



LOMITAS NEGRAS PHASE 2

BID AND CONTRACT DOCUMENTS BID AND AGREEMENT FORMS AND SPECIFICATIONS

SOUTHERN SANDOVAL COUNTY ARROYO FLOOD
CONTROL AUTHORITY (SSCAFCA)

IFB # 2018-07

SSCAFCA PROJECT NUMBER: MO_P0010



LOMITAS NEGRAS PHASE 2

BID AND CONTRACT DOCUMENTS

SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY (SSCAFCA)

IFB # 2018-07

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal as a professional engineer licensed to practice in the state of New Mexico, is affixed below.

November 14, 2018
Patrick Stovall, P.E. 13830



Patrick L. Stovall



SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY (SSCAFCA) •
LOMITAS NEGRAS PHASE 2 • BID AND CONTRACT DOCUMENTS

Engineer
Certification

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Advertisement for Bids

**SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY
(SSCAFCA)
LOMITAS NEGRAS PHASE 2
CONSTRUCTION SERVICES
INVITATION FOR BIDS
I. IFB 2018-07**

The Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA) requests competitive sealed bids for Construction Services for the Lomitas Negras Phase 2 project. The solicitation documents, which include criteria for selection, scope of work and any additional information, can be obtained on the SSSCAFCA website <http://www.sscafca.org>. Contact person: Deborah Casaus, Procurement Officer at (505) 892-7246.

SSCAFCA will accept bids until December 20, 2018 at 3:00 pm local time at SSSCAFCA offices located at 1041 Commercial Dr. SE, Rio Rancho, NM 87124. Bids received after the deadline will not be considered. A non-mandatory Pre-Bid Conference will be held on December 6, 2018 at 2:00 PM at SSSCAFCA offices.

**SOUTHERN SANDOVAL COUNTY
ARROYO FLOOD CONTROL AUTHORITY**

/s/ Chuck Thomas, PE
Executive Engineer

Instructions to Bidders

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INSTRUCTIONS TO THE BIDDERS¹

ARTICLE 1 – DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office* – The office from which the Bidding Documents are to be issued.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit with its Bid (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:
- A. Evidence of Bidder's authority to do business in the state where the Project is located.
 - B. Bidder's state or other contractor license number, if applicable.
 - C. Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."
 - D. [Deleted]
- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.
- 3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

¹ EJCDC® C-200, Suggested Instructions to Bidders for Construction Contracts. © 2013

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER’S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.01 *Site and Other Areas*

- A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.02 *Existing Site Conditions*

- A. Subsurface and Physical Conditions; Hazardous Environmental Conditions
 - 1. The Supplementary Conditions identify:
 - a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.
 - b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
 - c. reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.
 - 2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
 - 3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.
- B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.
- C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated

in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

4.03 *Site Visit and Testing by Bidders*

- A. Bidder shall conduct the required Site visit during normal working hours and shall not disturb any ongoing operations at the Site.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

- A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.05 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 5 – BIDDER'S REPRESENTATIONS

5.01 It is the responsibility of each Bidder before submitting a Bid to:

- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;
- E. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;
- F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
- I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and
- J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

- 6.01 A non-mandatory pre-Bid conference will be held at the time and location stated in the invitation or advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective. Bids received from Bidders that do not attend the pre-bid conference will not be considered for award.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Owner in writing, **via email, to dcasaus@sscafca.com**. Interpretations or clarifications considered necessary by Owner or Engineer in response to such questions will be issued by Addenda via the Owner's website, **www.sscafca.org**. It is the bidder's responsibility to check the web site to obtain addenda. Questions received after the deadline for written questions as stated in the bid, will not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **5** percent of Bidder's maximum Bid price and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS

- 11.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract

award process of possible substitute or “or-equal” items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or “or-equal” item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

- 11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.
- 12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.
- 12.03 The apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed for the following portions of the Work:

If requested by Owner, such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder’s Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

- 12.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form is included with the Bidding Documents. All questions relating to the bid documents must be directed to: dcasaus@sscafca.com.

- A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
 - B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item or items is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."
- 13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.
- 13.03 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.04 A Bid by an individual shall show the Bidder's name and official address.
- 13.05 A Bid by a joint venture shall be executed by an authorized representative of each joint venture in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.06 All names shall be printed in ink below the signatures.
- 13.07 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.08 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.09 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 *Unit Price*

- A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

14.02 Allowances

- A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 7 of the Bid Form.
- 15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED" and mailed Bid shall be addressed to [SSCAFCA: 1041 Commercial Dr. SE, Rio Rancho, NM 87124](#).
- 15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

- 17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids via the Owner's web site, www.sscafca.org.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.
- 19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.
- 19.03 Evaluation of Bids
- A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
 - B. In the comparison of Bids, alternates (including deductive alternates) will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner shall announce to all bidders a “Base Bid and the bids for the deductive alternatives” budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.
- 19.04 In evaluating whether a Bidder is responsible, Owner **may** consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 20 – BONDS AND INSURANCE

- 20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner’s requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within 10 days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 22 – PREVAILING WAGE RATES

22.01 Bidder is notified that the Successful Bidder shall pay to their employees, employed on site of the project, the wage rates and fringe benefit rates included in the Supplementary Conditions. State assisted projects in excess of \$60,000.00 are subject to State Wage Standards.

ARTICLE 23 – BRIBES, GRATUITIES AND KICKBACKS

23.01 Reference is hereby made to the criminal laws of New Mexico which prohibits bribes, kickbacks, and gratuities, violation of which constitutes a felony.

ARTICLE 24 – REGISTRATION OF CONTRACTOR'S AND SUBCONTRACTOR'S FOR PUBLIC WORKS CONTRACTS

24.01 In order to submit a bid valued at more than sixty thousand dollars (\$60,000.00), or to be considered for award of any portion of a public works project greater than sixty thousand dollars (\$60,000.00) the contractor serving as a prime contractor, subcontractor, or any tier thereof, shall be registered and obtain a New Mexico Public Works Registration Number.

