly basis (typically at the weekly meeting).

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

PART 4 – PAYMENT

4.01 PAYMENT

A. Payment for all materials, equipment, labor, superintendence, and incidentals to organize and maintain a safe working environment will be included in the various items of work and no additional payment will be made for this item. The Contractor is responsible for determining safety needs and personal protective equipment for the types of work to be performed at the site.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Measurement and payment criteria applicable to the Work performed under a unit price payment method.

B. Defect assessment and non-payment for rejected work.

C. Payment procedures and timelines.

1.02 AUTHORITY

A. Measurement methods defined in the individual specification sections complement the requirements of this section. In the event of conflict, the requirements of the individual specification section govern.

1.03 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Bid Schedule area described in Part 4 - Measurement and Payment of each specification

1.04 MEASUREMENT OF QUANTITIES

A. Prior to preparing a monthly request for payment, the Contractor shall estimate the percentage of each bid item that will be completed by the end of the month and e-mail the information to Construction Manager for confirmation.

B. Measurement by Volume

1. Measurement by volume will be by the cubic dimension listed or indicated in the Bid Schedule. Method of volume measurement will be as determined or directed by the Owner or Design Engineer.

C. Measurement by Area

1. Measurement by area will be by the square dimension listed or indicated in the Bid Schedule. Method of square measurement will be as determined or directed by the Owner, Construction Manager, and/or Design Engineer.

D. Linear Measurement

1. Linear measurement will be by the linear dimension listed or indicated in the Bid Schedule. Method of linear measurement will be as determined or directed by the Owner, Construction Manager or Design Engineer. Generally, items, components, or work to be measured will be measured at the centerline of the item in place.

E. Lump-Sum Measurement

1. Lump-sum measurement will be for the entire item, unit of work, structure, or combination thereof, as listed or indicated in the Bid Schedule.

1.05 PAYMENT

A. Payment Includes: Full compensation for all required labor, products, tools, equipment, plant, transportation, superintendence, bonds, insurance, taxes, services and incidentals; erection, application or installation of an item of the Work; overhead and profit and any other items not specifically listed.

B. Progress payments will be made monthly. Each progress payment shall be submitted to Construction Manager for approval 5 days prior to the end of the month. The progress payment shall show the following:

1 List of bid items with percentage billed during the period.

2. Documentation of the quantity of each bid item by means of survey, delivery tickets, or measurements that can be confirmed in the field by Construction Manager.

3. Previous amount billed for each bid item.

4. Total billed for each item to date.

5. Organized by the specific bid items shown on the Bid Schedule.

6. Materials and equipment that has been delivered but not incorporated in the work may be included in the invoice. Per the General Conditions, 50% of the value of the materials and equipment will be allowed for payment prior to installation.

7. Total current amount due this invoice.

8. Total billed to date.

9. 5% retention.

10. Signature line for Construction Management approval.

C. Submit the invoice to Construction Manager for review. Construction Manager will initial the invoice and return it to the Contractor for submittal to the Owner.

D. Upon receipt of the Notice of Completion of the project from the Design Engineer or Construction Manager, the Contractor shall invoice for the 10% retention.

1.06 NON-PAYMENT FOR REJECTED PRODUCTS

A. Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from the transporting vehicle.
4. Products placed beyond the lines and levels of the required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected products.

1.07 ALTERNATE BID DEDUCT ITEMS

A. The Bid Schedule for the work includes Alternate Bid Deduct Items. Alternate Bid Deduct Items are defined as work items that will be included in the bid total and used as a method of comparing bids, but may be removed from the scope of work to either reduce project cost to within the Owner's Budget or to be constructed by the Owner's resources.

B. Alternate Bid Deduct Items shall include the cost of all of the mobilization, overhead, profit, and work related to the item so that when they are deducted, no cost adjustment is necessary to the base bid items.

C. Prior to award of the Contract, the Owner will determine which Alternate Bid Deduct Items to remove from the Work.

1.08 VALUES OF UNIT PRICES

A. The number of units and quantities contained in the Bid Schedule are approximate only, and final payment will be made for the actual number of units and quantities which are incorporated in or made necessary by the Work included in the Contract.

B. In the event that work and materials or equipment are required to be furnished to a greater or lesser extent than is indicated by the Contract Drawings and Specifications, such work and materials or equipment shall be furnished in greater or lesser quantities and notified to the Design Engineer, Contruction Manager, and Owner with respect to the greater or lesser quantities.

1.09 CHANGE ORDERS

A. Changes in Work which require a contract change order must be approved by the Owner or Design Engineer prior to the change order work beginning. All change orders must be submitted in writing, with an estimate of time and expense to the Owner and Design Engineer for approval. When submitting change orders, the Contractor shall indicate the number of working days that the change will add or subtract to the project duration.

B. Changes in Quantity of a bid item that have the potential to result in a change in quantity of greater than 5% over that shown in the Bid Schedule shall be brought to the attention of the Construction Manager and Owner in writing upon discovering that potential.

1.09 ALL OTHER PAYMENT ITEM

A. The Bid Schedule includes a bid item called "All Other". The purpose for this item is to provide a place for the Contractor to include cost for items not described in any other bid item, but is required to complete the project. It is the responsibility of the Contractor to review the Documents thoroughly and identify any work that is not included in a bid item and include it in the "All Other" bid item.

PART 2 – PRODUCTS – not used

PART 3 - EXECUTION – not used

PART 4 - MEASUREMENT AND PAYMENT

Specifications not identified for specific payment shall be paid within the item for which they apply. This includes, but is not limited to the following Drawings related to the Transfer Station Backup Generator, as shown on the Bid Schedule, and as listed in Section 01010 -Summary of Work for the same.

TRANSFER STATION BACKUP GENERATOR DRAWINGS:

A. Drawings C1.0 & C2.0 – Site Drawings.

B. Drawings S1 & S2 – Structural and Building Design Criteria.

C. Drawings E1 through E6 – Electrical Design Criteria.

END OF SECTION

SECTION 01039

COORDINATION AND MEETINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Coordination.

B. Preconstruction conference.

C. Progress meetings.

1.02 RELATED SECTIONS

A. Section 01010 - Summary of Work – See coordination.

1.03 SUBMITTALS

A. Submit a project schedule within two weeks of authorization to proceed (or sooner if required elsewhere in the contract documents). The schedule shall be updated (if needed) and provided to the Owner and Construction Manager in Adobe pdf format prior to each construction meeting.

B. Submit a proposed sequencing plan (map) showing the construction phasing and anticipated completion of each phase within two weeks of authorization to proceed. The sequencing map shall be updated (if needed) and provided to the Owner and Construction Manager in Adobe pdf format prior to each construction meeting.

1.04 PRECONSTRUCTION CONFERENCE

A. Owner will schedule a preconstruction conference after Notice of Award.

B. Attendance is required by the following parties: Owner's representative, Construction Manager (Lawrence & Associates), Design Engineer (Pace Engineering), General Contractor, Foreman, and any other subcontractors not specifically listed may attend as requested by the General Contractor.

B. Meeting agenda shall include at a minimum the following topics:

1. Use of premises by Owner and Contractor.
2. Owner's requirements.
3. Construction facilities and controls provided by Owner.
4. Temporary utilities provided by Owner.

5. Submittal methods.
6. Inspection methods.
7. Security and housekeeping procedures.
8. Procedures for testing.
9. Procedures for maintaining recorded documents.
10. Chain-of-command.
11. Scheduling.
12. Measurement and payment.
13. Permits.
14. Safety Plans.
15. Water.
16. Other.

1.04 PROGRESS MEETINGS

A. The Contractor and Construction Manager will agree on a day and time of each week for a weekly progress (or bi-weekly, if appropriate) meeting.

B. The Construction Manager will prepare an agenda and preside at these meetings, record minutes, and prepare a weekly summary. Topics may include:

1. Work performed during the previous week.
2. Potential change orders or significant changes in quantities.
3. Status of schedule.
4. Status of invoices.
5. Presentation and/or discussion of submittals.
6. Presentation/discussion of testing results.
7. Requests for clarification or data needs.
8. Updates on repairs of inadequate work (if any).
9. Punch lists.
10. Upcoming items, required staging areas, or long lead time items.
11. Safety.
12. Owner concerns.

C. Attendance by the following parties is required: General contractor foreman, Construction Manager, Design Engineer, and appropriate subcontractors may attend when present on site and needed for discussion.

1.05 COORDINATION - GENERAL

A. Contractor shall coordinate scheduling, submittals, and work of the various sections of specifications to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Contractor shall coordinate work with subcontractors and Construction Manager.

C. Contractor is responsible for the overall Work to be complete. Contractor shall coordinate between sub-contractors to ensure that there are no gaps between work provided where work, equipment, or materials are shared or otherwise in common.

D. Contractor shall not endanger any work by cutting, digging, etc., and shall not cut or alter any completed work of any Section of these specifications without prior consent of Design Engineer.

E. Contractor shall coordinate work of subcontractors and trades to minimize delays and miscommunication, and to keep the Owner and the Construction Manager informed as to project status.

1.06 FOREMAN ONSITE

A. The Contractor shall have a designated foreman on site as a point of contact with the Construction Manager and Design Engineers. The Foreman will be on site at all times significant work is being performed. If situations arise where the Foreman must be absent from the site, the Foreman will appoint someone else as point of contact for the Construction Manager or Design Engineer.

1.07 COORDINATION WITH TRANSFER STATION

A. The Transfer Station is open 6 days a week (closed Sundays).

B. The Transfer Station is anticipated to remain open and operational during the entire length of this Work. Contractor shall maintain an ongoing accessible roadway to the Transfer Station at all times. Under no circumstances shall all access points to the landfill be blocked for any significant amount of time.

1.08 The closure cap contractor will be excavation soil from areas outside of but adjacent to the transfer station work area.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

PART 4 – MEASUREMENT AND PAYMENT

4.01 PAYMENT

A. Payment for coordination shall be included in the lump-sum price for the base-bid items and shall be included in the Contractor's cost breakdown under "Coordination" on the Bid Schedule.

B. Payment for all materials, equipment, labor, superintendence, and incidentals to provide all work required by this Section will be included in the various items of work. No additional payment will be made for the work described in this section.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 DESCRIPTION: The work of this section consists of submittal requirements before and during construction.

1.02 RELATED REQUIREMENTS: None.

1.03 SCHEDULES: As soon as possible after Notice of Award and before beginning any work, submit Progress Schedule and Schedule of Values as a package. The Construction Manager will review the Progress Schedule and the Schedule of Values for format and content.

A. Progress Schedule: Submit four copies of progress schedule (normally in bar chart form) showing estimated starting and completion dates for each part of the work. The first progress payment will not be issued until an acceptable progress schedule is submitted.

B. Schedule of Values: Submit a schedule of dollar values for lump sum bid items based on the Contract Bid Schedule. Break down into component parts each bid item involving a series of operations for which progress payments may be requested. The total costs for the component parts shall equal the bid amount for that item, and the total cost of all items shall equal the contract sum. The Construction Manager may request data to verify accuracy of dollar values. The schedule of values will form the basis for progress payments as provided for in the general provisions.

1.04 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES:

A. General Procedures:

1. As specified in the individual sections, forward submittals to the Construction Manager and Design Engineer at least ten (10) business days before need for approval. Unless a different number is specified or it is determined that all submittals; will be made via email, submit three copies of each shop drawing, two specimens of each sample, and three copies of all other submittals requested, all of which will be retained by the Construction Manager. Submit any additional copies that are to be returned.

2. Coordinate all submittals and review them for legibility, accuracy, completeness, and compliance with contract requirements. Forward submittals that are related to or affect one another as a package to facilitate coordinated review.

3. List submittals on a transmittal letter with date of submittal and content of submittal. Transmittal letter shall be on Contractor's letterhead or other approved format. All submittals shall be uniformly transmitted.

4. Submittals will not be accepted for review if an incorrect amount of submittals are submitted, the transmittal form is incorrectly filled out, submittals are not coordinated, or submittals do not show evidence of Contractor's approval.

5. Specific Procedures:

    a. Shop Drawings: Identify each copy of shop drawings with contract drawing number in lower right-hand corner.

    b. Samples: Samples shall be large enough to illustrate clearly the functional characteristics and full range of color, texture, or pattern.

    c. Manufacturer's Literature: Submit only pertinent pages; mark each copy of standard printed data to identify products referenced in specification section.

    d. Manufacturer's Maintenance and Operation Manuals: Provide two hard copies and an electronic copy.

B. Design Engineer's Review:

1. After approving submittals, the Design Engineer will return Contractor's copies.

2. If submittals are not approved, the Design Engineer will return all copies to Contractor with reasons for rejection. Resubmit, identifying changes.

3. Any work done before approval shall be at Contractor's own risk.

1.05 APPROVED EQUALS AND SUBSTITUTIONS:

A. For each item proposed as an 'approved equal', submit a separate request. With each request, submit supporting data, including:

1. Drawings and samples as appropriate.

2. Comparison of the qualities of the proposed item with that specified.

3. Changes required in other elements of the work because of the substitution.

4. Name, address, and telephone number of vendor.

5. Manufacturer's literature regarding installation, operation and maintenance, including schematics for electrical and hydraulic systems, lubrication

requirements, and parts lists. Describe availability of maintenance service, and state source of replacement materials.

B. A request for approval constitutes a representation that the contractor:

1. Has investigated the proposed item and determined that it is equal or superior in all respects to that specified.

2. Will provide the same warranties for the proposed item as for the item specified.

3. Has determined that the proposed item is compatible with interfacing items.

4. Will coordinate the installation of an approved item and make all changes required in other elements of the work because of the substitution.

5. Waives all claims for additional expenses that may be incurred as a result of the substitution.

C. New Construction Materials: The Contractor is encouraged to submit for approval products made out of recycled or environmentally responsible material. Every effort will be made by the Owner to approve these materials.

1.06 MANUFACTURER'S INSTALLATION INSTRUCTIONS: When contract documents require compliance with manufacturer's printed instructions, provide one complete set of instructions for the Design Engineer and keep another complete set of instructions at the project site until substantial completion.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

PART 4 - MEASUREMENT AND PAYMENT

4.01 SUBMITTALS: Payment that relates to this work will be included in various items in the Bid Schedule, and no measurement or separate payment shall be made.

END OF SECTION

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SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Adjusting.

D. Project record documents.

E. Operation and maintenance data.

F. Spare parts and maintenance Products.

G. Warranties and bonds.

H. Maintenance service.

I. Operational Rediness Test.

J. Training.

1.2 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Construction Manager and Design Engineer review.

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

1.3 FINAL CLEANING

A. Perform final cleaning prior to final project assessment.

B. Clean interior and exterior surfaces, as applicable; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces.

C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

D. Replace filters of operating equipment.

E. Clean site; rake clean gravel and landscaped surfaces.

F. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.4 ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.5 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addendum(s).
   4. Change Orders and other modifications to the Contract.
   5. Reviewed Shop Drawings, Product Data, and Samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addendums and/or modifications.

F. Record Drawings (and Shop Drawings): Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

G. Submit documents to Construction Manager with claim for final Application for Payment.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit data bound in 8-1/2 x 11 inch text pages, three D side ring capacity expansion binders with durable plastic covers.

B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.

C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, typed on (24)(20) pound white paper, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Construction Manager, Design Engineer, Contractor, Subcontractors, and major equipment suppliers.

   2. Part 2: Operation and maintenance instructions, arranged by system flow. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for (special) finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.
      b. Certificates.
      c. Originals of warranties.

E. Submit one draft copy of completed volumes fifteen (15) days prior to final inspection. This copy will be reviewed and returned after final inspection, with Engineer comments. Revise content of all document sets as required prior to final submission.

E. Submit four sets of revised final volumes, within 10 days after final inspection.

1.7 WARRANTIES AND BONDS

A. Provide duplicate notarized copies.

B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.

C. Provide Table of Contents and assemble in three D side ring binder with durable cover.

D. Submit prior to final Application for Payment.

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

1.8 MAINTENANCE SERVICE

A. Furnish service and maintenance of components indicated in specification sections.

B. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

D. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the Owner.

1.9 OPERATIONAL READINESS TEST

A. As part of this project, the Contractor shall be performed an operatational readiness test for the generator and controls, as Specified on Drawing E1.

2.0 TRAINING

A. Contractor shall coordinate startup activities with Transfer Station staff and provide training on the use and maintenance of the generator and control system.

B. Contractor shall provide all service and operation manuals in a 3-ring binder and an electronic version in PDF format.

C. Contractor shall train Tranfer Station staff on operations, basic maintenance, troubleshooting, lubrication, fueling, and safety.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

PART 4 – MEASURMENT AND PAYMENT

4.1 PAYMENT: Payment for the work described in this section shall be included in the base-bid item and shall be included under "Mobilization" and "Startup and Training."

END OF SECTION

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SECTION 01900

MOBILIZATION

PART 1 – GENERAL

1.1 DESCRIPTION: This work shall include preparatory work and operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site, and for all other work and operations that must be performed prior to beginning work on various items on the project.

1.2 MOBILIZATION SHALL INCLUDE:

A. Mobilization of all construction equipment, materials, supplies, appurtenances, and the like, manned and ready for commencing and performing the work. Preparation for the Contractor's work area; complete assembly, and in working order, of equipment necessary to perform the required work; personnel services preparatory to commencing actual work; and all other preparatory work required to permit commencement of actual work on construction items for which payment is provided under the Contract.

1.3 DEMOBILIZATION SHALL INCLUDE:

A. Subsequent removal from the site of all construction plants, equipment, materials (excluding surplus materials specified to remain on site), supplies, appurtenances, and the like; and cleaning and restoration of the site as directed by Owner/Engineer upon completion of the work.

1.4 RELATED SECTIONS

A. Section 01010 – Summary of Work.

B. Section 02210 – Site Grading.

C. Section 02271 – Erosion Control.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.1 CONSTRUCTION TRAILER: The Contractor is not required to provide a construction trailer but may provide one at his or her discretion at no additional cost to the Owner.

3.2 RESTROOM FACILITIES: The Contractor shall provide temporary restroom facilities throughout the Work.

3.3 CONSTRUCTION WATER: The facility has an existing water-supply system that can be used for construction purposes. The Contractor is responsible for providing a water truck, hoses, and any other miscellaneous hose/piping fitting needed to complete the work as specified.

3.4 POTABLE WATER: the Contractor shall provide a source of potable drinking water for his or her employees, and their visitors.

3.5 SECURITY: The Contractor shall restrict public access to the work site and provide access to the Contractor, his or her employees, subcontractors, the Owner or their representatives, Construction Management, Design Engineer, Surveyors, and regulatory agencies.

3.6 TRASH: The Contractor shall provide trash receptacles for his or her employees and subcontractors. Trash must be disposed of regularly and shall not be allowed to accumulate on site. The Contractor will be responsible for collecting wind-blown trash generated from the construction site.

3.7 DUST CONTROL: The Contractor shall provide dust control in the areas of work. Dust control shall include watering to minimize dust and sweeping adhered soil from the paved access road and staging areas.

3.8 MUD CONTROL: The Contractor shall provide a means of removing mud from tires of trucks leaving the work area, as necessary. Methods can include a section of course rock at the work area exit, and/or clearing mud and sweeping the on-site access paved entrance road when mud is caused by the Contractor's equipment, deliveries, or employees.

PART 4 – MEASUREMENT AND PAYMENT

4.1 MEASUREMENT: Mobilization shall be lump sum for the job under the Bid Schedule item "Mobilization" pertaining to the construction area as indicated and shown on the Bid Schedule.

4.2 PAYMENT FOR MOBILIZATION: Progress payments shall be made as follows:

A. 25% of mobilization will be paid during the first monthly pay request but shall not exceed 50% of the first invoice.

B. Up to 50% of mobilization will be paid during the subsequent two monthly pay requests.

C. The last 25% will be paid upon successful completion of the project and demobilization.

END OF SECTION

PROJECT DIRECTORY

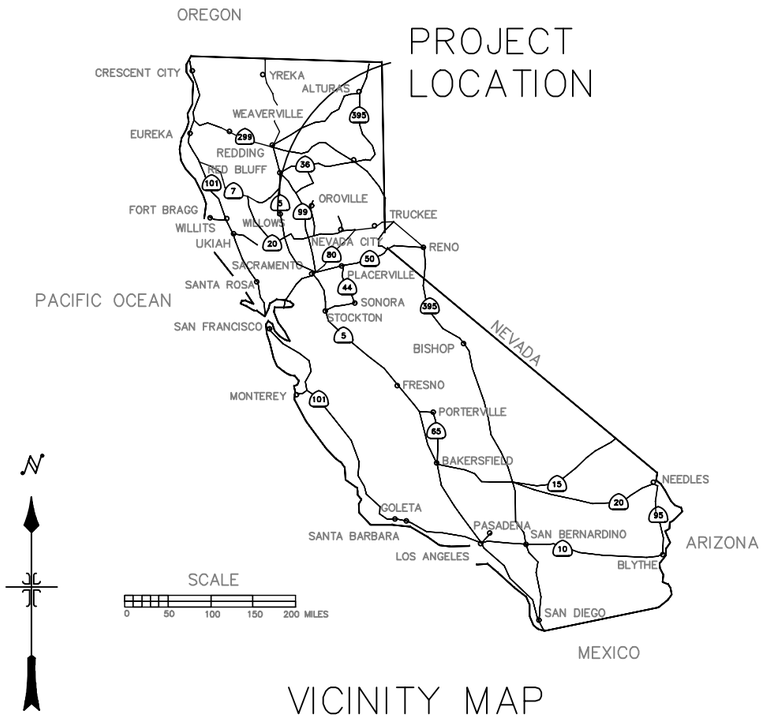
OWNER: COUNTY OF GLENN
PUBLIC WORKS AGENCY
777 N. COLUSA ST.
WILLOWS, CA 95988
CONTACT: TALIA RICHARDSON

PROJECT ENGINEER: LAWRENCE & ASSOCIATES
3590 IRON COURT
SHASTA LAKE, CA 96019
CONTACT: DARREN LANGFIELD
(530) 275-4800

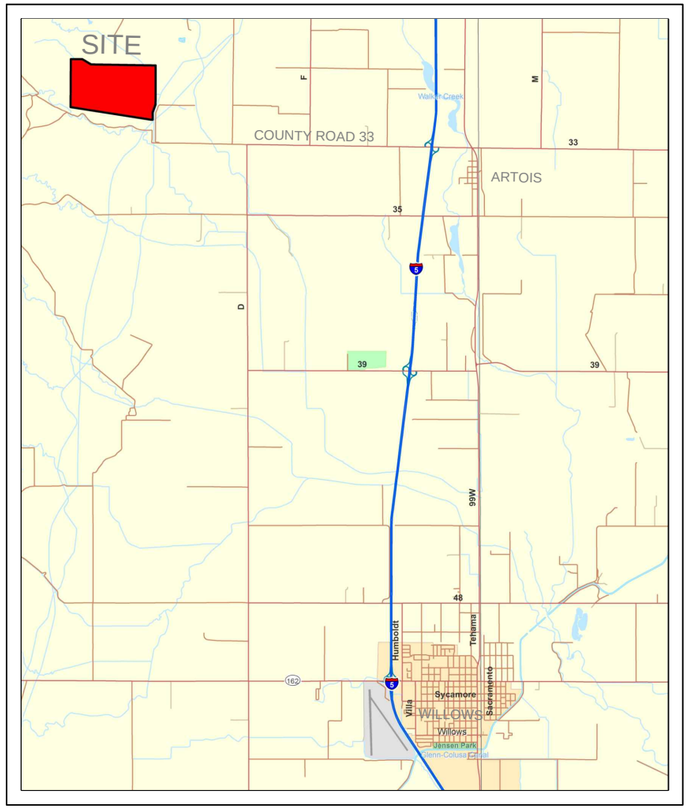
ELECTRICAL AND STRUCTURAL ENGINEER: PACE ENGINEERING
5155 VENTURE PARKWAY
REDDING, CA 96002
CONTACT: ELI JURISICH
(530) 244-0202

GLENN COUNTY TRANSFER STATION GENERATOR

JANUARY 2024



VICINITY MAP



LOCATION MAP

1"=1 MI.

INDEX TO DRAWINGS

DRAWING	DRAWING TITLE
	COVERSHEET
C1.0	EXISTING SITE CONDITIONS (11-20-18 AERIAL PHOTOGRAPHY
C2.0	ENLARGED EXISTING SITE CONDITIONS (11-20-18 AERIAL PHOTOGRAPHY)
G1	PACE ENGINEERING COVERSHEET
S1	ELECTRICAL SPECIFICATIONS
S2	GENERATOR SPECIFICATIONS
E1	ONE-LINE DIAGRAM & ELECTRICAL SCHEDULES
E2	PANEL SCHEDULES
E3	ELECTRICAL PLANS
E4	TITLE 24 ELECTRICAL COMPLIANCE DOCUMENTS
E5	STRUCTURAL NOTES
E6	GENERATOR PAD DETAILS

PLANS PREPARED BY: LAWRENCE & ASSOCIATES
&
PACE ENGINEERING

PLANS PREPARED FOR: GLENN COUNTY PUBLIC WORKS AGENCY (P.W.A.)

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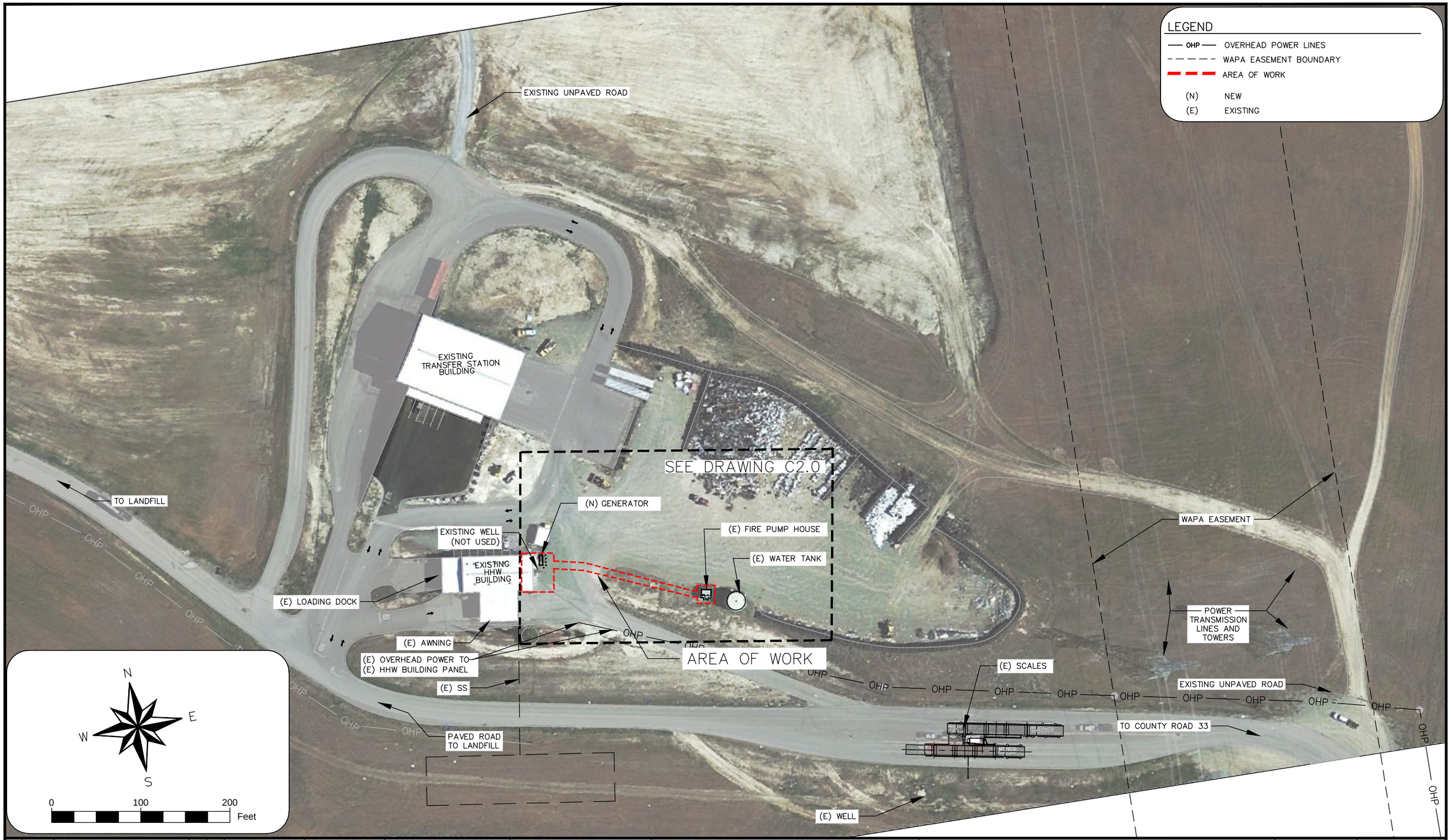

NO.	DATE	REVISIONS	BY	CHK

PROJECT NO: 009169.04	PROJECT ID:
DRAWN BY: Z. MORGAN	SCALE: 1" = 50'
ENGINEER: K. SWANSON	DATE:
CHECKED BY: C. COLES	DATE:

ORIGINAL SCALE IN INCHES
0 1 2

LAWRENCE & ASSOCIATES
ENGINEERS & GEOLOGISTS

TRANSFER STATION

GLENN COUNTY LANDFILL

EXISTING SITE CONDITIONS AND AREA OF WORK

DRAWING: C1.0
SHEET: OF
DATE: 1/25/2024

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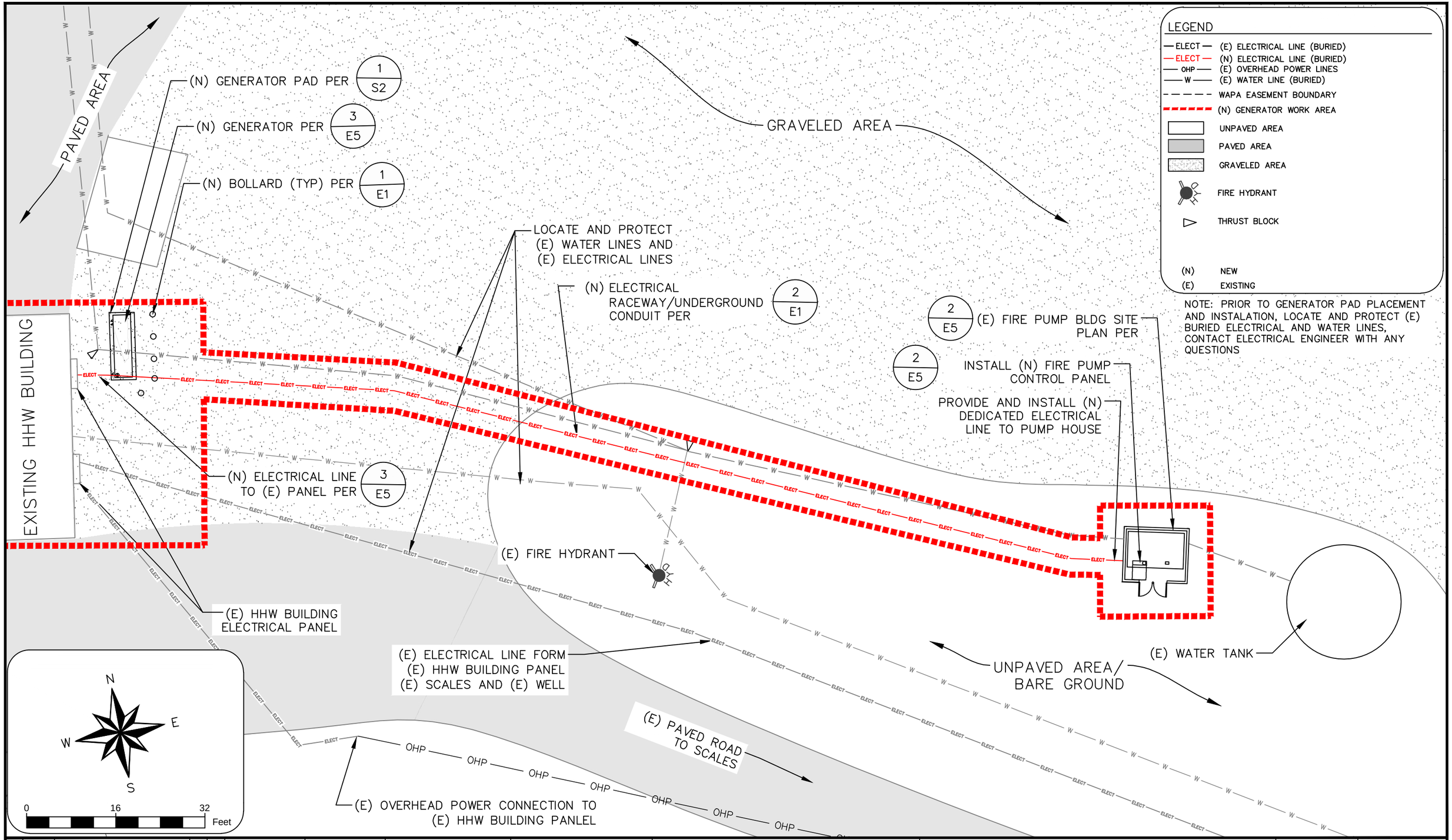

NO.	DATE	REVISIONS	BY	CHK

PROJECT NO: 009169.04	PROJECT ID:
DRAWN BY: Z. MORGAN	SCALE: 1" = 16'
ENGINEER: K. SWANSON	DATE:
CHECKED BY: C. COLES	DATE:

ORIGINAL SCALE IN INCHES
0 1 2

LAWRENCE & ASSOCIATES
ENGINEERS & GEOLOGISTS

TRANSFER STATION

GLENN COUNTY LANDFILL

SITE MAP SHOWING LOCATIONS OF WORK

DRAWING: C2.0
SHEET: OF
DATE: 1/25/2024

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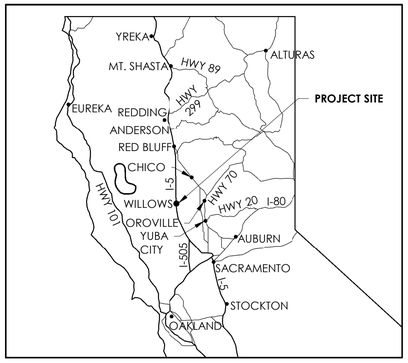
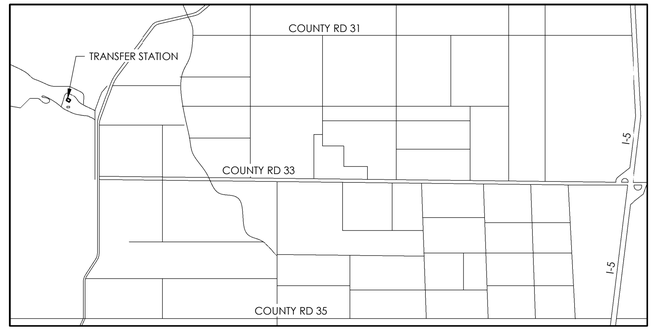
GLENN COUNTY
TRANSFER STATION GENERATOR



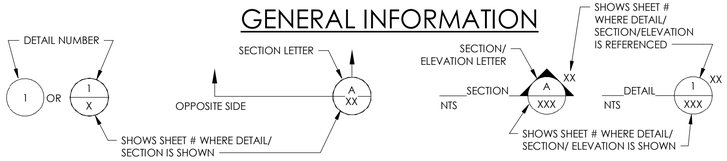
VICINITY MAP

SHEET INDEX		
PAGE NUMBER	SHEET	SHEET NAME
GENERAL		
1	G1	TITLE SHEET
STRUCTURAL		
2	S1	STRUCTURAL NOTES
3	S2	GENERATOR PAD DETAILS
ELECTRICAL		
4	E1	ELECTRICAL SPECIFICATIONS
5	E2	GENERATOR SPECIFICATIONS
6	E3	ONE-LINE DIAGRAM & ELECTRICAL SCHEDULES
7	E4	PANEL SCHEDULES
8	E5	ELECTRICAL PLANS
9	E6	TITLE 24 ELECTRICAL COMPLIANCE DOCUMENTS
TOTAL SHEETS: 9		



LOCATION MAP

GENERAL INFORMATION



DETAIL CALLOUT SECTION MARKERS DETAIL/SECTION/ELEVATION TITLE WHERE SHOWN

TYPICALLY (E) FACILITIES SHOWN FADED AND (N) FACILITIES SHOWN BOLD.

PACE DESIGN TEAM

BRYAN BARNES	PROJECT MANAGER / ELECTRICAL ENIGNEER OF RECORD
ELI JURISICH	STRUCTURAL ENGINEER OF RECORD

CURRENT CODES & STANDARDS

2019 BUILDING STANDARDS ADMINISTATION CODE

2019 NFPA 20: STATIONARY PUMPS FOR FIRE PROTECTION.

2021 NFPA 30: FLAMMABLE AND COMBUSTIBLE LIQUIDS.

2016 NFPA 72: FIRE ALARM AND SIGNALLING CODE.

2019 NFPA 110: EMERGENCY AND STANDBY POWER.

2019 NFPA 111: STANDBY POWER SYSTEMS.

2019 CALIFORNIA BUILDING CODE.

2019 CALIFORNIA ELECTRIC CODE.

2019 CALIFORNIA ENERGY CODE.

2019 CALIFORNIA FIRE CODE.

PACE ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
BRYAN MICHAEL BARNES
No. E22549
ELECTRICAL
STATE OF CALIFORNIA

12/02/22

12/6/2022 4:40:48 PM

PROJECT DESIGN AND CONSTRUCTION NOTES

STRUCTURAL AND BUILDING DESIGN CRITERIA

Adopted Building Codes:	2019 California Building Code
Risk category:	II
Foundation Design Data	
Allowable Bearing Stress:	1500 psf per CBC TBL 1806.2, class 4 material (Assumed) Contact Engineer if unsuitable soils are encountered at foundations.
Wind Design Data	
Ultimate Design Wind Speed:	Vult = 95mph
Exposure Category:	C
Earthquake Design Data	
Seismic Importance Factor:	Ip = 1.0
Acceleration Parameters:	Ss = 0.862 S1 = 0.466 Sds = 0.689
Site Class:	D
Seismic Design Category:	D

GENERAL REQUIREMENTS

All construction shall conform with the adopted editions of the Building Codes and all other applicable codes, ordinances, laws and provisions set forth in these Construction Documents. The Construction Documents are considered to be, but are not limited to, the plans and specifications, notifications, change orders, addendums, clarifications and instructions. Any construction that does not comply with the Construction Documents shall be subject to rejection by the Engineer or Architect.

STRUCTURAL REVIEWS AND INSPECTIONS

See testing and inspections checklist. See Concrete notes for mix design submittal.

The Contractor shall notify the Engineer at least 2 days in advance of any construction activity which requires inspection. Failure of the Engineer to inspect the work when required due to lack of notification will be cause for the Engineer to be relieved of all liability associated with the work.

CONTRACTOR REQUIREMENTS

Dimensions shall be checked by the Contractor prior to construction between these plans and existing field conditions. Verify existing dimensions prior to construction. Discrepancies shall be brought to the immediate attention of the Engineer for resolution.

CONCRETE

All concrete materials and workmanship shall comply with the adopted Building Codes and ACI 301 "Specifications for Structural Concrete". The concrete footings have been designed for a 28 day compressive strength of 2500 psi, therefore concrete special inspections not required. See the table of concrete proportions for specified concrete strength.

Concrete Ingredients shall consist of water, Type II Portland cement, fine aggregate, coarse aggregate that's indicated in the table below. and air-entraining admixture when required. A water reducing admixture shall be added if required to keep the water cement ratio below that specified. Class F fly ash may be substituted for up to 20 percent of the Portland cement, by weight, provided a proven mix design is submitted for the Engineer's review.

Concrete Mix Design per ACI 301shall be submitted to the engineer for approval at least three days prior to concrete placement.

TABLE OF CONCRETE PROPORTIONS

END USE OF CONCRETE	Tests	Min Sacks of Cement per C.Y.	Min 28-day Compression Strength PSI	Max W/C Ratio by Weight	Total Air Content(3)	Slump	WRDA	Super Plasticizer
Footing, Slab, and Equipment Pads	---	5.5	3000	.5	-	3-5	YES	---

Aggregates: Fine and coarse aggregates shall conform to ASTM C33. Coarse aggregate shall be 1-inch max. Aggregates and sand shall be free of materials that are susceptible to alkali-aggregate reactivity (alkali-silica reactivity and alkali-carbonate reactivity).

Placement practices are required to be in accordance with ACI 305 for hot weather and ACI 306 for cold weather. Concrete that has been batched for more than two hours in cold weather and one and one-half hours in hot weather before being placed shall automatically be rejected.

Consolidation of formed concrete and concrete containing anchor bolts, rebar and other embedments shall be accomplished with a concrete vibrator. The size of the vibrator shall be sufficient to adequately consolidate the concrete. Tremie concrete shall not be vibrated.

Finish: Exterior slabs and exposed top of footing shall be given a medium broom finish.

Curing of all concrete shall be continuous for at least 7 days beginning immediately after completion of finishing. Wet curing of slabs using damp burlap or burleen or liquid membrane forming compounds conforming to ASTM C309 or C1315 are acceptable. Curing time and procedures shall be adjusted to suit hot and cold weather conditions.

Formed Surfaces exposed after construction shall be uniformly flat and free of surface defects such as bug holes, form board joints, rock pockets, etc. Flatness tolerance shall be 1/8-inch between any two points in 10 feet. Line shall be within 1/4-inch in 50 feet. Exposed surfaces that are not acceptable shall be corrected or replaced as directed by the Engineer.

Reinforcing Bars shall meet ASTM A615 Grade 60 requirements. Lap lengths shall be 28" for #4 bars.

Adhesive Anchors (ADH AB) shall be ASTM A36 or F1554 grade 36 HDG steel or type 304 SS all thread w/ Simpson SET-3G or Hilti HIT-HY 200 adhesive. A hole of the proper diameter and depth shall be drilled and cleaned with a bottle brush and compressed air. Anchors shall be installed in full conformance with the manufacturer installation instructions. After installation the anchor shall not be disturbed until the minimum cure time has elapsed - see mfr data for cure time. Sufficient adhesive shall be installed such that the hole with the anchor shall be completely filled.

DEMOLITION & SITE PREPARATION:

All loose soils and debris shall be removed to expose dense native soils prior to placing proposed aggregate base materials.

AGGREGATE BASE (AB):

Class 2 aggregate base (AB), referred to as aggregate base material shall be 3/4" max. gradation conforming to Caltrans Standard Specifications, Section 26. Virgin crushed rock shall be utilized. All aggregate base shall be spread and compacted to 95% modified proctor in layers not more than 6" compacted thickness per ASTM D-1557 U.O.N. Test compaction per ASTM D6938

ABBREVIATIONS:

AB	Anchor Bolt, Aggregate Base	FG, FIN GR	Finish Grade	SF	Square Feet
ACI	American Concrete Institute	FND	Foundation	SS, SST	Stainless Steel
ADH AB	Adhesive Anchor Bolt	FOC	Face of Concrete	STL	Steel
APPROX	Approximately				
ASTM	American Society of Testing Materials	GALV	Galvanized	THRD, THD TYP	Threaded Typical
BOD	Basis of Design	HDG	Hot Dip Galvanized		
CBC	California Building Code	HORIZ	Horizontal	UNO	Unless Noted Otherwise
CERT	Certificate				
CG	Center of Gravity	MAX	Maximum	VERT	Vertical
CIP	Cast in Place	MIN	Minimum		
℄	Centerline	MISC	Miscellaneous	W/	With
CONC	Concrete			W/O	Without
CONT	Continuous	O/	Over		
CY	Cubic yard	OC	On Center		
DIA, Ø	Diameter	PSI	Pounds per Square Inch		
EA	Each	REQD	Required		
EF	Each Face	REV	Reversed		
EG	Existing Grade				

TESTING & SPECIAL INSPECTION CHECKLIST

ITEM	TESTING	INSPECTION BY	INSPECTION TYPE	NOTES ON TESTING AND INSPECTION CRITERIA AND METHODS
ADHESIVE ANCHORS EXPANSION ANCHORS	NONE	SPECIAL	CONT	Hole Ø & Depth; Brush & Air Clean; Specs for Adhesive Rod Ø & Length: Sufficient Adhesive, Cleanup. Conform to all mfr installation instructions. Wedge anchor embedment & torque.
AGGREGATE BASE	COMPACTION	SPECIAL	CONT	Test compaction per ASTM D6938

SPECIAL denotes an inspector qualified to perform the inspection and/or testing for the particular item under consideration. The inspector shall not be an employee of the Construction Contractor nor shall he be selected by the Contractor. The Engineer and the Owner shall receive a copy of the inspector's report. The Engineer shall approve the Special Inspector and testing agency prior to employment for this project.

STR ENGR denotes the Engineer responsible for the structural design or his representative.

SPOT denotes observation by the designated inspector after the item is constructed to verify the item is in general conformance with the contract documents and is satisfactory for the next phase of construction.

PACE ENGINEERING

NO.	DATE	REVISIONS	BY	CHK

PROJECT NO: 022046.00	PROJECT ID:
DRAWN BY: AJN	SCALE: AS SHOWN
ENGINEER: AJN	DATE: 12/02/22
CHECKED BY: EJ	DATE: 12/02/22

ORIGINAL SCALE IN INCHES
0 1 2

LAWRENCE & ASSOCIATES
ENGINEERS & GEOLOGISTS

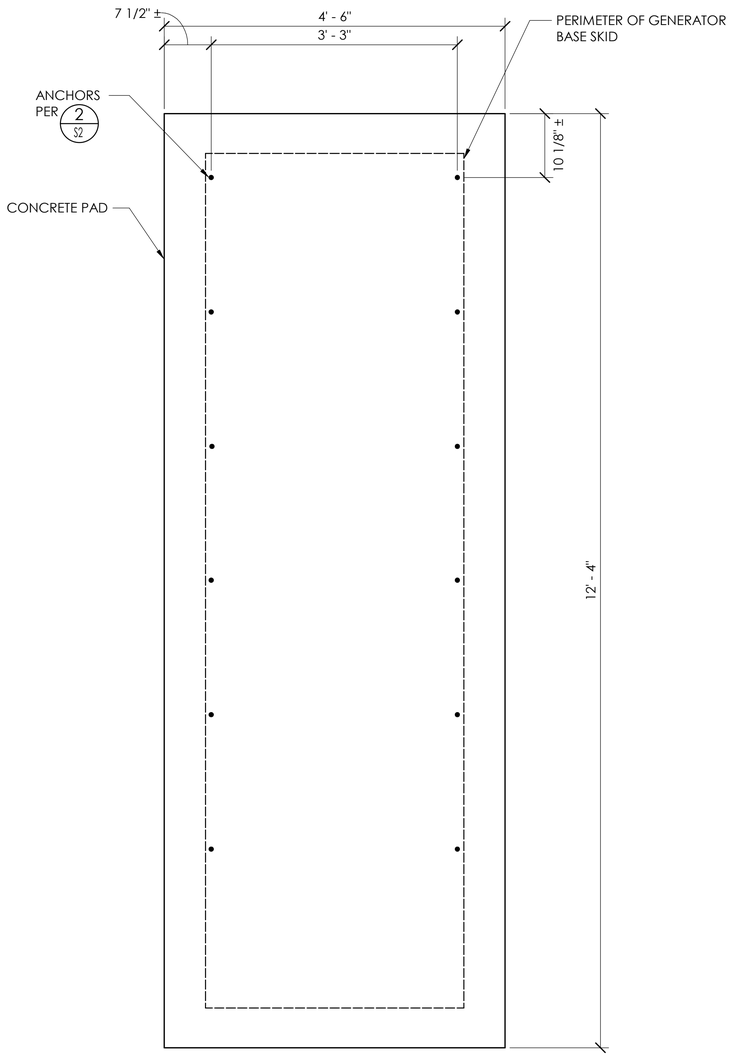
TRANSFER STATION GENERATOR

5700 COUNTY RD 33
ARTOIS, CA 95913

STRUCTURAL NOTES

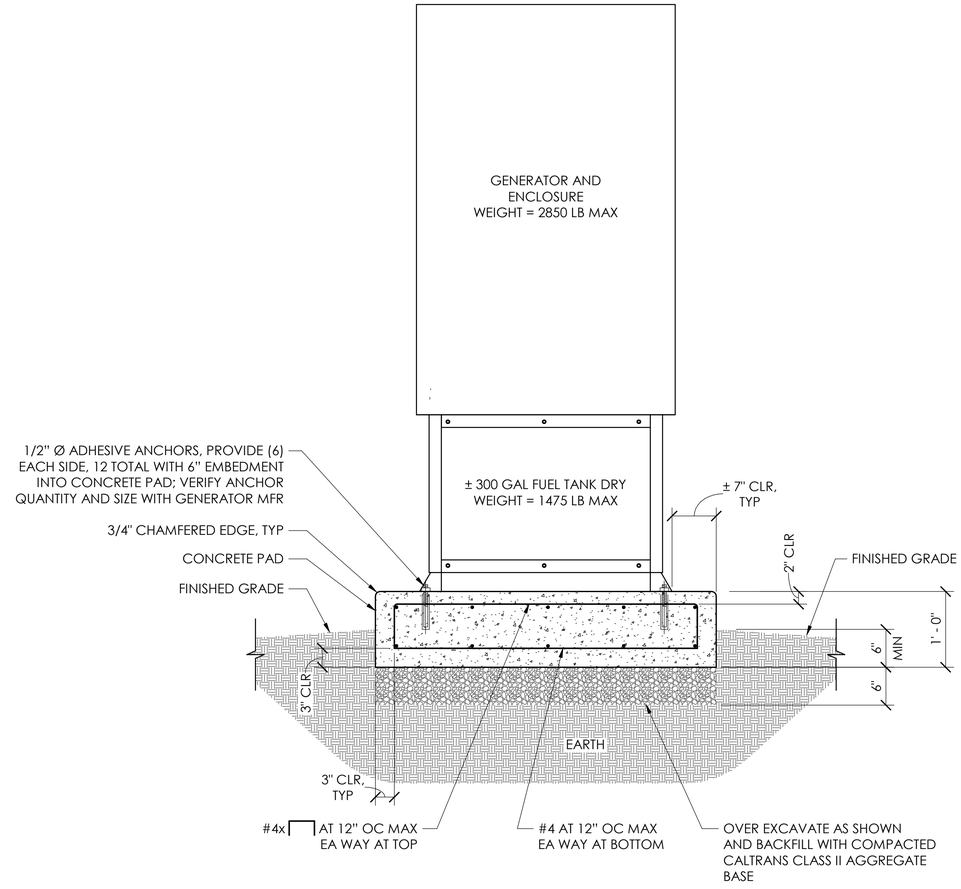
REGISTERED PROFESSIONAL ENGINEER
ELI S. JURISON
No.4718
STRUCTURAL
STATE OF CALIFORNIA
11/30/22

DRAWING: S1
SHEET: 2 OF 9
DATE: 12/02/22



NOTES:
1. FOUNDATION SIZE IS BASED ON THE BOD GENERATOR. CONTRACTOR SHALL VERIFY PAD DIMENSIONS, SIZE, AND ANCHOR LOCATIONS WITH GENERATOR AND TANK MFR PRIOR TO CONSTRUCTION OF CONCRETE PADS. CONCRETE PAD SHALL EXTEND AT LEAST 6" BEYOND TANK BASE ON ALL SIDES.
2. CONTRACTOR SHALL ADJUST TOP REINF LOCATION AS REQ'D TO AVOID CONFLICT WITH ANCHOR LOCATIONS. SEE GENERATOR DRAWINGS FOR ANCHOR LOCATIONS.
3. THE PAD ORIENTATION SHOWN IS GENERIC. SEE ELECTRICAL DRAWINGS FOR ACTUAL ORIENTATION.

GENERATOR ANCHORAGE PLAN 1/S2
1" = 1'-0"



GENERATOR FOUNDATION DETAIL 2/S2
1" = 1'-0"

PACE ENGINEERING

NO.	DATE	REVISIONS	BY	CHK

PROJECT NO: 022046.00	PROJECT ID:
DRAWN BY: AJN	SCALE: AS SHOWN
ENGINEER: AJN	DATE: 12/02/22
CHECKED BY: EJ	DATE: 12/02/22

ORIGINAL SCALE IN INCHES
0 1 2

LAWRENCE & ASSOCIATES
ENGINEERS & GEOLOGISTS

TRANSFER STATION GENERATOR

5700 COUNTY RD 33
ARTOIS, CA 95913

GENERATOR PAD DETAILS

REGISTERED PROFESSIONAL ENGINEER
ELI S. JURISON
No.4718
STRUCTURAL
STATE OF CALIFORNIA
11/30/22

DRAWING: S2
SHEET: 3 OF 9
DATE: 12/02/22

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ELECTRICAL SPECIFICATIONS

PART 1 – GENERAL

1.1 INTENT OF PLANS
- A. ELECTRICAL PLAN DRAWINGS SHOW ONLY GENERAL LOCATIONS OF EQUIPMENT, DEVICES, AND RACEWAY UNLESS SPECIFICALLY DIMENSIONED. THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER ROUTING OF RACEWAY, SUBJECT TO THE APPROVAL OF THE ENGINEER. MAKE ADJUSTMENTS AS NECESSARY TO WIRING, CONDUIT, DISCONNECTS, BRANCH CIRCUIT PROTECTION, AND OTHER AFFECTED MATERIAL OR EQUIPMENT TO ACCOMMODATE ACTUAL EQUIPMENT SUPPLIED FOR THIS PROJECT.

1.2 CODES, PERMITS, AND REGULATIONS
- A. DO ALL WORK AND INSTALL PRODUCTS IN ACCORDANCE WITH APPLICABLE NECA REQUIREMENTS, THE REQUIREMENTS OF APPLICABLE STATE AND LOCAL LAWS, CODES AND ORDINANCES. IT IS OF THE UTMOST IMPORTANCE THAT THE INSTALLING CONTRACTOR HAVE A MASTERY OF THE PROJECT-SPECIFIC REQUIREMENTS SHOWN IN SPECIFICATIONS AND PLANS. IT IS STRONGLY ADVISED THAT THE CONTRACTOR CONTACT THE EEOR FOR CLARIFICATION OR RFI THE EEOR IF FURTHER INFORMATION IS REQUIRED. THE EEOR SHALL REQUIRE REVISIONS TO BE MADE IN THE FIELD IF THE INSTALLATION DOES NOT FALL WITHIN THESE PROJECT-SPECIFIC GUIDELINES. NO ALLOWANCE SHALL BE MADE FOR INSTALLATIONS NOT ADHERING TO THESE REQUIREMENTS.

1.3 SUBMITTALS
- A. GENERAL:
  1. BEFORE ANY MATERIAL IS FABRICATED OR SHIPPED, FURNISH TO THE ENGINEER FULL DETAILS, SHOP DRAWINGS, DIMENSIONS, CATALOG CUTS, SCHEMATIC (ELEMENTARY) DIAGRAMS, AND OTHER DESCRIPTIVE MATTER AS REQUIRED TO FULLY DESCRIBE THE EQUIPMENT SPECIFIED.

1.4 TESTING RELATED SUBMITTALS
- A. TEST PROCEDURES: SUBMIT THE PROCEDURES TO BE FOLLOWED DURING THE OPERATIONAL READINESS TEST. PROCEDURES SHALL INCLUDE TEST DESCRIPTIONS, FORMS, AND CHECKLISTS TO BE USED TO CONTROL AND DOCUMENT THE REQUIRED TESTS. UPON COMPLETION OF EACH REQUIRED TEST, DOCUMENT THE TEST BY SUBMITTING A COPY OF THE SIGNED OFF TEST PROCEDURES.

PART 2 – PRODUCTS

2.1 NOTE
- A. UNLESS OTHERWISE INDICATED, PROVIDE ALL FIRST-QUALITY NEW MATERIALS, FREE FROM ANY DEFECTS, AND SUITABLE FOR THE INTENDED USE AND THE SPACE PROVIDED. PROVIDE MATERIALS APPROVED BY UL WHEREVER STANDARDS HAVE BEEN ESTABLISHED BY THAT ORGANIZATION. FURNISH AND INSTALL ALL INCIDENTAL ITEMS NOT SPECIFICALLY SHOWN OR SPECIFIED WHICH ARE REQUIRED TO PROVIDE THE COMPLETE SYSTEMS SPECIFIED HEREIN. WHERE TWO OR MORE UNITS OF THE SAME CLASS OF MATERIAL OR EQUIPMENT ARE REQUIRED, PROVIDE PRODUCTS OF A SINGLE MANUFACTURER. COMPONENT PARTS OF MATERIALS OR EQUIPMENT NEED NOT BE PRODUCTS OF THE SAME MANUFACTURER.

2.2 EQUIPMENT FINISH
- A. UNLESS OTHERWISE INDICATED, FINISH FOR ELECTRICAL EQUIPMENT AND ENCLOSURES SHALL BE MANUFACTURER'S STANDARD GRAY OR ANSI 61 GRAY OVER A PRIMER AND RUST INHIBITOR.

2.3 OUTLET AND DEVICE BOXES
- A. SHEET STEEL: ONE-PIECE DRAWN TYPE, ZINC- OR CADMIUM-PLATED.

2.4 JUNCTION AND PULL BOXES
- A. OUTLET BOXES USED AS JUNCTION OR PULL BOX: AS SPECIFIED UNDER OUTLET AND DEVICE BOXES.
- B. LARGE WEATHERPROOF: NEMA 3R.
  1. BOX: GALVANIZED STEEL.
  2. COVER: SCREW WITH PROVISIONS FOR PAD LOCKING.
  3. EMBOSSED MOUNTING HOLES ON BACK OF ENCLOSURE.
  4. NO GASKETING.
- C. CONCRETE PULL BOX:
  1. BOX: PRECAST CONCRETE.
  2. EXTENSIONS: PRECAST CONCRETE, 12 INCHES DEEP, PROVIDE MINIMUM OF TWO PER BOX.
  3. COVER: STEEL TRAFFIC COVER, CLEARLY AND PERMANENTLY LABEL BOX ELECTRICAL, TELEPHONE, OR TELEMETRY, AS APPLICABLE.
  4. SIZE: SIZED IN ACCORDANCE WITH CEC, BUT MINIMUM SIZE 17"H X 30"W WITH DEPTH AS REQUIRED.

2.5 CONDUIT AND CONDUIT FITTINGS:
- A. GALVANIZED RIGID STEEL CONDUIT (GRS):
  1. CONDUIT:
     - A. MEET REQUIREMENTS OF ANSI C80.1 AND UL 6.
     - B. MATERIAL: HOT-DIP GALVANIZED, WITH CHROMATED PROTECTIVE LAYER.
  2. FITTINGS:
     - A. MEET REQUIREMENTS OF UL 514B.
     - B. TYPE: THREADED, GALVANIZED. SETSCREW FITTINGS NOT PERMITTED.
     - C. MATERIAL: MALLEABLE IRON WITH INSULATED THROAT.
- B. ELECTRIC METALLIC TUBING (EMT):
  1. CONDUIT:
     - A. MEET REQUIREMENTS OF ANSI C80.3 AND UL 797.
     - B. MATERIAL: HOT-DIP GALVANIZED, WITH CHROMATED AND LACQUERED PROTECTIVE LAYER.
  2. FITTINGS:
     - A. MEET REQUIREMENTS OF UL 514B.
     - B. TYPE: STEEL BODY AND LOCK NUTS WITH STEEL OR MALLEABLE IRON COMPRESSION NUTS.
- C. PVC SCHEDULE 40 CONDUIT:
  1. CONDUIT:
     - A. MEET REQUIREMENTS OF NEMA TC2 AND UL 651.
     - B. UL LISTED FOR CONCRETE ENCASEMENT, UNDERGROUND DIRECT BURIAL, CONCEALED OR DIRECT SUNLIGHT EXPOSURE, AND 90°C INSULATED CONDUCTORS.
  2. FITTINGS
     - A. MEET REQUIREMENTS OF NEMA TC-3 AND UL 514B.
     - B. TYPE: PVC, SLIP-ON.
- D. FLEXIBLE METAL, LIQUID-TIGHT CONDUIT:
  1. CONDUIT:
     - A. UL 360.
     - B. TEMPERATURE RATED FOR 80°C.
     - C. MATERIAL: GALVANIZED STEEL, WITH AN EXTRUDED PVC JACKET.
  2. FITTINGS: FLEXIBLE METAL, LIQUID-TIGHT CONDUIT: INSULATED THROAT AND SEALING O-RINGS.
- E. RACEWAY WARNING TAPE:
  1. HEAVY-GAUGE, YELLOW PLASTIC TAPE OF 6-INCH MINIMUM WIDTH FOR USE IN TRENCHES CONTAINING ELECTRIC CIRCUITS.
  2. UTILIZE TAPE MADE OF MATERIAL RESISTANT TO CORROSIVE SOIL.
  3. PRINTED WARNING THAT AN ELECTRIC CIRCUIT IS LOCATED BELOW THE TAPE.

2.7 CONDUCTORS
- A. ELECTRICAL TERMINALS AND TERMINATIONS: IT IS ASSUMED THAT ALL TERMINATIONS IN THE FIELD SHALL HAVE MINIMUM RATED 75°C RATED TERMINALS. THE CONTRACTOR SHALL FIELD VERIFY ALL TERMINALS FOR CONNECTION IN COMPLIANCE WITH CEC 110.14. THE CONTRACTOR SHALL INFORM THE ENGINEER OF RECORD OF ANY TERMINALS DEVIATING FROM A RATING OF 75°C.
  1. ALL CONDUCTORS ARE RATED FOR 75°C ON PLANS UNLESS OTHERWISE NOTED.
- B. ALL CONDUCTORS SHOWN SHALL BE NEW UNLESS OTHERWISE INDICATED.
- C. CONDUCTOR TYPE:
  1. ALL CIRCUITS: STRANDED.
  2. INSULATION: TYPE THHN/THWN, 90°C DRY OR 75°C WET.
- D. COPPER BUILDING WIRE:
  1. DESCRIPTION: FLEXIBLE, INSULATED AND UNINSULATED, DRAWN COPPER CURRENT-CARRYING CONDUCTOR WITH AN OVERALL INSULATION LAYER OR JACKET, OR BOTH, RATED 600 VAC OR LESS.
     - a. INSULATION:
       - TYPE THHN AND TYPE THWN-2: COMPLY WITH UL 83.

2.9 CONDUCTOR ACCESSORIES
- A. TAPE:
  1. GENERAL PURPOSE, FLAME RETARDANT: 7-MIL, VINYL PLASTIC, RATED FOR 90°C MINIMUM MEETING REQUIREMENTS OF UL 510.
  2. FLAME RETARDANT, COLD AND WEATHER RESISTANT: 8.5 MIL, VINYL PLASTIC.
- B. CABLE TIES:
  1. NYLON, ADJUSTABLE, AND SELF-LOCKING.
  2. COMPLY WITH UL 20 AND FS W-S-896.

PART 3 – EXECUTION

3.1 NOTE:
- A. COORDINATE ELECTRICAL WORK WITH THE OWNER AND THE WORK OF OTHER TRADES TO AVOID CONFLICTS, ERRORS, DELAYS, AND UNNECESSARY INTERFERENCE DURING CONSTRUCTION.

3.2 PROTECTION DURING CONSTRUCTION
- A. FOLLOWING INSTALLATION, PROTECT MATERIALS, EQUIPMENT, AND INSULATION FROM CORROSION, PHYSICAL DAMAGE, AND MOISTURE. CAP CONDUIT RUNS DURING CONSTRUCTION WITH MANUFACTURED SEALS. KEEP OPENINGS IN BOXES OR EQUIPMENT CLOSED DURING CONSTRUCTION.

3.3 MATERIAL AND EQUIPMENT INSTALLATION
- A. FOLLOW THE MANUFACTURER'S INSTALLATION RECOMMENDATIONS UNLESS OTHERWISE INDICATED. FOLLOW THE ENGINEER'S DECISION, WHEREVER ANY CONFLICT ARISES. KEEP COPY OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AVAILABLE ON THE JOBSITE FOR REVIEW AT ALL TIMES.

3.4 CUTTING AND PATCHING
- A. DO NOT CUT OR NOTCH ANY STRUCTURAL MEMBER OR BUILDING SURFACE WITHOUT SPECIFIC APPROVAL OF THE ENGINEER. FOLLOWING SUCH WORK, RESTORE SURFACES NEATLY TO NEW CONDITION USING SKILLED CRAFTSMEN OF THE TRADES INVOLVED.

3.5 CLEANING AND TOUCH-UP PAINTING
- A. KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH. UPON COMPLETION OF WORK, REMOVE MATERIALS, SCRAPS, AND DEBRIS FROM THE PREMISES AND FROM THE INTERIOR AND EXTERIOR OF ALL DEVICES AND EQUIPMENT. REFINISH DAMAGED SURFACES TO NEW CONDITION USING SKILLED CRAFTSMEN OF THE TRADES INVOLVED.

3.6 RACEWAY SYSTEM
- A. UNLESS OTHERWISE SPECIFIED OR INDICATED, WIRING SHALL CONSIST OF INSULATED CONDUCTORS INSTALLED IN RACEWAYS OF THE TYPES INDICATED:
- B. EXTERIOR, EXPOSED: GALVANIZED RIGID STEEL.
- C. INTERIOR, EXPOSED: ELECTRIC METALLIC TUBING.
- D. DIRECT EARTH BURIAL: PVC SCHEDULE 40.
- E. ALL CONDUIT PENETRATIONS THROUGH CONCRETE FLOOR SLABS SHALL BE GALVANIZED RIGID ENTIRE DEPTH OF FLOOR SLAB.
- F. FOR EQUIPMENT WHERE FLEXIBLE CONNECTION IS REQUIRED TO MINIMIZE VIBRATION:
  1. FLEXIBLE METAL, LIQUID-TIGHT CONDUIT.
  2. LENGTH: 18-INCH MINIMUM, 60-INCH MAXIMUM OF SUFFICIENT LENGTH TO ALLOW MOVEMENT OR ADJUSTMENT OF EQUIPMENT.
- G. BOX TYPE (ALL RACEWAY SYSTEMS):
  1. EXTERIOR LOCATIONS: WEATHERPROOF TYPE 3R.
  2. BURIED RACEWAY: CONCRETE PULLBOX.
- H. INSTALL PULL BOXES WHERE SHOWN AND WHERE NECESSARY TO TERMINATE, TAP-OFF, OR REDIRECT MULTIPLE CONDUIT RUNS. INSTALL PULL BOXES WHERE NECESSARY IN RACEWAY SYSTEM TO FACILITATE CONDUCTOR INSTALLATION. INSTALL PULL BOXES IN CONDUIT RUNS AT LEAST EVERY 150 FEET OR AFTER THE EQUIVALENT OF THREE RIGHT-ANGLE BENDS. USE OUTLET BOXES AS JUNCTION AND PULL BOXES WHEREVER POSSIBLE AND ALLOWED BY APPLICABLE CODES.
- I. SUPPORT BOXES INDEPENDENTLY OF CONDUIT BY ATTACHMENT TO BUILDING STRUCTURE OR STRUCTURAL MEMBER. INSTALL BAR HANGERS IN FRAME CONSTRUCTION, OR FASTEN BOXES DIRECTLY WITH WOOD SCREWS ON WOOD, BOLTS AND EXPANSION SHIELDS ON CONCRETE OR BRICK, TOGGLE BOLTS ON HOLLOW MASONRY UNITS, AND MACHINE SCREWS OR WELDED THREADED STUDS ON STEELWORK.

3.7 RACEWAY INSTALLATION
- A. CONDUIT AND TUBING SIZES SHOWN ARE BASED ON THE USE OF COPPER CONDUCTORS.
- B. MAINTAIN RACEWAY ENTIRELY FREE OF OBSTRUCTIONS AND MOISTURE.
- C. GROUP RACEWAYS INSTALLED IN SAME AREA.
- D. FOLLOW STRUCTURAL SURFACE CONTOURS WHEN INSTALLING EXPOSED RACEWAYS. AVOID OBSTRUCTION OF PASSAGEWAYS. RUN EXPOSED RACEWAYS PARALLEL OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS, OR INTERSECTIONS OF VERTICAL PLANES.
- E. INSTALL WATERTIGHT FITTINGS IN OUTDOOR, UNDERGROUND, OR WET LOCATIONS.
- F. ALL METAL CONDUIT TO BE REAMED, BURRS REMOVED, AND CLEANED BEFORE INSTALLATION OF CONDUCTORS, WIRES, OR CABLES.
- G. HORIZONTAL RACEWAYS INSTALLED UNDER FLOOR SLABS SHALL LIE COMPLETELY UNDER SLAB, WITH NO PART EMBEDDED WITHIN SLAB.
- H. INSTALL CONCEALED, EMBEDDED, AND BURIED RACEWAYS SO THAT THEY EMERGE AT RIGHT ANGLES TO SURFACE AND HAVE NO CURVED PORTION EXPOSED.
- I. FOR EMPTY CONDUITS INSTALL A NYLON PULL CORD TO BE USED FOR FUTURE INSTALLATIONS.

3.8 RACEWAY PENETRATIONS
- A. MAKE AT RIGHT ANGLES, UNLESS OTHERWISE SHOWN.
- B. NOTCHING OR PENETRATION OF STRUCTURAL MEMBERS, INCLUDING FOOTINGS AND BEAMS, NOT PERMITTED.
- C. FIRE-RATED WALLS, FLOORS, OR CEILINGS: FIRE-STOP OPENINGS AROUND PENETRATIONS TO MAINTAIN FIRE-RESISTANCE RATING.
- D. APPLY SINGLE LAYER OF WRAPAROUND DUCT BAND TO ALL METALLIC CONDUIT PROTRUDING THROUGH CONCRETE FLOOR SLABS TO A POINT 2 INCHES ABOVE CONCRETE SURFACE.

3.9 RACEWAY SUPPORT
- A. SUPPORT FROM STRUCTURAL MEMBERS ONLY, AT INTERVALS NOT EXCEEDING CEC REQUIREMENTS, AND IN ANY CASE NOT EXCEEDING 10 FEET. DO NOT SUPPORT FROM PIPING, PIPE SUPPORTS, OR OTHER RACEWAYS.
- B. WALL BRACKETS AND ASSOCIATED HARDWARE IN CONTACT WITH CONCRETE OR MASONRY SHALL BE STAINLESS STEEL. PROVIDE GALVANIZED STEEL AT ALL OTHER LOCATIONS. STRAP HANGERS AND CEILING TRAPEZE INCLUDING HARDWARE, SHALL BE GALVANIZED STEEL.
- C. PROVIDE AND ATTACH WALL BRACKETS, STRAP HANGERS, OR CEILING TRAPEZE AS FOLLOWS:
  1. WOOD: WOOD SCREWS.
  2. HOLLOW MASONRY UNITS: TOGGLE BOLTS.
  3. CONCRETE OR BRICK: EXPANSION SHIELDS, OR THREADED STUDS DRIVEN IN BY POWDER CHARGE, WITH LOCK WASHERS AND NUTS.
  4. STEELWORK: MACHINE SCREWS.
- D. NAILS OR WOODEN PLUGS INSERTED IN CONCRETE OR MASONRY FOR ATTACHING RACEWAY NOT PERMITTED. DO NOT WELD RACEWAYS OR PIPE STRAPS TO STEEL STRUCTURES. DO NOT USE WIRE IN LIEU OF STRAPS OR HANGERS.

3.10 RACEWAY BENDS
- A. INSTALL CONCEALED RACEWAYS WITH A MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE.
- B. AVOID FIELD-MADE BENDS AND OFFSETS, BUT WHERE NECESSARY, MAKE WITH ACCEPTABLE HICKEY OR BENDING MACHINE. DO NOT HEAT METAL RACEWAYS TO FACILITATE BENDING.
- C. PVC CONDUIT:
  1. BENDS 30° AND LARGER: PROVIDE FACTORY-MADE ELBOWS.
  2. 90° BENDS: PROVIDE GALVANIZED RIGID STEEL ELBOWS.
- D. FLEXIBLE CONDUIT: DO NOT MAKE BENDS THAT EXCEED ALLOWABLE CONDUCTOR BENDING RADIUS OF CABLE TO BE INSTALLED OR THAT SIGNIFICANTLY RESTRICTS CONDUIT FLEXIBILITY.

3.12 PVC CONDUIT
- A. SOLVENT WELDING:
  1. PROVIDE MANUFACTURER RECOMMENDED SOLVENT; APPLY TO ALL JOINTS.
  2. INSTALL SUCH THAT JOINT IS WATERTIGHT.
- B. ADAPTERS:
  1. PVC TO METALLIC FITTINGS: PVC TERMINAL TYPE.
  2. PVC TO RIGID METAL CONDUIT: PVC FEMALE ADAPTER.
- C. BELLED END CONDUIT: BEVEL THE UNBELLED END OF THE JOINT PRIOR TO JOINING.

3.13 UNDERGROUND RACEWAYS
- A. COVER: MAINTAIN MINIMUM 2-FOOT COVER ABOVE CONDUIT, UNLESS OTHERWISE SHOWN.
- B. INSTALLATION WITH OTHER PIPING SYSTEMS: MAINTAIN MINIMUM 12-INCH SEPARATION UNLESS OTHERWISE INDICATED. INSTALLATION OVER VALVES OR COUPLINGS NOT PERMITTED.

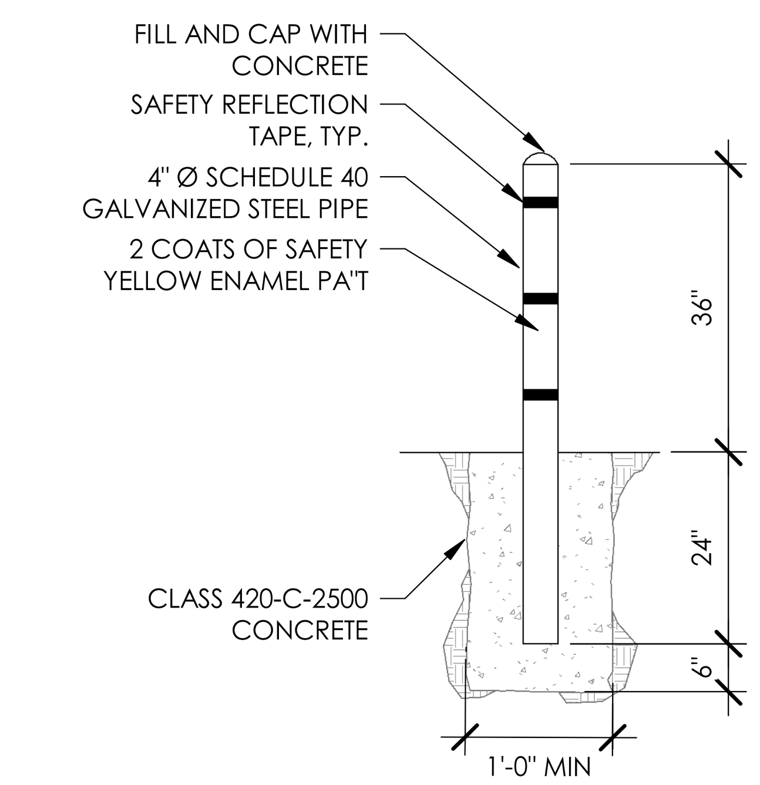
3.16 CONDUCTORS
- A. DO NOT SPLICE INCOMING SERVICE CONDUCTORS AND BRANCH POWER DISTRIBUTION CONDUCTORS NO. 6 AWG AND LARGER UNLESS SPECIFICALLY INDICATED OR APPROVED BY ENGINEER.
- B. CONNECTIONS AND TERMINATIONS:
  1. INSTALL WIRE NUTS ONLY ON SOLID CONDUCTORS.
  2. INSTALL NYLON SELF-INSULATED CRIMP CONNECTORS AND TERMINATORS FOR CIRCUIT CONDUCTORS NO. 6 AWG AND SMALLER.
  3. INSTALL UNINSULATED CRIMP CONNECTORS AND TERMINATORS FOR CIRCUIT CONDUCTORS NO. 4 AWG THROUGH NO. 2/0 AWG.
  4. INSTALL UNINSULATED, BOLTED, TWO-WAY CONNECTORS AND TERMINATORS FOR CIRCUIT CONDUCTORS NO. 4/0 AWG AND LARGER.
  5. TAPE INSULATE ALL UNINSULATED CONNECTIONS.
  6. PLACE NO MORE THAN ONE CONDUCTOR IN ANY SINGLE-BARREL PRESSURE CONNECTION.
  7. INSTALL CRIMP CONNECTORS WITH TOOLS APPROVED BY CONNECTOR MANUFACTURER.
  8. COMPRESSION LUGS:
     - a. ATTACH WITH A TOOL SPECIFICALLY DESIGNED FOR PURPOSE.
     - b. TOOL SHALL PROVIDE COMPLETE, CONTROLLED CRIMP AND SHALL NOT RELEASE UNTIL CRIMP IS COMPLETE.
     - c. DO NOT USE PLIER TYPE CRIMPERS.
- C. DO NOT USE SOLDERED MECHANICAL JOINTS.
- D. SPLICES AND TERMINATIONS:
  1. INDOORS: USE GENERAL PURPOSE, FLAME RETARDANT TAPE.
  2. OUTDOORS: USE FLAME RETARDANT, COLD- AND WEATHER-RESISTANT TAPE.
- E. CABINETS AND PANELS:
  1. REMOVE SURPLUS WIRE, BRIDLE AND SECURE.
  2. WHERE CONDUCTORS PASS THROUGH OPENINGS OR OVER EDGES IN SHEET METAL, REMOVE BURRS CHAMFER EDGES, AND INSTALL BUSHINGS AND PROTECTIVE STRIPS OF INSULATING MATERIAL TO PROTECT THE CONDUCTORS.
- F. PROVIDE ADEQUATE LENGTH PIGTAILS FOR CONDUCTORS CONNECTED BY OTHERS.

3.17 GROUNDING
- A. UNLESS OTHERWISE INDICATED, GROUND ALL EXPOSED NON-CURRENT-CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, RACEWAY SYSTEMS, AND THE NEUTRAL OF ALL WIRING SYSTEMS IN ACCORDANCE WITH THE CEC, STATE, AND OTHER APPLICABLE LAWS AND REGULATIONS.

3.21 OPERATIONAL READINESS TEST (ORT)
- A. TESTING, TEST PLANS, AND TEST REPORTS SHALL BE PROVIDED BY THE CONTRACTOR AS SPECIFIED HEREIN. THE CONTRACTOR SHALL PROVIDE LABOR, INSTRUMENTS, AND OTHER MATERIAL TO COMPLETE THE TEST.
- B. THE ENTIRE INSTALLED ELECTRICAL SYSTEM SHALL BE CERTIFIED (INSPECTED, TESTED, AND DOCUMENTED) THAT IT IS READY FOR OPERATION. THE OBJECTIVE OF THIS TEST IS TO DEMONSTRATE THAT THE ELECTRICAL SYSTEM IS COMPLETE AND READY FOR USE.
  1. INSULATION RESISTANCE TEST:
     - a. PERFORM INSULATION RESISTANCE TEST ON EACH CONDUCTOR NO. 6 AND LARGER WITH RESPECT TO GROUND. APPLIED POTENTIAL TO BE 1,000 VDC FOR ONE MINUTE.
     - b. RECORD TEST VALUES AND SUBMIT TO THE ENGINEER. INSULATION RESISTANCE TO BE 50 MEGAOHMS MINIMUM.
     - c. MEASURE INSULATION RESISTANCE OF COMPLETE CIRCUITS WITH THE CIRCUIT BREAKERS OPEN.
     - d. NOTIFY THE ENGINEER ONE WEEK PRIOR TO THE INSULATION TEST.
  2. GROUNDING SYSTEM:
     - a. VERIFY GROUND SYSTEM IS IN COMPLIANCE WITH THE PLANS.
  3. DEMONSTRATION:
     - a. DEMONSTRATE PROPER CIRCUITING.
     - b. DEMONSTRATE PROPER OPERATION OF GFCI RECEPTACLES (USE GFCI TESTER).
     - c. DEMONSTRATE PROPER PANEL RELABELING.
- C. PANELBOARD DIRECTORIES SHALL MEET MINIMUM CEC 408.4 REQUIREMENTS. THE CONTRACTOR SHALL IDENTIFY EACH CIRCUIT WITH ROOM NUMBER, ROOM NAME AND EQUIPMENT SERVED. STANDARD ABBREVIATIONS FROM THE NEC AND WEBSTER'S DICTIONARY ARE ALLOWED. (E.G., "207 JANITOR WH" OR "102,103 RR RCPT".)
- D. LABELS SHALL BE MELAMINE, FLEXI-BRASS, OR EQUAL MATERIAL, 1.5"HX3"L, WITH 3/8"H TIMES NEW ROMAN LETTERING.
  1. BACKGROUND/LETTERING COLOR SHALL BE AS FOLLOWS:
     - a. BLACK/WHITE (NORMAL BRANCHES)
     - b. RED/WHITE (EMERGENCY BRANCHES)
  2. EQUIPMENT LABELING (FOR ALL PROJECT TYPES) SHALL FOLLOW AFTER THE EXAMPLES SHOWN BELOW (FOR GENERATOR/ATS, PANELBOARDS, DISCONNECTS, LIGHTING CONTROL PANELS, ETC.):

PANEL A2
FED FROM PNL B1
400A, 120/208V, 3Ø

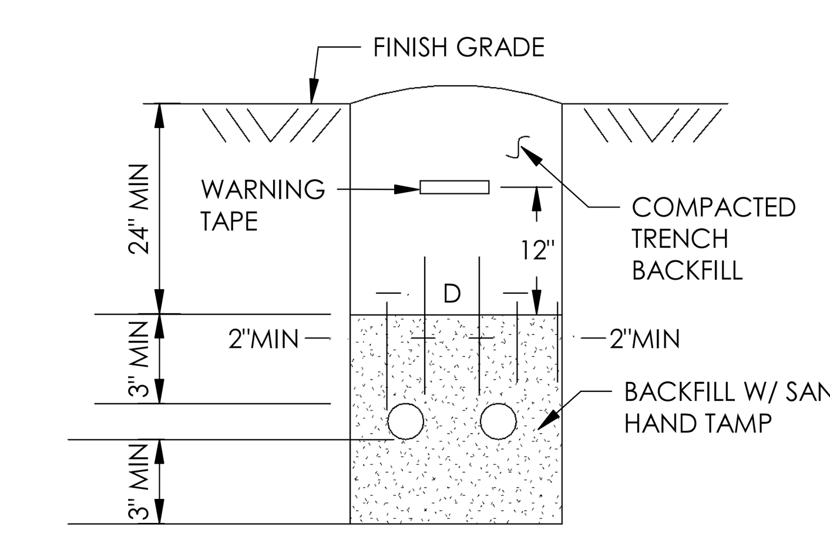
DISCONNECT B1
FED FROM PNL M1
60A/15F, 208V/3Ø



NOTES:

1. PERMANENT BOLLARDS SHALL BE INSTALLED, UNLESS NOTED OTHERWISE.

SUPPORTS - BOLLARD DETAIL (1/E1)
NTS



NOTES:

1. D=3" MIN FOR 2" AND LARGER CONDUIT
2. D=2" MIN FOR 1 1/2" AND SMALLER CONDUIT
3. CONDUIT DETAIL FOR LESS THAN 4 RACEWAYS PER TRENCH.
4. DUCT RUNS WITH 5 OR MORE CONDUITS SHALL EMPLOY DUCT SPACERS.
5. PATCH AND REPAIR SURFACE TO MATCH EXISTING.

RACEWAY - UNDERGROUND CONDUIT (2/E1)
NTS

PACE® ENGINEERING

NO.	DATE	REVISIONS	BY	CHK

PROJECT NO: 022046.00
PROJECT ID:
DRAWN BY: NP
SCALE: AS SHOWN
ENGINEER: NP
DATE: 12/02/2022
CHECKED BY: BB
DATE: 12/02/2022

ORIGINAL SCALE IN INCHES
0 1 2

LAWRENCE & ASSOCIATES
ENGINEERS & GEOLOGISTS

TRANSFER STATION GENERATOR

5700 COUNTY RD 33
ARTOIS, CA 95913

ELECTRICAL SPECIFICATIONS

12/02/22
REGISTERED PROFESSIONAL ENGINEER
No. E22549
ELECTRICAL
STATE OF CALIFORNIA

DRAWING: E1
SHEET: 4 OF 9
DATE: 12/02/22

DIESEL GENERATOR SPECIFICATIONS

PART 1 –GENERAL

1.01 WORK INCLUDED
A. WORK INCLUDES FURNISHING, INSTALLING, ADJUSTING, TESTING, DOCUMENTING, AND STARTING UP GENERATOR EQUIPMENT IN ACCORDANCE WITH THESE SPECIFICATIONS, THE ACCOMPANYING PLANS, AND THE DIRECTIONS OF THE ENGINEER.
1. SUPPLY ALL EQUIPMENT CONTAINED HEREIN.
2. ASSUME OVERALL RESPONSIBILITY FOR THE COMPLETE OPERATING SYSTEM.
3. COORDINATE INTERCONNECTION WITH AUTOMATIC TRANSFER SWITCHES SPECIFIED IN THIS SECTION.
4. COORDINATE INTERCONNECTION WITH FIRE PUMP AUTOMATIC TRANSFER SWITCH.

1.02 REFERENCES
A. EXCEPT AS OTHERWISE SPECIFIED, THE APPLICABLE RULES, REGULATIONS, AND STANDARDS OF THE FOLLOWING ORGANIZATIONS SHALL BE CONSIDERED AS MINIMUM REQUIREMENTS:
1. UNDERWRITERS LABORATORIES (UL).
2. CALIFORNIA BUILDING CODE (CBC).
3. CALIFORNIA ELECTRICAL CODE (CEC).
4. CALIFORNIA FIRE CODE (CFC).
5. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA).
6. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE).
7. THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA).
8. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).
9. DIESEL ENGINE MANUFACTURERS ASSOCIATION (DEMA).
10. INTERNAL COMBUSTION ENGINE INSTITUTE.
11. AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
12. NATIONAL ELECTRICAL CONTRACTOR'S ASSOCIATION (NECA).

1.03 LOCATION
A. THE SUPPLIER OF THE GENERATOR-SET AND THE MANUFACTURERS OF THE COMPONENT PARTS SHALL HAVE REPRESENTATIVES LOCATED WITHIN 200 MILES OF THE INSTALLATION THAT CAN PROVIDE REGULAR SERVICE, INSPECTION, SPARE PARTS, AND EMERGENCY SERVICE.

1.04 SUBMITTALS
A. SHOP DRAWINGS:
A. DIMENSIONED OUTLINE DRAWING SHOWING PLAN AND ELEVATIONS OF THE PROPOSED ENGINE GENERATOR SET AND DRIVE SYSTEM, INCLUDING ANCHORING REQUIREMENTS.
1. ENGINE AND GENERATOR WEIGHTS.
2. CATALOG INFORMATION AND TECHNICAL DESCRIPTION OF THE PROPOSED ENGINE GENERATOR SET. INCLUDE PROPOSED MATERIALS FOR THE BLOCK, HEADS, VALVES, RINGS, CYLINDERS, PISTONS, CRANKSHAFT, AND MAJOR BEARINGS AND WEAR SURFACES.
3. COMPLETE LIST OF ACCESSORIES PROVIDED.
4. PERFORMANCE CURVES SHOWING ENGINE EFFICIENCY (FUEL CONSUMED PER KWH OUTPUT), GROSS FUEL CONSUMPTION RATE, AND KW OUTPUT AT DESIGN RATED OUTPUT, ONE-HALF LOAD, AND ONE-QUARTER LOAD. ACCOUNT FOR DESIGN ALTITUDE AND TEMPERATURE CORRECTIONS AND FOR ENGINE PARASITIC LOADS.
5. GENERATOR TRANSIENT AND SUBTRANSIENT REACTANCES IN PER UNIT.
6. GENERATOR OUTPUT WAVEFORM AND TELEPHONE INTERFERENCE FACTOR (TIF).
7. ELECTRICAL SCHEMATIC AND WIRING DIAGRAMS:
a. GENERATOR CONTROL PANEL.
b. MAIN GENERATOR.
c. INTERCONNECTION WIRING DIAGRAM FOR AUTOMATIC TRANSFER SWITCH.
8. CONTROL PANEL INSTRUMENT IDENTIFICATION INSCRIPTIONS.
9. ENGINE GENERATOR SET MOTOR STARTING CAPABILITY AND PERCENT VOLTAGE DIP CURVE.
10. HEATER SIZE AND VOLTAGE.
B. QUALITY CONTROL SUBMITTALS:
1. OPERATION AND MAINTENANCE MANUAL.
2. DESCRIPTION OF PARTS AND SERVICE AVAILABILITY.
3. CERTIFICATION, COPIES OF ANALYSES OR TEST REPORTS DEMONSTRATING APPROPRIATE VIBRATION ANALYSIS AND DESIGN IN ALL MODES.
4. FACTORY TEST REPORT.
5. MANUFACTURER'S CERTIFICATE OF PERFORMANCE.
6. MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION.
C. CONTRACT CLOSEOUT SUBMITTALS: SPECIAL GUARANTEE.

1.05 QUALITY ASSURANCE
A. COMPONENTS SHALL BE UL LISTED WHERE UL LISTING CATEGORIES ARE AVAILABLE.
B. GENERATOR SET SHALL COMPLY WITH BOTH THE EPA AND LOCAL AIR QUALITY BOARD EMISSION REQUIREMENTS.

PART 2 – PRODUCTS

2.01 STANDARD DESIGN
A. THE DESIGN OF THE GENERATOR SETS SHALL BE THE STANDARD OF THE MANUFACTURER, EXCEPT AS NOTED. EACH ENGINE GENERATOR UNIT SHALL BE FACTORY ASSEMBLED ON A COMMON STEEL BASE.

2.02 MANUFACTURERS
A. MATERIALS AND EQUIPMENT SPECIFIED IN THIS SECTION SHALL BE PRODUCTS OF:
1. GENERAC.
2. KOHLER.
3. CATERPILLAR.
4. ONAN.
5. OR EQUAL.

2.03 SEISMIC LOADING DESIGN PROVISIONS
A. THE ENGINE GENERATOR SETS AND THEIR APPURTENANCES AND SUPPORTS SHALL BE DESIGNED TO RESIST LATERAL FORCES IN ACCORDANCE WITH THE CALIFORNIA BUILDING CODE (CBC).

2.04 PERFORMANCE
A. THE GENERATOR SET SHALL BE CAPABLE OF CONTINUOUS OPERATION AT RATED CONDITIONS FOR THE DURATION OF ANY INTERRUPTION OR OUTAGE OF THE NORMAL POWER SUPPLY. THE GENERATOR SET SHALL BE RATED AS FOLLOWS:
1. KILOWATTS: 80KW
2. VOLTAGE: 277/480V
3. POWER FACTOR: 0.8
4. PHASE: THREE
5. FREQUENCY: 60HZ
6. RATED FOR FIRE PUMP USE.

2.05 ENGINE
A. GENERAL DESIGN: STANDARDS OF THE VARIOUS MANUFACTURERS, EXCEPT WHERE THESE DIFFER FROM THE REQUIREMENTS OF THESE SPECIFICATIONS. PROVIDE ADEQUATE STRENGTH OF ALL PARTS FOR THE SPECIFIED DUTY. MOUNT THE COMPLETE ENGINE GENERATOR UNIT ON A COMMON STEEL SUBBASE, COMPLETELY PIPED AND WIRED.
B. ENGINE:
1. FOUR-CYCLE DIESEL TYPE.
2. SUITABLE FOR A STAND-BY OUTPUT OF 80KW WHEN DRIVING A SYNCHRONOUS GENERATOR AT A SPEED NOT EXCEEDING 1,800 RPM.
3. TURBOCHARGED.
C. STARTING SYSTEM:
1. AUTOMATIC WITH A DC ELECTRIC STARTING SYSTEM.
2. BATTERY: HEAVY-DUTY, LEAD-ACID STORAGE BATTERY, CAPABLE OF PROVIDING 12 MINUTES TOTAL CRANKING TIME WITHOUT RECHARGING.
3. BATTERY FRAME: ACID RESISTANT.
4. BATTERY CHARGER: CURRENT-LIMITING FLOAT-TYPE WITH OVERLOAD PROTECTION, FULL-WAVE RECTIFIERS, VOLTAGE SURGE SUPPRESSORS, DC AMMETER AND VOLTMETER WITH PLUS OR MINUS 2 PERCENT ACCURACY AND FUSED AC INPUT.
D. GOVERNOR: ENGINE SPEED SHALL BE CONTROLLED BY AN ISOCHRONOUS GOVERNOR CAPABLE OF REGULATING THE NO-LOAD TO FULL-LOAD FREQUENCY TO A 5 PERCENT MAXIMUM AND CAPABLE OF 0.5 PERCENT STEADY-STATE FREQUENCY REGULATION. GOVERNOR ADJUSTMENT SHALL BE BY MEANS OF AN EXTERNAL VERNIER SCALE.
E. AIR INTAKE SYSTEM: REPLACEABLE ELEMENT DRY TYPE AIR CLEANERS WITH FILTER SERVICE INDICATORS.
F. COOLING SYSTEM:
1. SIZED TO MEET SYSTEM COOLING REQUIREMENTS WITH 122°F AMBIENT AIR.
2. JACKET WATER PUMP: ENGINE DRIVEN.
3. RADIATOR FAN: ENGINE DRIVEN.
4. RADIATOR FAN GUARD: OSHA APPROVED.
5. RADIATOR:
a. ENGINE-MOUNTED RADIATOR WITH JACKET WATER PUMP, FAN ASSEMBLY, FAN GUARD, AND DUCT FLANGE OUTLET.
6. THERMOSTAT: SET AT COOLANT TEMPERATURE RECOMMENDED BY MANUFACTURER.
7. HIGH TEMPERATURE DEVICE: SHUT DOWN ENGINE THROUGH ENGINE CONTROLS AT COOLANT TEMPERATURE RECOMMENDED BY MANUFACTURER.
8. JACKET WATER HEATERS:
a. MAINTAIN COOLANT TEMPERATURE RECOMMENDED BY MANUFACTURER AT ALL TIMES THE ENGINE IS IDLE.
b. THERMOSTATICALLY CONTROLLED, 120 VAC, 60 HZ.
9. COOLANT: MIXTURE OF WATER AND PERMANENT TYPE ANTIFREEZE WITH CORROSION INHIBITOR AS RECOMMENDED BY ENGINEER MANUFACTURER.
G. LUBRICATING SYSTEM:
1. FULL-PRESSURE TYPE.
2. LOW PRESSURE DEVICE: SHUT DOWN THE ENGINE THROUGH THE ENGINE CONTROLS IN LOW OIL PRESSURE.
3. OIL FILTER: REPLACEABLE ELEMENT.
4. OIL LEVEL STICK: BAYONET TYPE.
5. OIL COOLER: WATER-COOLED HEAT EXCHANGER UTILIZING JACKET WATER.
6. PROVIDE A VALVED OIL DRAIN EXTENSION.
H. EXHAUST SYSTEM:
1. EXHAUST MUFFLER: RATED FOR RESIDENTIAL SILENCING
2. SYSTEM COMPONENTS, INCLUDING PIPING: SIZED SUCH THAT BACK PRESSURE DOES NOT EXCEED THE MAXIMUM ALLOWABLE FOR THE ENGINE USED.
3. EXHAUST PIPE: 10-GAUGE CARBON STEEL, MINIMUM.
4. EXHAUST PIPE FITTINGS: STANDARD WEIGHT FLANGED OR BUTT WELDING TYPE.
5. RAIN CAP AT TOP OF EXHAUST STACK.
6. GUARDS: PROVIDE IN ACCORDANCE WITH SAFETY REQUIREMENTS TO PROTECT PERSONNEL FROM ACCIDENTAL CONTACT FROM THE EXHAUST MANIFOLDS, TURBOCHARGERS, EXHAUST PIPE, ETC.
I. FUEL SYSTEM:
1. ENGINE-DRIVEN FUEL PUMP, FUEL FILTERS, FUEL TANK AND FUEL PIPING.
2. FUEL TANK:
a. BASE TYPE FOR MOUNTING BELOW AND SUPPORTING THE GENERATOR SET.
b. PROVIDE SECONDARY CONTAINMENT WITH MEANS FOR SENSING FUEL LEVEL FOR PANEL-MOUNTED GAUGE, INDICATE LOCALLY LOW FUEL LEVEL.
c. THE FUEL TANK SHALL PROVIDE A MINIMUM CAPACITY FOR THREE DAYS OF RUNTIME AT 25% LOADING.
3. FUEL PIPING: FLEXIBLE CONNECTORS AT THE ENGINE.
4. FUEL FILTERS: PRIMARY AND SECONDARY FILTERS WITH REPLACEABLE ELEMENTS.

2.06 GENERATOR
A. SINGLE-BEARING, SYNCHRONOUS TYPE, SUITABLE FOR DIRECT CONNECTION TO THE ENGINE WITH THE FOLLOWING ELECTRICAL CHARACTERISTICS:
1. STANDBY RATING: 80KW.
2. VOLTAGE: 277/480V.
3. PHASE: THREE.
4. FREQUENCY: 60 HZ.
5. INSULATION: CLASS F.
B. SUITABLE FOR USE IN A SOLIDLY GROUNDED SYSTEM.
C. SUITABLE COIL BRACING FOR A BOLTED LINE-TO-NEUTRAL FAULT AT THE GENERATOR TERMINALS.
D. OUTPUT WAVE FORM:
1. NOT TO DEPART FROM A TRUE SINE WAVE BY MORE THAN 10 PERCENT.
2. TELEPHONE INFLUENCE FACTOR: NOT TO EXCEED 50.
E. STEADY-STATE VOLTAGE REGULATION: NOT TO EXCEED PLUS OR MINUS 2 PERCENT.
F. TRANSIENT VOLTAGE DIP: NOT TO EXCEED 20 PERCENT OF RATED VOLTAGE WITH SUDDEN OR MULTIPLE APPLICATIONS OF SEQUENCED, STARTING KVA LOAD.
G. SUSTAINED FAULT CURRENT: CAPABLE OF SUSTAINING AN OUTPUT CURRENT OF AT LEAST 110 PERCENT OF THE GENERATOR BREAKER SHORT TIME SETTING FOR THE BREAKER TOTAL CLEARING TIME.

2.07 UNIT MOUNTING BASE
A. MOUNT ENGINE AND GENERATOR ON A COMMON STEEL BASE SUFFICIENTLY RIGID TO PREVENT DEFLECTION BETWEEN POINTS OF SUPPORT.
B. PROVIDE ISOLATION PADS BETWEEN THE GENERATOR SUPPORT AND THE BASE.
C. PROVIDE A FACTORY-APPLIED PRIMER AND TWO FINISH COATS OF THE MANUFACTURER'S STANDARD, HEAT-RESISTANT ENGINE PAINT FOR THE COMPLETE GENERATOR SET, INCLUDING THE CONTROL PANEL.

2.08 GENERATOR SET ENCLOSURE
A. HOUSE ENTIRE GENERATOR SET IN A WEATHERPROOF ENCLOSURE, INCLUDING ALL CONTROL EQUIPMENT.
B. CONSTRUCTED OF SHEET STEEL, 10-GAUGE MINIMUM THICKNESS WITH REMOVABLE PANELS AND HINGED DOORS.
C. PROVIDE HINGED DOORS WHERE NECESSARY FOR SERVICE WITH 3-POINT FLUSH HANDLES OF THE LOCKING TYPE.
D. KEY ALL DOORS ALIKE.
E. PROVIDE SCREENED INTAKE LOUVERS.
F. PROVIDE FOR VERTICAL DISCHARGE OF COOLING AIR FROM THE RADIATOR.
G. CHEMICALLY TREATED WITH A COATING OF ZINC PHOSPHATE FOLLOWED BY A PRIMER COAT, THEN TWO COATS OF FACTORY-APPLIED ENAMEL.
H. PROVIDE TOUCH-UP PAINT FOR REPAIR OF ANY DAMAGED SURFACES FOLLOWING INSTALLATION.

2.09 AUTOMATIC TRANSFER SWITCH
A. PROVIDE AUTOMATIC LOAD TRANSFER SWITCH CAPABLE OF HANDLING THE CONTINUOUS CURRENT AND SHORT CIRCUIT CURRENT SHOWN ON THE PLANS.
B. PROVIDE SWITCH CONTROL WITH ADJUSTABLE 0 TO 2 MINUTE TIMER TO PERMIT A DELAY ON TRANSFER AFTER POWER FAILURE. PROVIDE A 0 TO 30 MINUTE TIMER TO PERMIT A DELAY ON RETRANSFER FOLLOWING RESTORATION OF NORMAL POWER.
C. PROVIDE STARTING CONTACTS TO START AN ENGINE-GENERATOR SET SHOULD THE VOLTAGE OF THE NORMAL SOURCE DROP BELOW AN ADJUSTABLE SETTING OF 75 TO 98 PERCENT OF PICKUP VALUE ON ANY PHASE, AFTER AN ADJUSTABLE TIME DELAY OF 0 TO 6 SECONDS.
D. TRANSFER TO STANDBY WHEN ENGINE-GENERATOR RATED FREQUENCY AND VOLTAGE ARE REACHED. STANDBY VOLTAGE PICKUP SHALL BE ADJUSTABLE 85 TO 100 PERCENT OF NOMINAL AND FREQUENCY PICKUP SHALL BE ADJUSTABLE 90 TO 100 PERCENT OF NOMINAL.
E. AFTER RESTORATION OF NORMAL POWER ON ALL PHASES TO 85 TO 100 PERCENT OF RATED VOLTAGE, FOR AN ADJUSTABLE TIME DELAY RETRANSFER TO NORMAL POWER. IF THE STANDBY POWER SOURCE SHOULD FAIL DURING THE TIME DELAY PERIOD, THE SWITCH SHALL AUTOMATICALLY RETURN TO THE NORMAL SOURCE. AFTER RETRANSFER TO NORMAL THE ENGINE-GENERATOR WILL OPERATE AT NO LOAD FOR 0 TO 10 MINUTES ADJUSTABLE.
F. PROVIDE TWO SPARE AUXILIARY CONTACTS, ONE CLOSED ON NORMAL AND THE OTHER CLOSED ON STANDBY. IN ADDITION, SUPPLY ONE SET OF RELAY CONTACTS TO OPEN UPON LOSS OF NORMAL POWER SUPPLY. PROVIDE CONTACTS RATED 5-AMPS, 120 VAC.
G. PROVIDE VOLTAGE SENSING RELAYS AND ALL ADJUSTABLE TIMERS CAPABLE OF BEING ADJUSTED, WHILE ENERGIZED. PROVIDE ALL CONTROL WIRE TERMINALS WITH RING OR LOCKING SPADE TERMINALS. IDENTIFY ALL WIRING BY TUBULAR SLEEVE-TYPE MARKERS.
H. SUPPLY TRANSFER SWITCH WHICH IS MECHANICALLY HELD AND ELECTRICALLY OPERATED WITH OPERATING CURRENT FROM THE SOURCE TO WHICH LOAD IS BEING TRANSFERRED. SUPPLY SWITCH CONSTRUCTED TO PREVENT A NEUTRAL POSITION AND ELECTRICALLY AND MECHANICALLY INTERLOCKED TO PREVENT CONNECTION OF THE LOAD SIMULTANEOUSLY TO BOTH SOURCES.
I. INCLUDE A 4 POSITION SELECTOR SWITCH TEST/AUTO/OFF/START FOR TRANSFER/ENGINE-GENERATOR OPERATION.
J. PROVIDE TRANSFER SWITCH SUITABLE FOR CONNECTION TO NORMAL AND STANDBY SOURCES AS SHOWN ON THE PLANS.
K. PROVIDE SWITCH HOUSED IN A WALL MOUNTED NEMA 12 ENCLOSURE WITH LOCKABLE HINGED FRONT COVER.
L. SUPPLY TRANSFER SWITCHES SUITABLE FOR USE WITH 75°C WIRE AT FULL NEC 75°C AMPACITY.