ARTICLE 25 – CAMPAIGN CONTRIBUTION DISCLOSURE

25.01 A Bidder or a family member or representative of a of the Bidder shall not give a campaign contribution or other thing of value to an applicable public official or the applicable public official's employees during the pendency of the solicitation for Bids.

ARTICLE 26 – RESIDENT CONTRACTOR PREFERENCE AND RESIDENT VETERAN CONTRACTOR PREFERENCE

26.01 Due to the source of the funding for this project, New Mexico Resident Preference or Resident Veteran Preference will not be applicable for this project.

Bid Forms

Bid Form

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Bid Form²

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

***SOUTHERN SANDOVAL COUNTY ARROYOFLOOD CONTROL AUTHORITY (SSCAFCA) - SSCAFCA:
1041 Commercial Dr. SE, Rio Rancho, NM 87124***

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

- A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

<u>Addendum No.</u>	<u>Addendum, Date</u>
_____	_____
_____	_____
_____	_____
_____	_____

- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent

² EJCDC® C-410, Bid Form for Construction Contracts. © 2013

to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

- E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.
- F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at

artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 – BASIS OF BID

- 5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s): **As shown on the attached Unit Price Bid Proposal.**

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor’s overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 6 – TIME OF COMPLETION

- 6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

- 7.01 The following documents are submitted with and made a condition of this Bid:
- A. Required Bid security;
 - B. List of Proposed Subcontractors;
 - C. List of Proposed Suppliers;
 - D. Non-Collusion Affidavit;
 - E. **SSCAFCA Campaign Contribution Disclosure Form;**
 - F. **Federal Campaign Contribution Disclosure Form;**
 - G. **Affirmative Action/Equal Employment Opportunity Form;**
 - H. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;
 - I. Contractor’s License No.: **or** Evidence of Bidder’s ability to obtain a State Contractor’s License and a covenant by Bidder to obtain said license within the time for acceptance of Bids;
 - J. Bidder’s Qualification Statement with supporting data (ONLY REQUIRED IF REQUESTED AFTER BID OPENING).

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

By:

[Signature] _____

[Printed name] _____

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

Bidder's License No.: _____

(where applicable)

NM Public Works Registration No: _____

Unit Price Bid Proposal

UNIT PRICE BID PROPOSAL FOR: LOMITAS NEGRAS PHASE 2 Southern Sandoval County Arroyo Flood Control Authority							
BID ITEM NUMBER	Deductive Alternate #	BUILD / PAY ITEM NUMBER	ITEM DESCRIPTION Complete in Place = C.I.P.	UNIT	EST. QUANTITY	UNIT COST \$	AMOUNT \$
1		1200	Construction Traffic Control and Barricading: including any and all access signs and permitting by the City of Rio Rancho, Complete	LS	1		
2		1504	Temporary Pollution Control: NPDES and SWPPP Preparation and Maintenance, Complete	LS	1		
3		1505	Control of Storm Water and Nuisance Flow: C.I.P.	LS	1		
4		1506	Construction Staking: Complete	LS	1		
5		1508	Project Record Documents: Complete	LS	1		
6		1510	Project Signs: Place at designations by SSCAFCA at beginning of project and R&D after project finish, Complete	EA	2		
7		1510.1	Sign Remove and Replace: Existing roadway signs (2) along Obregon Rd. (south side), remove, store and replace, C.I.P.	EA	2		
8		201	Clearing and Grubbing: clearing and grubbing including haul and disposal, dust abatement is required and incidental, Complete	ACRE	37		
9		202	Excavation and Rough Grading: Excavation and rough grading to within 6-inches of finish grades on plans. Haul and dispose of excess soils off-site to SSCAFCA designated location within 6 mi radius included, compaction not required, dust abatement is required and incidental. Complete	CY	280,582		
10	1	204	Fill Construction: Fill soil material for NE side of N. Trib. Arroyo west of access road, when obtained from within the limits of construction, includes, subgrade preparation, blending / mixing to obtain homogeneous material / construction in lifts, rough and final grading, dust abatement is required and incidental, C.I.P.	CY	850		
11		204	Fill Construction: Fill soil material, when obtained from within the limits of construction, includes, subgrade preparation, blending / mixing to obtain homogeneous material / construction in lifts, rough and final grading, dust abatement is required and incidental, C.I.P.	CY	11,865		
12	1	513	Soil Cement: North Side of North Tributary Arroyo west of Maint. Access Rd., Construct soil cement structures with on-site soils as aggregate including excavation, subgrade preparation, and backfill, C.I.P.	CY	777		
13	1	509	Cement: Portland Cement (12% minimum) Type II-LA for Soil Cement, North Side of North Tributary Arroyo, Complete	TON	179		

UNIT PRICE BID PROPOSAL FOR: LOMITAS NEGRAS PHASE 2							
Southern Sandoval County Arroyo Flood Control Authority							
BID ITEM NUMBER	Deductive Alternate #	BUILD / PAY ITEM NUMBER	ITEM DESCRIPTION Complete in Place = C.I.P.	UNIT	EST. QUANTITY	UNIT COST \$	AMOUNT \$
14	2	513	Soil Cement: South Side of Main Arroyo west of Saratoga Rd. to the Flow Diversion Wall, Construct soil cement structures with on-site soils as aggregate including excavation, subgrade preparation, and backfill, C.I.P.	CY	2,605		
15	2	509	Cement: Portland Cement (12% minimum) Type II-LA for Soil Cement, South Side of Main Arroyo from Box Culverts at Saratoga to Flow Diversion Wall, Complete	TON	599		
16		513	Soil Cement: Construct soil cement structures with on-site soils as aggregate including excavation, subgrade preparation, and backfill, C.I.P.	CY	11,145		
17		509	Cement: Portland Cement (12% minimum) Type II-LA for Soil Cement, Complete	TON	2,552		
18		511000	Structural Concrete Class A: Structural RPCC, 4,000 psi, including excavation, subgrade prep, engineered fill, backfill, formwork, includes rebar, C.I.P.	CY	245		
19		301	Subgrade Preparation: 12" at 95% compaction, C.I.P.	SY	668		
20		541200	Structural Steel for Miscellaneous Structures: grate and steel support beam, includes all materials and labor, C.I.P.	LS	1		
21		541200	Structural Steel for Miscellaneous Structures: install steel sediment stage marker post, includes all materials, labor, C.I.P.	LBS	3,546		
22		602010	Rip-Rap Class B: includes riprap, non-woven filter fabric and placement, C.I.P.	CY	1,673		
23		602020	Rip-Rap Class C: Both Sides of Energy Dissipation Chute, and Below Energy Dissipation Final Step, includes riprap, non-woven filter fabric and placement, C.I.P.	CY	204		
24		570.1	Storm Sewer Pipe Installations: Principal Spillway 36-inch Smooth interior corrugated pipe, includes material, C.I.P. (joints must maintain min. 10.8 psi pressure for a min. of 10 minutes), Contech UltraFlo Pipe or approved equal	LF	284		
25		701.1	Trenching, Excavation and Backfill: Principal Spillway Trenching, Backfilling and Compaction, for 18" - 36" diameter drain, up to 8' in depth, pipe not incl., Complete	LF	284		