2.10 FIRE PUMP CONTROLLER WITH INTEGRAL AUTOMATIC TRANSFER SWITCH
A. THE CONTROLLER SHALL CONFORM TO ALL THE REQUIREMENTS OF THE LATEST EDITIONS OF:
1. NFPA 20, STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION.
B. LISTED IN ACCORDANCE WITH UL218, STANDARD FOR FIRE PUMP CONTROLLERS.
C. THE MAIN FIRE PUMP CONTROLLER SHALL BE A FACTORY ASSEMBLED, WIRED AND TESTED UNIT.
D. PROVIDE SWITCH HOUSED IN A NEMA 2 PEDISTAL ENCLOSURE WITH LOCKABLE HINGED FRONT COVER.
E. SOLID STATE REDUCED CURRENT STARTING WITH VOLTAGE SURGE ARRESTOR.
F. COMBINATION ISOLATING DISCONNECT SWITCH/CIRCUIT BREAKER:
1. RATED FOR NOT LESS THAN 115% OF THE MOTOR FULL LOAD CURRENT.
2. MECHANICALLY INTERLOCKED AND OPERATED WITH A SINGLE, EXTERNALLY MOUNTED HANDLE.
3. CAPABLE OF BEING PADLOCKED IN BOTH THE OFF AND ON POSITION.
G. SINGLE HANDLE, MANUALLY OPERATED, EMERGENCY START MECHANISM.
H. AUTOMATIC TRANSFER SWITCH, ELECTRICALLY OR MANUALLY OPERATED, MECHANICALLY HELD.
I. OPERATOR INTERFACE:
1. START, STOP, RUN TEST AND TRANSFER SWITCH TEST.
2. AUDIBLE AND VISIBLE ALARMS IN COMPLIANCE WITH APPLICABLE STANDARDS.
J. REMOTE ALARM CONTACTS RATED 5-AMPS, 120 VAC MINIMUM:
1. POWER AVAILABLE.
2. MOTOR RUN.
3. COMMON PUMP ROOM ALARM (OVERVOLTAGE, UNDERVOLTAGE, PHASE UNBALANCE, LOW/HIGH PUMP ROOM TEMPERATURE).
4. COMMON MOTOR TROUBLE (OVERCURRENT, FAIL TO START, UNDERCURRENT, GROUND FAULT).
5. TRANSFER SWITCH IN NORMAL POSITION.
6. TRANSFER SWITCH IN ALTERNATE POSITION.
7. ALTERNATE POWER ISOLATING SWITCH OFF.
K. PROVIDE STARTING CONTACTS TO START AN ENGINE-GENERATOR.
L. SUITABLE FOR USE WITH 75°C WIRE AT FULL NEC 75°C AMPACITY.
M. THE FOLLOWING ELECTRICAL CHARACTERISTICS:
1. FIRE PUMP RATING: 30HP.
2. VOLTAGE: 277/480V.
3. PHASE: THREE.
4. FREQUENCY: 60 HZ.

2.11 CONTROL PANEL
A. PROVIDE A GENERATOR-SET CONTROL PANEL WITH THE FOLLOWING:
1. VIBRATION ISOLATED, DEAD FRONT, 14-GAUGE STEEL.
2. STRANDED CONTROL WIRING BROUGHT TO MASTER TERMINAL BLOCKS.
B. PROVIDE INDICATING LAMPS FOR EACH OF THE FOLLOWING CONDITIONS:
1. ENGINE RUNNING.
2. ENGINE NOT IN AUTO.
3. LOW OR HIGH BATTERY VOLTAGE.
4. PROVIDE A CONTACT TO CLOSE TO INDICATE THE ENGINE IS RUNNING AND A CONTACT TO CLOSE TO INDICATE BATTERY VOLTAGE HIGH/LOW.
C. FAULTS:
1. PROVIDE FAULT-INDICATING LIGHTS TO INDICATE EACH OF THE FOLLOWING ALARMS:
a. OVERCRANK
b. OVERSPEED
c. LOW OIL PRESSURE
d. HIGH ENGINE TEMPERATURE
e. FAIL TO START
2. PROVIDE A COMMON ALARM CONTACT WHICH CLOSES UNDER ANY OF THE ABOVE ALARM CONDITIONS.
D. OPERATOR CONTROLS:
1. MANUAL START/STOP SWITCH.
2. THREE-POSITION SELECTOR SWITCH FOR OFF-AUTO-MANUAL SELECTION.
3. RESET PUSHBUTTON.
4. SILENCE PUSHBUTTON.
5. MANUAL CONTROL FOR VOLTAGE AND SPEED ADJUSTMENT.
6. AUDIBLE ALARM.
7. LAMP TEST PUSHBUTTON.
E. METERING:
1. VOLTMETER, 2 PERCENT MINIMUM ACCURACY.
2. AMMETER, 2 PERCENT MINIMUM ACCURACY.
3. CURRENT TRANSFORMERS AND POTENTIAL TRANSFORMERS AS REQUIRED.
4. FREQUENCY METER.
5. ELAPSED TIME METER.
F. DESCRIPTION OF OPERATION:
1. PREVENT STARTING AND CAUSE SHUTDOWN IN MANUAL OR AUTO MODES FOR THE FOLLOWING:
a. OVERCRANK.
b. OVERSPEED.
c. LOW OIL PRESSURE.
d. HIGH ENGINE TEMPERATURE.
e. FAIL TO START.
2. THE ENGINE SHALL BE SHUTDOWN UNDER ANY OF THE ABOVE CONDITIONS, AND MAY NOT BE RESTARTED UNTIL THE SYSTEM IS MANUALLY RESET.
3. AUDIBLE ALARM:
a. ACTIVATE WHENEVER AN ALARM OCCURS.
b. SILENCE BY PRESSING THE SILENCE PUSHBUTTON.
4. RESET PUSHBUTTON:
a. TURN OFF ALARM LIGHT AND OPEN THE COMMON ALARM CONTACT IF THE CONDITION IS NO LONGER PRESENT.
5. AUTO MODE:
a. START THE ENGINE WHEN CLOSURE OF A REMOTE TWO-WIRE CONTROL CONTACT IS SENSED.
b. STOP THE ENGINE AFTER AN ADJUSTABLE TIME DELAY WHEN OPENING OF THE TWO-WIRE CONTROL CONTACT IS SENSED. SET ADJUSTABLE TIME DELAY AS RECOMMENDED BY MANUFACTURER TO ALLOW THE GENERATOR-SET TO COOL DOWN.
6. MANUAL MODE:
a. START AND STOP IN RESPONSE TO START/STOP CONTROL SWITCH.

PART 3 – EXECUTION

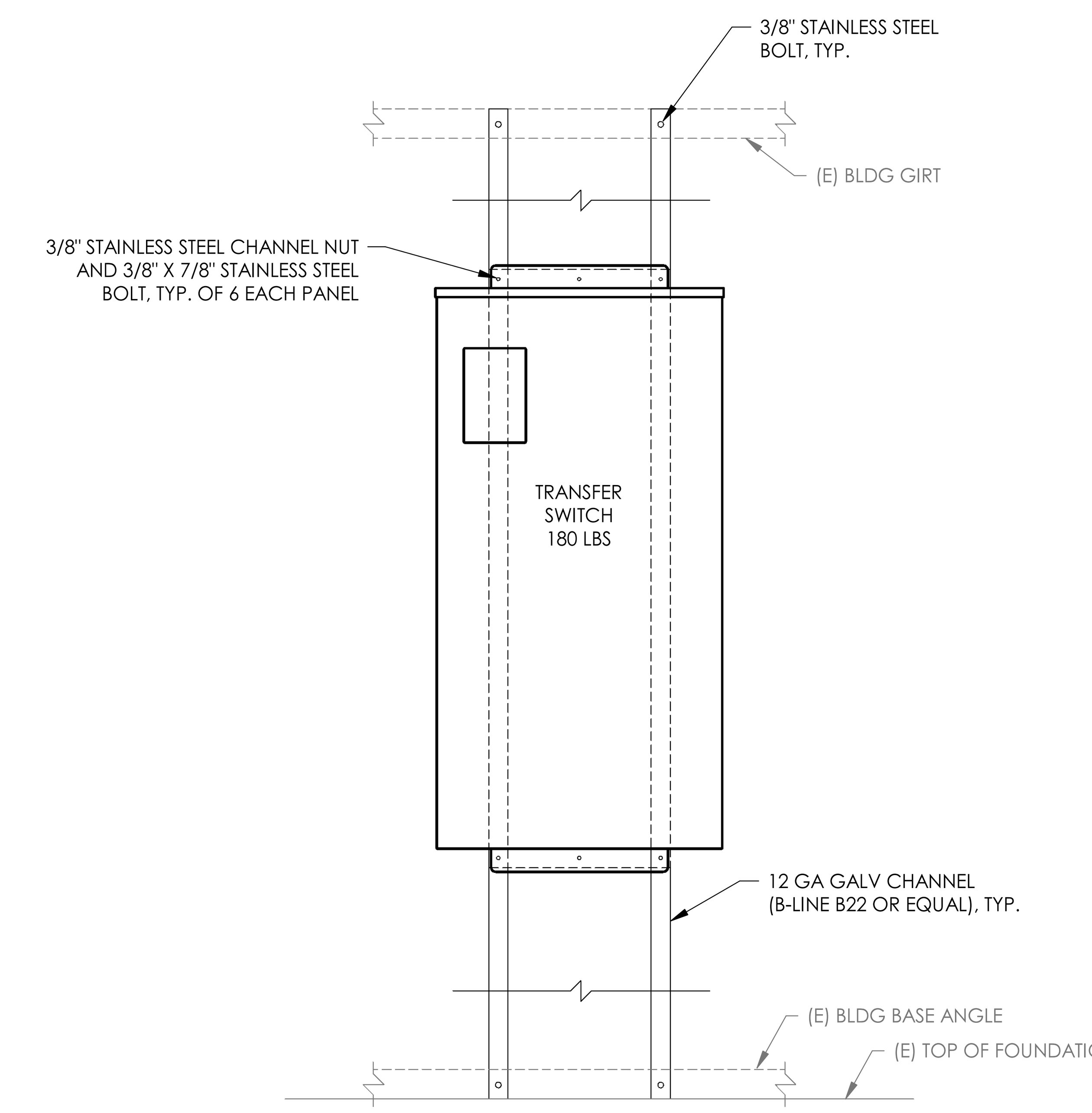
3.01 GENERAL
A. THE DESIGN, FABRICATION, ASSEMBLY, TESTING, AND INSPECTION OF ALL ENGINE GENERATOR SYSTEM COMPONENTS SHALL BE IN ACCORDANCE WITH NFPA-110; LATEST EDITION.

3.02 ENGINE GENERATOR INSTALLATION
A. INSTALL IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. WRITTEN INSTALLATION AND STARTUP INSTRUCTIONS SHALL BE AT THE JOB SITE BEFORE INSTALLATION MAY BEGIN.

3.03 ANCILLARY EQUIPMENT INSTALLATION
A. INSTALL ALL ENGINE GENERATOR SYSTEM ANCILLARY EQUIPMENT AND CONNECTING PIPING AND WIRING IN STRICT CONFORMANCE WITH THE RECOMMENDATIONS OF THE VARIOUS MANUFACTURER'S AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE ENGINE GENERATOR SUPPLIER. ALL MINIMUM CLEARANCES REQUIRED BY THE NATIONAL ELECTRIC CODE SHALL BE MAINTAINED.

3.04 TESTING
A. VISUAL AND MECHANICAL INSPECTIONS:
1. COMPARE EQUIPMENT NAMEPLATE WITH DRAWINGS AND SPECIFICATIONS.
2. INSPECT PHYSICAL AND MECHANICAL CONDITION.
3. INSPECT CORRECT ANCHORAGE AND GROUNDING.
B. ELECTRICAL AND MECHANICAL TESTS:
1. PERFORM AN INSULATION RESISTANCE TEST ON GENERATOR WINDING WITH RESPECT TO GROUND IN ACCORDANCE WITH ANSI/IEEE STANDARD 43.
2. PERFORM PHASE ROTATION TEST TO DETERMINE COMPATIBILITY WITH LOAD REQUIREMENTS.
3. FUNCTIONALLY TEST ENGINE SHUTDOWN FOR LOW OIL PRESSURE, OVER TEMPERATURE, OVERSPEED AND OTHER FEATURES AS APPLICABLE.
4. PERFORM VIBRATION BASELINE TEST.
5. VERIFY CORRECT FUNCTIONING OF GOVERNOR AND REGULATOR.
C. CONDUCT 2 HOUR LOAD TEST:
1. A FULL-LOAD LOAD SHALL BE APPLIED FOR 2 HOURS.
2. THE FACILITY LOAD CAN SERVE AS PART OR ALL OF THE LOAD, SUPPLEMENTED BY A RESISTIVE LOAD BANK OF SUFFICIENT SIZE TO PROVIDE A LOAD EQUAL TO 100 PERCENT OF THE NAMEPLATE KW RATING, LESS APPLICABLE DERATING FACTORS.
3. A UNITY POWER FACTOR SHALL BE ACCEPTABLE FOR ON-SITE TESTING, PROVIDED THAT THE RATED LOAD TEST AT THE RATED POWER FACTOR HAVE BEEN PERFORMED BY THE MANUFACTURER PRIOR TO SHIPMENT.
4. THE FOLLOWING DATA SHALL BE RECORDED EVERY 15 MINUTES THROUGHOUT THE DURATION OF THE LOAD TEST.
a. VOLTAGE.
b. FREQUENCY.
c. AMPERES.
d. OIL PRESSURE.
e. WATER TEMPERATURE.
D. TEST VALUES:
1. VIBRATION LEVELS SHALL BE IN ACCORDANCE WITH MANUFACTURERS PUBLISHED DATA.

3.05 MANUFACTURER'S FIELD SERVICE
A. MANUFACTURERS REPRESENTATIVE: PRESENT AT SITE FOR MINIMUM PERSON DAYS LISTED BELOW, TRAVEL TIME EXCLUDED:
1. ONE-HALF PERSON-DAYS FOR INSTALLATION ASSISTANCE AND INSPECTION.
2. ONE-HALF PERSON-DAYS FOR FUNCTIONAL AND PERFORMANCE TESTING AND COMPLETION OF MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION.



TRANSFER SWITCH - SURFACE MOUNT TO BUILDING (1/E2)
NTS

PACE ENGINEERING

NO.	DATE	REVISIONS	BY	CHK

PROJECT NO: 022046.00
PROJECT ID:
DRAWN BY: NP
SCALE: AS SHOWN
ENGINEER: NP
DATE: 12/02/2022
CHECKED BY: BB
DATE: 12/02/2022

ORIGINAL SCALE IN INCHES 0 1 2

LAWRENCE & ASSOCIATES
ENGINEERS & GEOLOGISTS

TRANSFER STATION GENERATOR
5700 COUNTY RD 33
ARTOIS, CA 95913

GENERATOR SPECIFICATIONS

REGISTERED PROFESSIONAL ENGINEER No. E22549 ELECTRICAL STATE OF CALIFORNIA 12/02/22

DRAWING: E2
SHEET: 5 OF 9
DATE: 12/02/22

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ELECTRICAL SYMBOLS

LINE TYPES AND SYMBOLS	(solid line)	CONDUIT EXPOSED
	(dashed line)	CONDUIT CONCEALED or BURIED
	(long dash line)	INDICATES FIRE RATED WALL
	(line with circle)	CONDUIT UP
	(line with circle)	CONDUIT DOWN
	LA-2 (arrow)	HOME RUN-DESTINATION SHOWN
EQUIPMENT AND TERMINATIONS	(J)	JUNCTION BOX
	(symbol)	CONNECTION POINT (CONTRACTOR SHALL DETERMINE CONNECTION CONFIGURATION)
	(symbol)	PULLBOX
	(hatched box)	MAJOR ELECTRICAL COMPONENT OR DEVICE NAME OR IDENTIFYING SYMBOL AS SHOWN
	(symbol)	SURFACE MOUNT PANELBOARD
	(symbol)	FLUSH MOUNT PANELBOARD
	(symbol)	CIRCUIT BREAKER
	(symbol)	CURRENT TRANSFORMER, NUMBER INDICATED
	(#)	KEYNOTE
	(A : B)	INDICATES INTERCONNECTION OF PATHWAYS AND/OR CONDUCTORS, E.G., 4"C-4#500,1#3G (MSB : PNL A) INDICATES CONDUIT AND CONDUCTORS ROUTED FROM THE MAIN SWITCHBOARD TO PANELBOARD A.

NOTE: THIS IS A SUPPLEMENTAL STANDARD ELECTRICAL LEGEND. SOME SYMBOLS MAY APPEAR ON THIS LEGEND AND NOT ON THE PLANS.

ELECTRICAL ABBREVIATIONS

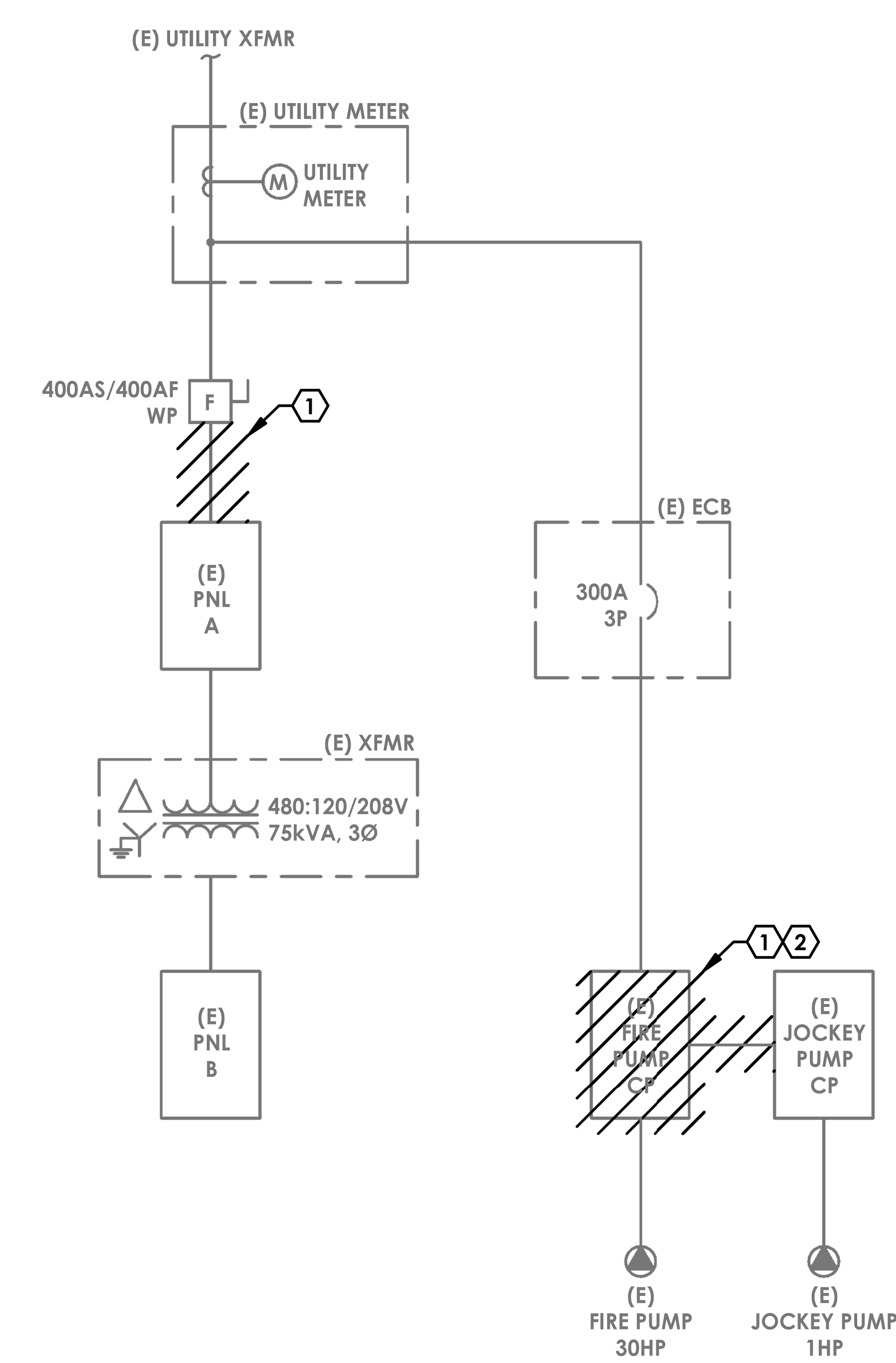
A	- AMMETER, AMPERE
AC	- ALTERNATING CURRENT
ACH	- ABOVE COUNTER HEIGHT
AFF	- ABOVE FINISHED FLOOR OR GRADE
AIC	- AMPS INTERRUPTING CAPACITY
AL	- ALUMINUM
ATS	- AUTOMATIC TRANSFER SWITCH
BRKR	- BREAKER
BOD	- BOTTOM OF DEVICE
C or COND	- CONDUIT
CAB	- CABINET
CBL	- CABLE
CEC	- CALIFORNIA ELECTRIC CODE
CKT	- CIRCUIT
COD	- CENTER OF DEVICE
CP	- CONTROL PANEL
CT	- CURRENT TRANSFORMER
DC	- DIRECT CURRENT
(E) or EXIST	- EXISTING
ECB	- ENCLOSED CIRCUIT BREAKER
EEOR	- ELECTRICAL ENGINEER OF RECORD
EGC	- EQUIPMENT GROUNDING CONDUCTOR
ENC	- ENCLOSURE
(F)	- FUTURE
G	- EQUIPMENT GROUNDING CONDUCTOR
GEC	- GROUNDING ELECTRODE CONDUCTOR
GND	- GROUND
J	- JUNCTION BOX
LTG	- LIGHTING
MBJ	- MAIN BONDING JUMPER
MCB	- MAIN CIRCUIT BREAKER
MFR	- MANUFACTURER
MLO	- MAIN LUG ONLY
MOCP	- MAXIMUM OVERCURRENT PROTECTION
MSB	- MAIN SWITCH BOARD
NEC	- NATIONAL ELECTRIC CODE
NEMA	- NATIONAL ELECTRIC MANUFACTURER'S ASSOCIATION
N	- NEUTRAL
(N)	- NEW
OFCI	- OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	- OWNER FURNISHED, OWNER INSTALLED
PB	- PULLBOX
PMP	- PUMP
PNL	- PANELBOARD
RCPT	- RECEPTACLE
RM	- ROOM
SWBD	- SWITCHBOARD
T	- THERMOSTAT OR TELE CONDUIT
TOD	- TOP OF DEVICE
TR	- TAMPER
TYP	- TYPICAL
V	- VOLTMETER, VOLT
W	- WATT
WW	- WIREWAY
WP	- WEATHERPROOF (NEMA 3R)
XFMR	- TRANSFORMER

NOTE: THIS IS A SUPPLEMENTAL STANDARD LEGEND. SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS LEGEND AND NOT ON THE PLANS

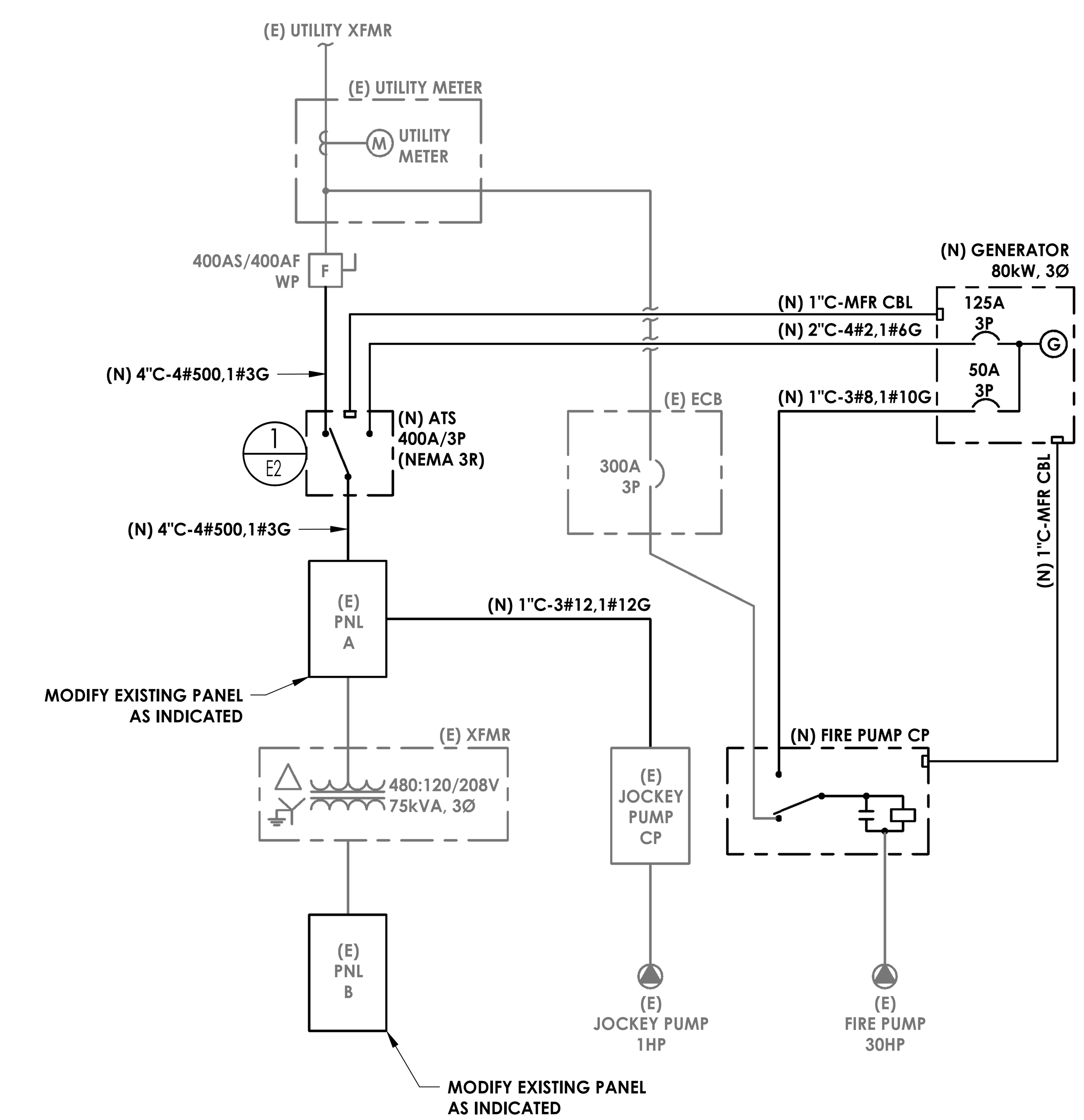
KEYNOTES

(#) NOTE

1. DISCONNECT AND REMOVE EXISTING CONDUIT AND CONDUCTORS.
2. DISCONNECT AND REMOVE EXISTING FIRE PUMP CONTROLLER.



EXISTING PARTIAL ONE-LINE DIAGRAM 1/E3



NEW PARTIAL ONE-LINE DIAGRAM 2/E3

CONTINUOUS SPECIAL LOADS

LOAD	VAC	A	Ø	QTY	TOTAL VA
GENERATOR HEATER	120	13	1	1	1,500
GENERATOR BATTERY CHARGER	120	10	1	1	1,200
				TOTAL LOAD	2,700

COMMERCIAL LOAD CALCULATIONS

CONTINUOUS LOADS							
SPECIAL LOADS - 220.14(a), 220.56, 422.10(a)					=	2,700	VA
CONTINUOUS LOADS TOTAL - NEC 210.20(A) (125% DEMAND FACTOR)						3,375	VA
EXISTING LOADS							
EXISTING MAXIMUM DEMAND					=	22,720	VA
ELECTRICAL SERVICE - 3Ø	26,095	VA	/	480	V =	**31**	**A**

VOLTAGE DROP CALCULATIONS - FIRE PUMP (FROM GENERATOR)

DISTRIBUTION	LOAD TYPE	CONDUIT MATERIAL	CONDUCTOR MATERIAL	QUANTITY OF RUNS	CONDUCTOR SIZE (AWG)	CURRENT (A)	DISTANCE (FT)	VOLTAGE (V)	IMPEDANCE (Z)	VOLTAGE DROP (VD)	**VOLTAGE DROP (%)**
GEN : FP CP	LINE-LINE (3Ø)	PVC	CU	1	8	46	225	480	0.69	12.37	**2.58%**
										TOTAL VOLTAGE DROP:	**2.58%**

LINE-NEUTRAL VD = (L * Z * I)/1000 LINE-LINE (3Ø) VD = (SQRT(3) * L * X * I)/1000 L = DISTANCE Z = IMPEDANCE
LINE-LINE (1Ø) VD = (2 * L * Z * I)/1000 I = CURRENT VD = VOLTAGE DROP

VOLTAGE DROP CALCULATIONS - JOCKEY PUMP

DISTRIBUTION	LOAD TYPE	CONDUIT MATERIAL	CONDUCTOR MATERIAL	QUANTITY OF RUNS	CONDUCTOR SIZE (AWG)	CURRENT (A)	DISTANCE (FT)	VOLTAGE (V)	IMPEDANCE (Z)	VOLTAGE DROP (VD)	**VOLTAGE DROP (%)**
DISC : ATS	LINE-LINE (3Ø)	PVC	CU	1	500	320	30	480	0.04	0.71	**0.15%**
ATS : PNL A	LINE-LINE (3Ø)	PVC	CU	1	500	320	20	480	0.04	0.48	**0.10%**
PNL A : PMP	LINE-LINE (3Ø)	PVC	CU	1	12	3	225	480	1.70	1.66	**0.35%**
										TOTAL VOLTAGE DROP:	**0.59%**

LINE-NEUTRAL VD = (L * Z * I)/1000 LINE-LINE (3Ø) VD = (SQRT(3) * L * X * I)/1000 L = DISTANCE Z = IMPEDANCE
LINE-LINE (1Ø) VD = (2 * L * Z * I)/1000 I = CURRENT VD = VOLTAGE DROP

PACE ENGINEERING

NO.	DATE	REVISIONS	BY	CHK

PROJECT NO: 022046.00 | PROJECT ID:
DRAWN BY: NP | SCALE: AS SHOWN
ENGINEER: NP | DATE: 12/02/2022
CHECKED BY: BB | DATE: 12/02/2022

ORIGINAL SCALE IN INCHES 0 1 2

LAWRENCE & ASSOCIATES ENGINEERS & GEOLOGISTS

TRANSFER STATION GENERATOR

5700 COUNTY RD 33
ARTOIS, CA 95913

ONE-LINE DIAGRAM & ELECTRICAL SCHEDULES

REGISTERED PROFESSIONAL ENGINEER No. E22549 ELECTRICAL STATE OF CALIFORNIA 12/02/22

DRAWING: E3
SHEET: 6 OF 9
DATE: 12/02/22

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(E) PANELBOARD A

LOCATION	EXTERIOR	VOLTS	480/277 WYE				
MOUNTING TYPE	SURFACE	WIRES	4	BUS RATING	400 A		
ENCLOSURE TYPE	NEMA 3R	CIRCUITS	18	MAIN BREAKER	MLO		

CKT	HOME RUN	LOAD NAME	TRIP	INT TYPE	A	B	C	A	B	C	INT TYPE	TRIP	LOAD NAME	HOME RUN	CKT
1	--	(E) SPACE	--	--	--			167 VA			--	35 A	(E) WELL PUMP	(E) CONDUIT/CONDUCTORS	2
3	--	(E) SPACE	--	--		--			167 VA						4
5	--	(E) SPACE	--	--			--			167 VA					6
7	--	(E) SPARE	50 A	--	0 VA			0 VA			--	30 A	(E) SPARE	--	8
9						0 VA			0 VA						10
11							0 VA			0 VA					12
13					**583 VA**			167 VA							14
2 15	**(N) 1"C-2#12,1#12G**	**(N) FIRE JOCKEY PUMP**	20 A	--		**583 VA**			167 VA		--	100 A	(E) XFMR	(E) CONDUIT/CONDUCTORS	16
17							**583 VA**			167 VA					18
					PHASE A		PHASE B			PHASE C	Notes:				
		TOTAL LOAD (VA)			**917 VA**		**917 VA**			**917 VA**					
		TOTAL LOAD (AMPS)			**4**		**4**			**4**					

(E) PANELBOARD B

LOCATION	EXTERIOR	VOLTS	120/208 WYE				
MOUNTING TYPE	SURFACE	WIRES	4	BUS RATING	200 A		
ENCLOSURE TYPE	NEMA 3R	CIRCUITS	42	MAIN BREAKER	200 A		

CKT	HOME RUN	LOAD NAME	TRIP	INT TYPE	A	B	C	A	B	C	INT TYPE	TRIP	LOAD NAME	HOME RUN	CKT	
1	--	(E) SPACE	--	--	--			--				--	(E) SPACE	--	2	
3	--	(E) SPACE	--	--		--			--			--	(E) SPACE	--	4	
5	--	(E) SPACE	--	--			--			--		--	(E) SPACE	--	6	
7	(E) CONDUIT/CONDUCTORS	(E) PNL A	100 A	--	250 VA			250 VA			--	100 A	(E) PNL E	(E) CONDUIT/CONDUCTORS	8	
9						250 VA			250 VA						10	
11	--	(E) SPACE	--	--			--			500 VA	--	20 A	(E) USED OIL PUMP	(E) CONDUIT/CONDUCTORS	12	
13	--	(E) SPACE	--	--	--			500 VA			--	20 A	(E) PUMP HOUSE RCPT	(E) CONDUIT/CONDUCTORS	14	
15	--	(E) SPACE	--	--		--			500 VA		--	20 A	(E) FIRE CALL OUT	(E) CONDUIT/CONDUCTORS	16	
17	--	(E) SPACE	--	--			--			**1200 VA**	**--**	**20 A**	**(N) GEN BATTERY CHGR**	**(N) 3/4"C-2#12,1#12G**	18	1
19	--	(E) SPACE	--	--	--			**1500 VA**			**--**	**20 A**	**(N) GEN HEATER**	**(N) 3/4"C-2#12,1#12G**	20	1
21	--	(E) SPACE	--	--		--			--		--	--	(E) SPACE	--	22	
23	--	(E) SPACE	--	--			--			--	--	--	(E) SPACE	--	24	
25	--	(E) SPACE	--	--	--			--			--	--	(E) SPACE	--	26	
27	--	(E) SPACE	--	--		--			--		--	--	(E) SPACE	--	28	
29	--	(E) SPACE	--	--			--			--	--	--	(E) SPACE	--	30	
31	--	(E) SPACE	--	--	--			--			--	--	(E) SPACE	--	32	
33	--	(E) SPACE	--	--		--			--		--	--	(E) SPACE	--	34	
35	--	(E) SPACE	--	--			--			--	--	--	(E) SPACE	--	36	
37	--	(E) SPACE	--	--	--			--			--	--	(E) SPACE	--	38	
39	--	(E) SPACE	--	--		--			--		--	--	(E) SPACE	--	40	
41	--	(E) SPACE	--	--			--			--	--	--	(E) SPACE	--	42	
					PHASE A		PHASE B			PHASE C	Notes:					
		TOTAL LOAD (VA)			**2500 VA**		1000 VA			**1700 VA**						
		TOTAL LOAD (AMPS)			**21**		9			**15**						

KEYNOTES

#	NOTE
1.	PROVIDE AND INSTALL NEW CIRCUIT BREAKER OF SAME TYPE AND RATING AS EXISTING. NOTIFY EEOR IF THE ELECTRICAL REQUIREMENTS OF THE GENERATOR CIRCUITS DIFFER FROM SHOWN. UPDATE CIRCUIT DIRECTORY.
2.	UTILIZE EXISTING CIRCUIT BREAKER FOR FEEDER CIRCUIT IF FOUND IN GOOD CONDITION. NOTIFY EEOR IF CONDITIONS DIFFER.

PACE ENGINEERING

NO.	DATE	REVISIONS	BY	CHK

PROJECT NO: 022046.00	PROJECT ID:
DRAWN BY: NP	SCALE: AS SHOWN
ENGINEER: NP	DATE: 12/02/2022
CHECKED BY: BB	DATE: 12/02/2022

ORIGINAL SCALE IN INCHES
0 1 2

LAWRENCE & ASSOCIATES
ENGINEERS & GEOLOGISTS

TRANSFER STATION GENERATOR

5700 COUNTY RD 33
ARTOIS, CA 95913

PANEL SCHEDULES

REGISTERED PROFESSIONAL ENGINEER
No. E22549
ELECTRICAL
STATE OF CALIFORNIA
12/02/22

DRAWING: E4
SHEET: 7 OF 9
DATE: 12/02/22

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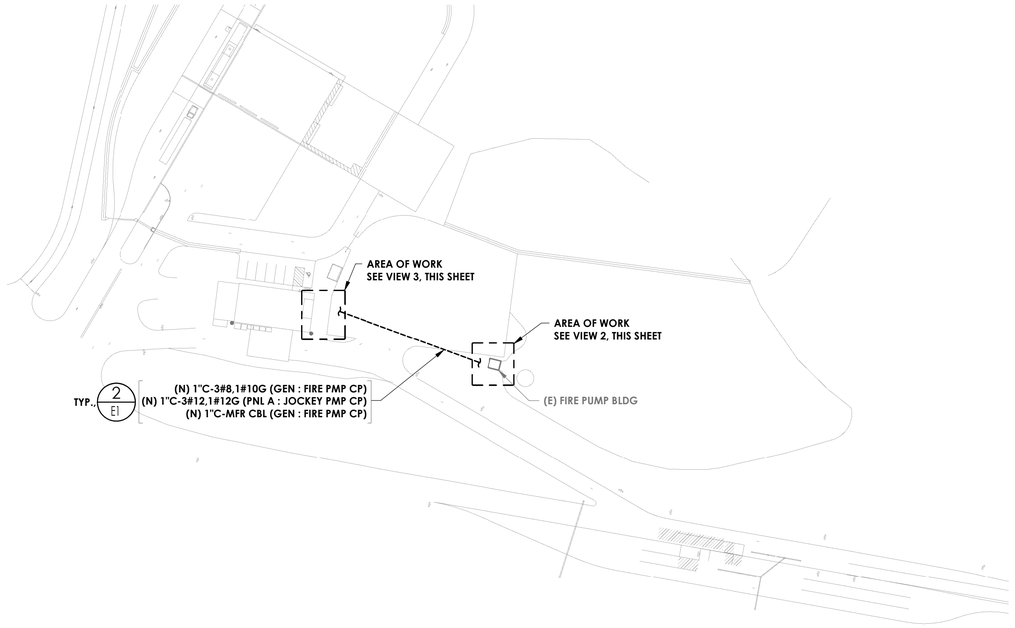
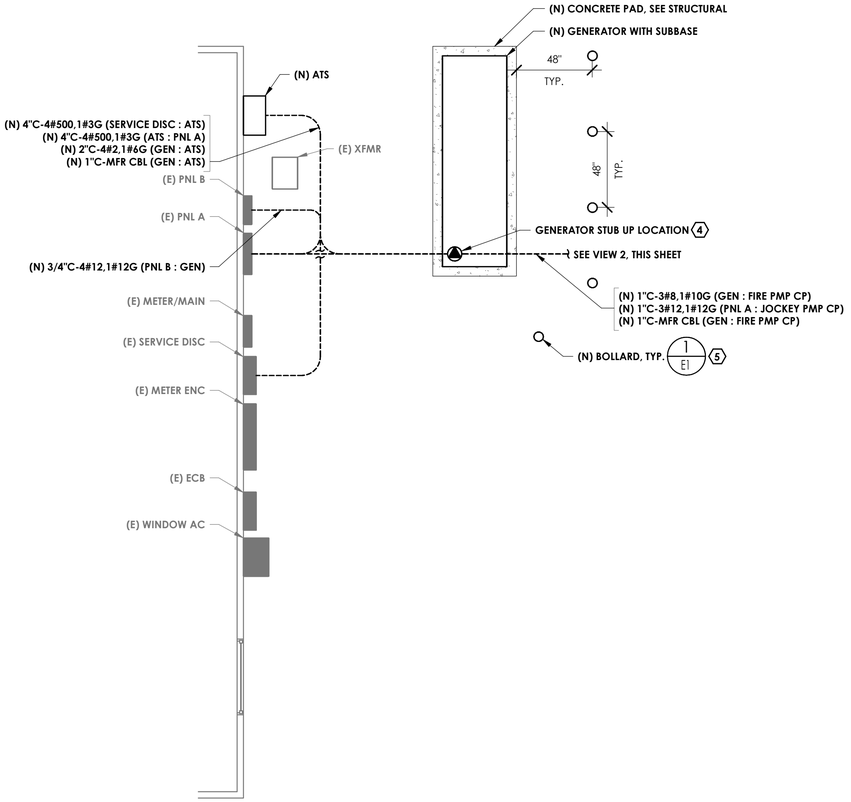
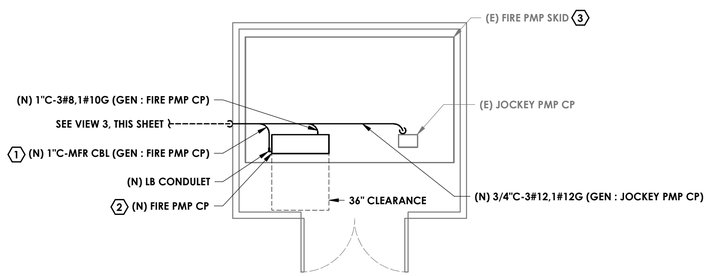
KEYNOTES

#	NOTE
1.	COORDINATE CONTROL WIRING WITH GENERATOR AND FIRE PUMP CONTROL PANEL MANUFACTURER. PROVIDE AND INSTALL CONTROL CONDUCTORS.
2.	MAKE MODIFICATIONS AS REQUIRED TO EXTEND THE EXISTING POWER CONDUCTORS TO NEW FIRE PUMP CONTROL PANEL.
3.	MAKE MODIFICATIONS AS REQUIRED TO EXISTING PUMP SKID TO MOUNT THE NEW FIRE PUMP CONTROL PANEL. THE FIRE PUMP CONTROL PANEL SHALL BE MOUNTED TO ALLOW FOR AN ELECTRICAL WORKING SPACE OF 36-INCHES PER CEC 110.26(A).
4.	COORDINATE FINAL LOCATION OF ALL CONNECTION POINTS WITH GENERATOR MANUFACTURER PRIOR TO INSTALLATION. NO ALLOWANCES WILL BE MADE FOR CONDUIT STUB-UPS IN THE WRONG LOCATION DUE TO IMPROPER COORDINATION.
5.	BOLLARD PLACEMENT SHALL COMPLY WITH CFC 312 AND PROVIDE ADEQUATE CLEARANCE TO ALLOW FOR THE GENERATOR DOORS TO OPEN. RFI EEOR IF CONDITIONS DIFFER FROM SHOWN.



ELECTRICAL SITE PLAN 1 E5
1" = 80'-0"





ENLARGED ELECTRICAL SITE PLAN - FIRE PUMP BLDG 2 E5
NTS

ENLARGED ELECTRICAL SITE PLAN 3 E5
NTS

PACE ENGINEERING

NO.	DATE	REVISIONS	BY	CHK

PROJECT NO: 022046.00	PROJECT ID:
DRAWN BY: NP	SCALE: AS SHOWN
ENGINEER: NP	DATE: 12/02/2022
CHECKED BY: BB	DATE: 12/02/2022

ORIGINAL SCALE IN INCHES
0 1 2

LAWRENCE & ASSOCIATES
ENGINEERS & GEOLOGISTS

TRANSFER STATION GENERATOR

5700 COUNTY RD 33
ARTOIS, CA 95913

ELECTRICAL PLANS

REGISTERED PROFESSIONAL ENGINEER
No. E22549
ELECTRICAL
STATE OF CALIFORNIA
12/02/22

DRAWING: E5
SHEET: 8 OF 9
DATE: 12/02/22

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STATE OF CALIFORNIA

Electrical Power Distribution

NRCC-ELC-E (Created 01/20) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-ELC-E
This document is used to demonstrate compliance with mandatory requirements in §130.5 for electrical systems in newly constructed nonresidential, high-rise residential and hotel/motel occupancies. Additions and alterations to electrical service systems in these occupancies will also use this document to demonstrate compliance per §141.0(a) or §141.0(b)2P for alterations.		
Project Name: Glenn County Transfer Station Generator	Report Page:	Page 1 of 4
Project Address: 5700 County Rd 33, Artois, CA 95913	Date Prepared:	11/23/2022

A. GENERAL INFORMATION

01	Project Location (city)		02	Occupancy Types Within Project:	
☐ Office	☐ Retail	☐ Warehouse	☐ Hotel/ Motel	☐ School	☐ Support Areas
☐ Parking Garage	☐ High-Rise Residential	☐ Relocatable	☐ Healthcare Facilities	☑ Other (Write In):	Transfer Station

B. PROJECT SCOPE

Table Instructions: Include any electrical service systems that are within the scope of the permit application.

01	02	03	04	05	06
Electrical Service Designation/ Description	Scope of Work[1]	Rating (kVA)	Utility Provided Metering System Exception to §130.5(a)[2]	System subject to CA Elec Code Article 517 Exception to §130.5(a)&(b)	Demand Response Controls: Where required, demand response controls must be specified which are capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal. Sections §120.2, §130.1 and §130.3 and compliance documents NRCC-MCH, NRCC-LTI and NRCC-LTS will indicate when demand response controls are required.
GENERATOR ADDITION	Add/Alt to feeders and branch circuits only		☐	☐	

[1] FOOTNOTES: Adding only new feeders and branch circuits triggers Voltage Drop 130.5(c), no other requirements from 130.5 are required.
[2] Applicable if the utility company is providing a metering system that indicates instantaneous kW demand and kWh for a utility-defined period.

C. COMPLIANCE RESULTS

Table Instructions: If this table says "DOES NOT COMPLY" refer to Table D. for guidance and review the Table that indicates "No".

01		02		03		04	05
Service Electrical Metering §130.5(a)	AND	Separation for Monitoring §130.5(b)	AND	Voltage Drop §130.5(c)	AND	Controlled Receptacles §130.5(d)	Compliance Results
(See Table F)		(See Table G)		(See Table H)		(See Table I)	
	AND		AND	Yes	AND		COMPLIES

STATE OF CALIFORNIA

Electrical Power Distribution

NRCC-ELC-E (Created 01/20) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-ELC-E
Project Name: Glenn County Transfer Station Generator	Report Page:	Page 2 of 4
Project Address: 5700 County Rd 33, Artois, CA 95913	Date Prepared:	11/23/2022

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

No exceptional conditions apply to this project.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. SERVICE ELECTRICAL METERING

This Section Does Not Apply

G. SEPARATION OF ELECTRICAL CIRCUITS FOR ENERGY MONITORING

This Section Does Not Apply

H. VOLTAGE DROP

Table Instructions: Please complete this table for entirely new or complete replacement electrical power distribution systems, or alterations that add, modify or replace both feeders and branch circuits to demonstrate compliance with §130.5(c). For alterations, only the altered circuits must demonstrate compliance per §141.0(b)2Piii.

01	02		03	04	05	
Electrical Service Designation/ Description	Combined Voltage Drop on Installed Feeder/Branch Circuit Conductors Compliance Method		Location of Voltage Drop Calculations[1]	Sheet Number for Voltage Drop Calculations in Construction Documents	Field Inspector	
					Pass	Fail
	☑ Voltage drop < 5%	☐ Permitted by CA Elec Code (Exception to §130.5(c))*	In construction documents	E3	☐	☐

**NOTES If "Permitted by CA Elec Code*" is selected under Compliance Method above, please indicate where the exception applies in the space provided below.*

[1] FOOTNOTES: Voltage drop calculations may be attached to the permit application outside the construction documents if allowed by the Authority Having Jurisdiction. Select "attached" if applicable. If calculations will be the responsibility of the installing contractor, select "Contractor Responsible".

I. CIRCUIT CONTROLS FOR 120-VOLT RECEPTACLES AND CONTROLLED RECEPTACLES

This Section Does Not Apply

STATE OF CALIFORNIA

Electrical Power Distribution

NRCC-ELC-E (Created 01/20) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-ELC-E
Project Name: Glenn County Transfer Station Generator	Report Page:	Page 3 of 4
Project Address: 5700 County Rd 33, Artois, CA 95913	Date Prepared:	11/23/2022

J. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Table Instructions: Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://ww2.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

YES	NO	Form/Title	Field Inspector	
			Pass	Fail
◉	○	NRCI-ELC-01-E - Must be submitted for all buildings.	☐	☐

K. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

There are no Certificates of Acceptance applicable to electrical power distribution requirements.

STATE OF CALIFORNIA

Electrical Power Distribution

NRCC-ELC-E (Created 01/20) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-ELC-E
Project Name: Glenn County Transfer Station Generator	Report Page:	Page 4 of 4
Project Address: 5700 County Rd 33, Artois, CA 95913	Date Prepared:	11/23/2022

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Bryan Barnes	Documentation Author Signature:	
Company:	PACE Engineering	Signature Date:	11/23/2022
Address:	5155 Venture Parkway	CEA/ HERS Certification Identification (if applicable):	
City/State/Zip:	Redding, CA 96002	Phone:	(530) 244-0202

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. **The information provided on this Certificate of Compliance is true and correct.**
2. **I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)**
3. **The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.**
4. **The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.**
5. **I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.**

Responsible Designer Name:	Bryan Barnes	Responsible Designer Signature:	
Company :	PACE Engineering	Date Signed:	11/23/2022
Address:	5155 Venture Parkway	License:	E22549
City/State/Zip:	Redding, CA 96002	Phone:	(530) 244-0202

PACE® ENGINEERING

NO.	DATE	REVISIONS	BY	CHK

PROJECT NO: 022046.00	PROJECT ID:
DRAWN BY: NP	SCALE: AS SHOWN
ENGINEER: NP	DATE: 12/02/2022
CHECKED BY: BB	DATE: 12/02/2022

ORIGINAL SCALE IN INCHES 0 1 2

LAWRENCE & ASSOCIATES ENGINEERS & GEOLOGISTS

TRANSFER STATION GENERATOR

5700 COUNTY RD 33
ARTOIS, CA 95913

TITLE 24 ELECTRICAL COMPLIANCE DOCUMENTS

12/02/22

DRAWING: E6
SHEET: 9 OF 9
DATE: 12/02/22

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Project No. 70641-01
JULY 31, 2017

GEOTECHNICAL ENGINEERING INVESTIGATION REPORT

GLENN COUNTY LANDFILL TRANSFER STATION
5700 COUNTY ROAD 33, ARTOIS, CALIFORNIA

PREPARED FOR:

LAWRENCE & ASSOCIATES
ENGINEERING • GEOLOGY • DRILLING

LAWRENCE & ASSOCIATES
3590 IRON COURT
SHASTA LAKE, CALIFORNIA 96019

PREPARED BY:

HOLDREGE & KULL, AN NV5 COMPANY
48 BELLARMINE COURT, SUITE 40
CHICO, CALIFORNIA 95928
O: 530.894.2487 F: 530.894.2437

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
An NV5 Company

July 31, 2017
Project No. 70641-01

Mr. Clayton Coles, CEG
Lawrence & Associates
3590 Iron Court
Shasta Lake, California 96019

Reference: ***Glenn County Landfill Transfer Station***
Glenn County Landfill
Artois, California

Subject: ***Geotechnical Engineering Investigation Report***

Dear Mr. Coles,

Holdrege & Kull (H&K) is pleased to have this opportunity to provide geotechnical engineering services for development of the proposed Glenn County Landfill Transfer Station located at Glenn County Landfill in Artois, California. The geotechnical engineering investigation of the site was performed consistent with the scope of services presented in H&K's July 1, 2016 proposal (PC16.116).

The findings, conclusions and recommendations presented in this report are based on the following relevant information collected and evaluated by H&K: literature review, surface observations, subsurface exploration, laboratory test results, and H&K's experience with similar projects, sites and conditions in the area. The proposed transfer station footprint is underlain by undocumented fill soil that is soft to stiff clay and is susceptible to consolidation under heavy loads or vehicle traffic. The subgrade soil below the transfer station and roadway improvements requires overexcavation with the material being replaced with non-expansive compacted engineered fill. It is H&K's opinion that the site is suitable for the proposed construction provided the geotechnical engineering recommendations presented in this report are incorporated into the earthwork and structural improvements.

This report should not be relied upon without review by H&K if a period of 24 months elapses between the report date shown above and the date when construction commences.

H&K's experience, and that of the civil engineering profession, clearly indicates that during the construction phase of a project the risks of costly design, construction and maintenance problems can be significantly reduced by retaining the geotechnical engineering firm to review the project plans and specifications and to provide geotechnical engineering construction quality assurance (CQA) observation and testing services. Upon your request H&K will prepare a CQA geotechnical engineering services proposal that will present a work scope, tentative schedule and fee estimate for your consideration and authorization.

If H&K is not retained to provide geotechnical engineering CQA services during the construction phase of the project, then H&K will not be responsible for geotechnical engineering CQA services provided by others nor any aspect of the project that fails to meet your or third party expectations in the future.

H&K appreciates the opportunity to provide geotechnical engineering services for this important project. If you have questions or need additional information, please do not hesitate to contact the undersigned below at 530-894-2487.

Sincerely,

HOLDREGE & KULL, AN NV5 COMPANY

Shane D. Cummings, CEG 2492
Principal Engineering Geologist

Chuck R. Kull, GE 2359, CEG 1622
Principal Engineer

TABLE OF CONTENTS

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FIGURES

APPENDICES

ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
AB	aggregate base
AC	asphalt concrete
ACI	American Concrete Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
bgs	below ground surface
CalEPA	California Environmental Protection Agency
CAT	Caterpillar
CBC	California Building Code
CQA	construction quality assurance
DTSC	Department of Toxic Substances Control
GBA	Geoprofessional Business Association
H&K	Holdrege & Kull
HHW	Household Hazardous Waste
ksi	kips per square inch
L&A	Lawrence & Associates
MCE	maximum considered earthquake
msl	mean sea level
mybp	million years before present
OSHA	Occupational Safety and Hazards Administration
oz/yd	ounce per square yard
PCA	Portland Cement Association
PI	plasticity index
psf	pounds per square foot
psi	pounds per square inch
PVC	polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
R-Value	resistance value
SPT	standard penetration test
SSD	saturated surface dry
S-Wave	shear wave
TI	Traffic Index
USCS	Unified Soil Classification System
USGS	United States Geological Survey
UU	Unconsolidated Undrained

1 INTRODUCTION

Holdrege & Kull (H&K) performed a geotechnical engineering investigation of the Glenn County Landfill Transfer Station consistent with the scope of services presented in the Proposal for Geotechnical Engineering Services, Glenn County Landfill property located at 5700 County Road 33 in Artois, California. A copy of the scope of services, excluding the fee and contract sections, is included as Appendix A. The findings, conclusions and recommendations are presented herein.

For your review, Appendix B presents a publication prepared by the Geoprofessional Business Association (GBA) entitled *"Important Information About Your Geotechnical Engineering Report."* This publication summarizes project specific factors, limitations, content interpretation, responsibilities and other pertinent information. Please read this publication carefully.

The information presented in this report is organized into the following sections: Introduction, Site Investigation, Laboratory Testing, Conclusions, Recommendations, References, Limitations, Figures and Appendices.

1.1 *SCOPE-OF-SERVICES*

H&K performed a specific scope-of-services to develop geotechnical engineering design recommendations for earthwork and structural improvements. A brief description of each work scope task performed for the geotechnical engineering investigations is presented below. A detailed description of each work scope task is presented in Section 2 (Site Investigation) of this report.

- **Task 1 Site Investigation:** H&K performed a site investigation to characterize the existing surface and subsurface soil, rock and groundwater conditions encountered to the maximum depth excavated. H&K's field geologist made observations, took representative soil samples, and performed field tests at a limited number of subsurface exploratory locations. H&K performed laboratory tests on selected soil samples to evaluate their geotechnical engineering material properties.
- **Task 2 Data Analysis and Engineering Design:** H&K evaluated the site field and laboratory data, proposed site improvements and intended use, performed slope stability analyses, and used this information to develop geotechnical engineering design recommendations for earthwork and structural improvements. Engineering judgment was used to extrapolate observations and conclusions regarding the field and laboratory data to other areas located between and beyond the locations of the subsurface exploratory excavations. H&K reviewed geologic and seismic literature,

maps, aerial photographs and on-line sources of information about site soil and rock conditions, and potential geologic, geotechnical and seismic concerns.

- **Task 3 Report Preparation:** H&K prepared this report to present the findings, conclusions and recommendations from the geotechnical engineering investigation.

1.2 *SITE LOCATION AND DESCRIPTION*

The project site is situated within the Glenn County Landfill property located at 5700 County Road 33 in Artois, California. Glenn County Landfill is located at an approximate elevation of 250 feet above mean sea level (msl), and approximately 1000 feet north of White Cabin Creek, which is a tributary to the Sacramento River. The site is centered at about latitude 39.6325° north and longitude -122.2765° west based on GoogleEarth. The proposed project site is located east of the existing household hazardous waste (HHW) receiving and storage facility on a north and easterly sloping fill pad constructed from the remaining excavation soils generated during the construction of the HHW facility. A small water tank is planned to be installed south of the HHW on a native soil cut pad, and a new truck scale and scale house is proposed on the main landfill access road to the south of the HHW driveway exit. Figure 1 depicts the site location and near vicinity.

Photo 1. Google Earth Image of Glenn County Landfill Facility

1.3 *PROPOSED IMPROVEMENTS*

County of Glenn Department of Planning and Public Works is developing plans for a new transfer station at the Glenn County Landfill. The improvements will occur in two phases, with the initial Phase I including the following: concrete slab-on-grade public tipping area, concrete cantilevered retaining wall with fence, temporary concrete block push wall, asphalt concrete (AC) driveway entrance and landscape areas. Figure 2 is a site sketch showing the existing features for the proposed Glenn County Landfill Transfer Station area.

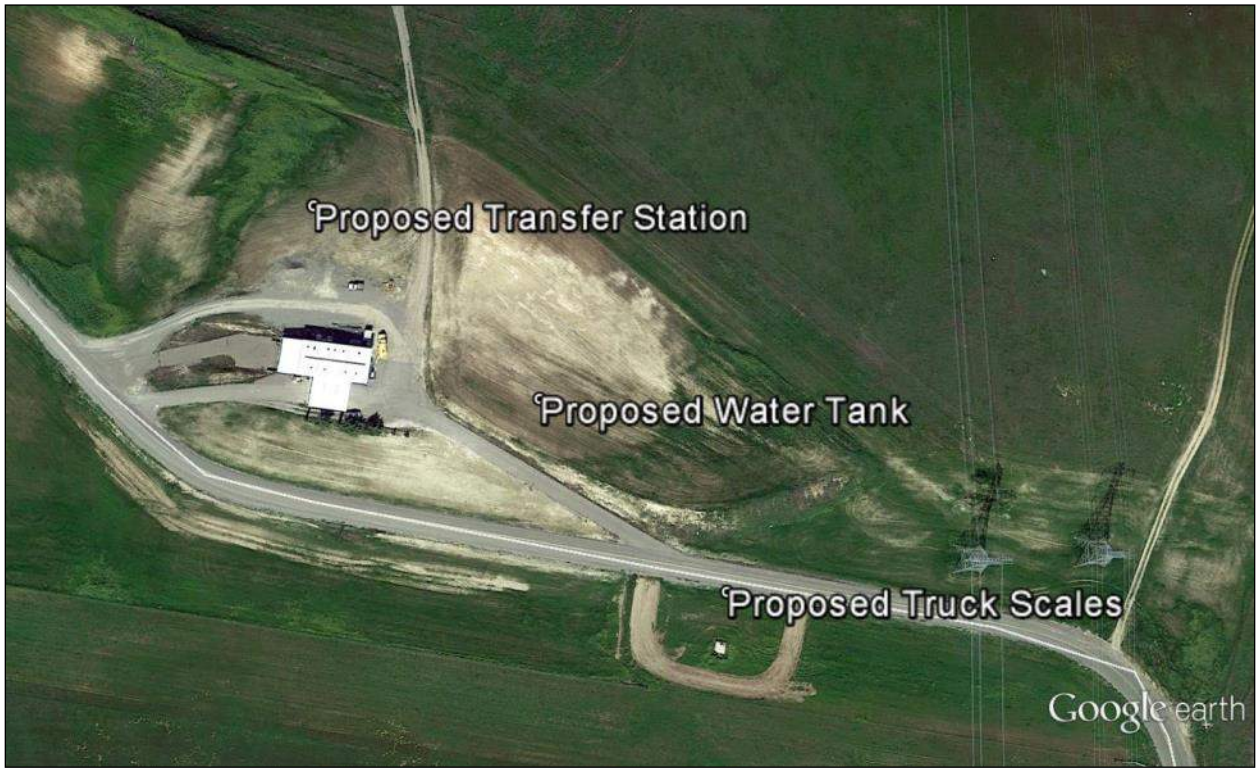


Photo 2. Aerial Image of Project Area

Earthwork grading will include the mitigation of undocumented fill within the building footprint by overexcavation and replacement of the soil as non-expansive engineered fill to meet the proposed section grades. Deep excavations will be cut along the west side of the proposed transfer station to construct a retaining wall to facilitate a below grade transfer truck loading bay and driveway.

1.4 *INVESTIGATION PURPOSE*

The purpose of the investigation was to obtain sufficient on-site information about the soil, rock and groundwater conditions at the site to allow us to prepare geotechnical engineering recommendations for construction of the proposed earthwork and structural

improvements described above. H&K did not evaluate the site for the presence of hazardous waste, mold, asbestos, radon gas and geological hazards. Therefore, the presence, removal and mitigation of these materials or hazards are not discussed in this report.

2 SITE INVESTIGATION

H&K performed a site investigation to characterize the existing subsurface conditions (limited to soil, rock and groundwater) beneath the proposed Glenn County Landfill Transfer Station to develop geotechnical engineering recommendations for earthwork and structural improvements. Each component of the site investigation is described below.

2.1 *LITERATURE REVIEW*

H&K performed a limited review of available literature pertinent to the project site. The following summarizes the findings.

2.1.1 Site Improvement Plan Review

Lawrence & Associates (L&A) provided the following documents for review prior to implementing the field investigation:

- Facility Plan Glenn County Landfill, Conceptual Permanent Transfer Station Site Plan, DRAFT, dated December 31, 2014, prepared by L&A.
- Transfer Station, Glenn County Planning and Public Works, CONCEPTUAL, Not For Construction, dated April 15, 2015, prepared by L&A.
- Transfer Station, Glenn County Landfill, Site map Showing Proposed Test Locations, dated November 17, 2016, prepared by L&A.

Prior to implementing grading and site improvements, H&K should be allowed to review the final plans to determine whether the recommendations herein have been implemented, and, if necessary, to provide additional and/or modified recommendations.

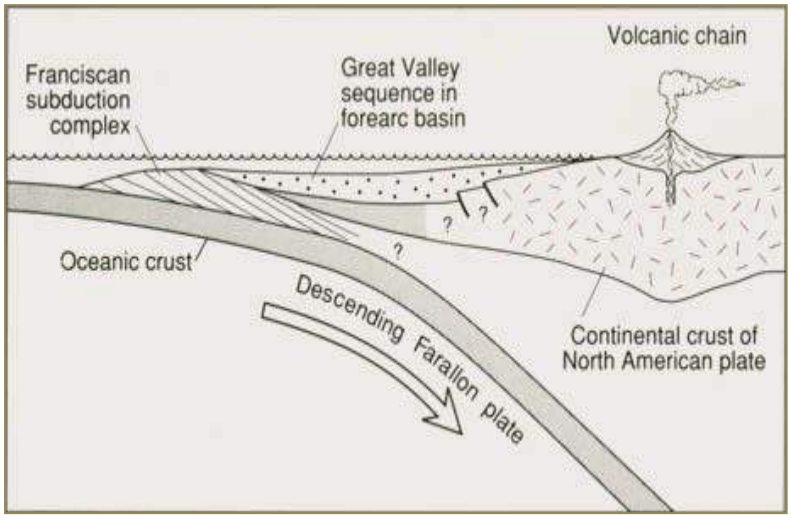
2.1.2 Previous Site Investigation Reports

There were no previous geotechnical reports, construction quality assurance documentation, or site improvement documents made available prior to the preparation of this report.

2.2 *REGIONAL GEOLOGY*

The Glenn County Landfill Transfer Station property is situated in the northern Sacramento Valley within the Great Valley geologic province west of the boundary with the Cascade geologic province and east of the boundary of the Coast Range geologic

province. The Great Valley geologic province is characterized as an asymmetrical synclinal trough composed of a thick sequence (up to 80,000 feet) of Jurassic and Eocene age marine sedimentary units deposited during periods of inundation and Pliocene to recent Holocene age terrestrial sediments originating from the Sierra Nevada, Cascade and Coast Range mountains during sea recession and periods of mountain uplift. In the central part of the Sacramento Valley, a mantle of Tertiary and Quaternary detrital continental deposits overlies the Great Valley sequence; these deposits, which are derived from the Coast Range mountains to the west, grade eastward into coeval volcanic materials derived from the Cascade Range province (Blake, et al, 1999).



Schematic diagram showing California as an Andean-type continental margin during late Mesozoic time (from Wallace 1990, modified from Dickinson 1981)

2.3 *SITE GEOLOGY*

Based on review of the *Geologic Map the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California* published by the United States Geological Survey, the geology immediately underlying the subject site is comprised of Tehama Formation deposited during the Pliocene Epoch (5.3 million years to 2.6 million years before present [mybp]). The Tehama Formation is characterized as sandstone and siltstone with lenses of crossbedded pebble and cobble conglomerate derived from the Coast Range and Klamath Mountains. (Helley, J., Harwood, D., 1985).

2.4 *REGIONAL FAULTING*

Regional faulting is associated with late Cenozoic tectonism of the northern Sacramento Valley including the Red Bluff Fault and the Corning Fault mapped north of the site, and the Battle Creek Fault mapped north of Red Bluff; Holocene fault activity in the Cascadian geologic province associated with the Hat Creek Fault and the McArthur Fault located northeast of the site; late Quaternary and Holocene fault activity associated with northern extent of the Foothill Fault System which includes the Chico Monocline, Cohasset Ridge Fault, Paradise Fault, Magalia Fault, and the Cleveland Hill Fault located east and southeast; and late Quaternary and Holocene fault activity in the

Coast Range geologic province associated with the Lake Mountain Fault, Round Valley Fault Zone, and Bartlett Springs Fault.

The 2010 Fault Activity Map of California by the California Geological Survey, (http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#), Geologic Data Map No. 6 shows the nearest known active faults with surface displacement within Holocene time (about the last 11,000 years) to be the Dunnigan Hill Fault, located approximately 55 miles south of the subject site and the Bartlett Springs Fault (approximately 55 miles west-southwest) show evidence of Holocene faulting, and the Cleveland Hills Fault, approximately 45 miles to the southeast of the subject site, is associated with ground surface rupture during the 1975 Oroville earthquake.

2.5 *FIELD INVESTIGATION*

H&K performed a field investigation of the site on November 22, 2016. H&K's field engineer/geologist described the surface and subsurface soil, rock and groundwater conditions observed at the site using the procedures cited in the American Society for Testing and Materials (ASTM), Volume 04.08, *Soil and Rock; Dimension Stone; and Geosynthetics* as general guidelines for the field and laboratory procedures. The field engineer/geologist described the soil color using the general guideline procedures presented in the Munsel Soil Color Chart. Engineering judgment was used to extrapolate the observed surface and subsurface soil, rock and groundwater conditions to areas located between and beyond the subsurface exploratory locations. The surface, subsurface and groundwater conditions observed during the field investigation are summarized below.

2.5.1 Surface Conditions

Figure 2 shows the project site boundaries and the subsurface exploration locations. The site is located on a rolling hill that has been graded flat on top to generate the buidling pad for the HHW facility. The natural sloped surfaces include 10- to 15-foot-high graded and natural slopes with native grasses and shrubs. The construction of the building pad generated excess soil that was placed to the north of the HHW within the area of the proposed transfer station and to the east of the HHW and east of the proposed water tower. These fills were placed and compacted without engineered fill density testing. The surface conditions at the proposed scale house include road fill and natural sloped surfaces that have been graded to create equipment access during the construction of the new groundwater supply well.

2.5.2 Subsurface Conditions

The subsurface soil, rock and groundwater conditions were investigated by excavating exploratory trenches and borings at the site. The subsurface information obtained from these investigation methods are described herein.

2.5.2.1 Exploratory Boring and Trench Information

H&K provided geotechnical oversight for the excavation of 4 exploratory soil borings at the Glenn County Landfill Transfer Station project site with a truck mounted CME 75 drill rig equipped with hollow stem augers. H&K also provided geologic oversight during the excavation of one exploratory trench using a Caterpillar D6 dozer within the footprint of the proposed transfer station in the area of the undocumented fill. Figure 2 shows the approximate locations of the subsurface exploratory excavations. The borings were excavated to depths ranging from approximately 15.5 to 27 feet below ground surface (bgs). The exploratory trench was terminated at a depth of approximately 6.5 feet bgs in a native, undisturbed sandy silt (ML) soil. Engineering judgment was used to extrapolate the observed soil, rock and groundwater conditions to areas located between and beyond H&K's subsurface exploratory excavations.

H&K's field engineer/geologist logged each exploratory boring using the Unified Soils Classification System (USCS) as guidelines for soil descriptions and the American Geophysical Union guidelines for rock descriptions. Representative relatively undisturbed soil samples were generally collected from the following depth intervals: 2.5-feet, 5-feet, and at 5 foot intervals through the termination of each boring. Relatively undisturbed soil samples were collected with a 2.5-inch inside-diameter split-spoon sampler equipped with brass or steel liner sample tubes and a standard penetration test (SPT) split barrel sampler. The samplers were driven into the soil using a 140-pound hammer with a 30-inch free fall automatic trip hammer. The liner tube samples were sealed with end-caps, labeled and transported to H&K's soil laboratory facility.

Selected soil samples were tested in H&K's laboratory to determine their engineering material properties which included natural moisture content, particle size gradation, plasticity, unconfined compressive strength, and resistance value. These soil engineering material properties were used to develop geotechnical engineering recommendations for retaining wall foundations, structures and pavement design.

Detailed descriptions of the soil, rock and groundwater conditions that were encountered in the subsurface exploratory locations are presented in the exploratory boring logs included in Appendix C. The soil and rock descriptions are based on visual field estimates of the particle size percentages (by dry weight), color, relative density or

consistency, moisture content, and cementation that comprise each soil material encountered.

A generalized profile of the soil, rock and groundwater conditions encountered to the maximum depth excavated (5 feet) for the proposed Glenn County Landfill Transfer Station area is presented below. The soil and/or rock unit encountered in the subsurface exploratory excavations was generally stratigraphically continuous across the site; however, the thickness of the unit within the area may vary slightly. The field descriptions of the subsurface units are described below.

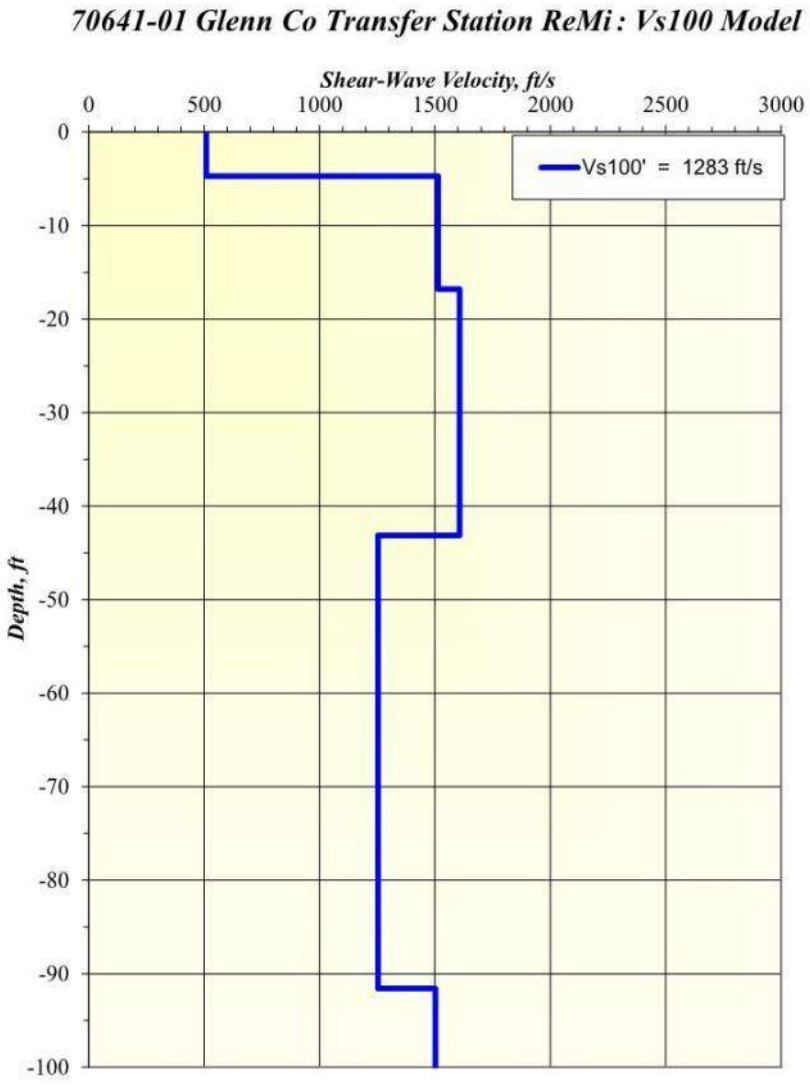
- **Undocumented Fill CL, Low Plasticity Clay Soil:** This undocumented fill soil consists of the following field estimated particle size percentages: 30 percent fine to coarse gravel and some cobbles, 40 percent low plasticity fines, and 30 percent fine to coarse sand. This soil is predominantly dark brown with a Munsel Color Chart designation of (7.5YR 3/4). This soil was soft to stiff at the time of the subsurface investigation. The undocumented fill was approximately two feet thick and appeared to be sourced from the local native soil in the area.
- **CH, High Plasticity Clay Soil:** This soil consists of the following field estimated particle size percentages: 90 percent low plasticity silt and clay, and 10 percent very fine sand. This soil is predominantly yellowish brown with a Munsel Color Chart designation of (10YR 5/4). This soil was stiff to hard and moist at the time of the subsurface investigation.
- **ML, Low Plasticity Silt Soil:** This soil consists of the following field estimated particle size percentages: 90 percent low plasticity silt and clay, and 10 percent very fine sand. This soil is predominantly light yellowish brown with a Munsel Color Chart designation of (2.5YR 6/3). This soil was stiff to hard and moist at the time of the subsurface investigation.
- **SM, Silty Sand Soil:** This soil consists of the following field estimated particle size percentages: 65 percent fine to coarse sand, 15 percent fine gravel, and 20 percent low plasticity silt and clay. This soil is predominantly pale brown with a Munsel Color Chart designation of (10YR 6/3). This soil was very dense and dry to damp at the time of the subsurface investigation.
- **ML, Low Plasticity Silt Soil:** This soil consists of the following field estimated particle size percentages: 70 percent low plasticity silt and clay, and 30 percent very fine sand. This soil is predominantly pale brown with a Munsel Color Chart designation of (10YR 6/3). This soil was very stiff to hard and dry to damp at the time of the subsurface investigation.

2.5.2.2 Groundwater Conditions

Groundwater was not encountered in the exploratory borings or trench at the time of the site investigation. Based on long-standing groundwater monitoring performed at the Glenn County Landfill, first groundwater is expected to be 70 feet bgs east of the landfill during the high water level season. Seasonal fluctuations in the local groundwater table at the landfill have been documented to fluctuate up to 20 feet per year. H&K does not expect to encounter groundwater during construction activities. However, seasonal infiltration of stormwater into excavations may occur following storm events and during wet times of the year.

2.5.2.3 Seismic Refraction Survey

A seismic refraction survey was performed by H&K on-site across the proposed building footprint area. The purpose of the seismic survey was to use the SeisOpt® ReMi™ Vs100 method to determine the in-situ shear wave (S-wave) velocity profile of the first 100 feet of soil beneath the site. H&K used the ReMi™ Vs100 survey results and the known subsurface geologic conditions at the site to determine the 2013 California Building Code (CBC) Site Class in accordance with Chapter 16, Section 1613 and Chapter 20 of American Society of Civil Engineers (ASCE) 7-10.



The seismic testing was performed at the surface using conventional seismograph and vertical P-wave geophones used for refraction surveys. The seismic source consists of ambient seismic microtremors which were constantly being generated by cultural and natural noise sources in the area including seismic vibrations generated by vehicle traffic driving on surrounding roadways and the drill rig operations. The data was

collected during a series of 20 recording periods that were each 30 seconds in duration. The Vs100 Model shown in the inset figure presents the subsurface shear wave velocity profile that was developed for the site from the SeisOpt® ReMi™ data.

The resulting subsurface shear wave model for the site indicates that the harmonic mean seismic shear wave velocity for the upper 100 feet of the subsurface is 1,283 feet per second. This weighted shear wave velocity corresponds to the range of Site Class C which represents Dense Soil and Soft Rock Profile, as described in Chapter 20, Table 20.3-1 Site Classification of ASCE 7-10.

3 LABORATORY TESTING

H&K performed laboratory tests on selected soil samples taken from the subsurface exploratory excavations to determine their engineering material properties. These engineering material properties were used to develop geotechnical engineering design recommendations for earthwork and structural improvements. The following laboratory tests were performed using the cited ASTM guideline procedures:

- ASTM D422 Particle Size Gradation (Sieve Only)
- ASTM D2166 Unconfined Compressive Strength for Cohesive Soil
- ASTM D2216 Soil Moisture Content
- ASTM D2487 Soil Classification by the USCS
- ASTM D2844 Resistance Value
- ASTM D2850 Unconsolidated Undrained (UU) Triaxial Compression
- ASTM D2937 Drive Tube Density-Moisture Determination
- ASTM D4318 Atterberg Limits (Dry Method)
- ASTM D4829 Expansion Index

Table 3.1 presents a summary of the laboratory test results. Appendix D presents the laboratory test results.

Table 3.1 Laboratory Test Results

Boring and Trench No.	Sample No.	Sample Depth (feet)	Test Results										
			D2487 D2488	D2216	D2937	D422		D4318		D4829	D2166	D2850	D2844 CTM301
			USCS (symbol)	Moisture Content (%)	Dry Density (pcf)	Passing No.4 (%)	Passing No.200 (%)	Plasticity Index (%)	Liquid Limit (%)	Expansion Index (dim)	Unconfined. Comp. Strength (psf)	Triaxial UU Strength (psf)	R-Value (dim)
	Bulk1 16-1122	0	CH			97.3	87.5	43	61	107 (High)			8
B16-1	L1-1-2, L1-2-2	0		31.7	88							7148.5	
B16-1	B2	2.5	ML			92.8	99.2	13	41				
B16-1	L3-1-1	5		29.9	81.8								
B16-1	L4-1-1	10		14.6	113.9								
B16-1	L5-1-1	15	ML			100	88	8	32				
B16-1	L6-1-1	20		27.8	90.3								
B16-1	L7-1-1	25		20.1	103.8								
B16-2	L2-1-1	2.5	CH	20.1	104.8							2995.5	
B16-3	L2-1-1	2.5		28.2	92.5								
B16-3	L3-2-2	5	CL	31.5	85.8							3145.6	

B16-3	B4	9.5	SM			88	24.1						
B16-4	L2-1-1	4.5		14.6	105.5								
B16-4	L4-1-1	10	ML	13.1	98.7							3565.7	
B16-4	B5	14.5	CL			99.0	76.1	10	31				
B16-4	L6-1-1	20	ML									4158.6	
B16-4	SPT-7	25.5	CL			100	98.7	22	48				

Notes:

pcf = pounds per cubic foot

psf = pounds per square foot

% = percent

4 CONCLUSIONS

The conclusions presented below are based on information developed from the field and laboratory investigations.

1. Shallow soils encountered in the exploratory borings and trench in the footprint of the proposed Glenn County Landfill Transfer Station site included up to 3.5 feet of sandy clay (CL and CH) undocumented fill that was soft to firm. Below the undocumented fill was native, very stiff to hard low plasticity clay (CL). The undocumented fill is not suitable to support the vehicle traffic or building loads in its present state. It is H&K's opinion that the site is suitable for the proposed construction improvements provided that the geotechnical engineering design recommendations presented in this report are incorporated into the earthwork and structural improvement project plans.
2. Prior to construction, H&K should be allowed to review the proposed final earthwork grading plan and improvement plans to determine if the geotechnical engineering recommendations are applicable or need modifications.
3. Based on the site geology, the observations from the exploratory borings, and the SeisOpt ReMi Vs100 shear-wave profile analysis, the site soil profile can be modeled, according to the 2013 CBC, Chapter 16, and Chapter 11 and 20 of ASCE 7-10, as a Site Class C (Dense Soil and Soft Rock Profile) designation for the purposes of establishing seismic design loads for the proposed improvements.
4. The shallow soil conditions observed within the influence of the proposed transfer station tipping area and transfer truck loading driveway included up to 3.5 feet of undocumented fill comprised of dark brown sandy clayey (CL and CH). The undocumented fill was placed during the excavation of the building pad for the HHW facility. Due to the lack of fill control testing documentation, the fill is not suitable to support the proposed improvements without reworking and re-compacting the material in accordance with the recommendations presented in Section 5 of this report. The undisturbed soil below the undocumented fill was comprised of a clayey (CL) and sandy silt (ML) that was dark brown and light brown, respectively, and very stiff to hard.
5. At the time of the subsurface site investigation, H&K did not encounter groundwater in the exploratory borings or trench. Regional groundwater in the area is up to 90 feet deep below exisitng ground surface. Isolated seepage and infitration may be encountered in excavtion and slope cuts during the wet weather seasons.

5 RECOMMENDATIONS

H&K developed geotechnical engineering design recommendations for earthwork and structural improvements based on the analysis of the field and laboratory investigation data and similar project experience and conditions in the area. The recommendations for earthwork grading and structural improvements are presented below.

5.1 *EARTHWORK GRADING*

The earthwork grading recommendations include: clearing and grubbing, native soil preparation, fill construction, fill and cut slope grading, erosion controls, underground utility trenches, construction de-watering, soil corrosion potential, subsurface drainage, surface water drainage, review of construction plans, and construction quality assurance/quality control (QA/QC) monitoring. The earthwork grading recommendations are presented below.

5.1.1 Demolition and Abandonment of Existing Site Improvements

H&K anticipates that the existing site improvements within the proposed Glenn County Landfill Transfer Station area will need to be demolished and removed from the site as described below.

1. Over-excavate and remove the undocumented fill soil from beneath the proposed transfer station footprint, parking lot and roadways out a minimum of 5 feet beyond the footprint of the new improvements. This may require the removal of soft fill soil placed at the head of the slope. The undocumented fill may be reused as engineered fill and replacement and compaction of the fill as engineered fill should follow the recommendation presented below.

5.1.2 Import Fill Soil

Import fill soil should meet the geotechnical engineering material properties described in Section 5.1.5.1 of this report. Prior to importation to the site, the source generator should document that the import fill meets the guidelines set forth by the California Environmental Protection Agency (CalEPA) Department of Toxic Substances Control (DTSC) in their 2001 “Information Advisory, Clean Imported Fill Material.” This advisory represents the best practice for characterization of soil prior to import for use as engineered fill. The project geotechnical engineer should approve all proposed imported fill soil for use in constructing engineered fills at the site.

5.1.3 Temporary Excavations

All temporary excavations must comply with applicable local, state and federal safety regulations, including the current Occupational Safety and Hazards Administration

(OSHA) excavation and trench safety standards. Construction site safety is the responsibility of the contractor, who is solely responsible for the means, methods and sequencing of construction operations. Under no circumstances should the findings, conclusions and recommendations presented herein be inferred to mean that H&K is assuming any responsibility for temporary excavations, or for the design, installation, maintenance, and performance of any temporary shoring, bracing, underpinning or other similar systems. H&K can provide temporary cut slope gradients, if required.

5.1.4 Stripping and Grubbing

The site should be stripped and grubbed of vegetation and other deleterious materials as described below.

1. Strip and remove the top 6 to 8 inches of soil from the landscaping areas containing shallow vegetation roots and other deleterious materials. This highly organic topsoil can be stockpiled on-site and used for surface landscaping, but should not be used for constructing compacted engineered fills. Grub the underlying 8 to 10 inches of soil to remove any large vegetation roots or other deleterious material while leaving the soil in place. The project geotechnical engineer or his/her representative should approve the use of any soil materials generated from the clearing and grubbing activities.
2. Remove all large shrub and tree roots and tree stumps. Excavate the remaining cavities or holes to a sufficient width so that an approved backfill soil can be placed and compacted in the cavities or holes in accordance with the recommendation below. Sufficient backfill soil should be placed and compacted in order to match the surrounding elevations and grades. The project geotechnical engineer or his/her representative should observe and approve the preparation of the cavities and holes prior to placing and compacting engineered fill soil in the cavities and holes.
3. Remove all rocks greater than 3 inches in greatest dimension from the top 12 inches of the soil. Rocks with a greatest dimension larger than 3 inches will be referred to in this report as “oversized” rock materials. Oversized rock materials can be stockpiled on-site and used to construct engineered fills; however, they must be placed at or near the bottom of deep fills but not shallower than 3 feet from the finished subgrade surface. The oversized rock should be placed with enough space between them to avoid clustering and the creation of void space. The project engineer or his/her representative should approve the use and placement of all oversized rock materials prior to constructing compacted engineered fills.
4. Excessively large amounts of vegetation, other deleterious materials, and oversized rock materials should be removed from the site.

5.1.5 Native Soil Preparation for Engineered Fill Placement

After completing demolition of existing structures and utilities, site clearing and grubbing activities, the exposed native soil should be overexcavated a minimum of 3.5 feet below or until very stiff native soil is encountered and 5 feet beyond the proposed transfer station building footprint and roadway improvements. The subgrade should be prepared for placement and compaction of engineered fills, as described below.

1. The native soil should be scarified to a minimum depth of 6 inches below the existing land surface, overexcavated surface, or cleared and grubbed surface and then uniformly moisture conditioned. If the soil is classified as a coarse-grained soil by the USCS (i.e., GP, GW, GC, GM, SP, SW, SC or SM) then it should be moisture conditioned to within plus/minus ± 3 percentage points of the ASTM D1557 optimum moisture content. If the soil is classified as a fine-grained soil by the USCS (i.e., CL, ML) then it should be moisture conditioned between 2 to 4 percentage points greater than the ASTM D1557 optimum moisture content.
2. The native soil should then be compacted to achieve a minimum relative compaction of 95 percent of the ASTM D1557 maximum dry unit weight (density). The moisture content, density and relative percent compaction should be tested by the project engineer or the project engineer's field representative to evaluate whether the compacted soil meets or exceeds the minimum percent compaction and moisture content requirements. The earthwork contractor shall assist the project engineer or the project engineer's field representative by excavating test pads with the on-site earth moving equipment. Native soil preparation beneath AC pavement should be prepared as specified in Section 5.2 (Structural Improvements).
3. The prepared native soil surface should be proof rolled with a fully loaded 4,000-gallon capacity water truck with the rear of the truck supported on a double-axle, tandem-wheel, undercarriage or approved equivalent. The proof rolled surface should be visually observed by the project engineer or the project engineer's field representative to be firm, competent and relatively unyielding. The project engineer or the project engineer's field representative may also evaluate the surface material by hand probing with a ¼-inch-diameter steel probe; however, this evaluation method should not be performed in place of proof rolling as described in the preceding.
4. Construction quality assurance (CQA) tests should be performed using the minimum testing frequencies presented in Table 5.1.5-1, or as modified by the project engineer to better suit the site conditions.
5. The native soil surface should be graded to minimize ponding of water and to drain surface water away from the building foundations and associated structures. Where

possible surface water should be collected, conveyed and discharged into natural drainage courses, storm sewer inlet structures, permanent engineered storm water runoff percolation/evaporation basins, or engineered infiltration subdrain systems.

Table 5.1.5-1 Minimum Testing Frequencies

ASTM No.	Test Description	Minimum Test Frequency(1)
D1557	Modified Proctor Compaction Curve	1 per 40,000 SF) Or Material Change (2)
D6938	Nuclear Moisture Content And Density	1 per 100 CY = 8-In. Loose Lift By 60-Ft. x 60-Ft.

Notes:
(1) These are minimum testing frequencies that may be increased or decreased at the project engineer's discretion on the basis of the site conditions encountered during grading.
(2) Whichever criteria provide the greatest number of tests.

ASTM = American Society for Testing and Materials
No. = number
SF = square feet

5.1.6 Engineered Fill Construction with Testable Earth Materials

Engineered fills are constructed to support structural improvements. Engineered fills should be constructed using non-expansive soil as described in Section 5.1.6.1. If possible, the use of expansive soil for constructing engineered fills should be avoided. If the use of expansive soil cannot be avoided then engineered fills should be constructed as described in Section 5.1.6.2 or as modified by the project engineer. If soil is to be imported to the site for constructing engineered fills, then H&K should be allowed to evaluate the suitability of the borrow soil source by taking representative soil samples for laboratory testing. Testable earth materials are generally considered to be soils with gravel and larger particle sizes retained on the No. 4 mesh sieve that make up less than 30 percent by dry weight of the total mass. The relative percent compaction of testable earth materials can readily be determined by the following ASTM test procedures: laboratory compaction curve (D1557), field density (D2922), and field moisture content (D3017). Construction of engineered fills with non-expansive and expansive testable earth materials are described below.

5.1.6.1 Engineered Fill Construction with Non-Expansive Soil

Construction of engineered fills with non-expansive soil should be performed as described below.

1. Non-expansive soil used to construct engineered fills should consist predominantly of materials less than 3 inch in greatest dimension and should not contain rocks greater than 6 inches in greatest dimension (oversized material). Non-expansive

soil should have a plasticity index (PI) of less than or equal to PI ≤ 15 as determined by ASTM D4318 Atterberg Indices test. Oversized materials should be spread apart to prevent clustering so that void spaces are not created. The project engineer or project engineer's field representative should approve the use of oversized materials for constructing engineered fills.

2. Non-expansive soil used to construct engineered fills should be uniformly moisture conditioned. If the soil is classified by the USCS as coarse grained (i.e., GP, GW, GC, GM, SP, SW, SC or SM), then it should be moisture conditioned to within ± 3 percentage points of the ASTM D1557 optimum moisture content. If the soil is classified by the USCS as fine grained (i.e., CL, ML), then it should be moisture conditioned to between 2 to 4 percentage points greater than the ASTM D1557 optimum moisture content.
3. Engineered fills should be constructed by placing uniformly moisture-conditioned soil in maximum 8-inch-thick loose lifts (layers) prior to compacting.
4. The soil should then be compacted to achieve a minimum relative compaction of 95 percent of the ASTM D1557 maximum dry density.
5. The earthwork contractor should compact each loose soil lift with a tamping foot compactor such as a Caterpillar (CAT) 815 Compactor or equivalent as approved by H&K's project engineer or the project engineer's field representative. A smooth steel drum roller compactor should not be used to compact loose soil lifts for construction of engineered fills.
6. The field and laboratory CQA tests should be performed consistent with the testing frequencies presented in Table 5.1.6.1-1 or as modified by the project engineer to better suit the site conditions.

Table 5.1.6.1-1 Minimum Testing Frequencies For Non-Expansive Soil

ASTM No.	Test Description	Minimum Test Frequency(1)
D1557	Modified Proctor Compaction Curve	1 per 1,500 CY Or Material Change (2)
D6938	Nuclear Moisture Content And Density	1 per 100 CY = 8-In. Loose Lift By 60-Ft. x 60-Ft.

Notes:
(1) These are minimum testing frequencies that may be increased or decreased at the project engineer's discretion on the basis of the site conditions encountered during grading.
(2) Whichever criteria provide the greatest number of tests.

ASTM = American Society for Testing and Materials
CY = cubic yards
No. = number

7. The moisture content, density and relative percent compaction of all engineered fills should be tested by the project engineer's field representative during construction to

evaluate whether the compacted soil meets or exceeds the minimum compaction and moisture content requirements. The earthwork contractor shall assist the project engineer's field representative by excavating test pads with the on-site earth moving equipment.

8. The prepared finished grade or finished subgrade soil surface should be proof rolled as mentioned above in Section 5.1.5, Paragraph 3.

5.1.6.2 Engineered Fill Construction with Expansive Soil

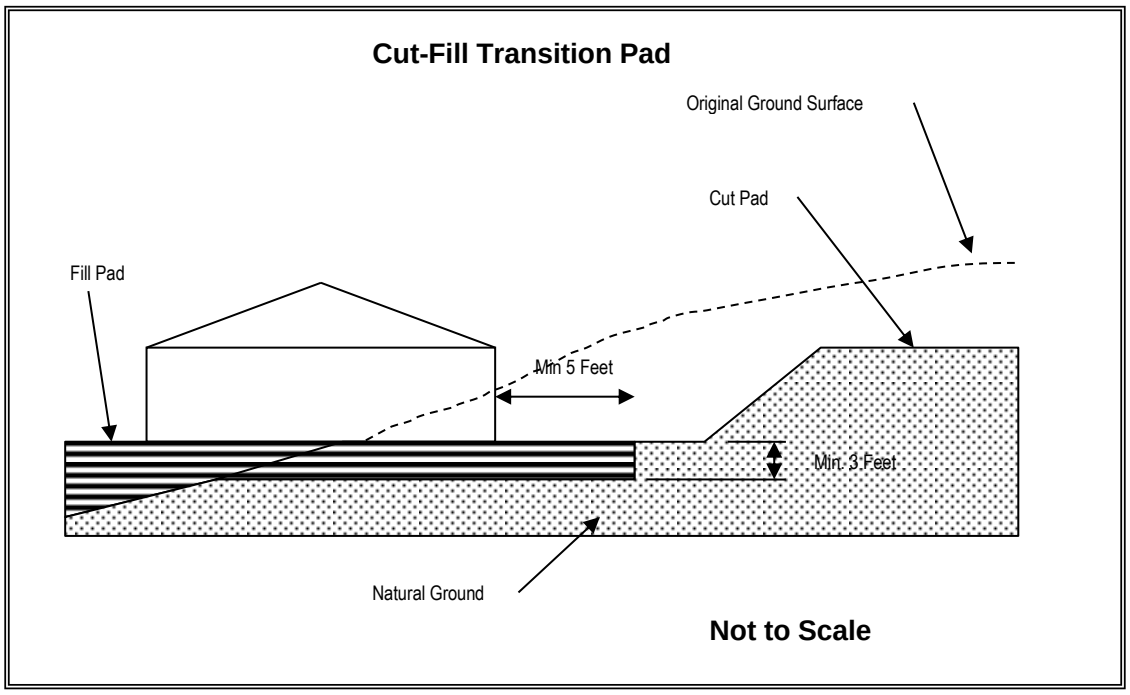
H&K did observe high expansive soil at the site during the subsurface investigation. H&K recommends that all high expansive soil be removed from the shallow subsurface or directly below foundation excavations in the building areas. If expansive soils are encountered during grading of the site and if the property owner desires to use expansive soil to construct engineered fills, then H&K should be notified to prepare recommendation options for constructing fills with potentially expansive soil, which may include placing the expansive soil at the bottom of deep fills to increase the confining pressure and total stress and reducing the swelling capability of the soil.

5.1.7 Cut-Fill Transitions

H&K understands that the proposed transfer station building will extend over an existing cut-fill transition created during the construction of the HHW facility. Generating cut and fill transitions under the building location presents the risk that differential settlement may occur in the future and cause significant cracking, shifting and potential failure to the structural integrity of the building. If this condition does occur, a cut-fill transition building pad should be graded as described below.

1. Building pads should be graded such that surface cut-fill transition lines do not occur on the surface directly beneath any structures. If a cut-fill transition line is located directly beneath a building footprint area, then the building pad areas should be over excavated and replaced with compacted engineered fill soil to eliminate the surface exposure of the cut-fill transition contact. This construction method will eliminate the occurrence of what is commonly referred to as a "hard-point or hard-line" beneath the building footprint. The hard-line demarks an abrupt change in both the elastic and consolidation settlement behaviors of the engineered fill and native soil and/or rock materials exposed on opposite sides of the hard-line on the building pad surface. This abrupt change in material behaviors can result in development of cracks in the building foundations and/or concrete slab-on-grade floors that are typically coincident with the location and orientation of the underlying hard-line. Over excavation of the entire building pad footprint area and then replacing with engineered fill to the finished design subgrade elevations will significantly diminish

the adverse impacts of the hard-line or cut/fill transition line beneath the building footprint area.



2. The depth of over excavation will depend on the foundation depth on the cut-side of the transition line and the total fill thickness on the fill-side of the transition line. In general, the fill depth differential should be limited to 5 feet across the building footprint. Thus, if a maximum fill depth of 8 feet was proposed on the fill-side, a minimum of 3 feet of over excavation and fill placement should occur on the cut side of the pad. Over excavation and replacement should extend a minimum of 5 feet beyond the proposed building footprint.

Actual cut-fill differential can vary with soil and foundation types. H&K can review differential loading and foundation conditions on a case-by-case basis.

5.1.8 Proposed Cut Slope Grading

Cut slopes for the proposed transfer station and roadway improvements should be graded as described below.

1. Cut slopes should be graded with a maximum slope gradient of 1H:1V (horizontal to vertical slope ratio) and with a maximum vertical height of 10 feet. If cut slopes are to be graded steeper than 1H:1V and/or with a vertical height greater than 10 feet, then H&K should be notified so that we can perform a slope stability analysis of the proposed slope configurations and provide revised recommendations, if necessary.
2. Surface benches should be graded into the finished fill slope with a minimum width of 10 feet and with maximum vertical intervals of 10 feet between benches or at the

mid slope height if the total vertical slope height is greater than 15 feet but less than 20 feet.

3. The benches should be graded with a minimum slope gradient of 2 percent towards the cut; in other words, the bench slope gradient should cause surface water to drain towards the cut slope side of the bench (not over and down the cut slope face).

5.1.9 Fill Slope Grading

Fill slopes should be graded as described below.

1. Fill slopes should be graded with a maximum slope gradient of 2H:1V (horizontal to vertical slope ratio) and with a maximum vertical height of 15 feet. If fill slopes are to be graded steeper than 2H:1V and/or with a vertical height greater than 15 feet, then H&K should be notified so that slope stability analysis of the proposed slope configuration can be performed and revised recommendations provided.
2. Fill slopes should be graded in horizontal lifts to the lines and grades shown on the grading plans. The design-finished grade of a fill slope should be achieved by over building the slope face and then cutting it back to the design-finished grade. Fill slopes should not be graded (extended horizontally) by compacting moisture conditioned, loose soil lifts on the slope face as thin veneer layers; in other words, do not construct engineered fill slopes by placing and compacting successive thin layers (veneers) of soil over the fill slope face at an inclination that is roughly coincident with the final fill slope horizontal to vertical slope ratio. The in-slope edge of each horizontal lift should be benched into the firm, competent and relatively unyielding soil of the natural ground slope.
3. If groundwater seepage from the slope is encountered during grading or if the site conditions indicate that groundwater seepage does occur during the wet winter season, then H&K should be notified so that we can assess the conditions and provide a design for installation of permanent dewatering subdrains.
4. Surface benches should be graded into the finished fill slope with a minimum width of 10 feet and with maximum vertical intervals of 10 feet between benches or at the mid slope height if the total vertical slope height is greater than 15 feet but less than 20 feet.
5. Benches should be graded with a minimum slope gradient of 2 percent towards the inside fill slope surface; in other words, the bench slope gradient should cause surface water to drain towards the fill slope side of the bench (not over and down the fill slope face).
6. Fill soils used to construct slopes should be uniformly moisture conditioned, placed in loose lifts, and compacted as described in Section 5.1.6.

5.1.10 Erosion Controls

Erosion controls should be installed as described below.