UNIT PRICE BID PROPOSAL FOR: LOMITAS NEGRAS PHASE 2 Southern Sandoval County Arroyo Flood Control Authority							
BID ITEM NUMBER	Deductive Alternate #	BUILD / PAY ITEM NUMBER	ITEM DESCRIPTION Complete in Place = C.I.P.	UNIT	EST. QUANTITY	UNIT COST \$	AMOUNT \$
26		570.2	Storm Sewer Pipe Installations: Obregon Rd. 42-inch Smooth interior corrugated pipe, includes material, C.I.P. (joints must maintain 10.8 psi pressure for a min. of 10 minutes), Contech UltraFlow pipe or approved equal	LF	717		
27		701.2	Trenching, Excavation and Backfill: Obregon Storm Drain Trenching, Backfilling and Compaction, for 42" - 60" diameter drain, up to 8' in depth, pipe not incl., Complete	LF	717		
28		660.024	Excavation, Backfill and Compaction for Manhole Type C - 6 Ft. Diameter: Obregon Storm Drain Manhole, 6' dia., Type "C", 10 ft -to 14 ft deep, Complete	EA	1		
29		660.042	Excavation, Backfill and Compaction for Manhole Type C - 8 Ft. Diameter: Obregon Storm Drain Manhole, 8' dia., Type "C", 6 ft to 10 ft deep, Complete	EA	1		
30		662024	Manhole Type C - 6 Ft. Diameter: Obregon Storm Drain Manhole, 6' dia., Type "C", 10 ft -to 14 ft deep, Complete, Contech UltraFlow or approved equal	EA	1		
31		662042	Manhole Type C - 8 Ft. Diameter: Obregon Storm Drain Manhole, 8' dia., Type "C", 6 ft to 10 ft deep, Complete, Contech UltraFlow or approved equal	EA	1		
32		410.6.4	Metal Pipe Access Control Gate: Pipe Gate, 16' wide, C.I.P.	EA	1		
33		410	Wood Posts: Twisted 5 Strand Barbless Wire Fence, fence including wood posts, mortises and concrete, C.I.P.	LF	4,312		
34		410.1	Steel Posts: Twisted 5 strand barbless wire fence: includes wire, 4 in. dia. SCH 40 A53 Grade B steel pipe, mortises, 7 ft long, 4 in. steel caps, welding, concrete, paint, all materials and labor, C.I.P.	LF	1,722		
35		662.1	Storm Drain Pyramid Structure, C.I.P., StormRax or approved equal	EA	1		
36		302	Aggregate Base Course: Pond Access Road, includes furnishing, placement and compaction of aggregate base course, C.I.P.	SY	1,797		
37		1509	Remove and Dispose Storm Drain: Remove and dispose existing Obregon Rd. storm drain, outfall concrete structure and appurtenances, includes haul and disposal fee. Complete.	LS	1		
38		607.2.3.1	Chain Link Fence: Saratoga Box Culverts upstream wingwalls: Build 5 ft tall fence, includes posts, rails, fasteners. C.I.P.	LF	32		

UNIT PRICE BID PROPOSAL FOR: LOMITAS NEGRAS PHASE 2 Southern Sandoval County Arroyo Flood Control Authority							
BID ITEM NUMBER	Deductive Alternate #	BUILD / PAY ITEM NUMBER	ITEM DESCRIPTION Complete in Place = C.I.P.	UNIT	EST. QUANTITY	UNIT COST \$	AMOUNT \$
39		607.2.3	Remove and Dispose Chain Link Fence: Saratoga Box Culverts upstream wingwalls (Remove and Dispose of existing fence & posts incidental), includes posts, rails, fasteners. C.I.P.	LF	32		
40		1509.1	Remove and Dispose Wire Enclosed Riprap: Remove and dispose existing wire enclosed riprap and appurtenances at Saratoga Box culverts upstream wingwalls, includes haul and disposal fee. Stockpile stones and reuse at Channel 6 per plans. Complete.	LS	1		
41		1506.1	Access control fencing around archeological site including remove and dispose after project is completed, Complete	LF	100		
42		905	SAS Cleanout Adjustments: Elevate 7 - 4-inch diameter PVC Pipe SAS cleanouts. Includes 4-inch PVC Sched. 40 pipes, 4-inch caps, appurtenances, 24-inch x 24-inch x 4-inch concrete pads. Includes all materials, labor. C.I.P.	LS	1		
43		1512	Weep Holes for lateral weir / energy dissipation structure: 3-inch PVC pipe Schedule 40, 3/4 inch crushed gravel, non-woven geotextile fabric, metal screen (1/4 inch X 1/4 inch openings)	LS	1		
44		2250	Stationary Steel Posts: Includes 4 in. dia. SCH. 40 A53 Grade B steel pipe, 5 ft. 2 in. long, cement, paint, bolts and nuts, 4 in. steel caps, all materials and labor, (Lateral Weir and Emergency Spillway). C.I.P.	EA	24		
45		2280	Steel Cable: Includes 1 / 2 in. dia. steel cable, bolts and nuts, metal cable alert signs, all materials and labor. C.I.P.	LF	530		
46		1012	Native Grass Seeding: Seed (Hydro Seed) all slopes and over bank disturbed areas, soil amendments and fertilizer not required, C.I.P.	ACRE	19		
47		1012.6.2. 3	Seeding with Gravel Mulch: includes soil preparation, install 2-inch thick gravel and seed, soil amendments and fertilizer not required. C.I.P.	ACRE	4.5		
OBERGON ROAD CURB AND GUTTER							
48		343	Removed and Dispose Existing Asphalt Pavement: Obregon Road existing pavement, asphalt concrete, sawcut, remove & dispose, any thickness, Complete	SY	243		
49		340	Curb and Gutter: Obregon Road Curb & Gutter, standard, Portland Cement concrete, incl. subgrade preparation, C.I.P.	LF	875		