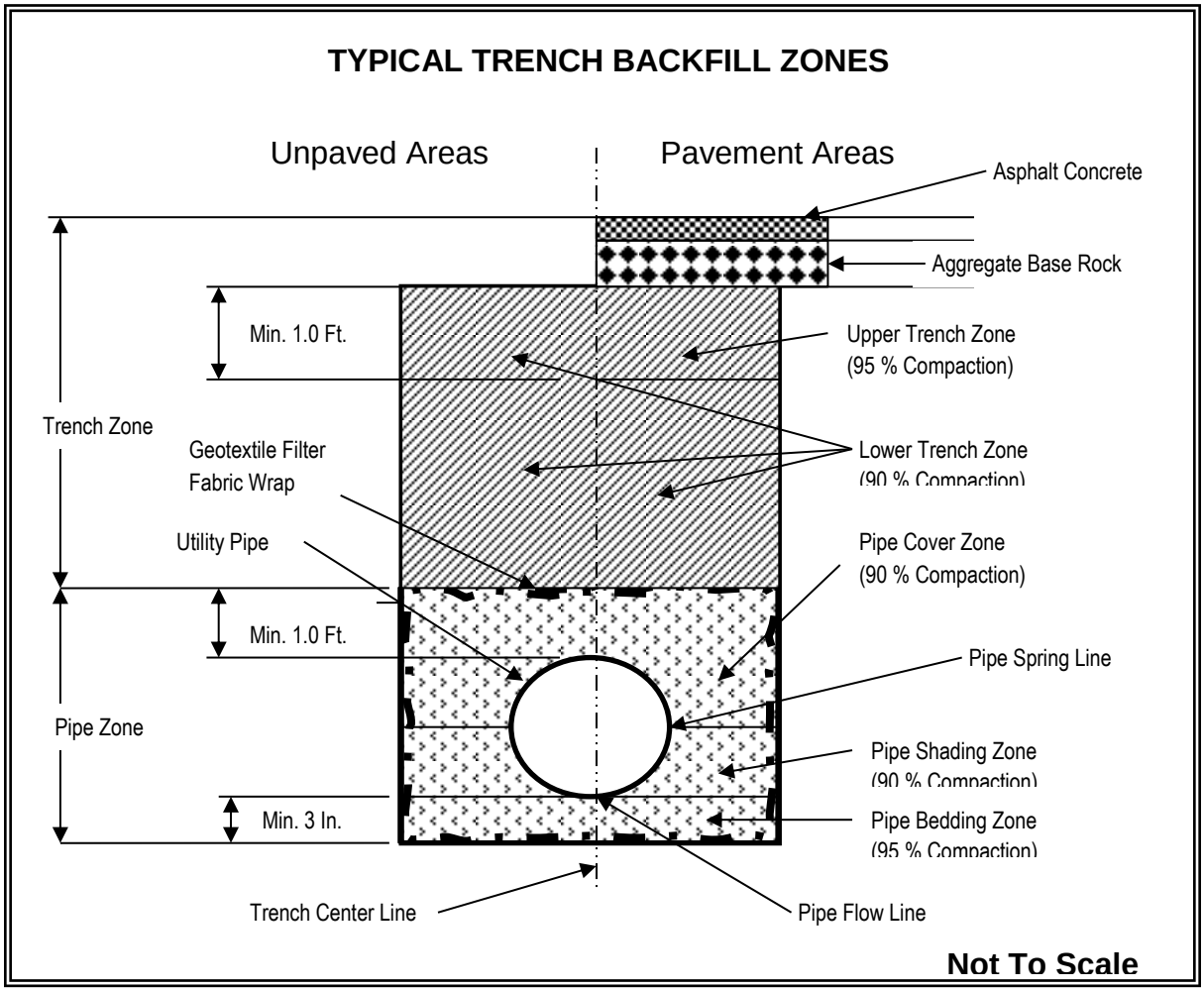
1. H&K recommends that the current vegetation growing on the slopes be maintained as an erosion prevention measure and that other surface water run-off and erosion controls may need to be employed in the future to mitigate erosion problems that may develop.
2. Erosion controls should be installed on all cut and fill slopes to minimize erosion caused by surface water runoff.
3. Install on all slopes either an appropriate hydroseed mixture compatible with the soil and climate conditions of the site as determined by the local United States Soil Conservation District or apply an appropriate manufactured erosion control mat.
4. Install surface water drainage ditches at the top of cut and fill slopes, (as necessary) to collect and convey both sheet flow and concentrated flow away from the slope face.
5. The intercepted surface water should be discharged into a natural drainage course or into other collection and disposal structures.

5.1.11 Underground Utility Trenches

Underground utility trenches should be excavated and backfilled as described below for each trench zone as shown in the figure below.

1. **Trench Excavation Equipment:** H&K anticipates that the contractor will be able to excavate all underground utility trenches with a Case 580 Backhoe or equivalent, however, deeper utility trenches (10 feet or greater) may require larger equipment.
2. **Trench Shoring:** All utility trenches that are excavated deeper than 4 feet below the surrounding ground surface are required by the California OSHA to be shored with bracing equipment or sloped back to an appropriate slope gradient prior to being entered by any individuals.
3. **Trench Dewatering:** H&K does not anticipate that the proposed underground utility trenches will encounter shallow groundwater. However, if the utility trenches are excavated during the winter rainy season, then shallow or perched groundwater may be encountered. The earthwork contractor may need to employ de-watering methods in order to excavate, place and compact the trench backfill materials.

4. **Pipe Zone Backfill Type and Compaction Requirements:** The backfill material type and compaction requirements for the pipe zone, which includes the bedding zone, shading zone and cover zone are shown in the figure below.



- **Pipe Zone Backfill Material Type:** Trench backfill used within the pipe zone which includes the bedding zone, shading zone and cover zone should consist of ¾-inch minus, washed, crushed rock. The crushed rock particle size gradation should meet the following requirements (percentages are expressed as dry weights using ASTM D422 test method): 100 percent passing the 3/4 inch sieve, 80 to 100 percent passing the ½ inch sieve, 60 to 100 percent passing the 3/8 inch sieve, 0 to 30 percent passing the No. 4 sieve, 0 to 10 percent passing the No. 8 sieve, and 0 to 3 percent passing the No. 200 sieve. Due to shallow groundwater occurring beneath the site, the pipe zone material should be wrapped with a minimum 6-ounce per square yard (oz/yd), non-woven, geotextile filter fabric such as Amoco 4506 manufactured by Amoco Fabrics and Fibers

Company or equivalent. The geotextile seam should be located along the trench centerline and have a minimum 1-foot overlap. If the utility pipes are coated with a corrosion protection material, then the pipes should be wrapped with a minimum 6-oz/yd, non-woven, geotextile cushion fabric such as Amoco 4506 manufactured by Amoco Fabrics and Fibers Company or equivalent. The geotextile cushion fabric should have a minimum 6-inch seam overlap. The geotextile cushion fabric will protect the pipe from being scratched by the crushed rock backfill material.

- **Pipe Bedding Zone Compaction:** Trench backfill soil placed in the pipe bedding zone (beneath the utilities) should be a minimum 3-inches thick, moisture conditioned to within ± 3 percentage points of the ASTM D1557 optimum moisture content and compacted to achieve a minimum relative compaction of 95 percent of the ASTM D1557 maximum dry density.
- **Pipe Shading Zone Compaction:** Trench backfill soil placed within the pipe-shading zone (above the bedding zone and to a height of one pipe radius length above the pipe spring line) should be moisture conditioned to within ± 3 percentage points of the ASTM D1557 optimum moisture content and compacted to achieve a minimum relative compaction of 90 percent of the ASTM D1557 maximum dry density. The pipe shading zone backfill material should be **shovel sliced** to remove voids and to promote compaction.
- **Pipe Cover Zone Compaction:** Trench backfill soil placed within the pipe cover zone (above the pipe shading zone to one foot over the pipe top surface) should be moisture conditioned to within ± 3 percentage points of the ASTM D1557 optimum moisture content and compacted to achieve a minimum relative compaction of 90 percent of the ASTM D1557 maximum dry density.

5. **Trench Zone Backfill and Compaction Requirements:** The trench zone backfill materials consists of both lower and upper zones as discussed below.

   - **Trench Zone Backfill Material Type:** Soil used as trench backfill within the lower and upper intermediate zones as shown on the preceding figure should consist of non-expansive soil with a PI of less than or equal to PI ≤ 15 (based on ASTM D4318) and should not contain rocks greater than 3 inches in greatest dimension.
   - **Lower Trench Zone Compaction:** Soil used to construct the lower trench zone backfills should be uniformly moisture conditioned to within 0 to 4 percentage points of the ASTM D1557 optimum moisture content, placed in maximum 12-inch-thick loose lifts (layers) prior to compacting and compacted to achieve a

minimum relative compaction of 90 percent of the ASTM D1557 maximum dry density.

- **Upper Trench Zone Compaction (Road and Parking Lot Areas):** Soil used to construct the upper trench zone backfills should be uniformly moisture conditioned to within 0 to 4 percentage points greater than the ASTM D1557 optimum moisture content, placed in maximum 8-inch-thick loose lifts (layers) prior to compacting and compacted to achieve a minimum relative compaction of 95 percent of the ASTM D1557 maximum dry density.
- **Upper Trench Zone Compaction (Non-Road and Non-Parking Lot Areas):** Soil used to construct the upper trench zone backfills should be uniformly moisture conditioned to within 0 to 2 percentage points greater than the ASTM D1557 optimum moisture content, placed in maximum 6-inch-thick loose lifts (layers) prior to compacting and compacted to achieve a minimum relative compaction of 90 percent of the ASTM D1557 maximum dry density.

6. **CQA Testing And Observation Engineering Services:** The moisture content, dry density, and relative percent compaction of all engineered utility trench backfills should be tested by the project engineer's field representative during construction to evaluate whether the compacted trench backfill materials meet or exceed the minimum compaction and moisture content requirements presented in this report. The earthwork contractor shall assist the project engineer's field representative by excavating test pads with the on-site earth moving equipment.
   - **Compaction Testing Frequencies:** The field and laboratory CQA tests should be performed consistent with the testing frequencies presented in Table 5.1.10-1 or as modified by the project engineer to better suit the site conditions.

Table 5.1.10-1 Minimum Testing Frequencies For Utility Trench Backfill

ASTM No.	Test Description	Minimum Test Frequency(1)
D1557	Modified Proctor Compaction Curve	1 per 500 CY (1) Or Material Change (2)
D6938	Nuclear Moisture Content And Density	1 per 100 LF per 24-Inch-Thick Compacted Backfill Layer (3) The maximum loose lift thickness shall not exceed 12-inches prior to compacting.

Notes:
(1) These are minimum testing frequencies that may be increased or decreased at the project engineer's discretion on the basis of the site conditions encountered during grading.
(2) CY = cubic yards.
(3) Whichever criteria provide the greatest number of tests

- **Final Proof Rolling:** The prepared finished grade aggregate base (AB) rock surface and/or finished subgrade soil surface of utility trench backfills should be proof rolled as mentioned above in Section 5.1.5, Paragraph 3.

5.1.12 Surface Water Drainage

H&K recommends the following surface water drainage mitigation measures:

1. Grade all slopes to drain away from building areas with a minimum 4 percent slope for a distance of not less than 10 feet from the building foundations.
2. Grade all landscape areas close to and adjacent to buildings to prevent ponding of water.
3. Direct all building downspouts to solid pipe collectors which discharge to natural drainage courses, storm sewers, catchment basins, infiltration subdrains or other drainage facilities.

5.1.13 Grading Plan Review and Construction Monitoring

CQA includes review of plans and specifications and performing construction monitoring as described below.

1. H&K should be allowed to review the final earthwork grading improvement plans prior to commencement of construction to determine whether the recommendations have been implemented, and if necessary, to provide additional and/or modified recommendations.
2. H&K should be allowed to perform CQA monitoring of all earthwork grading performed by the contractor to determine whether the recommendations have been implemented, and if necessary, to provide additional and/or modified recommendations.
3. H&K's experience, and that of H&K's engineering profession, clearly indicates that during the construction phase of a project the risks of costly design, construction and maintenance problems can be significantly reduced by retaining a design geotechnical engineering firm to review the project plans and specifications and to provide geotechnical engineering (CQA) observation and testing services. Upon your request H&K will prepare a CQA geotechnical engineering services proposal that will present a work scope, tentative schedule and fee estimate for your consideration and authorization. If H&K is not retained to provide geotechnical engineering CQA services during the construction phase of the project, then H&K will not be responsible for geotechnical engineering CQA services provided by others nor any aspect of the project that fails to meet your or third party expectations in the future.

5.2 *STRUCTURAL IMPROVEMENTS*

The structural improvement design criteria recommendations include: seismic design parameters, shallow continuous strip and isolated foundations, retaining walls, concrete slab-on-grade floors, sidewalks and pavement designs. These recommendations are presented hereafter.

5.2.1 Seismic Design Parameters

H&K developed the code-based seismic design parameters in accordance with Section 1613 of the 2016 CBC and the United States Geological Survey (USGS), *U.S. Seismic "DesignMaps" Web Application, Version 3.1.0.* The internet-based application can be found at (https://geohazards.usgs.gov/secure/designmaps/us/) and is used for determining seismic design values from ASCE/SEI-7-10 (erratum released July, 2013), the 2015 International Building Code (2016 CBC). The spectral acceleration, site class, site coefficients and adjusted maximum considered earthquake (MCE) spectral response acceleration, and design spectral acceleration parameters are presented in the Table 5.2.1-1.

Table 5.2.1-1 2016 CBC Seismic Design Parameters

Description	Value	Reference
Latitude	39.6325 deg	Google Earth
Longitude	-122.276 deg	Google Earth
Site Coefficient, F_A	1.097	*2016 CBC, Table 1613.3.3(1), USGS, USSDM, v 3.1.0, 2013*
Site Coefficient, F_V	1.470	*2016 CBC, Table 1613.3.3(2), USGS, USSDM, v 3.1.0, 2013*
Site Class (Stiff Soil Profile)	C	*2016 CBC, Section 1613.3.2, ASCE 7-10 Chapter 20, Table 20.3-1*
Short (0.2 sec) Spectral Response, S_S	0.758 *g*	*2016 CBC, Figure 1613.3.1(1), USGS, USSDM, v 3.1.0, 2013*
Long (1.0 sec) Spectral Response, S_1	0.330 *g*	*2016 CBC, Figure 1613.3.1(2), USGS, USSDM, v 3.1.0, 2013*
Short (0.2 sec) MCE Spectral Response, S_{MS}	0.831 *g*	*2016 CBC, Section 1613.3.3, USGS, USSDM, v 3.1.0, 2013*
Long (1.0 sec) MCE Spectral Response, S_{M1}	0.485 *g*	*2016 CBC, Section 1613.3.3, USGS, USSDM, v 3.1.0, 2013*
Short (0.2 sec) Design Spectral Response, S_{DS}	0.554 *g*	*2016 CBC, Section 1613.3.4, USGS, USSDM, v 3.1.0, 2013*
Long (1.0 sec) Design Spectral Response, S_{D1}	0.323 *g*	*2016 CBC, Section 1613.3.4, USGS, USSDM, v 3.1.0, 2013*

deg = degrees
CBC = California Building Code
MCE = *Maximum Considered Earthquake*
sec = second
USSDM = *U.S. Seismic Design Maps*
USGS = United States Geological Survey

The Seismic Design Parameter Detailed Report developed from the USGS analysis is presented in Appendix E.

5.2.2 Shallow Foundations

Shallow foundations for load-bearing walls should be designed as follows:

1. The base of all shallow foundations should bear on firm, competent non-expansive native soil, or either non-expansive engineered fill or expansive engineered fill compacted consistent with the earthwork recommendations of Section 5.1.
2. Continuous strip foundations should be constructed with the following dimensions:
   a. Minimum Width = 12 Inches.
   b. Minimum Embedment Depth below the lowest adjacent exterior surface grade as shown in Table 5.2.2-1.
3. The allowable bearing capacities to be used for structural design of shallow foundations founded in either non-expansive native soil or non-expansive engineered fill are presented in Table 5.2.2-1.

Table 5.2.2-1 Shallow Foundation Maximum Bearing Pressures

Minimum Foundation Embedment Depth (inches)	Maximum Bearing Pressures For Live + Dead Loads (pounds per square foot)	Maximum Bearing Pressures For Live + Dead + Wind or Seismic Loads (pounds per square foot)
12	2,250	2,990
18	2,500	3,325
24	3,000	3,990

4. Foundation lateral resistance may be computed from passive pressure along the side of the foundation and sliding friction resistance along the foundation base; however, the larger of the two resistance forces should be reduced by 50 percent when combining these two forces. The passive pressure can be assumed to be equal to an equivalent fluid pressure per foot of depth. The passive pressure force and sliding friction coefficient for computing lateral resistance are as follows:
   a. Passive pressure = 300 (H), where H = foundation depth below lowest adjacent soil surface.
   b. Foundation bottom sliding friction coefficient = 0.40 (dimensionless).
5. Minimum steel reinforcement for continuous strip foundations should consist of two No. 4 bars with one bar placed near the top and one bar placed near the bottom of each foundation or as designated by a California-licensed structural engineer.

6. The concrete should have a minimum 3,000 pounds per square inch (psi) compressive break strength after 28 days of curing and have a water to cement ratio from 0.40 to 0.45, and should be placed with minimum and maximum slumps of 3 and 5 inches, respectively. Since water is often added to uncured concrete to increase workability, it is important that strict quality control measures be employed during placement of the foundation concrete to minimize the potential for alteration of the water to cement ratio prior to or during placement.
7. Concrete coverage over steel reinforcements should be a minimum of 3 inches as recommended by the American Concrete Institute (ACI).
8. Prior to placing concrete in any foundation excavations, the contractor shall remove all loose soil, rock, wood, debris or other deleterious materials from the foundation excavations.
9. Foundation excavations should be saturated prior to placing concrete to aid the concrete curing process; however, concrete should not be placed in standing water.
10. Total settlement of individual foundations will vary depending on the plan dimensions of the foundation and actual structural loading. Based on the anticipated foundation dimensions and loads, we estimate that the total post-construction settlement of foundations designed and constructed in accordance with the recommendations will be on the order of 1/2 inch. Differential settlement between similarly loaded, adjacent foundations is expected to be about 1/4 inch, provided the foundations are founded into similar materials (e.g., all on competent and firm engineered fill, native soil or rock).
11. Prior to placing concrete in any foundation excavation the project geotechnical engineer or his/her field representative should observe the excavations to document that the following requirements have been achieved: minimum foundation dimensions, minimum reinforcement steel placement and dimensions, removal of all loose soil, rock, wood, debris, or other deleterious materials, and that firm and competent native or engineered fill soil is exposed along the entire foundation excavation bottom. Strict adherence to these requirements is paramount to the satisfactory behavior of a building foundation. Minor deviations of these requirements can cause the foundations to undergo minor to severe amounts of settlement which can result in cracks developing in the foundation and adjacent structural members such as concrete slab-on-grade floors.

5.2.3 Soil Nail Walls Design Parameters

A California-licensed civil engineer should design all soil nail walls with the following recommended geotechnical engineering design criteria:

The soil nail wall is anticipated to vary in height from a minimum of 2 feet to a maximum of 20 feet, with a shotcrete wall thickness of 12-inches where building surcharge loads bear on top of the wall, and 8 inch shotcrete face for non-surcharge wall areas. Depending on the height of the soil nail wall, the recommended horizontal and vertical spacing as well as the length and thickness of shotcrete facing of the soil nails may vary. The recommended soil nail spacing and length are shown in the table below.

Table 5.2.3-1 Soil Nail Spacing and Length

Wall Height	Maximum Vertical Spacing	Maximum Horizontal Spacing	Length
2 – 20 feet	6 feet on center, 1.5 foot from the top and bottom of wall	6 feet	9 to 14 feet

The recommended drill hole diameter is 4-inches with an inclination of 15 degrees from the horizontal. The recommended soil nail is a #6 Grade 75 All-Thread bar. The nails should be fully bonded with Type II cement grout with a minimum compressive strength of 2,000 psi prior to stressing, and a minimum of 4,000 psi at 28-days.

The recommended initial temporary facing is as follows: 4-inch thick shotcrete with 6x6 – W 4.0 x W 4.0 welded wire mesh reinforcement and two each, horizontal and vertical, minimum Grade 60 #4 waler bars. The recommended permanent facing will include the 4-inch temporary facing with the additional final thickness as follows: 8-inch shotcrete final face with vertical and horizontal reinforcement of minimum Grade 60 #4 rebar directly below the transfer station load out floor and areas of building surcharge load; 4-inch shotcrete final face with vertical and horizontal reinforcement of minimum Grade 60 #4 rebar on all other wall areas beyond the footprint of the transfer station load out floor. The recommended shotcrete concrete yield strength is 3,500 psi at 28 days with a water cement ratio of approximately 0.25.

The recommended bearing plate is 6-square-inches by 0.5-inches thick with a 1.5-inch-diameter bearing plate hole. The recommended bearing plate tensile strength is 75 kips per square inch (ksi) with a minimum yield strength of 60 ksi.

It is recommended that 4 studs with a head diameter of 1.25-inches, head thickness of 0.31-inches, stud shaft diameter of 0.75-inches, length of 5.0-inches, spaced 4-inches on center are required for each bearing plate. The recommended tensile strength of the studs is 60 ksi.

To limit water pressure development and corrosion of the soil nails, a drainage system is recommended between the initial facing and excavation face. Typically, this is a prefabricated synthetic drainage mat with drainage or weep holes installed near the bottom of the wall. Due to the aggressiveness of the soil Type (Class) I corrosion protection is recommended for the soil nails. Typical protection mechanisms include epoxy-coated bar and plastic sheathing encapsulation.

5.2.4 Retaining Walls Design Parameters

A California-licensed civil engineer should design all retaining walls with the following geotechnical engineering design criteria:

1. Retaining walls should be founded on firm competent native soil or engineered fill soil consistent with the requirements of Section 5.1.
2. The retaining wall should be designed by a California-licensed civil engineer using the geotechnical engineering design parameters presented in Table 5.2.3-1.
3. The retaining wall backfill soil should be free draining material that meets or exceeds the material requirements of Section 5.2.4 and is placed and compacted consistent with the requirements of Section 5.2.4.
4. The static lateral earth pressures exerted on the retaining walls may be assumed to be equal to an equivalent fluid pressure per foot of depth below the top of the wall. The lateral pressures presented below do not include a safety factor, and assumes a free draining backfill (no hydrostatic forces acting on the wall) and no surcharge loads applied within a distance of ½ the wall height.
5. The design engineer should determine the additional vehicle surcharge load to be applied to the design at the top of the wall/transfer station tipping floor.
6. The retaining wall foundation excavations should be saturated prior to placing concrete to aid the concrete curing process. However, concrete should not be placed in standing water.
7. The retaining wall should be designed to resist seismic loading conditions, also.

Table 5.2.1-1 Retaining Wall Design Parameters

Loading Conditions[1]	Retaining Wall With Horizontal Backfill Slope (psf)	Retaining Wall With Maximum 2H:1V Backfill Slope (psf)
Wall Active Pressures (psf) [2]	45 (H) [5]	60 (H)
Wall Passive Pressures (psf) [3]	300 (H)	300 (H)
Wall At-Rest Pressure (psf) [4]	65 (H)	80 (H)
Wall Seismic Pressure (psf)	9 (H)	9 (H)
P_{active} Force Located Above Foundation Base	0.33 (H)	0.33 (H)
$P_{passive}$ Force Located Above Foundation Base	0.33 (H)	0.33 (H)
$P_{at\text{-}rest}$ Force Located Above Foundation Base	0.33 (H)	0.33 (H)
$P_{seismic}$ Force Located Above Foundation Base	0.60 (H)	0.60 (H)
Foundation Bearing Capacity Pressure (psf) Live + Dead Loads	2,250	2,250
Foundation Bearing Capacity Pressure (psf) Live + Dead + Wind or Seismic Loads	2,990	2,990
Foundation Bottom Friction Coefficient (dim.) [5]	0.40	0.40

Notes:

(1) The indicated loading conditions are for static loads only with the exception of the foundation bearing capacity loads. All of the other load conditions do not include dynamic loads such as wind and seismic loading.

(2) The active pressure condition applies to a retaining wall with an unrestrained top (deflection allowed).

(3) The passive condition applies to a retaining wall with soil resistance at the base. If passive pressures are used then H&K recommends that the top 1.0 feet of soil weight be ignored.

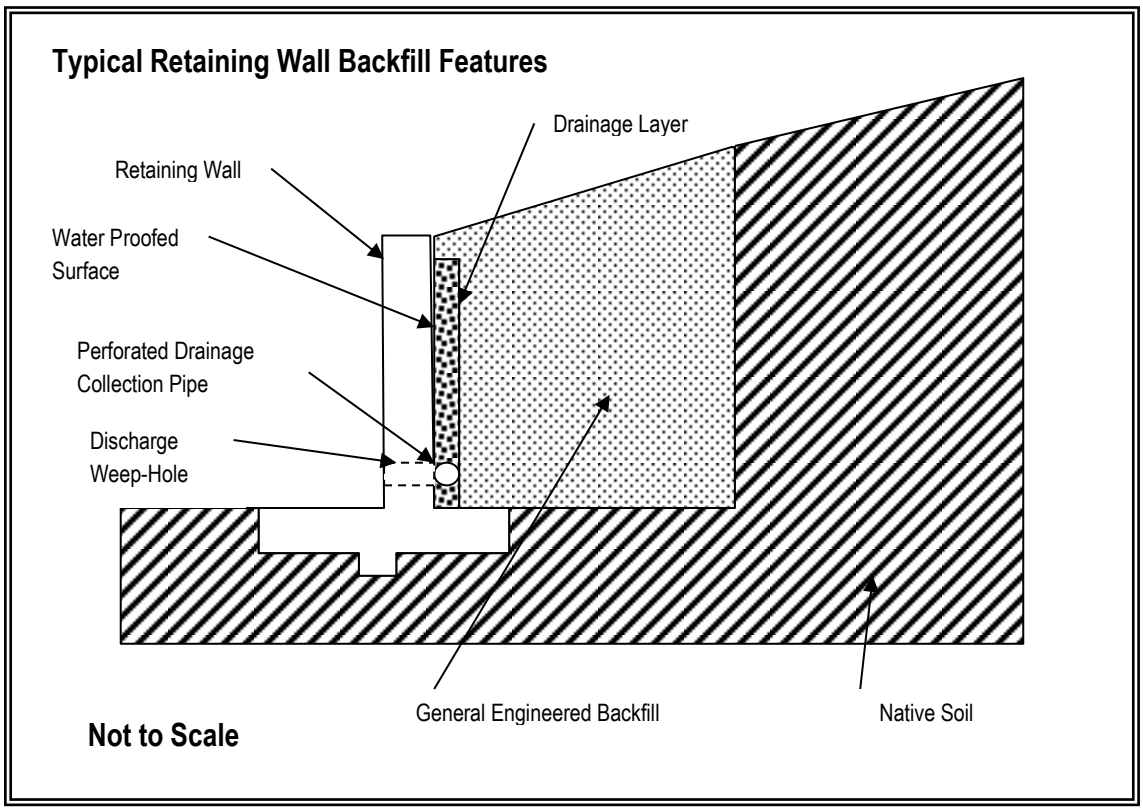
(4) The At-Rest pressure condition applies to a retaining wall with the top restrained (no deflection allowed).

(5) If the design horizontal resistance force acting on the wall foundation is computed by combining both the sliding friction force and passive soil pressure force, then the larger of the two forces should be reduced by 50 percent.

(6) H = The distance to a point in the backfill soil where the pressure is desired. The H distance is measured from the top of the wall for active and at-rest conditions and from one foot below the soil height at the toe of the wall (See Note 2 for passive condition).

5.2.5 Retaining Wall Backfill

Place and compact all retaining wall backfill and drainage layer materials as described below. Sub-structure retaining walls for below grade rooms, basements, garages, elevator shafts, etc. should also incorporate a water proofing sealant as described below. The water proofing sealant products should be installed by a qualified waterproofing contractor according to the manufacturer's directions. A typical retaining wall and backfill material zones is shown below.



1. **Waterproofing:** Waterproofing materials should be installed behind retaining walls prior to backfilling if retaining walls will be constructed for below grade rooms, basements, garages, elevator shafts, etc. The waterproofing materials should be installed by a qualified waterproofing contractor according to the manufacturer's directions.

2. **Drainage Layer:** A drainage layer should be placed between the wall and backfill material in order to prevent build up of hydrostatic pressures behind the wall. Additionally, care should be taken during placement of the drainage layer materials so as not to crush, tear or damage the water proofing materials. The drainage layer can be constructed from drain rock, geosynthetic drain nets or a combination of both as described below.

    a) **Caltrans Class II Permeable Material Method:** Place a minimum 12-inch-thick layer of Caltrans Class II Permeable Material directly against the wall or waterproofing system (as described below) without a geotextile wrapping to separate the backfill soil from the wall. The drainage material should extend form the wall bottom to within 12 inches of the wall top.

    b) **Geotextile Wrapped Drain Rock Method:** Place a minimum 12-inch-thick layer of drain rock wrapped in a geotextile filter fabric directly against the wall

or waterproofing system (as described below) to separate the backfill soil from the wall. The drain rock should extend from the wall bottom to within 12 inches of the wall top. A minimum 6-oz/sy non-woven geotextile fabric such as Amoco 4506 manufactured by Amoco Fabrics and Fibers Company or equivalent should be used.

c) **Geosynthetic Composite Drainnet (Geonet) Method:** Place a geosynthetic composite drain-net (geonet) directly against the wall or waterproofing system (as described below) to separate the backfill soil from the wall. The composite geonet should extend from the wall bottom to within 12 inches of the wall top. A geosynthetic composite drainnet such a Hydroduct 200 or Hydroduct 220 distributed by Grace Construction Products or equivalent should be used.

3. **Drainage Layer Collection and Discharge Pipes:** A minimum 4-inch-diameter polyvinyl chloride (PVC) perforated drainpipe should be placed at the wall base inside the geotextile wrapped drain rock or wrapped by the composite geonet. Four 1/4–inch-diameter perforations should be drilled into the pipe. The perforations should be orientated in cross section view at 90 degrees to one another and along the pipe length on 6-inch-centers. A minimum of 3 inches of drain rock should be placed below the perforated PVC pipe. The pipe should direct water away from the wall by gravity with a minimum 1 percent slope. The pipe should collect ground water collected by the drainage layer discharge to the surface at the end of the wall or through weep-hole penetrations through the wall.
4. **General Backfill Placement Equipment:** Heavy conventional motorized compaction equipment should not be used directly adjacent to the retaining walls unless the wall is designed with sufficient steel reinforcements and/or bracing to resist the additional lateral pressures. Compaction of backfill materials within 5 feet of the retaining wall should be accomplished by lightweight hand-operated, walk behind, and vibratory equipment. Additionally, care should be taken during placement of the general backfill materials so as not to crush, tear or damage the waterproofing and/or drainage layer materials.
5. **General Backfill Compaction:** The retaining wall backfill material placed between the drainage layer and temporary cut-slope should be compacted to a minimum of 90 percent of the ASTM D1557 maximum dry density. If the backfill material is classified by the USCS as a coarse-grained material (i.e., GP, GW, GC, GM, SP, SW, SC, and SM) then it should be moisture conditioned to between ± 3 percentage points of the ASTM D1557 optimum moisture content. If the backfill material is classified by the USCS as a fine-grained material (i.e., CL, CH, ML, or MH) then it

should be moisture conditioned to between 0 and 4 percentage points greater than the ASTM D1557 optimum moisture content.

5.2.6 Concrete Slab-On-Grade Floors

In general, H&K recommends that subgrade elevations on which the concrete slab-on-grade floors are constructed be a minimum of 6 inches above the elevation of the surrounding parking driveway and landscaped areas. Elevating the building will reduce the potential for subsurface water to enter beneath the concrete slab-on-grade floors and exterior surfaces and underground utility trenches.

The concrete slab-on-grade building floors, patios, sidewalks and driveway areas should be evaluated by a California-licensed civil engineer for expected live and dead loads to determine if the minimum slab thickness and steel reinforcement recommendations presented in this report should be increased or redesigned.

H&K recommends using the guideline procedures, methods and material properties that are presented in the following ASTM and ACI documents for construction of concrete slab-on-grade floors:

- ACI 302.1R-04 Guide For Concrete Floor And Slab Construction, reported by ACI Committee 302.
- ASTM E1643-98 (Reapproved 2005), Standard Practice For Installation Of Water Vapor Retarders Used In Contact With Earth Or Granular Fill Under Concrete Slabs.
- ASTM E1745-97 (Reapproved 2004), Standard Specifications For Plastic Water Vapor Retarders Used In Contact With Soil Or Granular Fill Under Concrete Slabs.
- ASTM F710-5 Standard Practice For Preparing Concrete Floors To Receive Resilient Flooring.

5.2.6.1 Interior Office Floors

The interior office building concrete slab-on-grade floor components are described below from top to bottom. If static or intermittent live floor loads greater than 250 pounds per square foot (psf) are anticipated, then a California-licensed engineer should design the necessary concrete slab-on-grade floor thickness and steel reinforcements.

1. The recommended modulus of subgrade value of 300 kips/cubic foot should be used if the site subgrade is prepared in accordance with the recommendations presented in Section 5.1 above.
2. Minimum 4-Inch-Thick Concrete Slab: The concrete slab should be installed with a minimum 3,000 psi compressive strength after 28 days of curing. H&K recommends that the concrete design uses a water to cement ratio between 0.40 and 0.45 and

should be placed with minimum and maximum slumps of 3 and 5 inches, respectively. The concrete mix design is the responsibility of the concrete supplier.

3. Prior to applying construction loads, all exposed concrete slab-on-grade floors should be moisture cured for a minimum of 7 days following placement of the concrete. If concrete is placed during the hot summer months when the ambient air temperatures may be as low as 50 to 60 degrees Fahrenheit (°F) in the early morning and in excess of 90 °F in the afternoon, then the contractor may need to implement special curing measures to reduce the development of shrinkage cracks. The concrete contractor is responsible for determining the appropriate curing process to be applied to the slab-on-grade floor.

4. Steel Reinforcement: Reinforcement should be used to improve the load-carrying capacity, and to reduce cracking caused by shrinkage during curing and from both differential and repeated loadings. It should be understood that it is nearly impossible to prevent all cracks from development in concrete slabs; in other words, it should be expected that some cracking will occur in all concrete slabs no matter how well they are reinforced. Concrete slabs that will be subjected to heavy loads should be designed with steel reinforcements by a California-licensed structural engineer.

   Steel Rebar: As a minimum, use No. 3 rebar (ASTM A615/A 615M-04 Grade 60), tied and placed with 18-inch centers in both directions (perpendicular) and supported on concrete “dobies” to position the rebar in the center of the slab during concrete pouring. H&K does not recommend that the steel reinforcements of the concrete slab-on-grade floor be tied into the perimeter or interior continuous strip foundations or interior isolated column foundations. In other words, we recommend that the concrete slab-on-grade floors be constructed as independent structural members so that they can move (float) independently from the foundation structures.

5. Underslab Vapor-Moisture Retarder Membrane: The underslab retarder membrane should be placed as a floor component that will minimize transmission of both liquid water and water vapor transmission through the concrete slab-on-grade floor. H&K recommends using at a minimum a Class A (ASTM E1745-97 [Reapproved 2004]), minimum 10-mil-thick, plastic, vapor-moisture, retarder membrane material such as Stego Wrap® underslab vapor retarder membranes or equivalents. Additionally, the following materials are recommended: Stego® Tape and Stego® Mastic or equivalents to seal membrane joints and any utility penetrations.

   Regardless of the type of moisture-vapor retarder membrane used, moisture can wick up through a concrete slab-on-grade floor. Excessive moisture transmission through a concrete slab floor can cause adhesion loss, warping, and peeling of resilient floor coverings, deterioration of adhesive, seam separation, formation of air

pockets, mineral deposition beneath flooring, odor and both fungi and mold growth. Slabs can be tested for water transmissivity in areas that are moisture sensitive. Commercial sealants, polymer additives to the concrete at the batch plant, entrained air, flyash, and a reduced water-to-content ratio can be incorporated into the concrete slab-on-grade floor mix design to reduce its permeability and water-vapor transmissivity properties. A waterproofing consultant should be contacted to provide detailed recommendations if moisture sensitive flooring materials will be installed on the concrete slab-on-grade floors.

6. Minimum 6-Inch-Thick Crushed Rock Layer: The crushed rock layer should be placed and compacted to a minimum of 95 percent of the ASTM D1557 dry density with a moisture content of ± 3 percentage points of the ASTM D1557 optimum moisture content. The crushed rock should be washed to produce an ASTM D422 test particle size distribution of 100 percent (by dry weight) passing the ¾ inch sieve and 0 to 5 percent passing the No. 4 sieve and 0 to 3 percent passing the No. 200 sieve. This relatively clean (washed) crushed rock will act as a capillary break for free water moisture transmission, as well as provide a uniform bearing surface for the concrete slab-on-grade floor.
7. Subgrade Soil Preparation: The subgrade soil should be prepared and compacted consistent with the recommendations of Section 6.1. The top 12 inches of the non-expansive soil should be compacted to a minimum of 90 percent of the ASTM D1557 dry density with relatively uniform moisture content within ± 3 percentage points of the ASTM D1557 optimum moisture content.
8. Crack Control Grooves: Crack control grooves should be installed during placement or saw cuts should be made in accordance with the ACI and Portland Cement Association (PCA) specifications. Generally, H&K recommends that expansion joints be provided between the slab and perimeter footings, and that crack control grooves or saw cuts are installed on maximum 10-foot-centers in both directions (perpendicular).
9. Field Observations: Field observations should be made by an H&K construction monitor of all concrete slab-on-grade subgrade surfaces and installed steel reinforcements prior to placing concrete.

5.2.6.2 Vehicle Traffic Floors

The transfer station tipping floor and vehicle traffic concrete slab-on-grade floor components are described below from top to bottom. If static or intermittent live floor loads greater than 250 psf are anticipated, then a California-licensed engineer should design the necessary concrete slab-on-grade floor thickness and steel reinforcements.

1. The recommended modulus of subgrade value of 300 kips/cubic foot should be used if the site subgrade is prepared in accordance with the recommendations presented in Section 5.1 above.

2. Minimum 6-Inch-Thick Concrete Slab: The concrete slab should be installed with a minimum 3,500 pounds psi compressive strength after 28 days of curing. H&K recommends that the concrete design uses a water-to-cement ratio between 0.40 and 0.45 and should be placed with minimum and maximum slumps of 3 and 5 inches, respectively. The concrete mix design is the responsibility of the concrete supplier.

3. Prior to applying construction loads, all exposed concrete slab-on-grade floors should be moisture cured for a minimum of 7 days following placement of the concrete. If concrete is placed during the hot summer months when the ambient air temperatures may be as low as 50 to 60 °F in the early morning and in excess of 90 °F in the afternoon, then the contractor may need to implement special curing measures to reduce the development of shrinkage cracks. The concrete contractor is responsible for determining the appropriate curing process to be applied to the slab-on-grade floor.

4. Steel Reinforcement: Reinforcement should be used to improve the load-carrying capacity, and to reduce cracking caused by shrinkage during curing and from both differential and repeated loadings. It should be understood that it is nearly impossible to prevent all cracks from development in concrete slabs; in other words, it should be expected that some cracking will occur in all concrete slabs no matter how well they are reinforced. Concrete slabs that will be subjected to heavy loads should be designed with steel reinforcements by a California-licensed structural engineer.

   Steel Rebar: As a minimum, use No. 4 rebar (ASTM A615/A 615M-04 Grade 60), tied and placed with 12-inch centers in both directions (perpendicular) and supported on concrete “dobies” to position the rebar in the center of the slab during concrete pouring. H&K does not recommend that the steel reinforcements of the concrete slab-on-grade floor be tied into the perimeter or interior continuous strip foundations or interior isolated column foundations. In other words, we recommend that the concrete slab-on-grade floors be constructed as independent structural members so that they can move (float) independently from the foundation structures.

5. Minimum 6-Inch-Thick Crushed Rock or Class II Aggregate Base Rock Layer: The crushed rock or Class II aggregate base layer should be placed and compacted to a minimum of 95 percent of the ASTM D1557 dry density with a moisture content of ± 3 percentage points of the ASTM D1557 optimum moisture content. The crushed rock should be washed to produce an ASTM D422 test particle size distribution of

100 percent (by dry weight) passing the ¾ inch sieve and 0 to 5 percent passing the No. 4 sieve and 0 to 3 percent passing the No. 200 sieve. This relatively clean (washed) crushed rock will act as a capillary break for free water moisture transmission as well as provide a uniform bearing surface for the concrete slab-on-grade floor. An alternative rock material for external slab-on-grade concrete surfaces would include AB rock meeting the specification of Caltrans Class II AB. Just prior to pouring the concrete slab, the rock layer should be moistened to a saturated surface dry (SSD) condition. This measure will reduce the potential for water to be withdrawn from the bottom of the concrete slab while it is curing and will help minimize the development of shrinkage cracks.

6. Subgrade Soil Preparation: The subgrade soil should be prepared and compacted consistent with the recommendations of Section 6.1. The top 12 inches of the non-expansive soil should be compacted to a minimum of 90 percent of the ASTM D1557 dry density with relatively uniform moisture content within ± 3 percentage points of the ASTM D1557 optimum moisture content.

7. Crack Control Grooves: Crack control grooves should be installed during placement or saw cuts should be made in accordance with the ACI and PCA specifications. Generally, H&K recommends that expansion joints be provided between the slab and perimeter footings, and that crack control grooves or saw cuts are installed on maximum 10-foot-centers in both directions (perpendicular).

8. Field Observations: Field observations should be made by an H&K construction monitor of all concrete slab-on-grade subgrade surfaces and installed steel reinforcements prior to placing concrete.

5.2.6.3 Exterior Sidewalks and Patios

The exterior concrete slab-on-grade surface components are described below from top to bottom. If static or intermittent live loads greater than 250 psf are anticipated, or if heavy traffic loads are anticipated, then a California-licensed structural engineer should design the necessary concrete slab-on-grade floor thickness and steel reinforcements.

1. Minimum 4-Inch-Thick Concrete Slab: The concrete slab should be installed with a minimum 2,500 psi compressive strength after 28 days of curing. H&K recommends that the concrete design uses a water-to-cement ratio between 0.40 and 0.45 and should be placed with minimum and maximum slumps of 4 and 6 inches, respectively. The concrete mix design is the responsibility of the concrete supplier.

   Prior to applying construction loads, all exposed concrete slab-on-grade floors should be moisture cured for a minimum of 7 days following placement of the concrete. If concrete is placed during the hot summer months when the ambient air temperatures may be as low as 50 to 60 °F in the early morning and in excess of 90

°F in the afternoon, then the contractor may need to implement special curing measures to reduce the development of shrinkage cracks. The concrete contractor is responsible for determining the appropriate curing process to be applied to the slab-on-grade floor.

2. Prior to applying construction loads, all exposed concrete slab-on-grade floors should be moisture cured for a minimum of 7 days following placement of the concrete. If concrete is placed during the hot summer months when the ambient air temperatures may be as low as 50 to 60 °F in the early morning and in excess of 90 °F in the afternoon, then the contractor may need to implement special curing measures to minimize the development of shrinkage cracks. The concrete contractor is responsible for determining the appropriate curing process to be applied to the slab-on-grade floors.

3. Steel Reinforcement: should be used to improve the load carrying capacity and to reduce cracking caused by shrinkage during curing and from both differential and repeated loadings. It should be understood that it is nearly impossible to prevent all cracks from development in concrete slabs; in other words, it should be expected that some cracking will occur in all concrete slabs no matter how well they are reinforced or cured. Concrete slabs that will be subjected to heavy loads should be designed with steel reinforcements by a California-licensed structural engineer.

   If the current property owner elects to eliminate the steel reinforcements from the exterior concrete slabs-on-grade for economic reasons, then there will be an inherent greater risk assumed by the developer for the occurrence of both shrinkage and bearing related cracks in the associated slabs.

   Steel Rebar: As a minimum, use No. 3 rebar (ASTM A615/A 615M-04 Grade 60), tied and placed with 18-inch centers in both directions (perpendicular) and supported on concrete “dobies” to position the rebar in the center of the slab during concrete pouring.

4. Minimum 4-Inch-Thick Crushed Rock or Class II Aggregate Base Rock Layer: should be placed and compacted to a minimum of 95 percent of the ASTM D1557 dry density with a moisture content of ± 3 percentage points of the ASTM D1557 optimum moisture content. The crushed rock should be washed to produce a particle size distribution of 100 percent (by dry weight) passing the ¾ inch sieve and 5 percent passing the No. 4 sieve and 0 to 3 percent passing the No. 200 sieve. An alternative rock material for external slab-on-grade concrete surfaces would include AB rock meeting the specification of Caltrans Class II AB. Just prior to pouring the concrete slab, the rock layer should be moistened to an SSD condition. This measure will reduce the potential for water to be withdrawn from the bottom of the

concrete slab while it is curing and will help minimize the development of shrinkage cracks.

If the current property owner elects to eliminate the crushed rock or AB rock layer beneath the exterior concrete slabs-on-grade for economic reasons, then there will be an inherent greater risk assumed by the developer for the development of both shrinkage and bearing related cracks in the associated slabs.

5. Subgrade Soil Preparation: The subgrade soil should be prepared and compacted consistent with the recommendations of Section 6.1. The top 12 inches of the non-expansive soil should be compacted to a minimum of 90 percent of the ASTM D1557 dry density with relatively uniform moisture content within ± 3 percentage points of the ASTM D1557 optimum moisture content.
6. Crack Control Grooves: Crack control grooves should be installed during placement or saw cuts should be made in accordance with the ACI and PCA specifications. Generally, H&K recommends that expansion joints be provided between the slab and perimeter footings, and that crack control grooves or saw cuts are installed on 10-foot-centers in both directions (perpendicular).
7. Field Observations: Field observations should be made by an H&K construction monitor of all concrete slab-on-grade surfaces and installed steel reinforcements prior to pouring concrete.

5.2.6.4 Rigid Pavement for Heavy Truck Traffic Areas

The truck route and loading dock concrete slab-on-grade floor components are described below from top to bottom. If static or intermittent live floor loads greater than 250 psf are anticipated, then a California-licensed structural engineer should design the necessary concrete slab-on-grade floor thickness and steel reinforcements.

1. The recommended modulus of subgrade value of 300 kips/cubic foot should be used if the site subgrade is prepared in accordance with the recommendations presented in Section 5.1 above.
2. Minimum 6-Inch-Thick Concrete Slab: The concrete slab should be installed with a minimum 3,500 pounds psi compressive strength after 28 days of curing. H&K recommends that the concrete design uses a water-to-cement ratio between 0.40 and 0.45 and should be placed with minimum and maximum slumps of 3 and 5 inches, respectively. The concrete mix design is the responsibility of the concrete supplier.
3. Prior to applying construction loads, all exposed concrete slab-on-grade floors should be moisture cured for a minimum of 7 days following placement of the concrete. If concrete is placed during the hot summer months when the ambient air

temperatures may be as low as 50 to 60 °F in the early morning and in excess of 90 °F in the afternoon, then the contractor may need to implement special curing measures to reduce the development of shrinkage cracks. The concrete contractor is responsible for determining the appropriate curing process to be applied to the slab-on-grade floor.

4. Steel Reinforcements: should be used to improve the load carrying capacity and to minimize cracking caused by shrinkage during curing and from both differential and repeated loadings. It should be understood that it is nearly impossible to prevent all cracks from development in concrete slabs; in other words, it should be expected that some cracking will occur in all concrete slabs no matter how well they are reinforced. Concrete slabs that will be subjected to heavy loads should be designed with steel reinforcements by a California-licensed structural engineer.

   If the property owner (developer) elects to eliminate the steel reinforcements from the exterior concrete slabs-on-grade for economic reasons, then there will be an inherent greater risk assumed by the developer for the development of both shrinkage and bearing related cracks in the associated slabs.

   Steel Rebar: Use No. 4 rebar (ASTM A615/A 615M-04 Grade 60), tied and placed with 12-inch centers in both directions (perpendicular) and supported on concrete "dobies" to position the rebar in the center of the slab during concrete pouring. H&K does not recommend that the steel reinforcements of the concrete slab-on-grade floor be tied into the perimeter or interior continuous strip foundations or interior isolated column foundations. In other words, we recommend that the concrete slab-on-grade floors be constructed as independent structural members so that they can move (float) independently from the foundation structures.

5. Minimum 8-Inch-Thick Crushed Rock or Class II AB Layer: should be placed and compacted to a minimum of 95 percent of the ASTM D1557 dry density with a moisture content of ± 3 percentage points of the ASTM D1557 optimum moisture content. For exterior concrete surface only, Caltrans Class II AB Rock is acceptable for use. If crushed rock is used, the crushed rock should be washed to produce a particle size distribution of 100 percent (by dry weight) passing the ¾ inch sieve and 5 percent passing the No. 4 sieve and 0 to 3 percent passing the No. 200 sieve. However, just prior to pouring the concrete slab, the crushed rock layer should be moistened to an SSDcondition. This measure will reduce the potential for water to be withdrawn from the bottom of the concrete slab while it is curing and will help minimize the development of shrinkage cracks. The use of processed onsite material is acceptable, as long as the material is screened to a 3-inch minus and washed clean of fines.

6. Subgrade Soil Preparation: The subgrade soil should be prepared and compacted consistent with the recommendations of Section 5.1. The top 12 inches of the non-expansive soil should be compacted to a minimum of 95 percent of the ASTM D1557 dry density with a relatively uniform moisture content of 0 to 4 percentage points greater than the ASTM D1557 optimum moisture content.

   After placing the overlying crushed rock layer or processed native soil, the subgrade soil must be moisture conditioned to achieve a uniform moisture content between 2 and 6 percentage points greater than the ASTM D1557 optimum moisture content to a depth of 12 inches below the finished subgrade surface. Moisture conditioning should be performed for a minimum of 24 hours prior to concrete placement. If the soil is not moisture conditioned prior to placing concrete, moisture could be wicked (transmitted) out of the concrete by the underlying potentially dryer soil, which could cause shrinkage cracks to develop in the concrete slab during the curing period.

   Additionally, we believe that moisture conditioning the subgrade soil will reduce the swell (heave) potential of fine-grained soil with moderate to high expansion properties. Typically, concrete slabs impart relatively small loads on the order of about 50 psf on the underlying subgrade soil. Therefore, some vertical movement of the concrete slab should be anticipated from possible expansion of the underlying subgrade soil, if it is not properly moisture conditioned as describe in the preceding.

7. Crack Control Grooves: should be installed during placement or saw cuts should be made in accordance with the ACI and PCA specifications. Generally, H&K recommends that expansion joints be provided between the slab and perimeter footings, and that crack control grooves or saw cuts are installed no greater than 10-foot-centers in both directions (perpendicular).

8. Field Observations: should be made by an H&K construction monitor of all concrete slab-on-grade subgrade surfaces and installed steel reinforcements prior to placing concrete.

5.2.7 Flexible Pavement Design and Construction

The design and construction of AC pavements for the project site are discussed below.

5.2.7.1 Asphalt Concrete Pavement Design

H&K used the Caltrans Design Method D301 to develop several AC pavement and AB rock design alternatives to allow for different traffic loading conditions. H&K used a Traffic Index (TI) of 4 to 8 which represents typical light passenger vehicle traffic to heavy truck traffic. The actual TI for the project pavement areas should be determined in accordance with Chapter 600 of the Caltrans Highway Design Manual.