UNIT PRICE BID PROPOSAL FOR: LOMITAS NEGRAS PHASE 2							
Southern Sandoval County Arroyo Flood Control Authority							
BID ITEM NUMBER	Deductive Alternate #	BUILD / PAY ITEM NUMBER	ITEM DESCRIPTION Complete in Place = C.I.P.	UNIT	EST. QUANTITY	UNIT COST \$	AMOUNT \$
			OBREGON ROAD RIPRAP RUNDOWN				
50		602020	Rip-Rap Class C: Obregon Road Rundown, includes riprap, non-woven filter fabric and placement, C.I.P.	CY	98		
51		204	Fill Construction: Fill soil material for Obregon Rd. Rundown channel construction in lifts, rough and final grading to rundown invert elevations, C.I.P.	CY	143		
			SARATOGA ROAD - DRAINAGE IMPROVEMENTS (Smith Engineering Design)				
52		301	Subgrade Preparation: Saratoga Road Subgrade Prep. for roads, 12" at 95% compaction, C.I.P.	SY	40		
53		302	Saratoga Road Aggregate base course for roads, 6" at 95% compaction, C.I.P.	SY	40		
54		343	Removed and Dispose Existing Asphalt Pavement: Saratoga Rd. Road Existing Pavement, Asphalt Concrete, sawcut, remove & dispose, any thickness, Complete	SY	40		
55		336	Saratoga Road Arterial Asphalt Concrete, SP-C, 3 inch thick, (Striping is incidental) C.I.P.	SY	40		
56		336	Saratoga Road - Asphalt Concrete Drainage Swales, SP-C, 3 inch thick, C.I.P.	SY	215		
57		341	Saratoga Road - Extruded Asphalt Curb, C.I.P.	LF	145		
			SARATOGA ROAD DIP SECTION, RUNDOWN and BOX CULVERT IMPROVEMENTS (Wilson & Company Plans)				
58		202	Excavation and Rough Grading: Excavation and rough grading to within 6-inches of finish grades on plans. Haul and dispose of excess soils off-site to SSCAFCA designated location within 6 mi radius included, compaction not required, dust abatement is required and incidental. Complete (NM Std. Spec. 202)	CY	123		
59		343	Removed and Dispose Existing Asphalt Pavement: Saratoga Rd. Road existing pavement at proposed concrete valley gutter and at existing drainage rundown east of Saratoga Rd., asphalt concrete, sawcut, remove & dispose, any thickness, Complete (NM Std. Spec. 343)	SY	226		
60		301	Subgrade Preparation: Saratoga Road Subgrade Prep. Under concrete valley gutter for roads, 12" at 95% compaction, C.I.P. (NM Std. Spec. 301)	SY	44		
61		101.1	Build Concrete Valley Gutter in Saratoga Rd. - Unreinforced concrete, (Striping is incidental) Complete (NM Std. Spec. Sect. 101)	CY	10		
62		101.2	Reinforced Concrete Drainage Rundown from Saratoga Rd. to box culvert, incl. rebar, subgrade prep, C.I.P. (NM Std. Specs. 101 & 602 & Std. Dwg. 2260 - "Type B" 10-ft bot. width, 1 ft deep)	CY	16		

UNIT PRICE BID PROPOSAL FOR: LOMITAS NEGRAS PHASE 2							
Southern Sandoval County Arroyo Flood Control Authority							
BID ITEM NUMBER	Deductive Alternate #	BUILD / PAY ITEM NUMBER	ITEM DESCRIPTION Complete in Place = C.I.P.	UNIT	EST. QUANTITY	UNIT COST \$	AMOUNT \$
63		301	Subgrade Preparation: Saratoga Road Subgrade Prep. Under Conc. Rundown, 12" at 95% compaction, C.I.P. (NM Std. Spec. 301)	SY	94		
64		340.1	Header Curb (Modified Cutoff Wall), Portland Cement Concrete, incl. subgrade prep. C.I. P.	LF	42		
65		301	East of Saratoga Rd. (asphalt swale), Subgrade Prep. for roads, 12" at 95% compaction, C.I.P. (NM Std. Spec. 301)	SY	85		
66		336	East of Saratoga Rd. - Asphalt Concrete Drainage Swale, SP-C, 3 inch thick, C.I.P. (NM Std. Spec. 336)	SY	85		
			SUB-TOTAL FOR <u>ALL</u> BID ITEMS above				
67		1503	Mobilization: Compl., Not to exceed 5% of the sub-total for Items 1 through 66	LS	1		
a)			BASE BID SUBTOTAL: Subtotal of Bid Item 1 through 67				
			Allowances				
68	b)	1511	Utility Relocation	LS	1		25,000.00
69	b)	1507	Materials Testing, Quality Assurance and Submittals.	LS	1		75,000.00
	b)		Total Allowances	---	---	---	100,000
c)			BASE BID SUBTOTAL: Line a) Base Bid, plus Line b) Allowances				

UNIT PRICE BID PROPOSAL FOR: LOMITAS NEGRAS PHASE 2							
Southern Sandoval County Arroyo Flood Control Authority							
BID ITEM NUMBER	Deductive Alternate #	BUILD / PAY ITEM NUMBER	ITEM DESCRIPTION Complete in Place = C.I.P.	UNIT	EST. QUANTITY	UNIT COST \$	AMOUNT \$
DEDUCTIVE ALTERNATE 1 BASE BID							
			SUBTOTAL of Deductive Alternate 1 Items =				
			DEDUCTIVE ALTERNATE 1 BASE BID SUBTOTAL: Base Bid reduced by Deductive Alternate 1 Items				
67		1503	Mobilization: Compl., Not to exceed 5% of the sub-total for Items 1 through 66 (excluding Deductive Alt. 1 Items)	LS	1		
a)			DEDUCTIVE ALTERNATE 1 BASE BID SUBTOTAL:				
Allowances							
68	b)	1511	Utility Relocation	LS	1		25,000.00
69	b)	1507	Materials Testing, Quality Assurance and Submittals.	LS	1		75,000.00
	b)		Total Allowances	---	---	---	100,000
c)			DEDUCTIVE ALTERNATE 1 BASE BID SUBTOTAL: Line a) Base Bid, plus Line b) Allowances				
DEDUCTIVE ALTERNATES 1 AND 2 COMBINED BASE BID							
			SUBTOTAL of Deductive Alternate 1 Items =				
			SUBTOTAL of Deductive Alternate 2 Items =				
			SUBTOTAL of Deductive Alternate 1 and Deductive Alternate 2 Items =				
			DEDUCTIVE ALTERNATES 1 AND 2 (COMBINED) BASE BID SUBTOTAL: Base Bid reduced by Deductive Alternate 1 Items and Deductive Alternate 2 Items				
67		1503	Mobilization: Compl., Not to exceed 5% of the sub-total for Items 1 through 66 (excluding Deductive Alternate 1 and 2 Items)	LS	1		
a)			DEDUCTIVE ALTERNATES 1 and 2 (COMBINED) BASE BID SUBTOTAL:				
Allowances							
68	b)	1511	Utility Relocation	LS	1		25,000.00
69	b)	1507	Materials Testing, Quality Assurance and Submittals.	LS	1		75,000.00
	b)		Total Allowances	---	---	---	100,000
c)			DEDUCTIVE ALTERNATES 1 and 2 (COMBINED) BASE BID SUBTOTAL: Line a) Base Bid, plus Line b) Allowances				
MANDATORY: PLEASE FILL OUT BLANKS BELOW							
- Bidder has registered at SAM.gov (Initial to acknowledge): _____							
- DUNS Number for Prime Contractor: _____							
SAMS Number will be checked for debarment and debarment shall be grounds for rejection of bid							
- Unit Price Bid Proposal End -							

**CERTIFICATION OF BIDDER REGARDING
AFFIRMATIVE ACTION / EQUAL EMPLOYMENT OPPORTUNITY
AND NONDISCRIMINATION**

PROJECT: Lomitas Negras, Phase 2

The Bidder hereby acknowledges and agrees to abide by the Special provisions for Affirmative Action/Equal Employment Opportunity and Nondiscrimination and all other provisions, regulations, of the OWNER for Affirmative Action/Equal Employment Opportunity and Nondiscrimination.

The Bidder has participated with any agency in a previous contract or subcontract subject to any Equal Employment Opportunity and Nondiscrimination in Employment requirements?

Yes () No ()

Compliance reports were required to be filled in connection with such contract or subcontract?

Yes () No ()

The Bidder has filed all compliance reports due under applicable instructions? If answer to this statement is "No, explain in detail on the reverse side of this certification.

Name of Bidder

Address of Bidder

Telephone Number

By (Signature) (Date)

Printed Name & Title of Bidder's Authorized Representative.

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure.)

Approved by OMB
0348-0046

1. Type of Federal Action: <input type="checkbox"/> a. contract <input type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance		2. Status of Federal Action: <input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award		3. Report Type: <input type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change For Material Change Only: year _____ quarter _____ date of last report _____	
4. Name and Address of Reporting Entity: <input type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier _____, if known: Congressional District, if known:			5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime: Congressional District, if known:		
6. Federal Department/Agency:			7. Federal Program Name/Description: CFDA Number, if applicable: _____		
8. Federal Action Number, if known:			9. Award Amount, if known: \$ _____		
10. a. Name and Address of Lobbying Entity (if individual, last name, first name, MI): (attach Continuation Sheet(s) SF-LLLA, if necessary)			b. Individuals Performing Services (including address if different from No. 10a) (last name, first name, MI): (attach Continuation Sheet(s) SF-LLLA, if necessary)		
11. Amount of Payment (check all that apply): \$ _____ <input type="checkbox"/> actual <input type="checkbox"/> planned			13. Type of Payment (check all that apply): <input type="checkbox"/> a. retainer <input type="checkbox"/> b. one-time fee <input type="checkbox"/> c. commission <input type="checkbox"/> d. contingent fee <input type="checkbox"/> e. deferred <input type="checkbox"/> f. other; specify: _____		
12. Form of Payment (check all that apply): <input type="checkbox"/> a. cash <input type="checkbox"/> b. in-kind; specify: nature _____ value _____					
14. Brief Description of Services Performed or to be Performed and Date(s) of Service, including officer(s), employee(s), or Member(s) contacted, for Payment Indicated in Item 11: (attach Continuation Sheet(s) SF-LLLA, if necessary)					
15. Continuation Sheet(s) SF-LLLA attached: <input type="checkbox"/> Yes <input type="checkbox"/> No					
16. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.			Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____		
Federal Use Only:			Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)		

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Use the SF-LLLA Continuation Sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.
14. Provide a specific and detailed description of the services that the lobbyist has performed, or will be expected to perform, and the date(s) of any services rendered. Include all preparatory and related activity, not just time spent in actual contact with Federal officials. Identify the Federal official(s) or employee(s) contacted or the officer(s), employee(s), or Member(s) of Congress that were contacted.
15. Check whether or not a SF-LLLA Continuation Sheet(s) is attached.
16. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

Bid Bond

BID BOND³

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

Southern Sandoval County Arroyo Flood Control Authority
1041 Commercial Dr. SE
City of Rio Rancho, NM 87124

BID

Bid Due Date:

Project Name - Lomitas Negras Phase 2

The Project is located within the City of Rio Rancho and consists of: Construction of a small storm water detention pond.