H&K obtained samples of the on-site soil and rock during H&K's field investigation that we anticipate will be representative of the subgrade soil for the roads, driveways and parking areas. Based on the gradation laboratory test and H&K's experience with similar materials, an R-Value (resistance value) of 8 for the on-site materials was assumed. The actual subsurface soil conditions exposed at the finished subgrade surface of the roadways may be different from this R-Value. Overexcavation and import of suitable borrow soil can change this R-Value significantly, producing a cost saving due to a reduction in AB or AC thicknesses. Please note that the Caltrans design method requires for design purposes that the maximum R-Value of the subgrade soil does not exceed 50.

H&K assumed that the pavement layers will be constructed with Class 2 Aggregate Base Rock (Minimum R-Value = 78) and Type A Asphalt Concrete in accordance with the requirements of Section 26 of the Caltrans Standard Specifications. Table 5.2.6.1-1 presents the road, driveway, and parking pavement design section. H&K recommends that the AB rock layer be constructed with a minimum thickness of 6-inches for constructability issues and to achieve a higher level of confidence that the road will achieve the expected service life.

Table 5.2.7.1-1 Flexible Pavement Design

Parameters	Design Values				
Traffic Description (approximate)	Light Automobiles	Light to Medium Autos and Trucks	Medium to Heavy Trucks	Heavy Trucks	Very Heavy Trucks
Traffic Index (TI)	4	5	6	7	8
Design R-Values Class II AB Rock Subgrade Soil	 78 8	 78 8	 78 8	 78 8	 78 8
AC Thickness (inch)	2.5	3.0	3.5	4.0	5.0
AB Rock Thickness (inch) (95% Relative Compaction)	8.0	10.5	13.0	15.0	17.5
Subgrade Soil Thickness (inch) (95% Relative Compaction)	12.0	12.0	12.0	12.0	12.0
Note: H&K recommends that the minimum thickness of AB rock should be 6 inches regardless of what the Caltrans design method indicates. This minimum thickness is necessary for constructability issues and will increase the level of confidence that the roads will achieve the expected service life.					

The subgrade soil and AB rock should be placed and compacted as described below.

1. The subgrade soil to a depth of 12 inches from the finished grade surface should be compacted to a minimum relative compaction of 95 percent of the ASTM D1557 maximum dry density with a moisture content of ± 3 percentage points of the ASTM

D1557 optimum moisture content. The compacted sub-grade soil shall be graded to achieve the design grades and tolerances. The native sub-grade shall be graded to within +0.00-feet higher and -0.10-feet lower than the design grade.

2. The stability of the compacted subgrade soil should be evaluated by wheel rolling prior to placing the overlying AB rock layer. Wheel rolling should be performed with a fully loaded water truck with tire pressures between 60 and 95 psi. The subgrade soil surface should exhibit only minor deflections as the wheel load passes by. Any unstable areas should be reworked and then retested for percent relative compaction and percent moisture content and then proof rolled again. This process should be repeated until the area appears to be relatively stable.
3. The Caltrans Class II AB rock should be compacted to a minimum relative compaction of 95 percent of the ASTM D1557 maximum dry density with a moisture content of ± 3 percentage points of the ASTM D1557 optimum moisture content. The aggregate base rock sub-grade surface shall be graded to within +0.00-feet higher and -0.05-feet lower than the design grade surface.
4. The stability of the compacted AB rock should be evaluated by wheel rolling prior to placing the overlying AC layer. Wheel rolling should be performed with a fully loaded water truck with tire pressures between 60 and 95 psi. The AB rock surface should exhibit only minor deflections as the wheel load passes by. Any unstable areas should be reworked and then retested for percent relative compaction and percent moisture content and then proof rolled again. This process should be repeated until the area appears to be relatively stable.
5. Concrete cut-off curbs should be constructed around all landscaped areas that are adjacent to AC paved driveways and parking areas. The curbs should extend to a minimum depth of 8 inches into the underlying subgrade soil. The extended curbs will reduce migration of irrigation and rain waters originating in the landscaped areas from entering the AB rock materials underlying the AC pavement material. This design is intended to minimize failures of the paved areas due to saturation of the underlying AB rock and subgrade soils.

6 REFERENCES

The following presents the references cited or used in preparation of this report:

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GBA, Important Information About This Geotechnical Engineering Report, copyright 2016.

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7 LIMITATIONS

The following limitations apply to the findings, conclusions and recommendations presented in this report:

1. This report should not be relied upon without review by H&K if a period of 24 months elapses between the issuance report date shown above and the date when construction commences.
2. H&K's professional services were performed consistent with the generally accepted geotechnical engineering principles and practices employed in Northern California. This warranty is in lieu of all other warranties, either expressed or implied.
3. H&K provided engineering services for the site project consistent with the work scope and contract agreement presented in H&K's proposal and agreed to by the client. The findings, conclusions and recommendations presented in this report apply to the conditions existing when H&K performed the services and are intended only for the client, purposes, locations, time frames and project parameters described herein. H&K is not responsible for the impacts of any changes in environmental standards, practices or regulations subsequent to completing the services. H&K does not warrant the accuracy of information supplied by others, or the use of segregated portions of this report. This report is solely for the use of the client unless noted otherwise. Any reliance on this report by a third party is at the party's sole risk.
4. If changes are made to the nature or design of the project as described in this report, then the conclusions and recommendations presented in this report should be considered invalid by all parties. The validity of the conclusions and recommendations presented in this report can only be made by H&K; therefore, H&K should be allowed to review all project changes and prepare written responses with regards to their impacts on the conclusions and recommendations. However, additional fieldwork and laboratory testing may be required for us to develop any modifications to the recommendations. The cost to review project changes and perform additional fieldwork and laboratory testing necessary to modify the recommendations is beyond the scope-of-services presented in this report. Any additional work will be performed only after receipt of an approved scope-of-work, budget and written authorization to proceed.
5. The analyses, conclusions and recommendations presented in this report are based on the site conditions as they existed at the time H&K performed the surface and subsurface field investigations. H&K has assumed that the subsurface soil and groundwater conditions encountered at the location of the exploratory borings are generally representative of the subsurface conditions throughout the entire project

site. However, if the actual subsurface conditions encountered during construction are different than those described in this report, then H&K should be notified immediately so that H&K can review these differences and, if necessary, modify the recommendations.

6. The elevation or depth to the groundwater table underlying the project site may differ with time and location. Therefore, the depth to the groundwater table encountered in the exploratory borings is only representative of the specific time and location where it was observed.

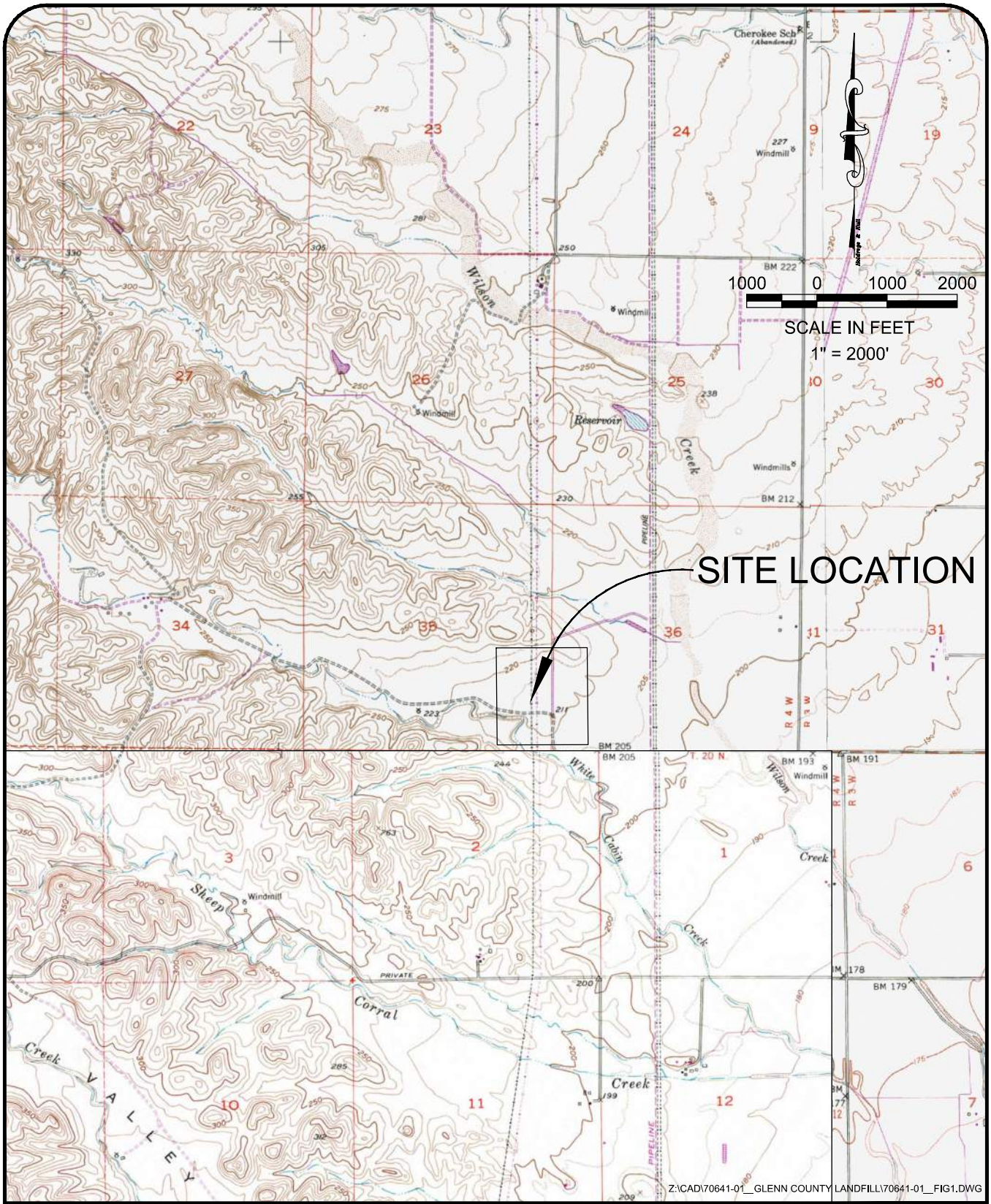
7. The project site map shows approximate exploratory trench and/or trench locations as determined by pacing distances from identifiable site features; therefore, their locations should not be relied upon as being exact nor located with the accuracy of a California-licensed land surveyor.

8. Our geotechnical investigation scope-of-services did not include an evaluation of the project site for the presence of hazardous materials. Although H&K did not observe the presence of hazardous materials at the time of the field investigation, all project personnel should be careful and take the necessary precautions in the event hazardous materials are encountered during construction.

9. The geotechnical investigation scope-of-services did not include an evaluation of the project site for the presence of mold nor for the future potential development of mold at the project site. If an evaluation of the presence of mold and/or for the future potential development of mold at the site is desired, then the property owner should contact a consulting firm specializing in these types of investigations. Holdrege & Kull does not perform mold evaluation investigations.

10. H&K's experience and that of the civil engineering profession clearly indicates that during the construction phase of a project the risks of costly design, construction and maintenance problems can be significantly reduced by retaining the design geotechnical engineering firm to review the project plans and specifications and to provide geotechnical engineering CQA observation and testing services. Upon your request H&K will prepare a CQA geotechnical engineering services proposal that will present a work scope, tentative schedule and fee estimate for your consideration and authorization. If H&K is not retained to provide geotechnical engineering CQA services during the construction phase of the project, then H&K will not be responsible for geotechnical engineering CQA services provided by others nor any aspect of the project that fails to meet your or third party expectations in the future.

FIGURES



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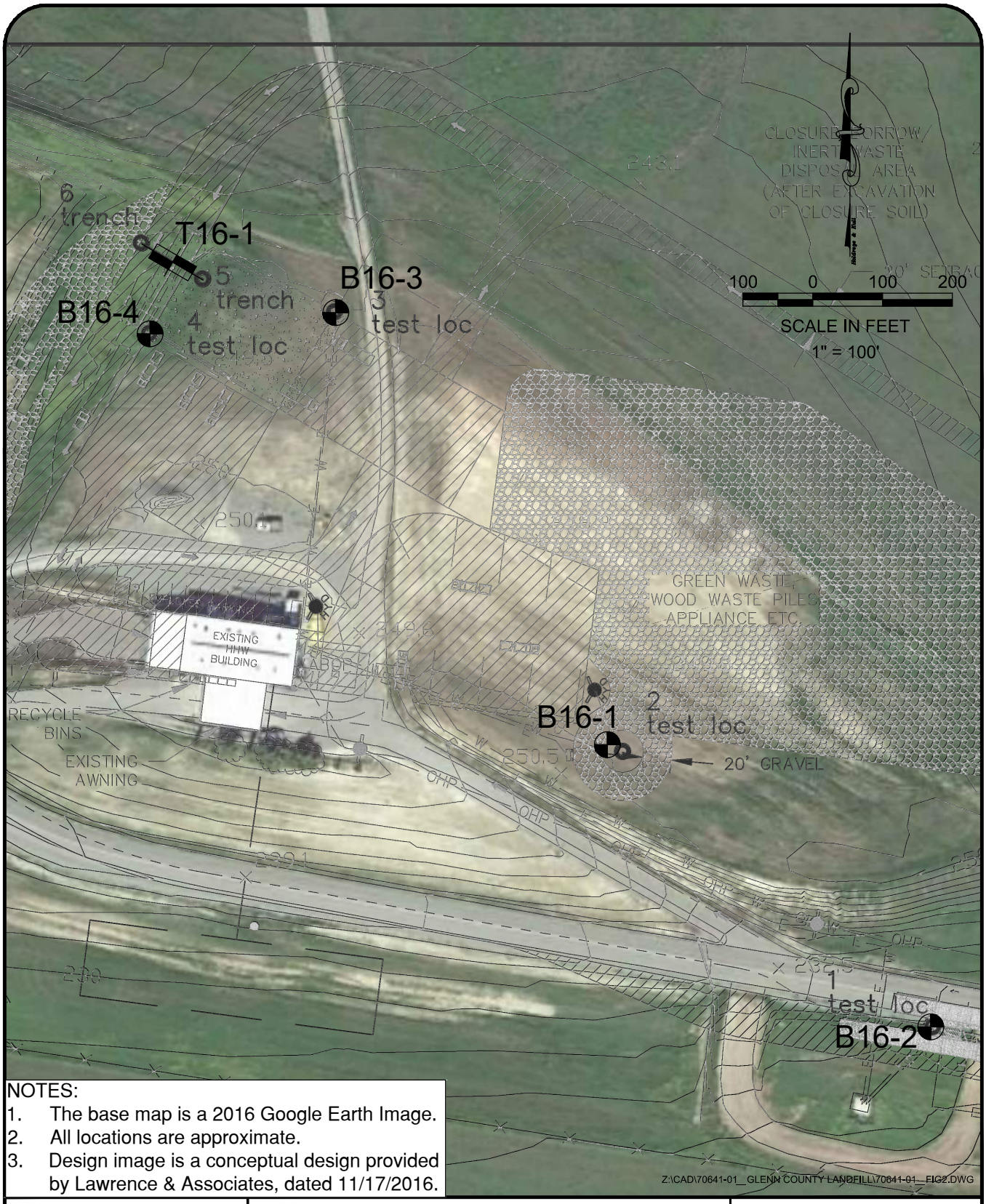
SITE LOCATION MAP

GLENN COUNTY TRANSFER STATION
ARTOIS, GLENN COUNTY, CALIFORNIA

PROJ NO.: 70641-01

DATE: DECEMBER,2016

FIGURE NO.: 1



NOTES:
1. The base map is a 2016 Google Earth Image.
2. All locations are approximate.
3. Design image is a conceptual design provided by Lawrence & Associates, dated 11/17/2016.

Z:\CAD\70641-01_GLENN COUNTY LANDFILL\70641-01_FIG2.DWG

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EXPLORATORY BORING LOCATIONS
GLENN COUNTY LANDFILL
5700 COUNTY ROAD 33
ARTOIS, GLENN COUNTY, CALIFORNIA

PROJ NO.: 70641-01
DATE: JANUARY,2017
FIGURE NO.: 2

APPENDIX A

Proposal for Glenn County Transfer Station, Phase I, Glenn County Landfill Artois, California (excluding fee)

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

July 1, 2016
Proposal No.: PC16.116

Mr. Clayton Coles
Lawrence & Associates
3590 Iron Court
Shasta Lake, California 96019

REFERENCE: ***Proposed Glenn County Transfer Station, Phase I***
Glenn County Landfill
Artois, California

SUBJECT: ***Proposal for Geotechnical Engineering Services***

Dear Mr. Coles,

In accordance with your request, Holdrege & Kull (H&K) prepared this proposal to provide geotechnical engineering services for the development of the above referenced activity center building. As part of the geotechnical and engineering services, H&K will perform the appropriate geological and geotechnical engineering investigation in accordance with the requirements of the 2013 California Building Code (CBC). H&K will prepare a geotechnical engineering investigation report that presents the findings, conclusions, and recommendations for earthwork grading and structural improvements which will be specific to the proposed improvements. The following presents H&K's understanding of the project and the proposed engineering services.

1.0 PROJECT DESCRIPTION

H&K understands that the County of Glenn Department of Planning and Public Works is developing plans for a new transfer station at the Glenn County Landfill. The improvements will occur in two phases, with the initial Phase I including the following: concrete slab-on-grade public tipping area, concrete cantilevered retaining wall with fence, temporary concrete block push wall, asphalt concrete driveway entrance, and landscape areas. Earthwork grading will include general site preparation with cuts and fills required to balance the site to meet the proposed building grades.

2.0 SCOPE OF SERVICES

H&K proposes to perform the following tasks as basic services with no other additional services included: Task 1 Site Investigation and Laboratory Testing, Task 2 Data Analysis and Engineering Design, Task 3 Report Preparation, Task 4 Final Design Plan Review, and Task 5 Construction Services. Each task is described in the following:

2.1 Task 1 Site Investigation

H&K will perform a site investigation using a hollow stem auger drill rig and seismic refraction survey equipment to characterize the soil, rock and groundwater conditions encountered at the surface and beneath the site to the maximum depth drilled. The site investigation will provide the basis for engineering design recommendations for earthwork and structural improvements. The site investigation includes the following components, which are described below: Surface Reconnaissance Investigation, Subsurface Investigation, and Laboratory Testing. This surface and subsurface investigations does not include the evaluation of the site for the presence of hazardous waste materials, and/or groundwater pollutants.

2.1.1 Literature Review and Surface Reconnaissance Investigation

H&K will perform a literature review of available geologic and engineering documents and a surface reconnaissance of the project site to identify surface conditions that may impact the proposed site development plans. In general, H&K's field engineer/geologist will observe and describe surface exposures of the following existing site conditions:

- Site and surrounding land uses.
- Surface soil conditions.
- Existing site improvements including earthwork grading and structures.
- Site topography and drainage.
- Vegetation.

2.1.2 Subsurface Investigation

A minimum of 48 hours prior to performing the subsurface investigation H&K will mark the proposed subsurface exploratory locations with white paint and notify Underground Services Alert (USA) as required by California state law. USA members will inspect each proposed subsurface exploratory location to determine if any underground utilities are present at these locations. The property owner is responsible for marking all known utilities within the proposed excavation areas inside the subject property. If USA identifies the presence of underground utilities at any of the proposed exploratory locations then we will move the excavation location to an area that is clear of underground utilities. A utility line locating firm may be utilized to identify utility line locations, if appropriate.

H&K will perform a subsurface investigation to obtain an understanding of the soil, rock and groundwater conditions underlying the new building site to the maximum depth explored. A maximum of four (4) exploratory borings will be advanced across the site using a truck mounted hollow stem auger drill rig. The exploratory borings within or adjacent to the building footprint will be advanced up to a maximum depth of 25 feet below the existing surface or until refusal is met, which ever occurs first. Additional borings may be advanced across the site to provide adequate covered for assessing the geologic conditions beneath the site, if deemed appropriate by our

engineering geologist. H&K will attempt to locate the exploratory borings at the approximate location of the building corners, deep retaining wall foundation areas, or locations where heavy column loads are expected. Each exploratory boring will be backfilled immediately after logging and sampling activities are completed.

H&K' field engineer/geologist will collect both relatively undisturbed and disturbed soil samples from each exploratory trench. Relatively undisturbed soil samples will be collected with a standard penetration test (SPT) sampler and a 2.5-inch-diameter (inside diameter) split-spoon barrel sampler equipped with brass liner tubes. Generally, soil samples will be collected at the following depths below the existing ground surface: 0 feet, 2.0 feet, 5 feet, 10 feet, and continuing on five foot intervals, or change in geologic material, until the boring is terminated. Additional soil samples may be collected and/or the sample intervals may be changed depending upon the soil conditions encountered. The soil samples will be labeled, sealed, and transported to our laboratory facility where selected samples will be tested to determine their engineering material properties. If the groundwater table is encountered, the depth to groundwater below the existing ground surface will be measured.

H&K will perform an in-situ shear-wave velocity profile of the upper 100 feet (30 meters) of the site using SeisOpt® ReMi™ Vs30 Method for shear-wave profiling. The shear wave velocity data will be used to determine a Site Class and seismic design parameters in accordance with chapter 16 of the 2013 CBC. The seismic survey line will include 12 geophones on approximate 8-meter spacing, for a total seismic line length of 96 meters. A 48-channel, microprocessor control signal enhancement seismograph will be used to record ambient seismic noise, or micro-tremors, which are constantly being generated by cultural and natural noise. Additional ambient noise will be initiated from vehicles and during exploratory excavations on site.

2.1.3 Laboratory Testing Investigation

H&K will perform laboratory tests on selected soil samples to determine their engineering material properties. All laboratory tests will be performed consistent with the guidelines of the American Society for Testing and Materials (ASTM). The ASTM soil characterization tests may include:

- D2487 & D2488, Unified Soil Classification System, Description Visual Method
- D2937 & D2216, Density and Moisture Content
- D422, Particle Size Distribution, Sieve and Hydrometer Analysis
- D2166 Unconfined Shear Strength
- D2850, Tri-axial Shear Strength
- D3080, Direct Shear Strength
- D2166, Unconfined Compressive Strength

- D4318, Atterberg Plasticity Indices
- D4829, Expansion Index
- D2844, Resistance Value (R-Value)

If soil is encountered with a high potential for volume change (i.e., expansion or consolidation), then H&K may recommend additional laboratory testing to evaluate expansion or consolidation impacts and provide appropriate recommendations on the proposed earthwork and structural improvements. Additional testing may include ASTM D2435 one-dimensional consolidation, ASTM D4546 one-dimensional swell, and ASTM D4767 consolidated-undrained triaxial shear strength. The costs to perform these additional tests are not included in the fee estimate presented herein. H&K will not perform these additional tests without written authorization to proceed and a budget augmentation to cover the cost of performing these additional laboratory tests.

2.2 Task 2, Data Analysis and Engineering Design

H&K will use the state-of-the practice geological and geotechnical engineering analyses methods to evaluate the on-site soil properties. These analyses methods may include but will not be limited to the following:

2.2.1 Data Analysis Methods

- Soil and rock stratigraphy.
- Soil bearing capacity for shallow and/or deep foundations.
- Lateral earth pressures.
- Soil-Concrete friction coefficients.
- Soil shear strength.
- Soil plasticity indices.
- Soil expansion potential.
- Soil corrosion potential.
- Building and surcharge loads.
- Groundwater seepage and drainage controls

H&K will develop geotechnical engineering design recommendations for earthwork and structural improvements and provide applicable recommendations. The geotechnical engineering design recommendations may include but not be limited to the following:

2.2.2 Earthwork Improvement Recommendations

- Site clearing and soil subgrade preparation.
- Exclusion of oversize fill soil materials.
- Aerial fill moisture conditioning and compaction requirements.

- Fill soil loose lift (layer) thickness requirements.
- Utility trench backfill material placement and compaction requirements.
- Expansive soil mitigation (not including lime, flyash or cement treatment details).
- Temporary construction de-watering methods.
- Subdrain systems (if necessary).

2.2.3 Structural Improvements

- Shallow and deep foundation types, dimensions and embedment depths.
- Shallow and deep foundation soil bearing capacity pressures.
- Concrete slab-on-grade floors.
- Design criteria for concrete pavement roads and parking lot areas.
- Seismic (earthquake shaking) design parameters.

2.3 Task 3 Report Preparation

H&K will prepare geotechnical engineering and geological hazard evaluation technical report that will present our findings. The geotechnical engineering report will meet the requirements of the 2013 CBC, and the accepted geological engineering principals and practices performed in northern California. The report will include descriptions of the site conditions, field investigation, laboratory testing, and geotechnical engineering design recommendations for the proposed earthwork and structural improvements. H&K will deliver four bound copies of the final report to the address shown on page one of this proposal. The report will be signed and stamped a responsible California Professional Engineer (PE) for this project.

3.0 SCHEDULE

H&K's proposed work schedule is based on our present and expected workload. H&K is prepared to commence work on this project following receipt of a sign contract and notice to proceed. H&K can provide verbal preliminary design recommendations immediately following the site investigation based on the field investigation data; however, the final recommendations will be developed from both the field and laboratory data. Therefore, the final recommendations will govern the design. H&K estimates that the final report can be completed within 5 weeks following receipt of the singed contract and a notice to proceed, weather and site access permitting. The time required to complete our geotechnical investigation field work may be increased as a result of encountering unforeseen subsurface conditions, adverse weather conditions, soil stability, property access problems, or scheduling of exploratory equipment.

4.0 COST ESTIMATE

H&K proposes to perform the geotechnical investigation proposed above on a lump sum basis of XXXXXXX, in accordance with the contract agreement terms and conditions. This fee includes the cost of a hollow stem auger drill rig and operator.

Invoices will be generated on a monthly basis; terms of payment are net 30 days. Full payment is due upon completion of the work and issuance of the report.

This cost estimate may require modification if unusual or unexpected site conditions are encountered which significantly change the work scope and increase the associated costs, if the client requests an expansion of the work scope, or if Glenn County requires the purchase of any additional permits in order to complete the site investigation. H&K will not perform additional work outside the scope of services presented above until a written authorization to proceed and an approved budget augmentation is received.

4.0 CLOSING

Please sign the attached contract agreement form to indicate your acceptance of this proposed work scope, schedule, and fee estimate. Your signature indicates that you accept the terms and conditions of this contract agreement and is a written authorization for us to proceed with the work scope presented in this proposal. Please mail or email the signed contract agreement forms to our office. After receiving the signed agreement form, H&K will sign and issue the fully executed contract agreement.

Holdrege & Kull appreciates the opportunity to provide you with a proposal on this important project. If you should have questions or comments, please do not hesitate to contact the undersigned at (530) 894-2487.

Sincerely,

Holdrege & Kull

Shane D. Cummings, PG, CHG, CEG
Operations Manager/Engineering Geologist

Attachments:
Attachment 1, Terms & Conditions Contract Agreement Form

Jesse Solorio

From: Shane D. Cummings <sdcummings@handk.net>
Sent: Wednesday, February 01, 2017 1:45 PM
To: Jesse Solorio
Subject: Request for Contract Amendment No.1

Jesse,
Chuck estimates that the soil nail wall can be designed and detailed for $4010.00. We will include the information in our final report and the structural engineer can take our detail sheets and incorporate them in the building design plans. I am requesting a contract amendment to increase our scope of services and fee to include a slope stability analysis and design of soil nails, reinforcement and shotcrete for wall to heights up to 20 feet. If this is acceptable, please sign below:

Authorization of Contract Extension

I hereby authorize Holdrege & Kull to implement the above scope of services per the fee estimate outlined in this contract amendment. This authorization extends the existing signed agreement signed November 1, 2016 between Lawrence & Associates and Holdrege & Kull and increase the total lump sum fee of services to $.

Clayton Coles
Name

V.P.
Title

6-28-17
Signature Date

WE RECENTLY MOVED, PLEASE NOTE OUR NEW ADDRESS BELOW
Sincerely,

Shane D. Cummings, PG, CHG, CEG, QSD/P
Principal \ Chico Operations Manager \ Hydrogeologist \ Engineering Geologist
Qualified SWPPP Developer/Practitioner

Holdrege & Kull Consulting Engineers and Geologists
48 Bellarmine Court, Suite 40 | Chico, CA 95928
530.894.2487 | 530.894.2437 fax | 530.362.0142 mobile
sdcummings@handk.net | www.holdregeandkull.com

HK HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

APPENDIX B:

Important Information about This Geotechnical Engineering Report (Included with permission of GBA, Copyright 2016)

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

APPENDIX C:

Exploratory Trench and Boring Logs

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

EXPLORATORY BORING LOG

48 BELLARMINE CT., SUITE 40, CHICO, CA 95928
PHONE: 530-894-2487, FAX: 530-894-2437

Boring No. B16-1

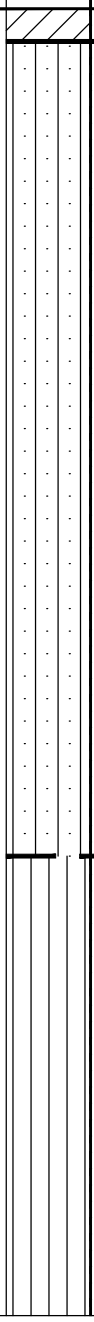
Sheet: 1 Of 2

Project Name: GLENN COUNTY TRANSFER STATION	Project No.: 70641-01	Task: 01	Date Start: 11-22-16
Location: GLENN COUNTY LANDFILL, ARTOIS, CA	Ground Elev. (Ft. AMSL): 249		Date Finish: 11-22-16
Logged By: CAB ESPOSITO	Drilling Cmpny: LAWRENCE AND ASSOCIATES		Drill Rig Type: CME-75
Driller: DAN JENKINS	Drilling Method: HOLLOW-STEM AUGER		Hammer Type: 140 lbf. SLIDE WITH CATHEAD
Boring Dia. (In.): 8.0	Total Depth (Ft.): 26.0	Backfill or Well Casing: 3/8" HOLE PLUG	

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.
08:55		6	2.5SS		
		20			L1-2-2
	>4.5	34		1.2/1.5	L1-1-2
			HSA		
09:12		13	2.5SS		
		20			
		50/5.5		0.9/1.5	B2
			HSA		
08:56		15	2.5SS		
		36			
	>4.5	50/3		1.1/1.5	L3-1-1
			HSA		
09:30		19	2.5SS		
	>4.5	50/4		0.8/1.0	L4-1-1
			HSA		
09:45		21	2.5SS		
	>4.5	50/2.5		0.9/1.0	L5-1-1
			HSA		

Depth B.G.S. (Ft.): 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

Sample Interval And Symbol / Well Construction Details / Graphic Log



Ground Water Information

Date	11-22-16			
Time (24 Hour)	10:20			
Depth (Ft.)	--			

Soil And/Or Rock Material Descriptions

SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc.
ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.

(CL) CLAY; FLD EST.: 100% CLAY; DARK BROWN (10YR 3/3), STIFF, MOIST.

(SM) SILTY SAND; FLD EST.: 50% LOW-PLASTICITY FINES, 50% FINE SAND; PALE BROWN (10YR 6/3); VERY DENSE; DRY.

(ML) CLAYEY SILT; FLD EST.: 90% LOW-PLASTICITY FINES, 10% FINE SAND; LIGHT OLIVE GREY (5Y 6/2); HARD.

NOTES: ENTER NOTES

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

EXPLORATORY BORING LOG

48 BELLARMINE CT., SUITE 40, CHICO, CA 95928
PHONE: 530-894-2487, FAX: 530-894-2437

Boring No. B16-1

Sheet: 2 Of 2

Project Name: GLENN COUNTY TRANSFER STATION	Project No.: 70641-01	Task: 01	Date Start: 11-22-16
Location: GLENN COUNTY LANDFILL, ARTOIS, CA	Ground Elev. (Ft. AMSL): 249		Date Finish: 11-22-16
Logged By: CAB ESPOSITO	Drilling Cmpny: LAWRENCE AND ASSOCIATES		Drill Rig Type: CME-75
Driller: DAN JENKINS	Drilling Method: HOLLOW-STEM AUGER		Hammer Type: 140 lbf. SLIDE WITH CATHEAD
Boring Dia. (In.): 8.0	Total Depth (Ft.): 26.0		Backfill or Well Casing: 3/8" HOLE PLUG

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.	Depth B.G.S. (Ft.)	Sample Interval And Symbol	Well Construction Details	Graphic Log
09:56		19	2.5SS			20			
	>4.5	50/3	▼	0.9/1.0	L6-1-1	21			
			HSA			22			
						23			
						24			
						25			
10:08		16	2.5SS						
	>4.5	50/4	▼	1.0/1.0	L7-1-1	26			
						27			
						28			
						29			
						30			
						31			
						32			
						33			
						34			
						35			
						36			
						37			
						38			
						39			
						40			

Ground Water Information

Date	11-22-16			
Time (24 Hour)	10:20			
Depth (Ft.)	--			

Soil And/Or Rock Material Descriptions

SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc.
ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.

BORING TERMINATED AT 26.0 FEET.

NOTES: ENTER NOTES

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

EXPLORATORY BORING LOG

48 BELLARMINE CT., SUITE 40, CHICO, CA 95928
PHONE: 530-894-2487, FAX: 530-894-2437

Boring No. B16-2

Sheet: 1 Of 1

Project Name: GLENN COUNTY TRANSFER STATION	Project No.: 70641-01	Task: 01	Date Start: 11-22-16
Location: GLENN COUNTY LANDFILL, ARTOIS, CA	Ground Elev. (Ft. AMSL): 226		Date Finish: 11-22-16
Logged By: CAB ESPOSITO	Drilling Cmpny: LAWRENCE AND ASSOCIATES		Drill Rig Type: CME-75
Driller: DAN JENKINS	Drilling Method: HOLLOW-STEM AUGER		Hammer Type: 140 lbf. SLIDE WITH CATHEAD
Boring Dia. (In.): 8.0	Total Depth (Ft.): 16.5		Backfill or Well Casing: 3/8" HOLEPLUG

Ground Water Information				
Date	11-22-16			
Time (24 Hour)	11:50			
Depth (Ft.)	--			

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.	Depth B.G.S. (Ft.)	Soil And/Or Rock Material Descriptions
		2	2.5SS			0	(CL) SANDY CLAY; FLD EST.: 70% LOW-PLASTICITY FINES, 30% FINE SAND; BROWN (7.5YR 5/2); FIRM; DAMP.
		4				1	
		4		0.8/1.5	B1		
			HSA			2	
							(CL) CLAY; FLD EST.: 90% LOW-PLASTICITY FINES, 10% FINE SAND; DARK BROWN (7.5YR 3/2); HARD; DRY.
		11	2.5SS			3	
		20					
	>4.5	41		1.1/1.5	L2-1-1	4	
			HSA				
11:28		10	2.5SS			5	
		21				6	
	>4.5	35		1.4/1.5	L3-1-1		
			HSA			7	
						8	
						9	
11:40		17	2.5SS			10	
	>4.5	50/5.5		0.8/1.0	L4-1-1	11	
			HSA			12	
						13	
						14	
11:46		16	2.5SS			15	
		23			L5-2-2	16	(ML) SILT; FLD EST.: 60% LOW-PLASTICITY FINES, 40% FINE SAND; LIGHT YELLOWISH BROWN (10YR 6/4); HARD; DRY.
	4.5	31		1.2/1.5	L5-1-2		
						17	BORING TERMINATED AT 16.5 FEET.
						18	
						19	
						20	

Soil And/Or Rock Material Descriptions

SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc.
ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.

Sample Interval And Symbol / Well Construction Details / Graphic Log

NOTES: ENTER NOTES

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

EXPLORATORY BORING LOG

48 BELLARMINE CT., SUITE 40, CHICO, CA 95928
PHONE: 530-894-2487, FAX: 530-894-2437

Boring No. B16-3

Sheet: 1 Of 1

Project Name: GLENN COUNTY TRANSFER STATION	Project No.: 70641-01	Task: 01	Date Start: 11-22-16
Location: GLENN COUNTY LANDFILL, ARTOIS, CA	Ground Elev. (Ft. AMSL): 248		Date Finish: 11-22-16
Logged By: CAB ESPOSITO	Drilling Cmpny: LAWRENCE AND ASSOCIATES		Drill Rig Type: CME-75
Driller: DAN JENKINS	Drilling Method: HOLLOW-STEM AUGER		Hammer Type: 140 lbf. SLIDE WITH CATHEAD
Boring Dia. (In.): 8.0	Total Depth (Ft.): 15.5		Backfill or Well Casing: 3/8" HOLEPLUG

Ground Water Information

Date	11-22-16			
Time (24 Hour)	13:05			
Depth (Ft.)	--			

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.	Depth B.G.S. (Ft.)	Sample Interval And Symbol	Well Construction Details	Graphic Log	Soil And/Or Rock Material Descriptions
										SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc. ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.
12:18		6	2.5SS			0				(CL) SANDY CLAY; FLD EST.: 80% LOW-PLASTICITY FINES, 20% FINE SAND; DARK BROWN (10YR 3/3); VERY STIFF; DRY.
		12				1				
	3.5	18		0.7/1.5	B1					
			HSA			2				
										(ML) SANDY SILT; FLD EST.: 70% LOW-PLASTICITY FINES, 30% FINE SAND; PALE BROWN (10YR 6/3); HARD; DRY.
09:12		16	2.5SS			3				
		50/5		0.8/1.0	L2-1-1					
			HSA			4				
12:35		16	2.5SS			5				
		30			L3-2-2					
	>4.5	50/5.5		1.2/1.5	L3-1-2	6				
			HSA			7				
						8				(SM) SILTY SAND; FLD EST.: 10% FINE GRAVEL, 30% COARSE SAND, 10% MEDIUM SAND, 10% FINE SAND, 40% LOW-PLASTICITY FINES; PALE BROWN (10YR 6/3); VERY DENSE; DRY.
						9				
12:50		50/5	2.5SS	0.1/0.5	B4	10				
			HSA			11				
						12				
						13				(ML) SANDY SILT; FLD EST.: 70% LOW-PLASTICITY FINES, 30% FINE SAND; PALE BROWN (10YR 6/3); VERY DENSE; DRY.
						14				
13:00		35	2.5SS			15				
	>4.5	50/2.5		0.9/1.0	L5-1-1					BORING TERMINATED AT 15.5 FEET.
						16				
						17				
						18				
						19				
						20				

NOTES: ENTER NOTES

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EXPLORATORY BORING LOG

48 BELLARMINE CT., SUITE 40, CHICO, CA 95928
PHONE: 530-894-2487, FAX: 530-894-2437

Boring No. B16-4

Project Name: GLENN COUNTY TRANSFER STATION | Project No.: 70641-01 | Task: 01 | Date Start: 11-22-16

Location: GLENN COUNTY LANDFILL, ARTOIS, CA | Ground Elev. (Ft. AMSL): 248 | Date Finish: 11-22-16 | Sheet: 1 Of 2

Logged By: CAB ESPOSITO | Drilling Cmpny: LAWRENCE AND ASSOCIATES | Drill Rig Type: CME-75

Driller: DAN JENKINS | Drilling Method: HOLLOW-STEM AUGER | Hammer Type: 140 lbf. SLIDE WITH CATHEAD

Boring Dia. (In.): 8.0 | Total Depth (Ft.): 27.0 | Backfill or Well Casing: 3/8" HOLEPLUG

Ground Water Information

Date	11-22-16			
Time (24 Hour)	14:50			
Depth (Ft.)	--			

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.	Depth B.G.S. (Ft.)	Sample Interval And Symbol	Well Construction Details	Graphic Log	Soil And/Or Rock Material Descriptions
			HSA			0				(CL) CLAY; FLD EST.: 80% LOW-PLASTICITY FINES, 10% MEDIUM SAND, 10% FINE SAND; DARK BROWN (7.5YR 3/2); HARD; DRY; UNDOCUMENTED FILL.
						1				
						2				
13:42		7	SPT			3				
		10								
		8			B1	4				(SM) SILTY SAND; FLD EST.: 70% FINE SAND, 30% LOW-PLASTICITY FINES; PALE BROWN (10YR 6/3); MEDIUM DENSE; DRY; UNDOCUMENTED FILL.
			HSA							
		20	2.5SS			5				(ML) SANDY SILT; FLD EST.: 70% LOW-PLASTICITY FINES, 30% FINE SAND; PALE BROWN (10YR 6/3); HARD; DRY.
	>4.5	50/3		1.2/1.5	L2-1-1					
13:53		26	SPT			6				
		32								SLIGHTLY CEMENTED
		50/4		1.0/1.5	SPT-3	7				
			HSA							
						8				
						9				
14:05		17	2.5SS			10				
	3.75	50/5		0.8/1.5	L4-1-1					
			HSA			11				
						12				
						13				(SM) SILTY SAND; FLD EST.: 5% COARSE SAND, 5% MEDIUM SAND, 60% FINE SAND, 40% LOW-PLASTICITY FINES; PALE BROWN (10YR 6/3); VERY DENSE; DRY.
						14				
14:16		27	2.5SS							
	>4.5	50/3		0.7/1.5	B5	15				
			HSA			16				
						17				
						18				
						19				
14:27		22	2.5SS			20				

Soil And/Or Rock Material Descriptions

SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc.
ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.

NOTES: ENTER NOTES

EXPLORATORY BORING LOG

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PHONE: 530-894-2487, FAX: 530-894-2437

Boring No. B16-4

Sheet: 2 Of 2

Project Name: GLENN COUNTY TRANSFER STATION	Project No.: 70641-01	Task: 01	Date Start: 11-22-16
Location: GLENN COUNTY LANDFILL, ARTOIS, CA	Ground Elev. (Ft. AMSL): 248		Date Finish: 11-22-16
Logged By: CAB ESPOSITO	Drilling Cmpny: LAWRENCE AND ASSOCIATES		Drill Rig Type: CME-75
Driller: DAN JENKINS	Drilling Method: HOLLOW-STEM AUGER		Hammer Type: 140 lbf. SLIDE WITH CATHEAD
Boring Dia. (In.): 8.0	Total Depth (Ft.): 27.0		Backfill or Well Casing: 3/8" HOLEPLUG

Ground Water Information

Date	11-22-16			
Time (24 Hour)	14:50			
Depth (Ft.)	--			

24 Hour Clock Time (HH:MM)	Pocket Penetrometer (TSF)	Uncorrected Blow Counts (Blows / 6-inch)	Drilling Method and/or Sampler Type	Sample Recovery (Ft./Ft.)	Sample No.	Depth B.G.S. (Ft.)	Sample Interval And Symbol	Well Construction Details	Graphic Log	Soil And/Or Rock Material Descriptions
	>4.5	50/5	HSA	0.9/1.0	L6-1-1	20				
						21				
						22				
						23				(ML) SANDY SILT; FLD EST.: 20% FINE SAND, 20% CLAY, 60% LOW-PLASTICITY FINES; PALE BROWN (10YR 6/3); HARD; DRY.
						24				
14:16		27	2.5SS			25				
	>4.5	50/3		0.7/1.5	L7-1-1					
		8	SPT			26				
		20								
		50/5		1.7/1.5	SPT-7	27				BORING TERMINATED AT 27.0 FEET.
						28				
						29				
						30				
						31				
						32				
						33				
						34				
						35				
						36				
						37				
						38				
						39				
						40				

SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc.
ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.

NOTES: ENTER NOTES

HOLDREGE & KULL
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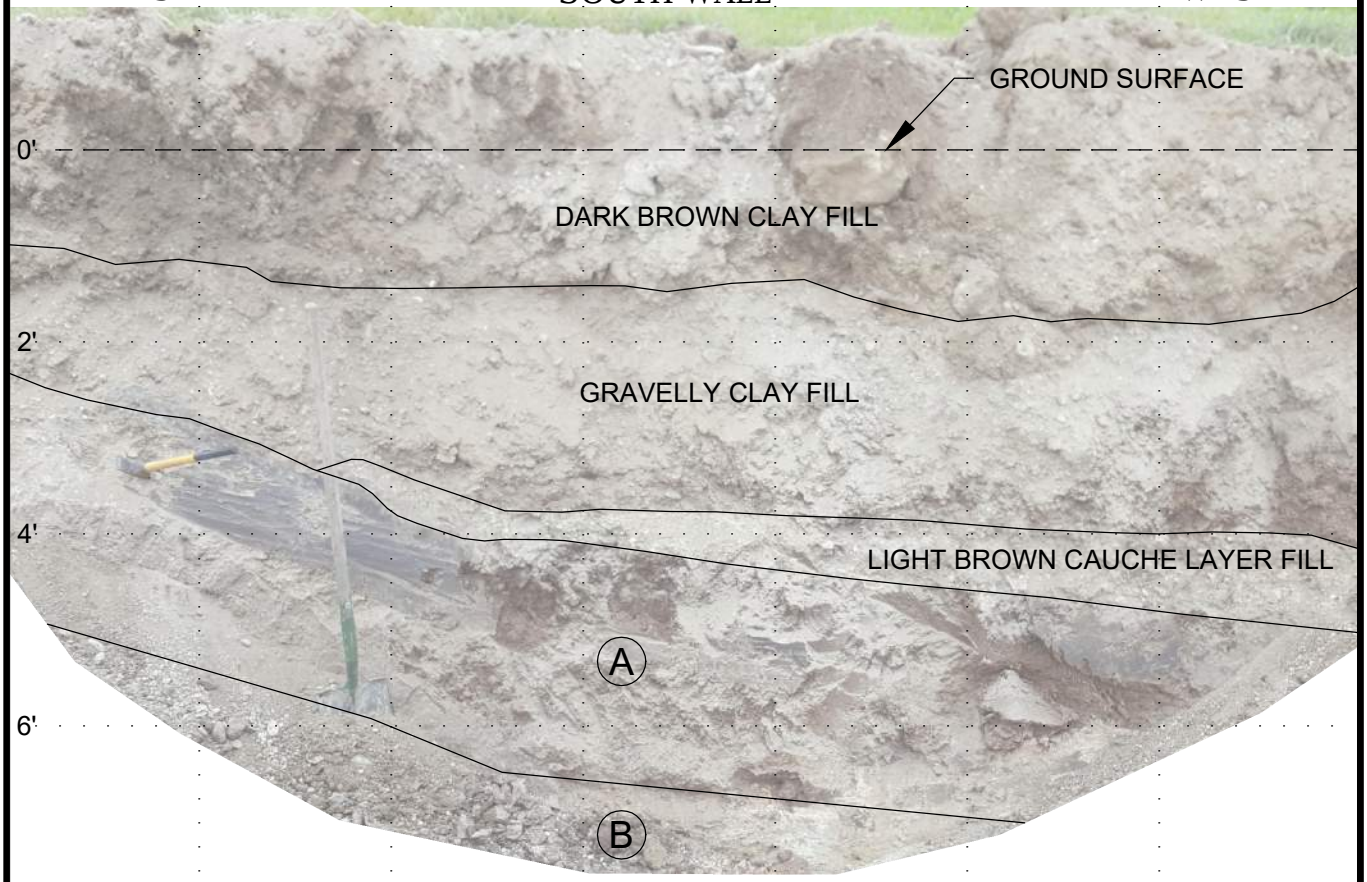
48 B□□□r□ □□□ C□□r□ S□□□ 40, C□□□, C□, 95928
P□□□□ 530-894-2487 A□d F□x 530-894-2437

Exploratory Trench Log

Trench No.
T16-1

Project Name: GLENN COUNTY TRANSFER STATION	Ground Water Information		
Project No.: 70641-01 Task No.: 01	Date:	11/22/2016	
Location: 5700 COUNTY ROAD 33, ARTOIS, CA 95913	Time (24 Hr. Clock):	12:45	
Logged By: SHANE CUMMINGS Date Logged: 11/22/2016	Depth bgs (ft):	N/A	
Backhoe Company: HOLDREGE AND KULL	Trench Elev.:	164 Ft. AMSL	
Backhoe Type: D6 DOZER	Trench Bearing:	Azimuth = 90°	
Backfill Description: NATIVE, LOOSE	Scale:	1 In. = 2 Ft.	

EAST SOUTH WALL WEST



Unit No.	Sample Depth(Ft)	Sample No.	Soil And/Or Rock Material Descriptions SOIL: USCS Symbol; Name; Particle Size Gradation %; Munsel Color; Density/Consistency; Moisture; Odor; Organics; Cementation; Texture; Refuse; Etc. ROCK: Unit Name; Lithology; Munsel Color; Cementation; Weathering; Competency; Bedding/Foliation; Fracture/Joint Spacing & Roughness; RQD; Moisture.
FILL			(FILL) SANDY CLAY□FLD EST: 60% LOW-PLASTICITY FINES, 30% FINE TO COARSE SAND, 10% FINE GRAVEL□DARK BROWN (7.5YR 3/3)□SOFT TO STIFF□DAMP.
A	3.5		(CL) CLAY□FLD EST: 95% LOW-PLASTICITY FINES, 5% FINE SAND□DARK BROWN (7.5YR 3/2)□VERY STIFF TO HARD□DAMP.
B	6.0		(ML) SANDY SILT□FLD EST: 75% LOW-PLASTICITY FINES, 25% FINE SAND□ FIRM□DAMP.