The major construction items include: a large soil excavation volume, construction of reinforced concrete structures, soil cement structures, storm drain structures and minor street improvements.

BOND

Bond Number:

Date:

Penal sum _____ \$ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER

SURETY

Bidder's Name and Corporate Seal (Seal) Surety's Name and Corporate Seal (Seal)

By: _____ By: _____
Signature Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____ Attest: _____
Signature Signature

Title

Title

Note: Addresses are to be used for giving any required notice.

Provide execution by any additional parties, such as joint venturers, if necessary.

³ EJCDC® C-430, Bid Bond (Penal Sum Form). Published 2013

Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.

1. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
2. This obligation shall be null and void if:
 - 2.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 2.2. All Bids are rejected by Owner, or
 - 2.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
3. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
4. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
5. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.
6. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
7. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
8. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
9. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
10. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

List of Proposed Suppliers

Not Required

List of Proposed Subcontractors

All Bidders shall complete this form for all proposed subcontracts great than **\$5,000** per the New Mexico State "Subcontractors Fair Practices Act" [13-4-31 to 13-4-42 NMSA 1978]. If the contractor fails to receive a bid for a category of work, the contractor shall designate on the listing form that no bid was received. If the contractor fails to receive more than one bid for a category of work, the contractor shall state on the listing form that only one bid was received, together with the name of the subcontractor (this designation shall not occur more than one time on the subcontractor list).

Contractor:	
--------------------	--

Subcontractor	Business Address	Phone/email	Department of Workforce Solutions Registration Number	Work Description

Qualification Statement

***Not Required**

Non-Collusion Affidavit

TO BE EXECUTED BY EACH AWARDEE OF A PRINCIPAL CONTRACT

_____, being first duly sworn, deposes and says that he/she is _____ (sole owner, a partner, president, secretary, etc.) of _____ the party making the foregoing bid; that such a bid is not made in the interest of or on behalf of any undisclosed person, partnership, company association, organization, or corporation; that such a bid is genuine and not collusive or sham; that said bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, nor that anyone shall refrain from bidding; that said bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of said bidder or of any other bidder, nor to fix any overhead, profit, or cost element of such bid price, nor of that of any other bidder, nor to secure any advantage against the public body awarding the contract or anyone interested in the proposed contract; that all statements contained in such bid are true; and, further, that said bidder has not directly or indirectly, submitted his bid price or any breakdown thereof, nor the contents thereof, nor divulged information or data relative thereto, nor paid and will not pay fee in connection therewith to any corporation, partnership, company, association, organization, bid depository, nor any member or agent thereof, nor any to any other individual except to such person or persons as have a partnership or other financial interest with said bidder in his general business.

Signed:

By _____

Title _____

Subscribed and sworn before me this _____ day of, 20_____.

Seal of Notary

NOTARY PUBLIC

Campaign Contribution Disclosure Form

Pursuant to the Procurement Code, Sections 13-1-28, et seq., NMSA 1978 and NMSA 1978, § 13-1-191.1 (2006), as amended by Laws of 2007, Chapter 234, any prospective contractor seeking to enter into a contract with any state agency or local public body for professional services, a design and build project delivery system, or the design and installation of measures the primary purpose of which is to conserve natural resources must file this form with that state agency or local public body. This form must be filed even if the contract qualifies as a small purchase or a sole source contract. The prospective contractor must disclose whether they, a family member or a representative of the prospective contractor has made a campaign contribution to an applicable public official of the state or a local public body during the two years prior to the date on which the contractor submits a proposal or, in the case of a sole source or small purchase contract, the two years prior to the date the contractor signs the contract, if the aggregate total of contributions given by the prospective contractor, a family member or a representative of the prospective contractor to the public official exceeds two hundred and fifty dollars (\$250) over the two year period.

Furthermore, the state agency or local public body may cancel a solicitation or proposed award for a proposed contract pursuant to Section 13-1-181 NMSA 1978 or a contract that is executed may be ratified or terminated pursuant to Section 13-1-182 NMSA 1978 of the Procurement Code if: 1) a prospective contractor, a family member of the prospective contractor, or a representative of the prospective contractor gives a campaign contribution or other thing of value to an applicable public official or the applicable public official's employees during the pendency of the procurement process or 2) a prospective contractor fails to submit a fully completed disclosure statement pursuant to the law.

The state agency or local public body that procures the services or items of tangible personal property shall indicate on the form the name or names of every applicable public official, if any, for which disclosure is required by a prospective contractor.

THIS FORM MUST BE INCLUDED IN THE REQUEST FOR PROPOSALS AND MUST BE FILED BY ANY PROSPECTIVE CONTRACTOR WHETHER OR NOT THEY, THEIR FAMILY MEMBER, OR THEIR REPRESENTATIVE HAS MADE ANY CONTRIBUTIONS SUBJECT TO DISCLOSURE.

The following definitions apply:

"Applicable public official" means a person elected to an office or a person appointed to complete a term of an elected office, who has the authority to award or influence the award of the contract for which the prospective contractor is submitting a competitive sealed proposal or who has the authority to negotiate a sole source or small purchase contract that may be awarded without submission of a sealed competitive proposal.

"Campaign Contribution" means a gift, subscription, loan, advance or deposit of money or other thing of value, including the estimated value of an in-kind contribution, that is made to or received by an applicable public official or any person authorized to raise, collect or expend contributions on that official's behalf for the purpose of electing the official to statewide or local office. "Campaign Contribution" includes the payment of a debt incurred in an election campaign, but does not include the value of services provided without compensation or unreimbursed travel or other personal expenses of individuals who volunteer a portion or all of their time on behalf of a candidate or political committee, nor does it include the administrative or solicitation expenses of a political committee that are paid by an organization that sponsors the committee.

"Family member" means spouse, father, mother, child, father-in-law, mother-in-law, daughter-in-law or son-in-law of (a) a prospective contractor, if the prospective contractor is a natural person; or (b) an owner of a prospective contractor.

"Pendency of the procurement process" means the time period commencing with the public notice of the request for proposals and ending with the award of the contract or the cancellation of the request for proposals.

"Prospective contractor" means a person or business that is subject to the competitive sealed proposal process set forth in the Procurement Code or is not required to submit a competitive sealed proposal because that person or business qualifies for a sole source or a small purchase contract.

"Representative of a prospective contractor" means an officer or director of a corporation, a member or manager of a limited liability corporation, a partner of a partnership or a trustee of a trust of the prospective contractor.

Name(s) of Applicable Public Official(s) if any: [List of SSCAFCA Board of Directors Listed here:](#)

[James Fahey Jr.,](#)
[Steve House,](#)
[Mark Conkling,](#)
[Michael Obrey,](#)
[John Chaney](#)

DISCLOSURE OF CONTRIBUTIONS BY PROSPECTIVE CONTRACTOR:

Contribution Made By: _____

Relation to Prospective Contractor: _____

Date Contribution(s) Made: _____

Amount(s) of Contribution(s) _____

Nature of Contribution(s) _____

Purpose of Contribution(s) _____

(Attach extra pages if necessary)

Signature Date

Title (position)

--OR--

NO CONTRIBUTIONS IN THE AGGREGATE TOTAL OVER TWO HUNDRED FIFTY DOLLARS (\$250) WERE MADE to an applicable public official by me, a family member or representative.

Signature Date

Title (Position)

Veterans Preference Certification

Not Applicable

Notice of Award

NOTICE OF AWARD

Date of Issuance:

Owner: **SOUTHERN SANDOVAL COUNTY
ARROYOFLOOD CONTROL
AUTHORITY (SSCAFCA)**

Owner's Contract No.: _____

Engineer: **Smith Engineering Company**

Engineer's Project No.: **115121-02**

Project: **LOMITAS NEGRAS PHASE 2**

Bidder:

Bidder's Address:

TO BIDDER:

You are notified that Owner has accepted your Bid dated [REDACTED] for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

The Contract Price of the awarded Contract is: \$ [REDACTED] subject to unit prices.

One copy of the Agreement accompanies this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

☐ a set of the Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner [REDACTED] counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security (performance and payment bonds) and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: **SOUTHERN SANDOVAL COUNTY ARROYOFLOOD CONTROL AUTHORITY (SSCAFCA)**

Authorized Signature

By: _____

Title: _____

Copy: **Smith Engineering Company**

Agreement Forms

Agreement

AGREEMENT⁴ BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

**SOUTHERN SANDOVAL COUNTY
ARROYOFLOOD CONTROL AUTHORITY
(SSCAFCA)**

THIS AGREEMENT is by and between _____ (“Owner”) and
_____ (“Contractor”).

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: The Project is located within the City of Rio Rancho and consists of: Construction of a small storm water detention pond. The major construction items include: a large soil excavation volume, construction of reinforced concrete structures, soil cement structures, storm drain structures and minor street improvements.

1.01 None

ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows:

The Project is located within the City of Rio Rancho and consists of: Construction of a small storm water detention pond. The major construction items include: a large soil excavation volume, construction of reinforced concrete structures, soil cement structures, storm drain structures and minor street improvements.

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by Patrick Stovall, P.E.

3.02 The Owner has retained (“Engineer”) to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 Time of the Essence

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

⁴ EJCDC® C-520, Agreement Between Owner and Contractor for Construction Contract (Stipulated Price). Copyright © 2013

4.02 Contract Times: Dates

- A. The Work will be substantially completed within **180 calendar** days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **210 calendar** days after the date when the Contract Times commence to run.

4.03 Liquidated Damages

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):
 - 1. Substantial Completion: Contractor shall pay Owner **\$ 500.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
 - 2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **\$ 500.00** for each day that expires after such time until the Work is completed and ready for final payment.
 - 3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

4.04 Special Damages

- A. In addition to the amount provided for liquidated damages, Contractor shall reimburse Owner (1) for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract Times, and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.
- B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

- A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 Progress Payments; Retainage

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 25th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
 - 1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract
 - a. 100 percent of Work completed (~~with the balance being retainage~~). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
 - b. 100 percent of cost of materials and equipment not incorporated in the Work (~~with the balance being retainage~~).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 100 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 Final Payment

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 7 – INTEREST

- 7.01 All amounts not paid when due shall bear interest at the rate of 1.5 percent per annum.

ARTICLE 8 – CONTRACTOR’S REPRESENTATIONS

8.01 *In order to induce Owner to enter into this Contract, Contractor makes the following representations:*

- A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
- B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
- E. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
- F. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- G. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- H. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- I. Contractor’s entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 Contents

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 44 to 50, inclusive).
 - 2. Performance bond (pages 51 to 53, inclusive).
 - 3. Payment bond (pages 54 to 56, inclusive).
 - 4. General Conditions (pages 57 to 129, inclusive).

5. Supplementary Conditions (pages 130 to 135, inclusive).
6. State and Federal Wage Rates (pages 136 to 142, inclusive)
7. Specifications as listed in the table of contents of the [Specifications Manual](#).
8. Drawings (not attached but incorporated by reference) consisting of [82](#) sheets with each sheet bearing the following general title: [LOMITAS NEGRAS PHASE 2](#).
9. Addenda (numbers to , inclusive).
10. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Unit Price Bid Proposal (Starts on page 22, inclusive).
11. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed
 - b. Payment Application
 - c. Work Change Directive
 - d. Change Order
 - e. Field Order
 - f. Certificate of Substantial Completion
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 Terms

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 Assignment of Contract

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

10.03 Successors and Assigns

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 Severability

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 Contractor's Certifications

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

10.06 Other Provisions

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on (which is the Effective Date of the Contract).

OWNER:

CONTRACTOR:

By: _____

By: _____

Title: _____

Title: _____

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

License No.: _____
(where applicable)

APPROVALS AS TO FORM:

Owner Attorney (if required)

Federal Id No.: _____

Agency concurrence (if required)

NM CRS Id
No.: _____

Business
License No.: _____

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

NOTE TO USER: Use in those states or other jurisdictions where applicable or required.