APPENDIX D:

Soil Laboratory Test Results

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Moisture & Density

ASTM D2216, D2937, C566

DSA File No.: n/a
DSA App No.: n/a

Project No.: 70641-01 Project Name: Glenn County Transfer Station Date: 12/09/16

Tested By: CHB
Checked By: SDC
Lab. No.: C16-147

SAMPLE LOCATION DATA										
Boring/Trench No.	Units	B16-1	B16-1	B16-1	B16-1	B16-1	B16-3	B16-4		
Sample No.		L1-2-2	L3-1-1	L4-1-1	L6-1-1	L7-1-1	L2-1-1	L2-1-10		
Depth Interval	(ft.)	0	5	10	20	25	2.5	4.5		
Sample Description										
USCS Symbol										
SAMPLE DIMENSION AND WEIGHT DATA										
Sample Length	(in)	5.990	6.085	5.263	5.478	5.436	5.121	4.984		
Sample Diameter	(in)	2.408	2.398	2.431	2.397	2.399	2.402	2.402		
Sample Volume	(cf)	0.0158	0.0159	0.0141	0.0143	0.0142	0.0134	0.0131		
Wet Soil + Tube Wt.	(gr)	1097.80	1042.00	1044.70	1024.30	1079.00	997.00	991.40		
Tube Wt.	(gr)	267.30	275.30	207.20	275.80	275.00	275.10	275.20		
Wet Soil Wt.	(gr)	830.50	766.70	837.50	748.50	804.00	721.90	716.20		
MOISTURE CONTENT DATA										
Tare No.		C13	C12	C16	C10	C2	ZZ7	ZZ8		
Tare Wt.	(gr)	189.90	180.90	188.30	108.20	180.60	171.60	172.40		
Wet Soil + Tare Wt.	(gr)	1029.80	970.50	1098.50	969.70	1046.70	978.80	960.10		
Dry Soil + Tare Wt.	(gr)	827.50	788.60	982.30	782.30	901.70	801.30	860.00		
Water Wt.	(gr)	202.30	181.90	116.20	187.40	145.00	177.50	100.10		
Dry Soil Wt.	(gr)	637.60	607.70	794.00	674.10	721.10	629.70	687.60		
Moisture Content	(%)	31.7	29.9	14.6	27.8	20.1	28.2	14.6		
TEST RESULTS										
Wet Unit Wt.	(pcf)	116.0	106.3	130.6	115.4	124.7	118.5	120.8		
Moisture Content	(%)	31.7	29.9	14.6	27.8	20.1	28.2	14.6		
Dry Unit Wt.	(pcf)	88.0	81.8	113.9	90.3	103.8	92.5	105.5		
MOISTURE CORRECTION DATA										
Gauge Moisture	(%)									
K Value Correction Factor										
COMPACTION CURVE DATA (ASTM D698, ASTM D1557, or CAL216)										
Test Method										
Curve No.										
Max Wet Unit Wt.	(pcf)									
Max Dry Unit Wt.	(pcf)									
Optimum Moisture	(%)									
Wet Relative Comp.	(%)									
Dry Relative Comp.	(%)									

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Atterberg Indices

ASTM D4318

DSA File No.: n/a

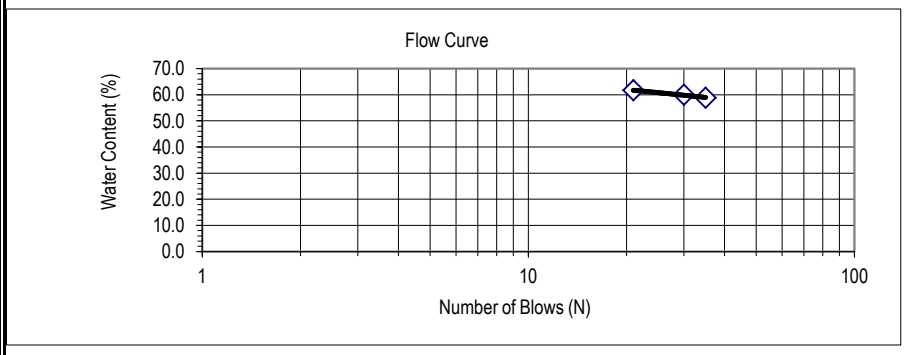
DSA App No.: n/a

Project No.:	70641-01	Project Name:	Glenn County Transfer Station			Date:	12/09/16
Sample No.:	Bulk_16-1122	Boring/Trench:	0	Depth, (ft.):	0	Tested By:	JFH
Description:	(CH) Clay; Clay 88%, Sand 9%, Lab Data; Yellowish Brown (10YR 5/4)					Checked By:	SDC
Sample Location:						Lab. No.:	C16-147

Estimated % of Sample Retained on No. 40 Sieve: 95 Sample Air Dried: yes

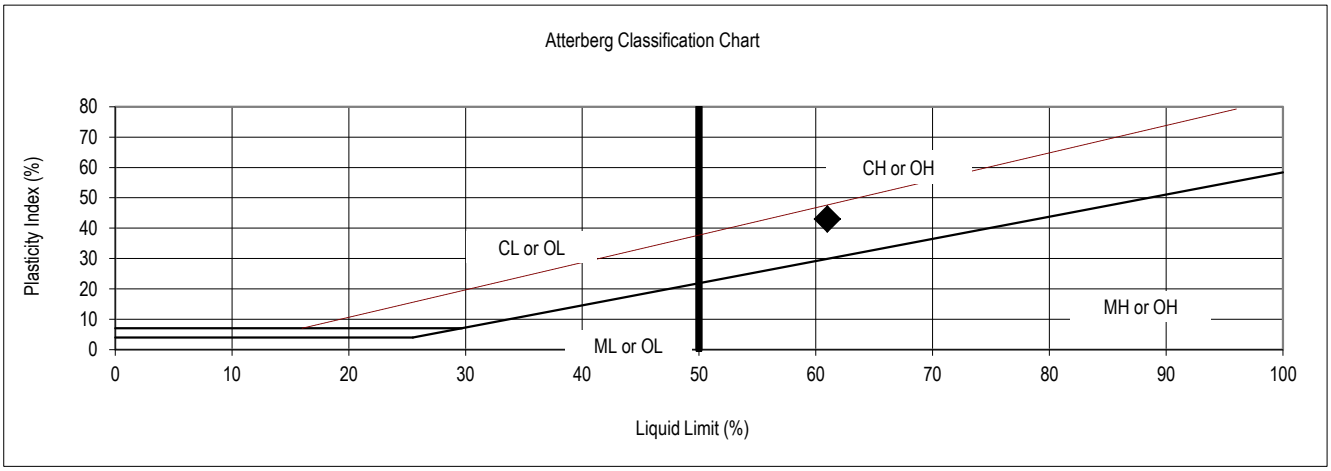
Test Method A or B: A

	LIQUID LIMIT:					PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	A	B	C			D	E	
Wt. Pan (gr)	38.45	38.96	38.46			38.26	36.44	
Wt. Wet Soil + Pan (gr)	50.41	51.65	53.14			49.75	42.93	
Wt. Dry Soil + Pan (gr)	45.98	46.89	47.54			47.96	41.93	
Wt. Water (gr)	4.43	4.76	5.60			1.79	1.00	
Wt. Dry Soil (gr)	7.53	7.93	9.08			9.70	5.49	
Water Content (%)	58.8	60.0	61.7			18.5	18.2	
Number of Blows, N	35	30	21					
				LIQUID LIMIT =	61	PLASTIC LIMIT =		18



Plasticity Index = 43

Group Symbol = CH



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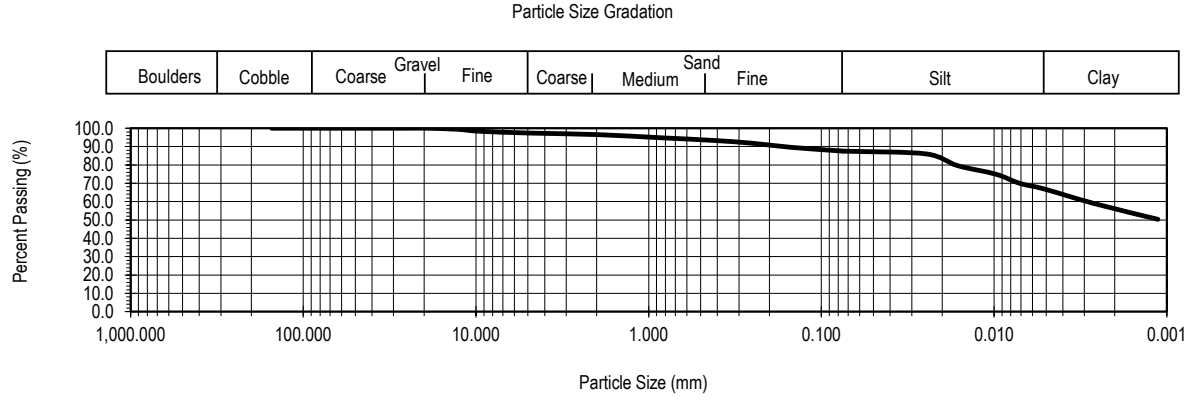
Particle Size Distribution

ASTM D422, C136

Project No.:	**70641-01**	Project Name:	**Glenn County Transfer Station**	Date:	**12/9/2016**
Sample No.:	**Bulk_16-1122**	Boring/Trench:	**0** Depth, (ft.): **0**	Tested By:	**JFH**
Description:	**(CH) Clay; Clay 88%, Sand 9%, Lab Data; Yellowish Brown (10YR 5/4)**			Checked By:	**SDC**
Sample Location:				Lab. No.:	**C16-147**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4		0.0	923.2	**100.0**
3 Inch	3.0000	76.2		0.0	923.2	**100.0**
2 Inch	2.0000	50.8		0.0	923.2	**100.0**
1.5 Inch	1.5000	38.1		0.0	923.2	**100.0**
1.0 Inch	1.0000	25.4	0.00	0.0	923.2	**100.0**
3/4 Inch	0.7500	19.1	0.00	0.0	923.2	**100.0**
1/2 Inch	0.5000	12.7	5.40	5.4	917.8	**99.4**
3/8 Inch	0.3750	9.5	9.90	15.3	907.9	**98.3**
#4	0.1870	4.7500	9.20	24.5	898.7	**97.3**
#10	0.0787	2.0000	7.40	31.9	891.3	**96.5**
#20	0.0335	0.8500	16.04	47.9	875.2	**94.8**
#40	0.0167	0.4250	13.13	61.1	862.1	**93.4**
#60	0.0098	0.2500	14.59	75.7	847.5	**91.8**
#100	0.0059	0.1500	20.42	96.1	827.1	**89.6**
#200	0.0030	0.0750	18.96	115.0	808.1	**87.5**
		0.0247				**86.0**
		0.0164				**79.7**
		0.0098				**74.9**
		0.0071				**70.0**
		0.0051				**66.9**
		0.0026				**59.0**
		0.0011				**50.4**

Hydrometer



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Expansion Index/Swell

ASTM D4829

DSA File No.: n/a

DSA App No.: n/a

Project No.:	70641-01	Project Name:	Glenn County Transfer Station			Date:	12/09/16
Sample No.:	Bulk_16-1122	Boring/Trench No.:	0	Depth (ft.)	0	Tested By:	JFH
Soil Description:	(CH) Clay; Clay 88%, Sand 9%, Lab Data; Yellowish Brown (10YR 5/4)					Checked By:	SDC
Estimated Percent Of Sample Retained On No 4 Mesh Sieve =						Lab. No.:	C16-147

BULK SAMPLE PREPARATION	Units	Symbol	Trial 1	Trial 2	Trial 3	Comments
Tare Bag No.	NA	I.D.	1	2		Prepare three bulk samples at the
Tare Bag Weight	(grams)	Wtb	12.1	11.9		same moisture content and as
Wet Soil + Tare Bag Weight	(grams)	Wbs+tb	1018.0	846.4		close to the same weight as
Wet Soil Weight	(grams)	Wbws	1005.9	834.5	0.0	possible (1000.0 grams).
Dry Soil Weight	(grams)	Wbds	912.9	726.9		
MOISTURE CONTENT						FINAL MOISTURE CONTENT
Tare No.	(grams)	I.D.	C7	C6		C3 / Comments
Tare Weight	(grams)	Wt	181.1	181.7		181.5
Wet Soil + Tare Weight	(grams)	Ws+t	257.9	250.7		587.8
Dry Soil + Tare Weight	(grams)	Wd+t	250.8	241.8		489.5
Water Weight	(grams)	Ww	7.1	8.9	0.0	98.3
Dry Soil Weight	(grams)	Wds	69.7	60.1	0.0	308.0
Moisture Content	(%)	w	10.2	14.8		31.9
TEST SAMPLE PREPARATION						Comments
Soil Specific Gravity	(dmnsnlss)	Gs	2.50	2.50	2.50	
Ring Height	(inches)	Hr	1.000	1.000	1.000	
Ring Diameter	(inches)	Dr	4.01	4.01	4.01	
Ring Weight	(grams)	Wr	367.4	367.4	367.4	
Tare Pan Weight	(grams)	Wtp	0.0	0.0		
Wet Soil + Ring + Tare Pan Weight	(grams)	Wws+r+tp	693.5	711.5		
Wet Soil Weight	(grams)	Wws	326.1	344.1		
Wet Unit Weight	(pcf)	δwet	98.4	103.8		
Dry Unit Weight	(pcf)	δdry	89.3	90.4		
Saturation	(%)	S	34.1	51.0		
Saturation Criteria Evaluation, 48% <= S <= 52%	NA	Pass/Fail	Fail	Pass		
APPROX. BULK SAMPLE MOISTURE ADJUST.						Comments
Moisture Content For S = 50%	(%)	w(S=50%)	14.9	14.5		
+/- Moisture Content Difference	(%)	+/- dw	4.8	-0.3		
+/- Water Weight	(grams)	+/-dWw	43.5	-2.2		

EXPANSION VERSUS TIME

Initial Height (inch) = 1.000 Final Height (inch) = 1.107

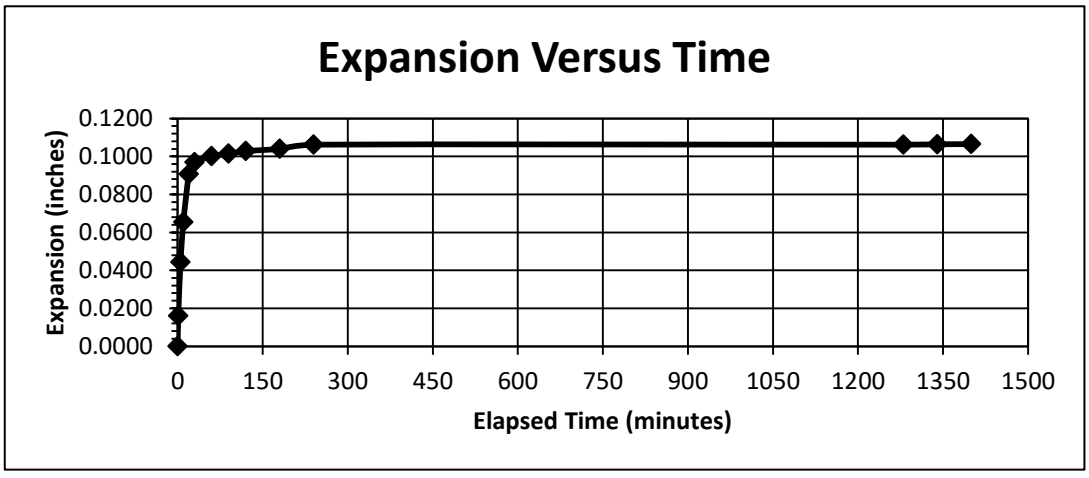
Expansion Indices (EI):	0 to 20	21 to 50	51 to 90	91 to 130	> 130
Expansion Potential:	Very Low	Low	Medium	High	Very High

TEST RESULTS

EI = 107

Expansive Potential High

Elapsed Time (min)	Height Change (inch)
0	0.0000
1	0.0160
5	0.0443
10	0.0654
20	0.0907
30	0.0970
60	0.1002
90	0.1015
120	0.1028
180	0.1040
240	0.1062
1280	0.1062
1340	0.1064
1400	0.1065



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Atterberg Indices

ASTM D4318

DSA File No.: n/a

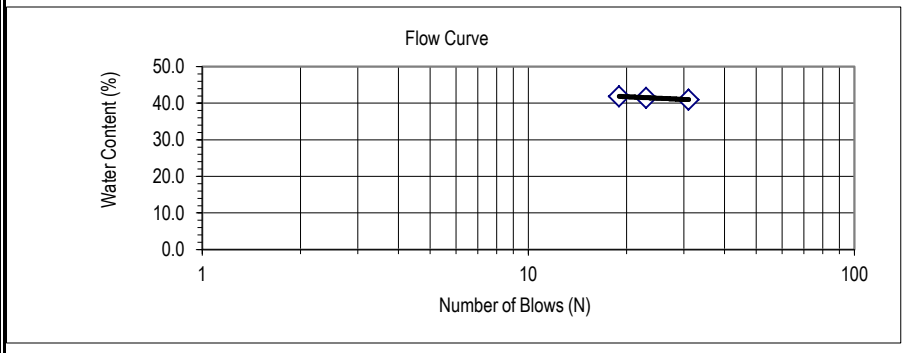
DSA App No.: n/a

Project No.:	70641-01	Project Name:	Glenn County Transfer Station			Date:	12/09/16
Sample No.:	B2	Boring/Trench:	B16-1	Depth, (ft.):	2.5'	Tested By:	JFH
Description:	(ML) Silt; Silt 93%, Sand 6%, Lab Data; Light Yellowish Brown 2.5 6/3					Checked By:	SDC
Sample Location:						Lab. No.:	C16-147

Estimated % of Sample Retained on No. 40 Sieve: 100 Sample Air Dried: yes

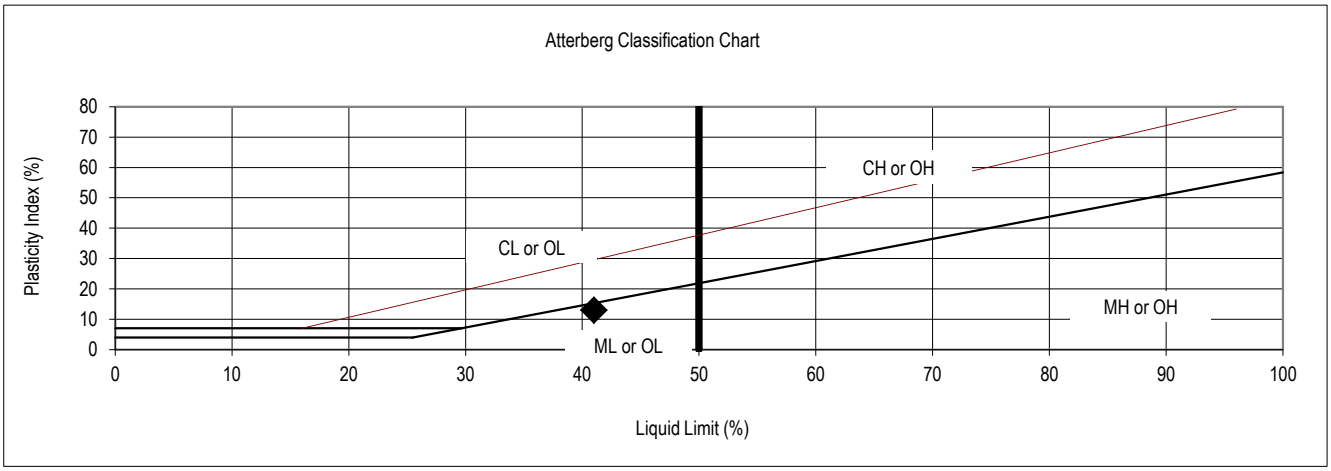
Test Method A or B: A

LIQUID LIMIT:						PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	A	B	C			D	E	
Wt. Pan (gr)	38.45	38.96	38.45			38.27	36.44	
Wt. Wet Soil + Pan (gr)	53.45	56.76	56.61			47.48	45.64	
Wt. Dry Soil + Pan (gr)	49.09	51.54	51.25			45.45	43.61	
Wt. Water (gr)	4.36	5.22	5.36			2.03	2.03	
Wt. Dry Soil (gr)	10.64	12.58	12.80			7.18	7.17	
Water Content (%)	41.0	41.5	41.9			28.3	28.3	
Number of Blows, N	31	23	19					
				LIQUID LIMIT =	41	PLASTIC LIMIT =		28



Plasticity Index = 13

Group Symbol = ML



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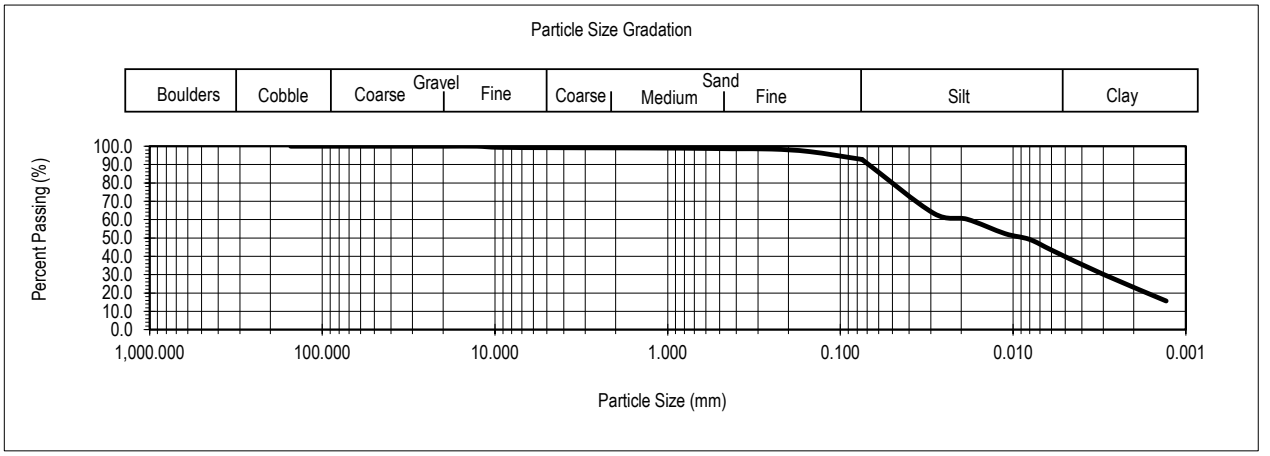
Particle Size Distribution

ASTM D422, C136

Project No.:	**70641-01**	Project Name:	**Glenn County Transfer Station**	Date:	**12/9/2016**
Sample No.:	**B2**	Boring/Trench:	**B16-1** Depth, (ft.): **2.5'**	Tested By:	**JFH**
Description:	**(ML) Silt; Silt 93%, Sand 6%, Lab Data; Light Yellowish Brown 2.5 6/3**			Checked By:	**SDC**
Sample Location:				Lab. No.:	**C16-147**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4		0.0	1,605.1	**100.0**
3 Inch	3.0000	76.2		0.0	1,605.1	**100.0**
2 Inch	2.0000	50.8		0.0	1,605.1	**100.0**
1.5 Inch	1.5000	38.1		0.0	1,605.1	**100.0**
1.0 Inch	1.0000	25.4	0.00	0.0	1,605.1	**100.0**
3/4 Inch	0.7500	19.1	0.00	0.0	1,605.1	**100.0**
1/2 Inch	0.5000	12.7	0.00	0.0	1,605.1	**100.0**
3/8 Inch	0.3750	9.5	9.60	9.6	1,595.5	**99.4**
#4	0.1870	4.7500	3.20	12.8	1,592.3	**99.2**
#10	0.0787	2.0000	1.70	14.5	1,590.6	**99.1**
#20	0.0335	0.8500	2.52	17.0	1,588.0	**98.9**
#40	0.0167	0.4250	5.05	22.1	1,583.0	**98.6**
#60	0.0098	0.2500	2.52	24.6	1,580.5	**98.5**
#100	0.0059	0.1500	22.72	47.3	1,557.7	**97.1**
#200	0.0030	0.0750	68.16	115.5	1,489.6	**92.8**
		0.0288				**63.4**
		0.0185				**60.3**
		0.0112				**52.4**
		0.0080				**49.2**
		0.0058				**42.9**
		0.0030				**30.3**
		0.0013				**15.6**

Hydrometer



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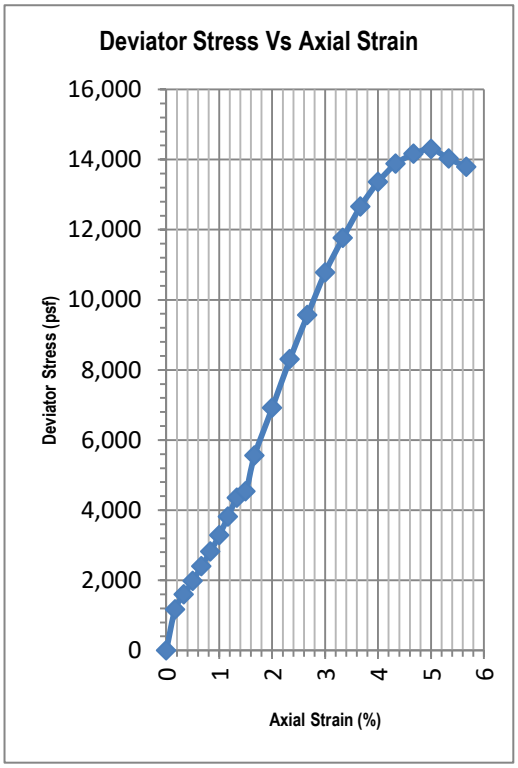
TRIAXIAL COMPRESSION SHEAR TEST
UNCONSOLIDATED UNDRAINED (UU) WITH PORE WATER PRESSURE
ASTM D2850

Project No:	70641-01	Project Name:	Glenn County Transfer Station	Date:	12/09/16
Sample No:	L1-1-2	Boring/Trench No:	B16-1	Tested By:	JFH
Soil Description:	(ML) Silt; Vis Est; Light Olive Brown (2.5Y 5/4)			Checked By:	SDC
				Lab No:	C16-147

SAMPLE PREPERATION DATA

PARAMETERS			INITIAL	FINAL
Equations	Tare I.D. No.	Units	ZZ1	G2
a	Wt. Tare	(gr)	169.20	767.50
b	Wt Wet Soil + Tare	(gr)	989.00	1598.00
c	Wt Dry Soil + Tare	(gr)	786.60	1384.90
d = b - a	Wt. Wet Soil	(gr)	819.80	830.50
e = c - a	Wt. Dry Soil	(gr)	617.40	617.40
f = b - c	Wt. Water	(gr)	202.40	213.10
w = f / e	Moisture Content	(%)	32.78	34.52
	Wet Density	(pcf)	114.6	116.1
	Dry Density	(pcf)	86.3	86.3
	void ratio	(dim.)	0.9523	
	Saturation	(%)	92.94	
	Diameter	(in)	2.405	
	Area	(in^2)	4.543	
	Height	(in)	5.997	
	Volume	(in^3)	27.243	
	B Parameter	(dim.)		0.970



TEST SETUP PARAMETERS

Gs	Specific Gravity	2.700	(dimensionless)		
γ_w	Unit Weight of Water	62.428	(pcf)		
D	Deformation Dial Constant	0.001	(inch / unit)		
Hc	Sample Height	5.997	(inch)		
Ac	Sample Cross-Sectional Area	4.543	(in^2)		
C_1	Primary Load Ring Constant	1.2300	(lbs/unit)		
U_{CH}	Chamber Cell Pressure	65	(psi)	9360	(psf)
U_{TB}	Sample Top and Bottom Back Pressure	55	(psi)	7920	(psf)
U_{CN}	Confining Pressure	10	(psi)	1440	(psf)
R	Strain Rate	0.084	(inch / minute)		
F_{dmax}	Maximum Failure Deviator Stress	14,297.07	(psf)		
τ_{max}	MaximumFailure Shear Stress	7,148.53	(psf)		

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Atterberg Indices

ASTM D4318

DSA File No.: n/a

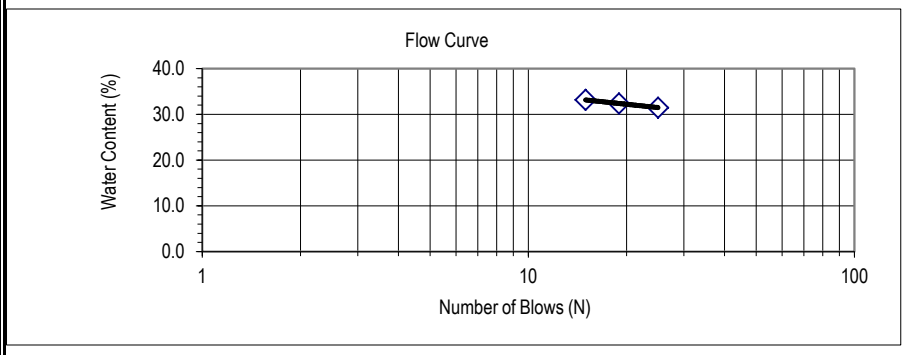
DSA App No.: n/a

Project No.:	70641-01	Project Name:	Glenn County Transfer Station			Date:	12/09/16
Sample No.:	L5-1-1	Boring/Trench:	B16-1	Depth, (ft.):	15'	Tested By:	JFH
Description:	(ML) Silt; Silt 88%, Fine Sand 12%' Lab Data; Light Olive Brown (2.5Y 5/3)					Checked By:	SDC
Sample Location:						Lab. No.:	C16-147

Estimated % of Sample Retained on No. 40 Sieve: 100 Sample Air Dried: yes

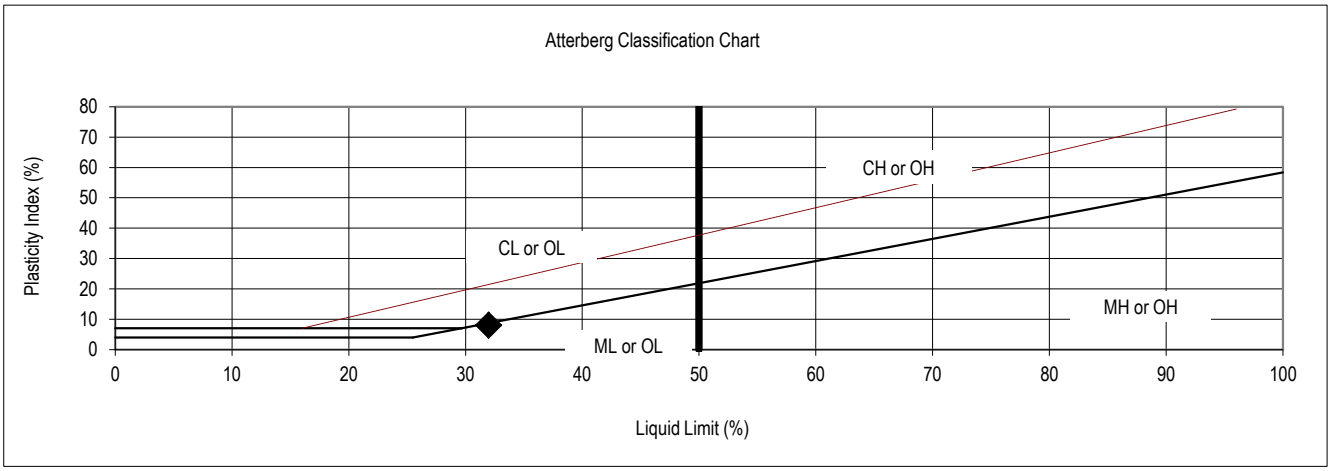
Test Method A or B: A

LIQUID LIMIT:						PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	F	G	H			L	N	
Wt. Pan (gr)	62.04	64.00	61.60			61.22	64.89	
Wt. Wet Soil + Pan (gr)	77.45	80.56	77.63			71.59	73.40	
Wt. Dry Soil + Pan (gr)	73.76	76.51	73.64			69.61	71.78	
Wt. Water (gr)	3.69	4.05	3.99			1.98	1.62	
Wt. Dry Soil (gr)	11.72	12.51	12.04			8.39	6.89	
Water Content (%)	31.5	32.4	33.1			23.6	23.5	
Number of Blows, N	25	19	15					
				LIQUID LIMIT =	32		PLASTIC LIMIT =	24



Plasticity Index = 8

Group Symbol = ML



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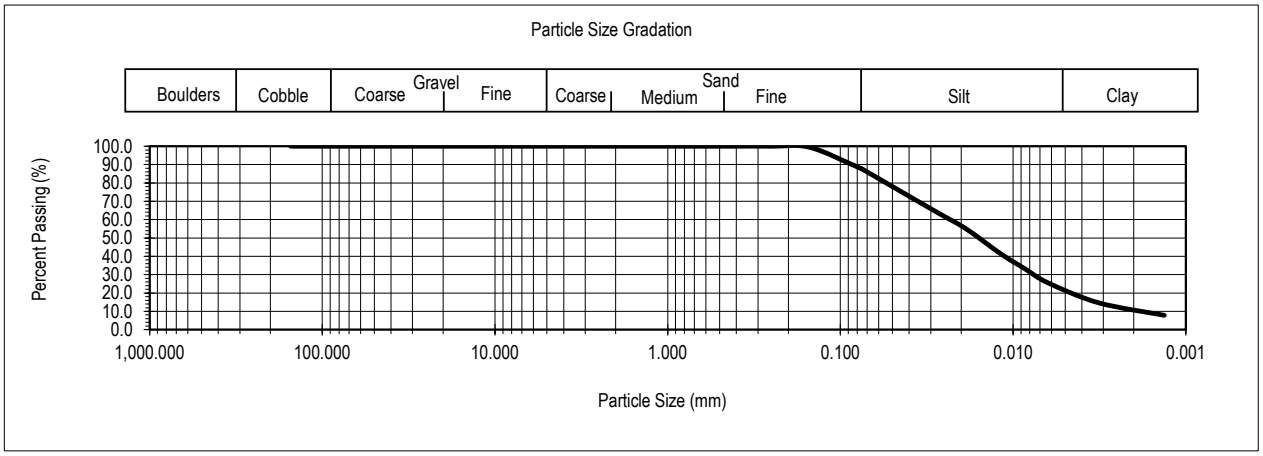
Particle Size Distribution

ASTM D422, C136

Project No.:	**70641-01**	Project Name:	**Glenn County Transfer Station**	Date:	**12/9/2016**
Sample No.:	**L5-1-1**	Boring/Trench:	**B16-1** Depth, (ft.): **15'**	Tested By:	**JFH**
Description:	**(ML) Silt; Silt 88%, Fine Sand 12%' Lab Data; Light Olive Brown (2.5Y 5/3)**			Checked By:	**SDC**
Sample Location:				Lab. No.:	**C16-147**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4		0.0	730.0	**100.0**
3 Inch	3.0000	76.2		0.0	730.0	**100.0**
2 Inch	2.0000	50.8		0.0	730.0	**100.0**
1.5 Inch	1.5000	38.1		0.0	730.0	**100.0**
1.0 Inch	1.0000	25.4	0.00	0.0	730.0	**100.0**
3/4 Inch	0.7500	19.1	0.00	0.0	730.0	**100.0**
1/2 Inch	0.5000	12.7	0.00	0.0	730.0	**100.0**
3/8 Inch	0.3750	9.5	0.00	0.0	730.0	**100.0**
#4	0.1870	4.7500	0.00	0.0	730.0	**100.0**
#10	0.0787	2.0000	0.00	0.0	730.0	**100.0**
#20	0.0335	0.8500	0.00	0.0	730.0	**100.0**
#40	0.0167	0.4250	0.00	0.0	730.0	**100.0**
#60	0.0098	0.2500	0.00	0.0	730.0	**100.0**
#100	0.0059	0.1500	4.57	4.6	725.4	**99.4**
#200	0.0030	0.0750	85.66	90.2	639.8	**87.6**
Hydrometer		0.0284				**64.7**
		0.0190				**55.3**
		0.0117				**41.2**
		0.0086				**33.4**
		0.0063				**25.6**
		0.0032				**14.7**
		0.0013				**7.9**



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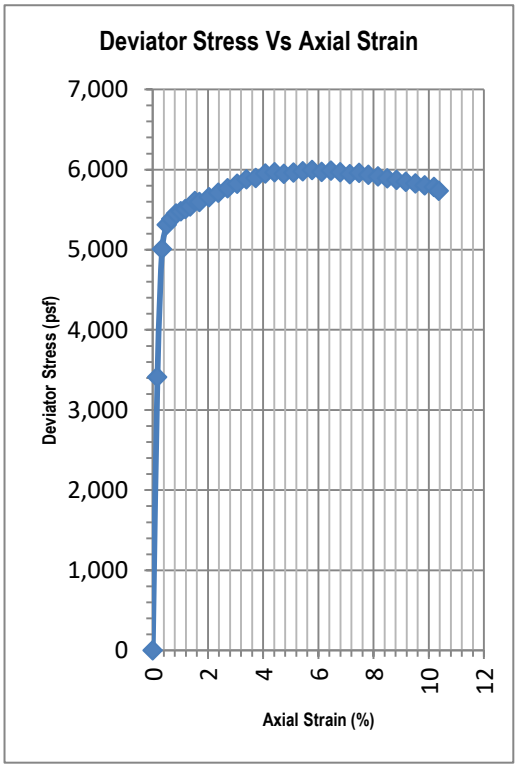
TRIAXIAL COMPRESSION SHEAR TEST
UNCONSOLIDATED UNDRAINED (UU) WITH PORE WATER PRESSURE
ASTM D2850

Project No:	70641-01	Project Name:	Glenn County Transfer Station	Date:	12/09/16
Sample No:	L2-1-1	Boring/Trench No:	B16-2	Tested By:	JFH
Soil Description:	(CH) Clay; Clay 90%, Sand 10%,Vis Est:; Brown (7.5YR 4/4)			Checked By:	
				Lab No:	C16-147

SAMPLE PREPERATION DATA

PARAMETERS			INITIAL	FINAL
Equations	Tare I.D. No.	Units	ZZ1	G9
a	Wt. Tare	(gr)	169.40	767.70
b	Wt Wet Soil + Tare	(gr)	1046.50	1673.90
c	Wt Dry Soil + Tare	(gr)	899.70	1498.00
d = b - a	Wt. Wet Soil	(gr)	877.10	906.20
e = c - a	Wt. Dry Soil	(gr)	730.30	730.30
f = b - c	Wt. Water	(gr)	146.80	175.90
w = f / e	Moisture Content	(%)	20.10	24.09
	Wet Density	(pcf)	125.9	130.0
	Dry Density	(pcf)	104.8	104.8
	void ratio	(dim.)	0.6084	
	Saturation	(%)	89.21	
	Diameter	(in)	2.397	
	Area	(in^2)	4.513	
	Height	(in)	5.883	
	Volume	(in^3)	26.548	
	B Parameter	(dim.)		0.820



TEST SETUP PARAMETERS

Gs	Specific Gravity	2.700	(dimensionless)		
γ_w	Unit Weight of Water	62.428	(pcf)		
D	Deformation Dial Constant	0.001	(inch / unit)		
Hc	Sample Height	5.883	(inch)		
Ac	Sample Cross-Sectional Area	4.513	(in^2)		
C_1	Primary Load Ring Constant	1.2300	(lbs/unit)		
U_{CH}	Chamber Cell Pressure	65	(psi)	9360	(psf)
U_{TB}	Sample Top and Bottom Back Pressure	55	(psi)	7920	(psf)
U_{CN}	Confining Pressure	10	(psi)	1440	(psf)
R	Strain Rate	0.084	(inch / minute)		
F_{dmax}	Maximum Failure Deviator Stress	5,991.05	(psf)		
τ_{max}	MaximumFailure Shear Stress	2,995.52	(psf)		

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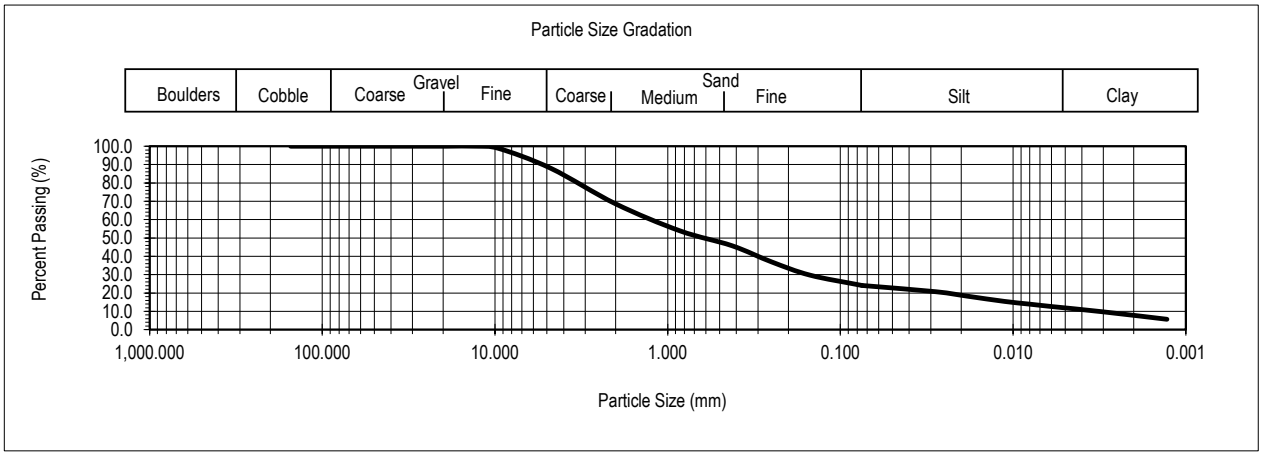
Particle Size Distribution

ASTM D422, C136

Project No.:	**70641-01**	Project Name:	**Glenn County Transfer Station**	Date:	**12/9/2016**
Sample No.:	**B4**	Boring/Trench:	**B16-3** Depth, (ft.): **9.5'**	Tested By:	**JFH**
Description:	**(SM) Silty Sand; Sand 64%, Silt 24%, Gravel 12%, Lab Data; Light Olive Brown**			Checked By:	
Sample Location:				Lab. No.:	**C16-147**

Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
	Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
6 Inch	6.0000	152.4		0.0	384.2	**100.0**
3 Inch	3.0000	76.2		0.0	384.2	**100.0**
2 Inch	2.0000	50.8		0.0	384.2	**100.0**
1.5 Inch	1.5000	38.1		0.0	384.2	**100.0**
1.0 Inch	1.0000	25.4	0.00	0.0	384.2	**100.0**
3/4 Inch	0.7500	19.1	0.00	0.0	384.2	**100.0**
1/2 Inch	0.5000	12.7	0.00	0.0	384.2	**100.0**
3/8 Inch	0.3750	9.5	4.50	4.5	379.7	**98.8**
#4	0.1870	4.7500	41.70	46.2	338.0	**88.0**
#10	0.0787	2.0000	74.50	120.7	263.5	**68.6**
#20	0.0335	0.8500	56.40	177.1	207.1	**53.9**
#40	0.0167	0.4250	31.13	208.2	176.0	**45.8**
#60	0.0098	0.2500	34.06	242.3	141.9	**36.9**
#100	0.0059	0.1500	27.65	269.9	114.3	**29.7**
#200	0.0030	0.0750	21.61	291.5	92.7	**24.1**
		0.0279				**20.7**
		0.0185				**18.3**
		0.0112				**15.4**
		0.0081				**14.0**
		0.0059				**12.6**
		0.0030				**9.7**
		0.0013				**5.7**

Hydrometer



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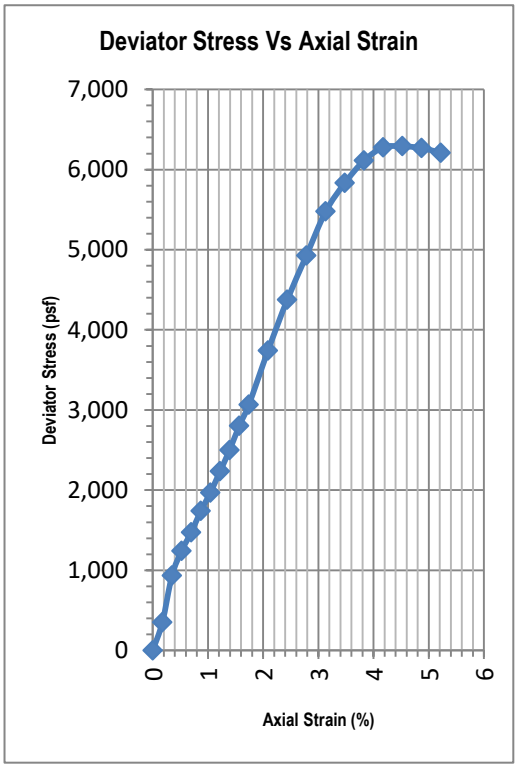
TRIAXIAL COMPRESSION SHEAR TEST
UNCONSOLIDATED UNDRAINED (UU) WITH PORE WATER PRESSURE
ASTM D2850

Project No:	70641-01	Project Name:	Glenn County Transfer Station	Date:	12/09/16
Sample No:	L3-2-2	Boring/Trench No:	B16-3	Tested By:	JFH
Soil Description:	(CL) Clay; Vis Est; Light Brownish Grey (2.5YR 6/2)			Checked By:	
				Lab No:	C16-147

SAMPLE PREPERATION DATA

PARAMETERS			INITIAL	FINAL
Equations	Tare I.D. No.	Units	0	G11
a	Wt. Tare	(gr)	0.00	763.90
b	Wt Wet Soil + Tare	(gr)	772.90	1558.90
c	Wt Dry Soil + Tare	(gr)	588.00	1351.90
d = b - a	Wt. Wet Soil	(gr)	772.90	795.00
e = c - a	Wt. Dry Soil	(gr)	588.00	588.00
f = b - c	Wt. Water	(gr)	184.90	207.00
w = f / e	Moisture Content	(%)	31.45	35.20
	Wet Density	(pcf)	112.8	116.0
	Dry Density	(pcf)	85.8	85.8
	void ratio	(dim.)	0.9645	
	Saturation	(%)	88.03	
	Diameter	(in)	2.405	
	Area	(in^2)	4.543	
	Height	(in)	5.747	
	Volume	(in^3)	26.107	
	B Parameter	(dim.)		0.970



TEST SETUP PARAMETERS

Gs	Specific Gravity	2.700	(dimensionless)		
γ_w	Unit Weight of Water	62.428	(pcf)		
D	Deformation Dial Constant	0.001	(inch / unit)		
Hc	Sample Height	5.747	(inch)		
Ac	Sample Cross-Sectional Area	4.543	(in^2)		
C_1	Primary Load Ring Constant	1.2300	(lbs/unit)		
U_{CH}	Chamber Cell Pressure	65	(psi)	9360	(psf)
U_{TB}	Sample Top and Bottom Back Pressure	55	(psi)	7920	(psf)
U_{CN}	Confining Pressure	10	(psi)	1440	(psf)
R	Strain Rate	0.084	(inch / minute)		
F_{dmax}	Maximum Failure Deviator Stress	6,291.12	(psf)		
τ_{max}	MaximumFailure Shear Stress	3,145.56	(psf)		

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Atterberg Indices

ASTM D4318

DSA File No.: n/a

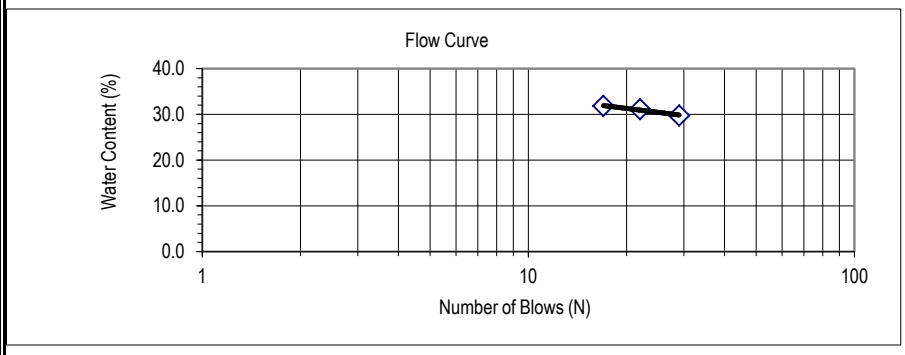
DSA App No.: n/a

Project No.:	70641-01	Project Name:	Glenn County Transfer Station			Date:	12/09/16
Sample No.:	B5	Boring/Trench:	B16-4	Depth, (ft.):	14.5'	Tested By:	JFH
Description:	(CL) Clay w/Sand; Clay 76%, Sand 23%, Lab Data; Light Olive Brown (2.5Y 5/3)					Checked By:	SDC
Sample Location:						Lab. No.:	C16-147

Estimated % of Sample Retained on No. 40 Sieve: 95 Sample Air Dried: yes

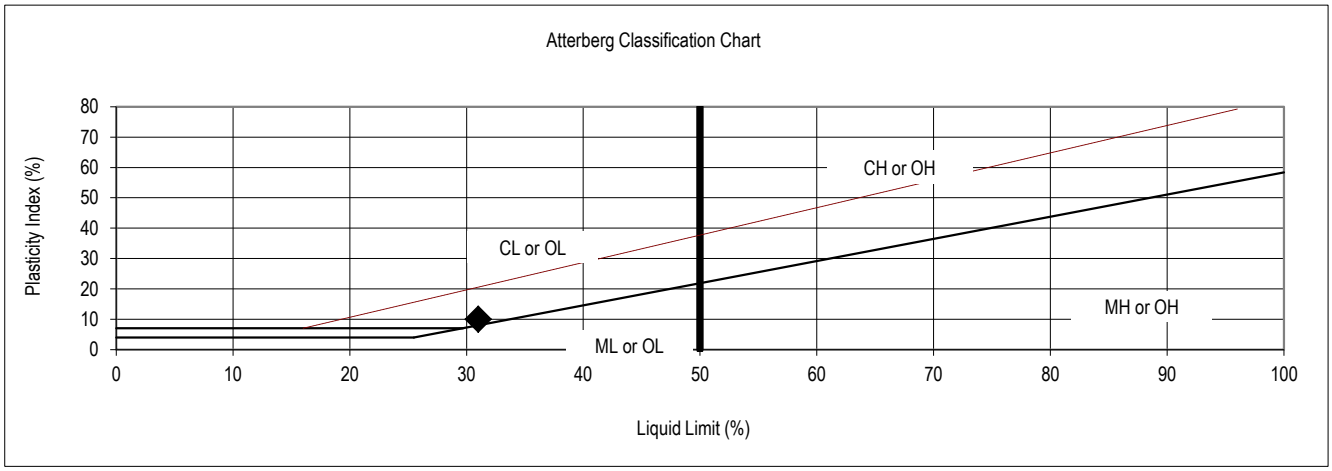
Test Method A or B: A

	LIQUID LIMIT:					PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	L	H	G			F	N	
Wt. Pan (gr)	61.22	61.60	63.99			62.04	64.90	
Wt. Wet Soil + Pan (gr)	77.26	79.13	79.65			71.45	74.41	
Wt. Dry Soil + Pan (gr)	73.58	74.97	75.87			69.84	72.79	
Wt. Water (gr)	3.68	4.16	3.78			1.61	1.62	
Wt. Dry Soil (gr)	12.36	13.37	11.88			7.80	7.89	
Water Content (%)	29.8	31.1	31.8			20.6	20.5	
Number of Blows, N	29	22	17					
				LIQUID LIMIT =	31	PLASTIC LIMIT =		21



Plasticity Index = 10

Group Symbol = CL



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Particle Size Distribution

ASTM D422, C136

Project No.:	**70641-01**	Project Name:	**Glenn County Transfer Station**	Date:	**12/9/2016**
Sample No.:	**B5**	Boring/Trench:	**B16-4**	Depth, (ft.): **14.5'**	Tested By: **JFH**
Description:	**(CL) Clay w/Sand; Clay 76%, Sand 23%, Lab Data; Light Olive Brown (2.5Y 5/3)**				Checked By: **SDC**
Sample Location:					Lab. No.: **C16-147**

	Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
		Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
	(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
#####	6 Inch	6.0000	152.4		0.0	1,032.9	**100.0**
#####	3 Inch	3.0000	76.2		0.0	1,032.9	**100.0**
#####	2 Inch	2.0000	50.8		0.0	1,032.9	**100.0**
#####	1.5 Inch	1.5000	38.1		0.0	1,032.9	**100.0**
#####	1.0 Inch	1.0000	25.4	0.00	0.0	1,032.9	**100.0**
#####	3/4 Inch	0.7500	19.1	0.00	0.0	1,032.9	**100.0**
#####	1/2 Inch	0.5000	12.7	0.00	0.0	1,032.9	**100.0**
9.5250	3/8 Inch	0.3750	9.5	0.00	0.0	1,032.9	**100.0**
4.7500	#4	0.1870	4.7500	10.60	10.6	1,022.3	**99.0**
2.0000	#10	0.0787	2.0000	23.50	34.1	998.8	**96.7**
0.8500	#20	0.0335	0.8500	16.10	50.2	982.7	**95.1**
0.4250	#40	0.0167	0.4250	12.88	63.1	969.8	**93.9**
0.2500	#60	0.0098	0.2500	35.42	98.5	934.4	**90.5**
0.1500	#100	0.0059	0.1500	40.25	138.8	894.1	**86.6**
0.0750	76.1 #200	0.0030	0.0750	107.88	246.6	786.3	**76.1**
0.0306	51.9		0.0306				**51.9**
0.0202	42.6		0.0202				**42.6**
0.0122	33.3		0.0122				**33.3**
0.0088	28.5		0.0088				**28.5**
0.0063	25.4		0.0063				**25.4**
0.0032	17.7		0.0032				**17.7**
0.0013	9.3		0.0013				**9.3**
0.0013	9.3						
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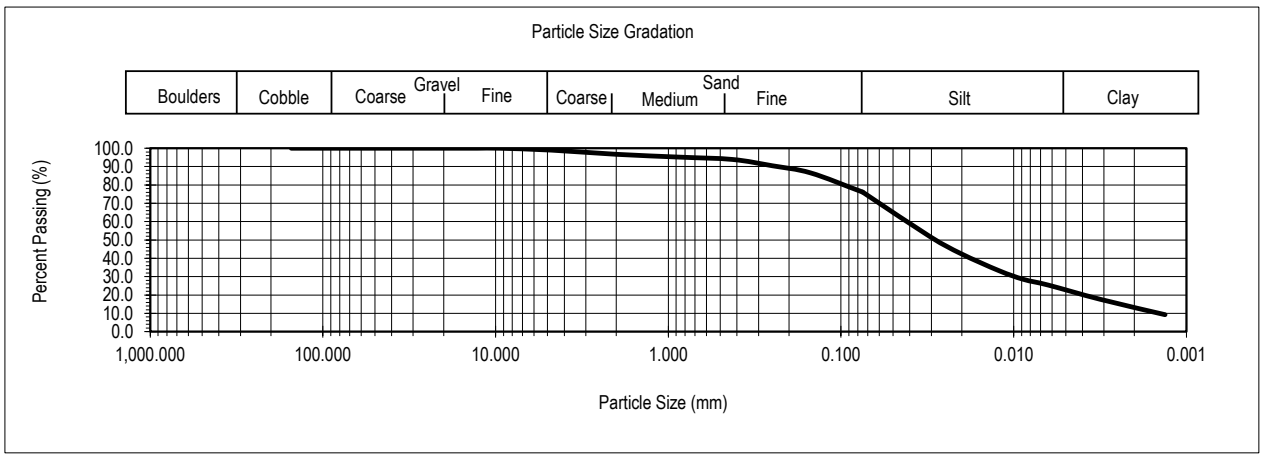
0.0013	9.3						

Hydrometer



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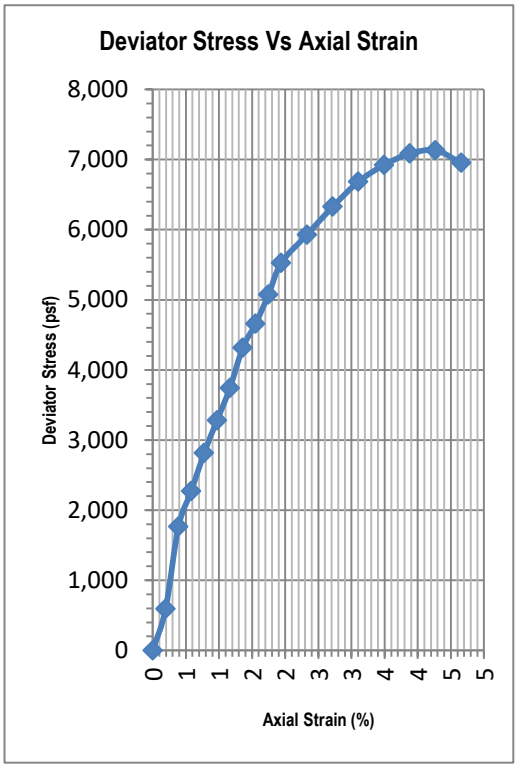
TRIAXIAL COMPRESSION SHEAR TEST
UNCONSOLIDATED UNDRAINED (UU) WITH PORE WATER PRESSURE
ASTM D2850

Project No:	70641-01	Project Name:	Glenn County Transfer Station	Date:	12/09/16
Sample No:	L4-1-1	Boring/Trench No:	B16-4	Tested By:	JFH
Soil Description:	(ML) Silt w/ Fine Sand; Silt 80%, Sand 20%, Vis Est; Olive (5Y 4/4)			Checked By:	
				Lab No:	C16-147

SAMPLE PREPERATION DATA

PARAMETERS			INITIAL	FINAL
Equations	Tare I.D. No.	Units	0	G13
a	Wt. Tare	(gr)	0.00	766.60
b	Wt Wet Soil + Tare	(gr)	678.50	1522.40
c	Wt Dry Soil + Tare	(gr)	599.80	1366.40
d = b - a	Wt. Wet Soil	(gr)	678.50	755.80
e = c - a	Wt. Dry Soil	(gr)	599.80	599.80
f = b - c	Wt. Water	(gr)	78.70	156.00
w = f / e	Moisture Content	(%)	13.12	26.01
	Wet Density	(pcf)	111.6	124.3
	Dry Density	(pcf)	98.7	98.7
	void ratio	(dim.)	0.7085	
	Saturation	(%)	50.00	
	Diameter	(in)	2.392	
	Area	(in^2)	4.494	
	Height	(in)	5.154	
	Volume	(in^3)	23.161	
	B Parameter	(dim.)		0.810



TEST SETUP PARAMETERS

Gs	Specific Gravity	2.700	(dimensionless)		
γ_w	Unit Weight of Water	62.428	(pcf)		
D	Deformation Dial Constant	0.001	(inch / unit)		
Hc	Sample Height	5.154	(inch)		
Ac	Sample Cross-Sectional Area	4.494	(in^2)		
C_1	Primary Load Ring Constant	1.2300	(lbs/unit)		
U_{CH}	Chamber Cell Pressure	65	(psi)	9360	(psf)
U_{TB}	Sample Top and Bottom Back Pressure	55	(psi)	7920	(psf)
U_{CN}	Confining Pressure	10	(psi)	1440	(psf)
R	Strain Rate	0.084	(inch / minute)		
F_{dmax}	Maximum Failure Deviator Stress	7,131.35	(psf)		
τ_{max}	MaximumFailure Shear Stress	3,565.68	(psf)		

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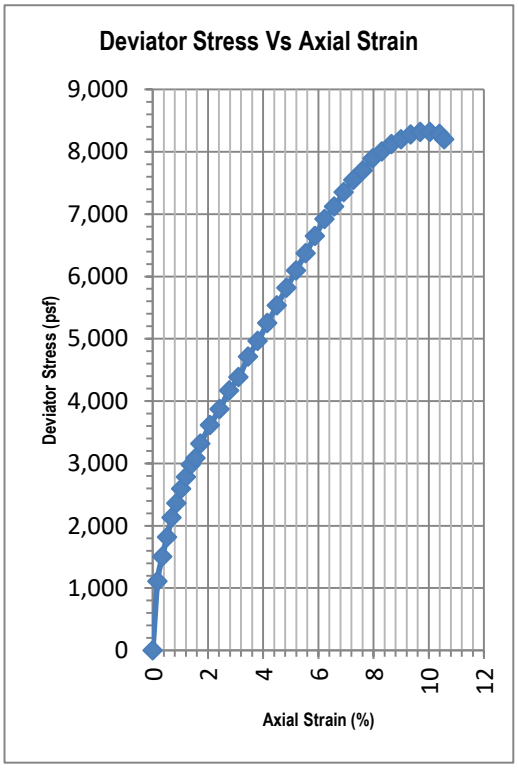
TRIAXIAL COMPRESSION SHEAR TEST
UNCONSOLIDATED UNDRAINED (UU) WITH PORE WATER PRESSURE
ASTM D2850

Project No:	70641-01	Project Name:	Glenn County Transfer Station	Date:	12/09/16
Sample No:	L6-1-1	Boring/Trench No:	B16-4	Tested By:	JFH
Soil Description:	(ML) Silt; Vis Est; Light Olive Brown (2.5Y 5/4)			Checked By:	SDC
				Lab No:	C16-147

SAMPLE PREPERATION DATA

PARAMETERS			INITIAL	FINAL
Equations	Tare I.D. No.	Units	ZZ1	G3
a	Wt. Tare	(gr)	169.20	764.10
b	Wt Wet Soil + Tare	(gr)	999.40	1620.00
c	Wt Dry Soil + Tare	(gr)	855.10	1450.00
d = b - a	Wt. Wet Soil	(gr)	830.20	855.90
e = c - a	Wt. Dry Soil	(gr)	685.90	685.90
f = b - c	Wt. Water	(gr)	144.30	170.00
w = f / e	Moisture Content	(%)	21.04	24.78
	Wet Density	(pcf)	122.6	126.4
	Dry Density	(pcf)	101.3	101.3
	void ratio	(dim.)	0.6634	
	Saturation	(%)	85.62	
	Diameter	(in)	2.384	
	Area	(in^2)	4.464	
	Height	(in)	5.777	
	Volume	(in^3)	25.787	
	B Parameter	(dim.)		0.830



TEST SETUP PARAMETERS

Gs	Specific Gravity	2.700	(dimensionless)		
γ_w	Unit Weight of Water	62.428	(pcf)		
D	Deformation Dial Constant	0.001	(inch / unit)		
Hc	Sample Height	5.777	(inch)		
Ac	Sample Cross-Sectional Area	4.464	(in^2)		
C_1	Primary Load Ring Constant	1.2300	(lbs/unit)		
U_{CH}	Chamber Cell Pressure	65	(psi)	9360	(psf)
U_{TB}	Sample Top and Bottom Back Pressure	55	(psi)	7920	(psf)
U_{CN}	Confining Pressure	10	(psi)	1440	(psf)
R	Strain Rate	0.084	(inch / minute)		
F_{dmax}	Maximum Failure Deviator Stress	8,317.09	(psf)		
τ_{max}	MaximumFailure Shear Stress	4,158.55	(psf)		

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Atterberg Indices

ASTM D4318

DSA File No.: n/a

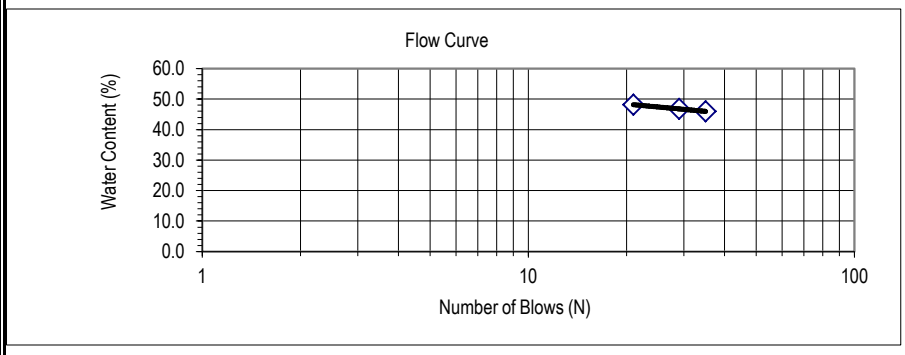
DSA App No.: n/a

Project No.:	70641-01	Project Name:	Glenn County Transfer Station			Date:	12/09/16
Sample No.:	SPT-7	Boring/Trench:	B16-4	Depth, (ft.):	25.5'	Tested By:	JFH
Description:	(CL) Clay; Caly 99%,Lab data; Light Olive Brown (2.5Y 5/4)					Checked By:	SDC
Sample Location:						Lab. No.:	C16-147

Estimated % of Sample Retained on No. 40 Sieve: 100 Sample Air Dried: yes

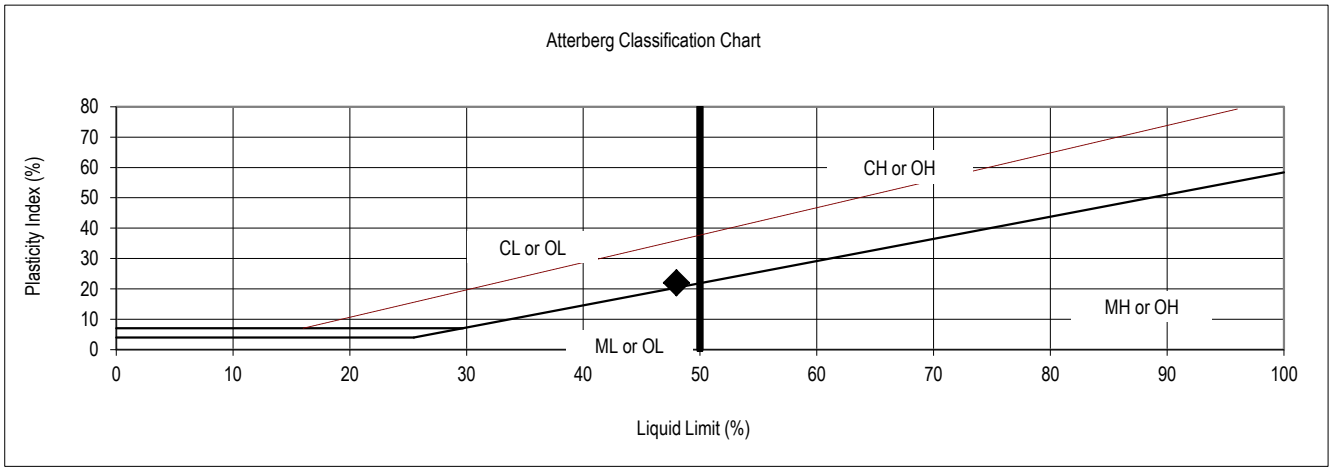
Test Method A or B: A

	LIQUID LIMIT:					PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	M	I	K			J	P	
Wt. Pan (gr)	60.89	62.67	61.29			63.31	1.95	
Wt. Wet Soil + Pan (gr)	76.61	77.35	77.78			71.70	11.58	
Wt. Dry Soil + Pan (gr)	71.66	72.67	72.42			69.96	9.59	
Wt. Water (gr)	4.95	4.68	5.36			1.74	1.99	
Wt. Dry Soil (gr)	10.77	10.00	11.13			6.65	7.64	
Water Content (%)	46.0	46.8	48.2			26.2	26.0	
Number of Blows, N	35	29	21					
				LIQUID LIMIT =	48		PLASTIC LIMIT =	26



Plasticity Index = 22

Group Symbol = CL



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Particle Size Distribution

ASTM D422, C136

Project No.:	**70641-01**	Project Name:	**Glenn County Transfer Station**	Date:	**12/9/2016**
Sample No.:	**SPT-7**	Boring/Trench:	**B16-4**	Depth, (ft.): **25.5'**	Tested By: **JFH**
Description:	**(CL) Clay; Caly 99%,Lab data; Light Olive Brown (2.5Y 5/4)**				Checked By: **SDC**
Sample Location:					Lab. No.: **C16-147**

		Sieve Size	Particle Diameter		Dry Weight on Sieve			Percent
			Inches	Millimeter	Retained On Sieve	Accumulated On Sieve	Passing Sieve	Passing
		(U.S. Standard)	(in.)	(mm)	(gm)	(gm)	(gm)	(%)
#####		6 Inch	6.0000	152.4		0.0	862.7	**100.0**
#####		3 Inch	3.0000	76.2		0.0	862.7	**100.0**
#####		2 Inch	2.0000	50.8		0.0	862.7	**100.0**
#####		1.5 Inch	1.5000	38.1		0.0	862.7	**100.0**
#####		1.0 Inch	1.0000	25.4	0.00	0.0	862.7	**100.0**
#####		3/4 Inch	0.7500	19.1	0.00	0.0	862.7	**100.0**
#####		1/2 Inch	0.5000	12.7	0.00	0.0	862.7	**100.0**
9.5250		3/8 Inch	0.3750	9.5	0.00	0.0	862.7	**100.0**
4.7500		#4	0.1870	4.7500	0.00	0.0	862.7	**100.0**
2.0000		#10	0.0787	2.0000	0.20	0.2	862.5	**100.0**
0.8500		#20	0.0335	0.8500	1.57	1.8	861.0	**99.8**
0.4250		#40	0.0167	0.4250	0.00	1.8	861.0	**99.8**
0.2500		#60	0.0098	0.2500	0.00	1.8	861.0	**99.8**
0.1500		#100	0.0059	0.1500	1.57	3.3	859.4	**99.6**
0.0750	98.7	#200	0.0030	0.0750	7.84	11.2	851.5	**98.7**
0.0261	91.4			0.0261				**91.4**
0.0170	86.0			0.0170				**86.0**
0.0104	75.1			0.0104				**75.1**
0.0077	66.1			0.0077				**66.1**
0.0057	55.1			0.0057				**55.1**
0.0030	35.2			0.0030				**35.2**
0.0013	16.3			0.0013				**16.3**
0.0013	16.3							
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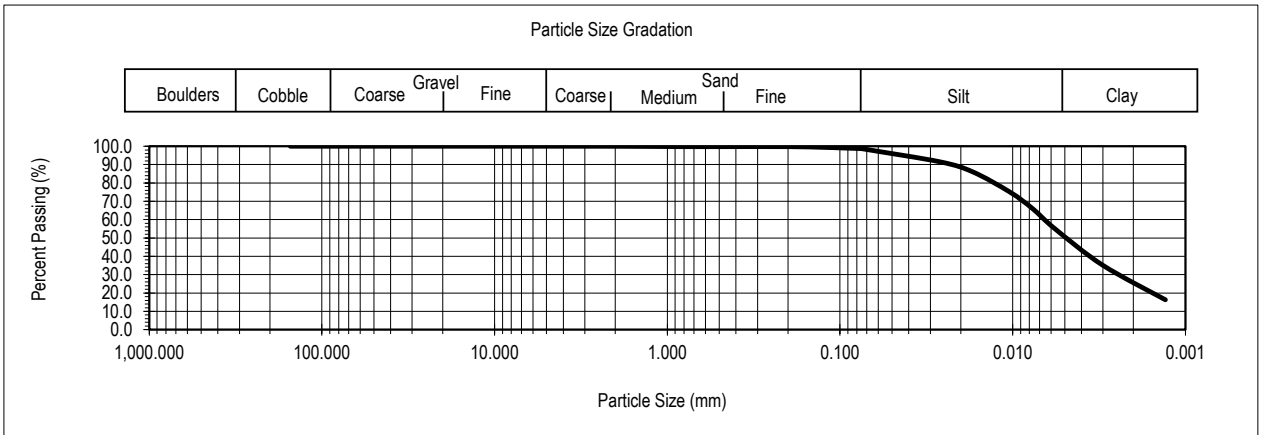
0.0013	16.3							

Hydrometer



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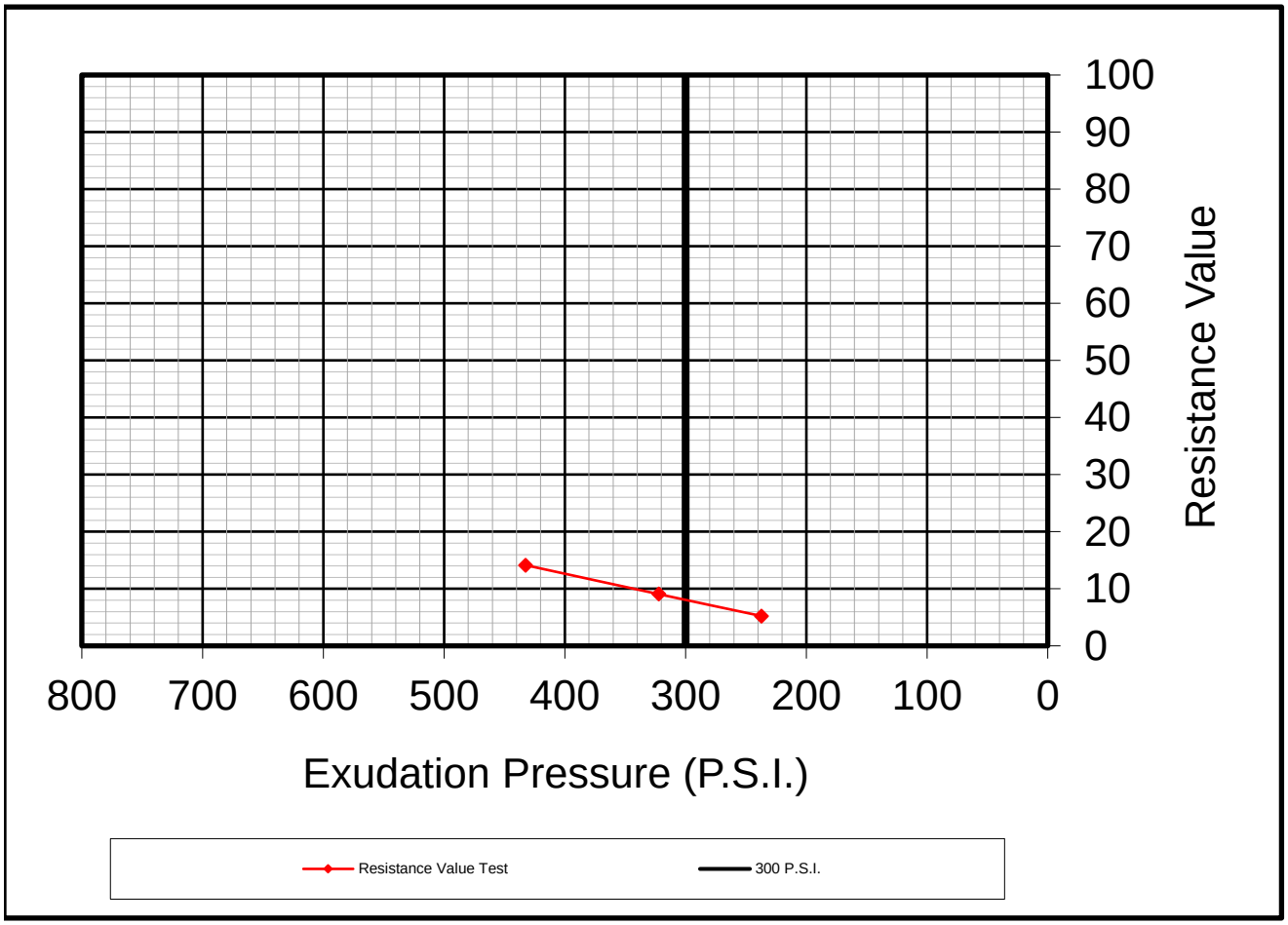
RESISTANCE (R) VALUE TEST

ASTM D 2844

PEI Laboratory No.:	L162745	**H & K Project Name:**	Glenn County Transfer Station
PEI Client:	Holdrege & Kull	**H & K Project No.:**	70641
PEI Project Name:	2016 Laboratory Testing	**H & K Task No.:**	01
PEI Project No.:	160023-01	**H & K Office:**	Chico
Report Date:	December 1, 2016	**H & K Engineer:**	Shane Cummings
Sample Description:	Brown Silty Clay	**H & K Sample No.:**	Bulk1 16-1122
		H & K Location:	n/a



Specimen No.	4	5	6
Moisture Content (%)	23.2	24.7	25.4
Dry Density (PCF)	101.7	99.9	99.5
Resistance Value (R)	14	9	5
Exudation Pressure (PSI)	432	322	237
Expansion Pressure	65	43	30
As Received Moisture Content (%)	23.2		

RESISTANCE VALUE AT 300 P.S.I. 8

AASHTO R18

Reviewed By: _____

Brandon Rodebaugh
Materials Engineer

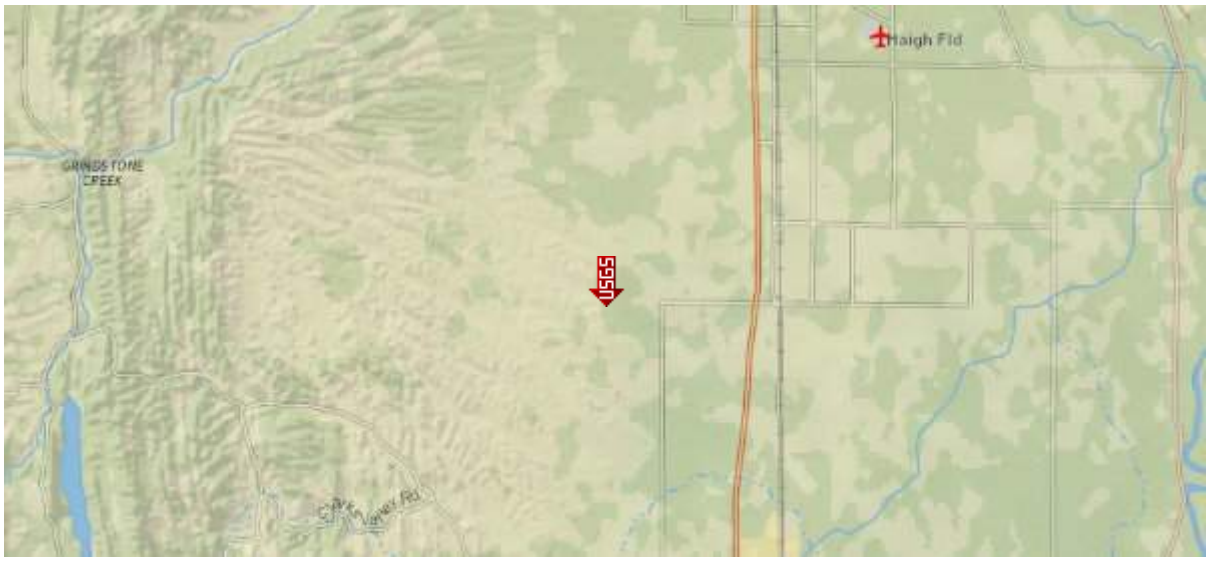
APPENDIX E:

Seismic Design Parameter Detailed Report

USGS Design Maps Summary Report

User–Specified Input

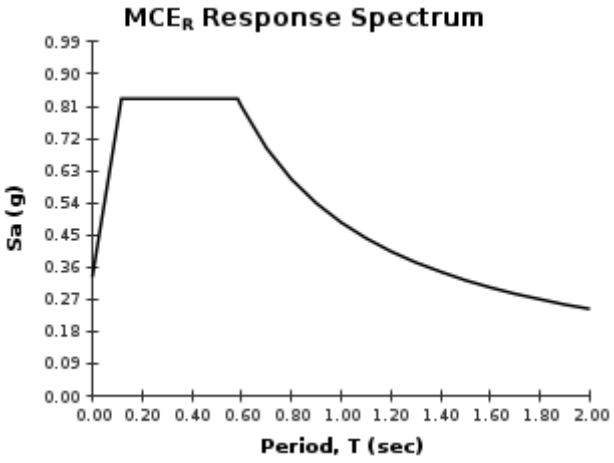
Report Title	Glenn Co Landfill Transfer Station Thu December 29, 2016 20:45:57 UTC
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	39.6325°N, 122.2765°W
Site Soil Classification	Site Class C – "Very Dense Soil and Soft Rock"
Risk Category	I/II/III

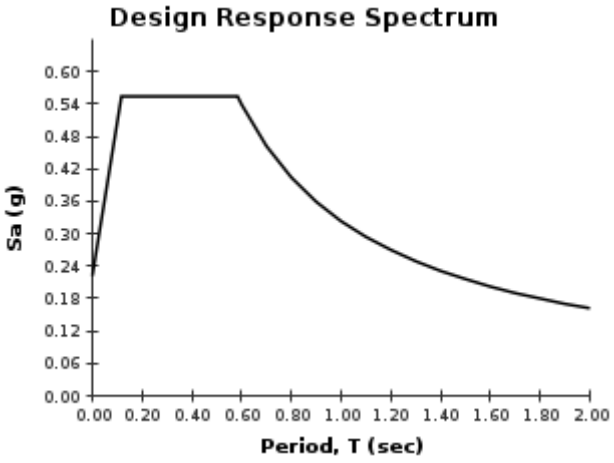


USGS–Provided Output

S_S =	0.758 g	S_{MS} =	0.831 g	S_{DS} =	0.554 g
S_1 =	0.330 g	S_{M1} =	0.485 g	S_{D1} =	0.323 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

USGS Design Maps Detailed Report

ASCE 7-10 Standard (39.6325°N, 122.2765°W)

Site Class C – "Very Dense Soil and Soft Rock", Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1]	S_S = 0.758 g
From Figure 22-2 [2]	S_1 = 0.330 g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class C, based on the site soil properties in accordance with Chapter 20.

Table 20.3–1 Site Classification

Site Class	$\overline{v}_s$	$\overline{N}$ or $\overline{N}_{ch}$	$\overline{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index *PI* > 20, • Moisture content *w* ≥ 40%, and • Undrained shear strength $\overline{s}_u$ < 500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk–Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4–1: Site Coefficient F_a

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_S

For Site Class = C and S_S = 0.758 g, F_a = 1.097

Table 11.4–2: Site Coefficient F_v

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at 1–s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_1

For Site Class = C and S_1 = 0.330 g, F_v = 1.470

Equation (11.4–1): $S_{MS} = F_a S_S = 1.097 \times 0.758 = 0.831$ g

Equation (11.4–2): $S_{M1} = F_v S_1 = 1.470 \times 0.330 = 0.485$ g

Section 11.4.4 — Design Spectral Acceleration Parameters

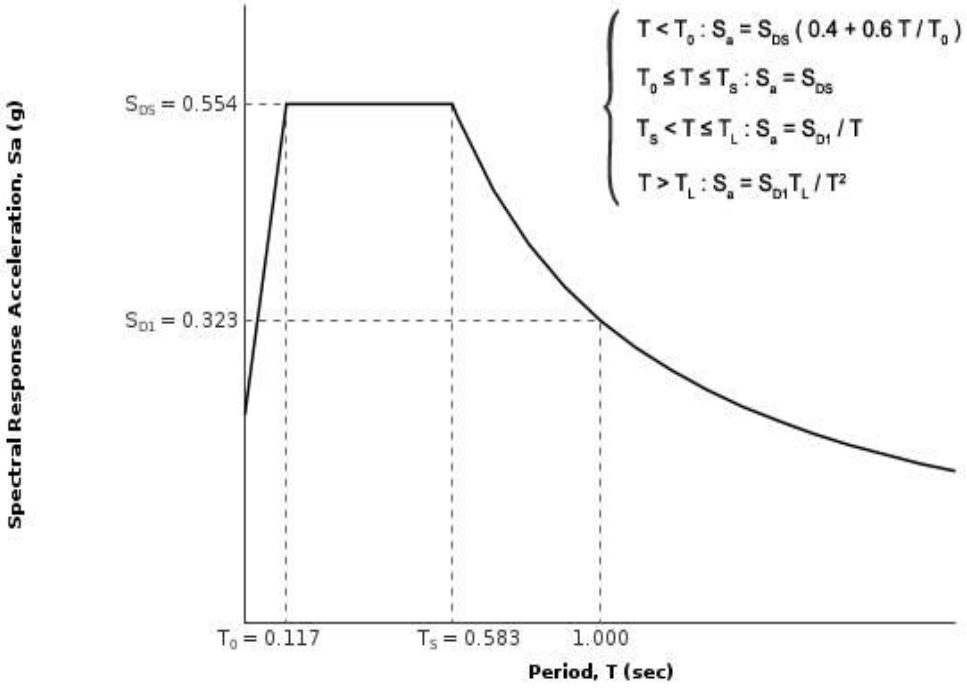
Equation (11.4–3): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 0.831 = 0.554$ g

Equation (11.4–4): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.485 = 0.323$ g

Section 11.4.5 — Design Response Spectrum

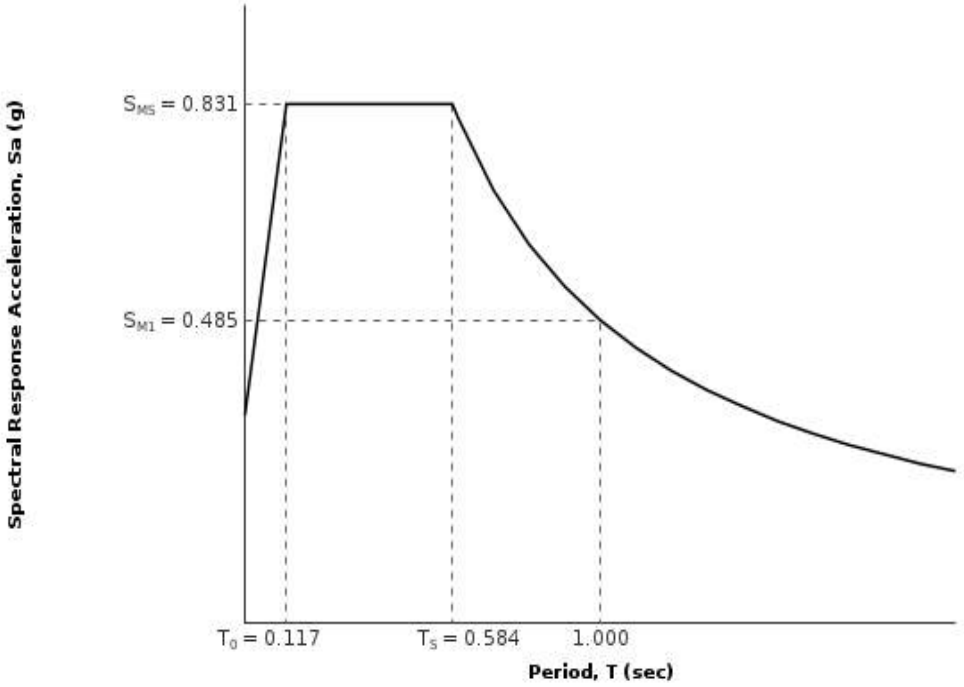
From Figure 22-12 [3] $T_L = 16$ seconds

Figure 11.4–1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.304

Equation (11.8–1): $PGA_M = F_{PGA}PGA = 1.096 \times 0.304 = 0.334$ g

Table 11.8–1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of PGA

For Site Class = C and PGA = 0.304 g, F_{PGA} = 1.096

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 0.992

From Figure 22-18 [6] C_{R1} = 0.992

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 0.554 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 0.323 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

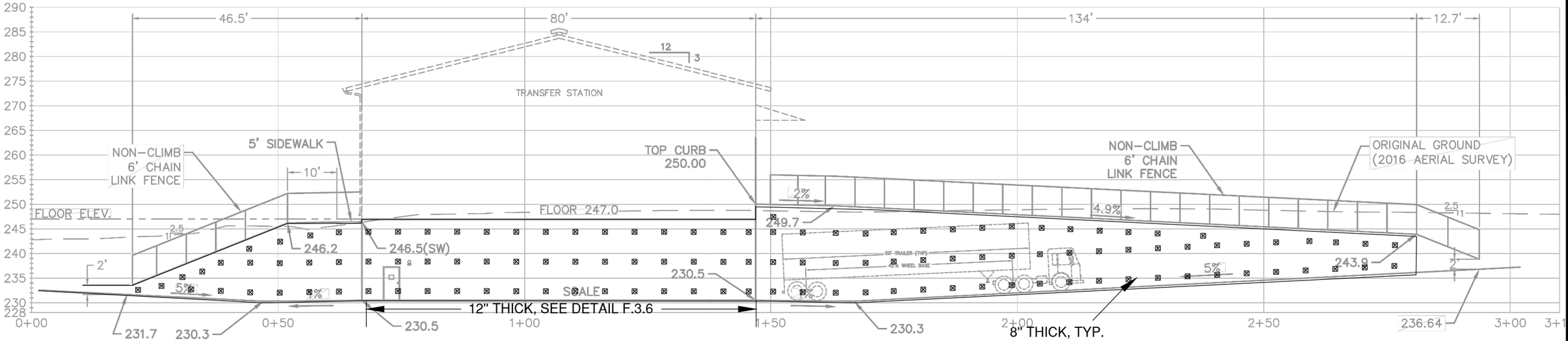
Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

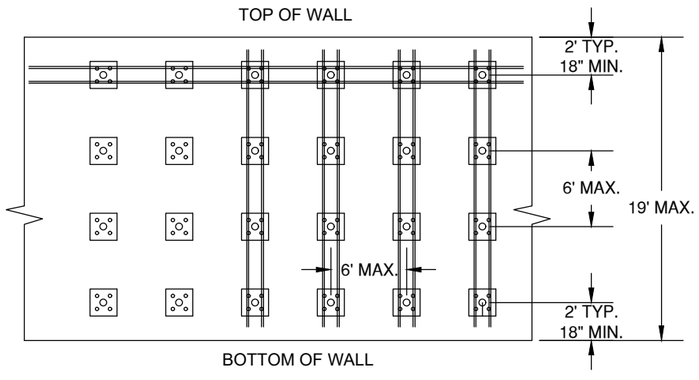
1. *Figure 22-1*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

APPENDIX F:

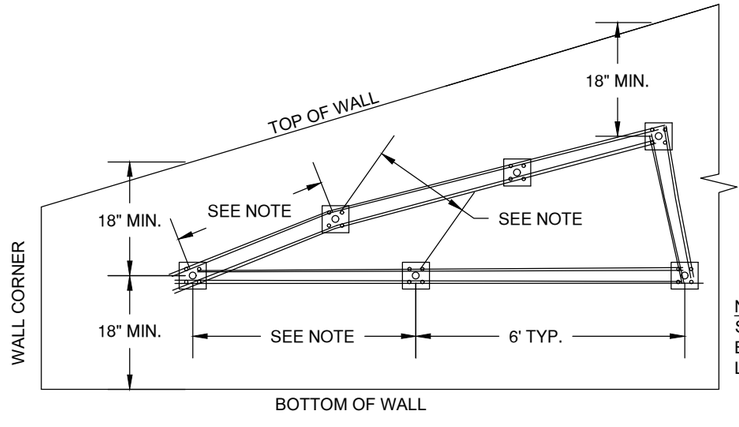
Soil Nail Wall Plan, Details, Slope Stability Analysis and Data Output



1 RETAINING WALL WITH TYPICAL NAIL SPACING - LOOKING EAST
NOT TO SCALE



2 TYPICAL SPACING OF SOIL NAILS
NOT TO SCALE



NOTE:
SPACING NEAR CORNERS WILL BE FIELD FITTED WITH SPACING LESS THAN THE TYPICAL 6 FEET.

3 CORNER DETAIL
NOT TO SCALE

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RETAINING WALL SPACING
PROPOSED GLENN COUNTY TRANSFER STATION
5700 COUNTY ROAD 33
ARTOIS, GLENN COUNTY, CALIFORNIA

PROJ NO.: 70641-01

DATE: JULY,2017

FIGURE NO.: F.1

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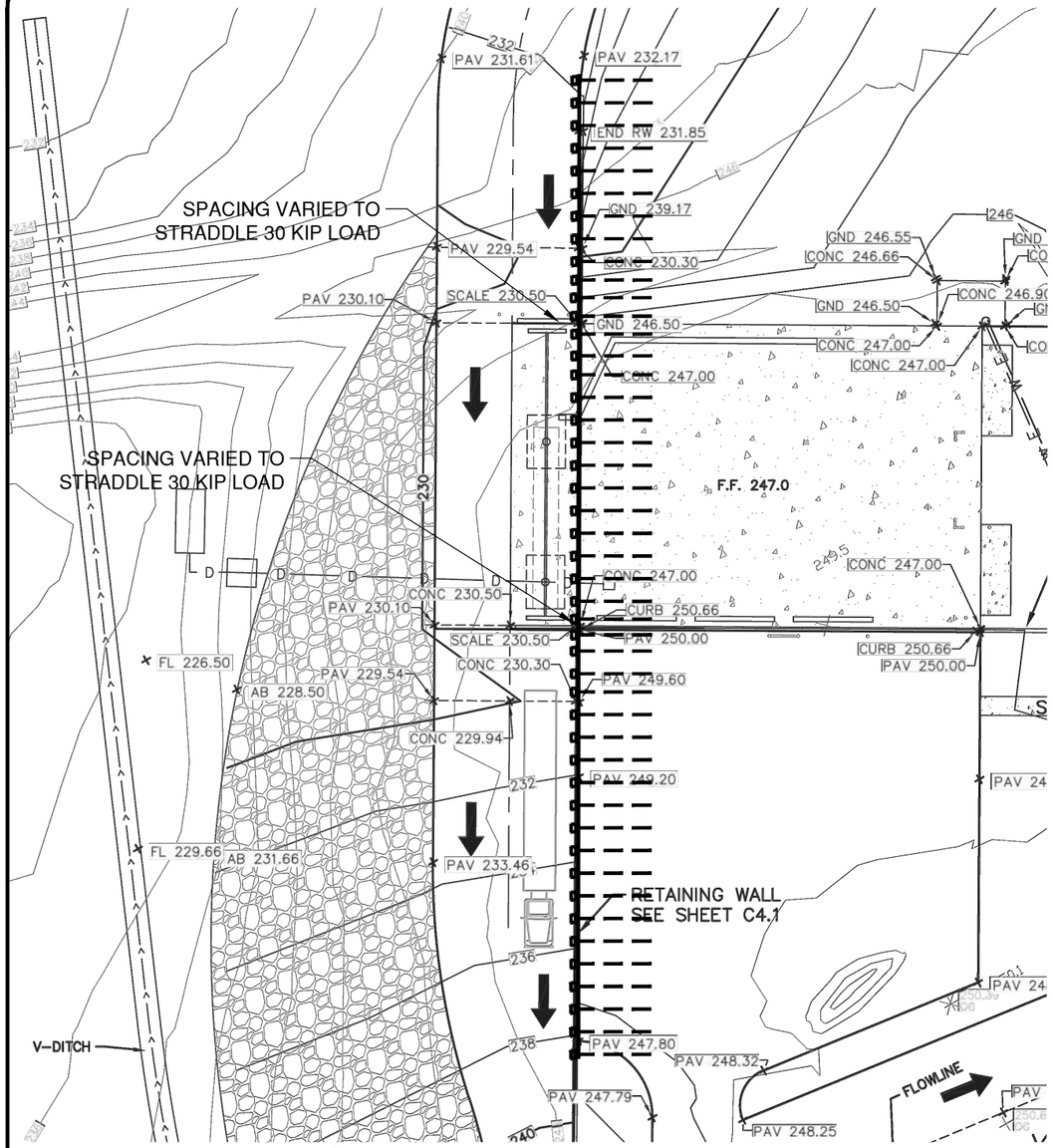
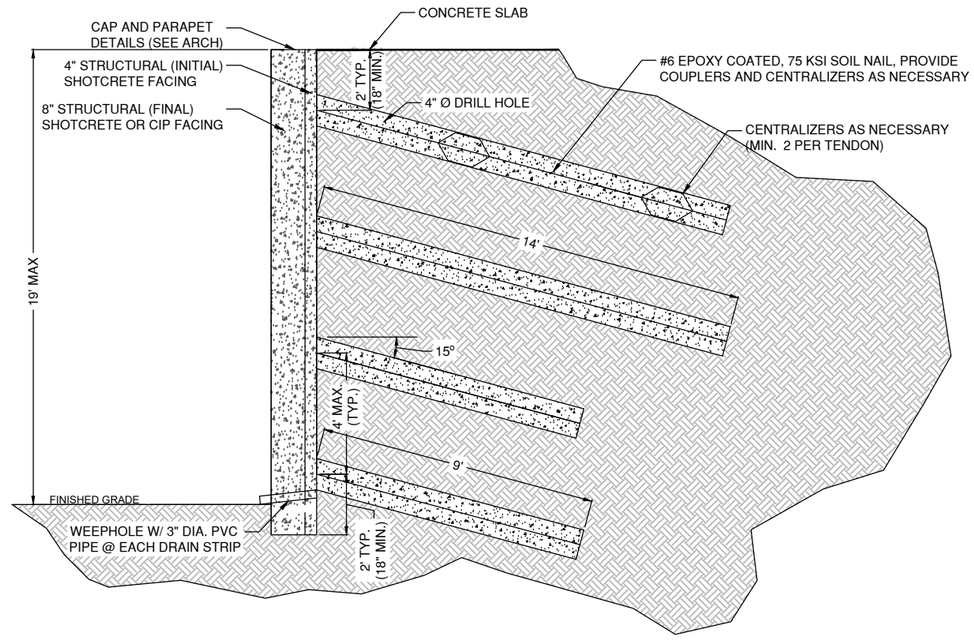


4 RETAINING WALL PLAN VIEW
1" □ 40'



5 TYPICAL PROFILE VIEW
NOT TO SCALE

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PROJ NO.: 70641-01

DATE: JULY,2017

FIGURE NO.: F.2

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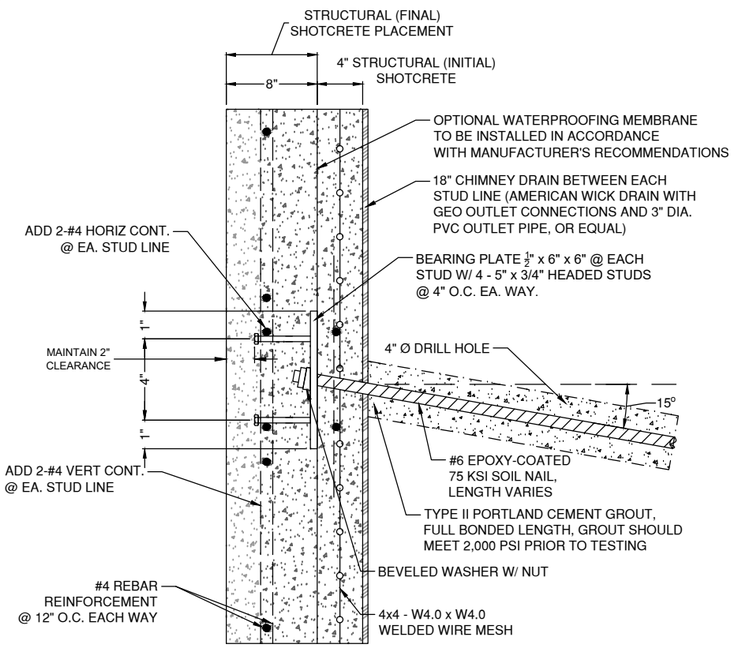
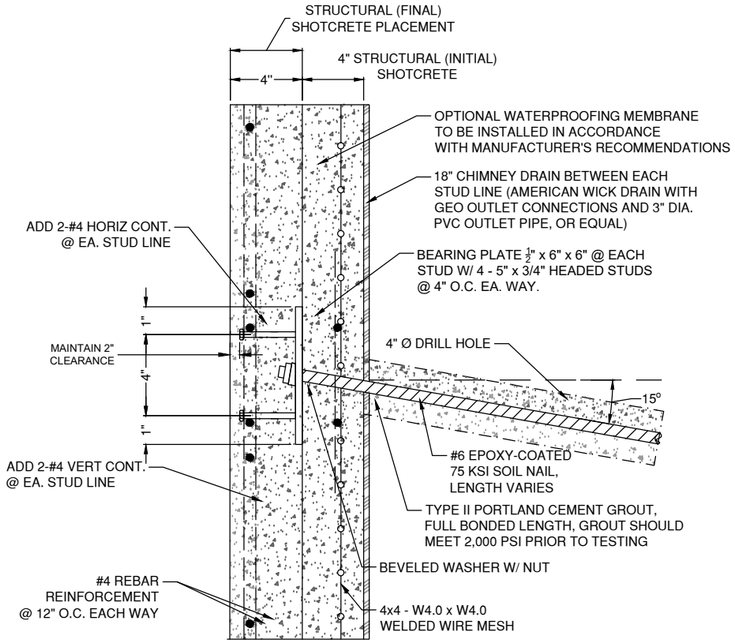
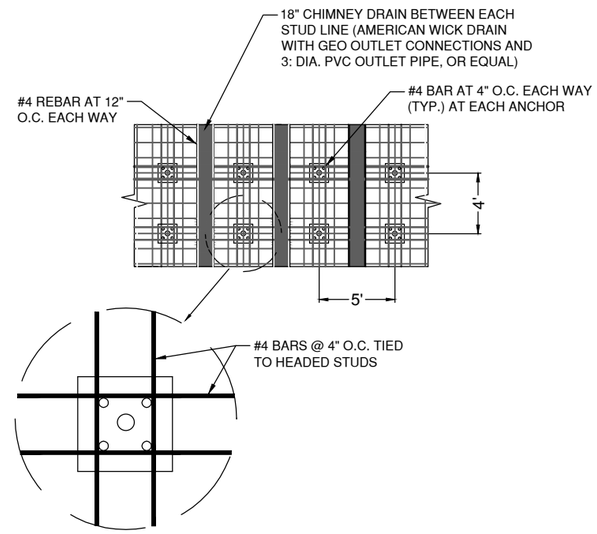


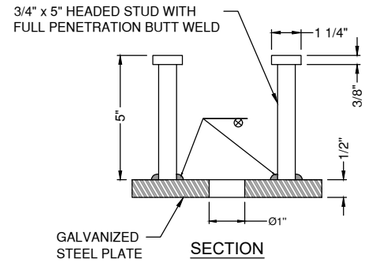
6 DETAILED SECTION VIEW
NOT TO SCALE



7 DETAILED SECTION VIEW (8")
NOT TO SCALE

8 REBAR DETAIL (FINAL STRUCTURAL LAYER)
NOT TO SCALE





9 BEARING PLATE DETAIL
NOT TO SCALE

CONSTRUCTION NOTES (NEW WALL):

1. EXCAVATION SHALL PROCEED IN MAXIMUM 5 FOOT LIFTS.
2. SLOPES SHALL BE SCALED TO REMOVE LOOSE MATERIAL.
3. HOLES SHALL BE DRILLED WITH EQUIPMENT CAPABLE OF DRILLING A 4" DIA. MINIMUM HOLE TO THE SPECIFIED DEPTHS AT THE SPECIFIED ANGLES.
4. HOLES SHALL BE DRILLED AT A INCLINE OF ABOUT 10-15 DEGREES DOWN FROM THE HORIZONTAL.
5. THE ENTIRE LENGTH OF EACH BAR SHALL BE GROUTED.
6. GROUT SHALL CONSIST OF 94 POUNDS OF TYPE II CEMENT TO 5 GALLONS OF CLEAN WATER.
7. GROUT SHALL BE PUMPED TO THE BOTTOM OF THE ANCHOR BOLT HOLES TO THE DESIRED BOND LENGTH. GROUT SHOULD BE PUMPED UNDER A MINIMUM PRESSURE OF 50 PSI.
8. SOIL NAILS (TENDONS) SHALL CONSIST OF #6 EPOXY-COATED 75 KSI REBAR. EPOXY COATING SHALL BE SUITABLE FOR CORROSION CLASS B.
9. GROUT SHOULD REACH A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI PRIOR TO STRESSING.
10. PLACE DRAINAGE STRIPS, PLACE WWM IN CENTER OF INITIAL SHOTCRETE LAYER (BLOCK AS NECESSARY) AND PLACE INITIAL SHOTCRETE 4" THICK ON WALL. PROTECT END OF RODS IF NECESSARY.
11. PLACE WATERPROOFING MEMBRANE (OPTIONAL).
12. INSTALL BEARING PLATE WITH HEADED STUDS OVER INITIAL SHOTCRETE ONCE CURED.
13. CONTINUE EXCAVATION TO TERMINUS, REPEATING THIS PROCESS.
14. VERIFICATION TESTING AND PROOF TESTING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. A MINIMUM OF THREE VERIFICATION TESTS SHALL BE COMPLETED PRIOR TO INSTALLING PRODUCTION NAILS, DISPERSED VERTICALLY AND HORIZONTALLY ACROSS THE WALL AREA. PROOF TESTS SHALL BE COMPLETED ON AT LEAST ONE OUT OF EVERY 15 PRODUCTION SOIL NAILS (APPROXIMATELY 6.7% OF ALL NAILS).
15. FOOTING DRAIN PIPES SHOULD BE CONNECTED TO CHIMNEY DRAIN PANELS PRIOR TO PLACING LOWER INITIAL SHOTCRETE FACING. PROTECT DRAIN PIPES AS NEEDED.

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PROJ NO.: 70641-01

DATE: JULY,2017

FIGURE NO.: F.3

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