- End of Agreement-

Performance Bond

PERFORMANCE BOND⁵

CONTRACTOR (*name and address*):

SURETY (*name and address of principal place of business*):

OWNER (*name and address*):

Southern Sandoval County Arroyo Flood Control Authority
1041 Commercial Dr. SE
City of Rio Rancho, NM 87124

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (*name and location*):

BOND

Bond Number:

Date (*not earlier than the Effective Date of the Agreement of the Construction Contract*):

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

(*seal*)

(*seal*)

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____

Signature

By: _____

Signature (*attach power of attorney*)

Print Name

Print Name

Title

Title

Attest: _____

Signature

Attest: _____

Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint ventures. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

⁵ EJCDC® C-610, Performance Bond Copyright © 2013

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:
 - 3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
 - 3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
 - 3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
 - 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
 - 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or
 - 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
 - 5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
 - 5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.
7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
 - 7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

- End of Performance Bond -

Payment Bond

PAYMENT BOND⁶

CONTRACTOR *(name and address):*

SURETY *(name and address of principal place of business):*

OWNER *(name and address):*

Southern Sandoval County Arroyo Flood Control Authority
1041 Commercial Dr. SE
City of Rio Rancho, NM 87124

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract):*

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

(seal)

(seal)

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____

By: _____

Signature

Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____

Attest: _____

Signature

Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

⁶ EJCDC® C-615, Payment Bond Copyright © 2013

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
 - 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2 Pay or arrange for payment of any undisputed amounts.
 - 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of

(1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. **Definitions**

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the person for whom the labor was done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
4. A brief description of the labor, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

18. Modifications to this Bond are as follows:

- End of Payment Bond -

General Conditions

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT⁷

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a

demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract* – The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents* – Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price* – The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times* – The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor* – The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work* – See Paragraph 13.01 for definition.
18. *Drawings* – The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract* – The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer* – The individual or entity named as such in the Agreement.
21. *Field Order* – A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition* – The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

23. *Laws and Regulations; Laws or Regulations* – Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
24. *Liens* - Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone* – A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award* – The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
27. *Notice to Proceed* – A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner* – The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule* – A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.
30. *Project* – The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual* – The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative* – The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.
33. *Samples* – Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals* – A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
35. *Schedule of Values* – A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.

36. *Shop Drawings* – All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
37. *Site* - Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications* – The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor* – An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion* – The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder* – The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions* – The part of the Contract that amends or supplements these General Conditions.
43. *Supplier* – A manufacturer, fabricator, supplier, distributor, material man, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data* – Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities* – All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

46. *Unit Price Work* – Work to be paid for on the basis of unit prices.
47. *Work* – The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
48. *Work Change Directive* – A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

- A. *Bonds:* When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance:* When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance:* After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 Copies of Documents

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract

available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 Before Starting Construction

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 2. a preliminary Schedule of Submittals; and
 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 Preconstruction Conference; Designation of Authorized Representatives

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 Initial Acceptance of Schedules

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 Electronic Transmittals

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 Intent

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 Reference Standards

- A. Standards Specifications, Codes, Laws and Regulations
 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 Reporting and Resolving Discrepancies

A. *Reporting Discrepancies:*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. The provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

- b. The provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 Requirements of the Contract Documents

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 Reuse of Documents

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. Have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. Have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 Commencement of Contract Times; Notice to Proceed

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A

Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 Starting the Work

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 Reference Points

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 Progress Schedule

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 Delays in Contractor's Progress

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those

for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 2. abnormal weather conditions;
 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work, resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.
- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 Availability of Lands

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 Use of Site and Other Areas

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 Subsurface and Physical Conditions

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 Differing Subsurface or Physical Conditions

A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
2. is of such a nature as to require a change in the Drawings or Specifications; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
 2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 Underground Facilities

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
 1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.
- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.
 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 Hazardous Environmental Conditions at Site

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer,

or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by

Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.

- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 Performance, Payment, and Other Bonds

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract.

Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner’s termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 Insurance—General Provisions

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 Contractor's Insurance

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).
 - 4. Foreign voluntary worker compensation (if applicable).

- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 2. claims for damages insured by reasonably available personal injury liability coverage.
 3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

- F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.
- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
1. include at least the specific coverages provided in this Article.
 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 Owner's Liability Insurance

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 Property Insurance

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
 - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to

the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).
 5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.

- E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 Waiver of Rights

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.

- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 Receipt and Application of Property Insurance Proceeds

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 Supervision and Superintendence

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 Labor; Working Hours

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday.

Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 Services, Materials, and Equipment

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and

- 4) it is not objectionable to Owner.
- b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 Substitutes

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

- a. shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from that specified, and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 Concerning Subcontractors, Suppliers, and Others

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.
- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.
- O. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 Patent Fees and Royalties

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents,

consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 Permits

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 Taxes

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 Laws and Regulations

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in

the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 Record Documents

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 Safety and Protection

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
- G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 Safety Representative

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.14 Hazard Communication Programs

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 Emergencies

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 Shop Drawings, Samples, and Other Submittals

A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*

- a. Contractor shall submit the number of Samples required in the Specifications.
- b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. *Engineer's Review:*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
 5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
 6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
 7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.
 8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.
- E. *Resubmittal Procedures:*
1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for

review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal;
 6. the issuance of a notice of acceptability by Engineer;
 7. any inspection, test, or approval by others; or
 8. any correction of defective Work by Owner.
- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 Delegation of Professional Design Services

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, 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 Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 Other Work

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 Coordination

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 Legal Relationships

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In

response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 Communications to Contractor

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 Replacement of Engineer

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 Furnish Data

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 Pay When Due

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 Lands and Easements; Reports, Tests, and Drawings

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 Insurance

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 Change Orders

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 Inspections, Tests, and Approvals

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 Limitations on Owner's Responsibilities

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 Undisclosed Hazardous Environmental Condition

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 Evidence of Financial Arrangements

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 Safety Programs

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 Owner's Representative

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 Visits to Site

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On

the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 Project Representative

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 Rejecting Defective Work

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 Shop Drawings, Change Orders and Payments

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 Determinations for Unit Price Work

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 Decisions on Requirements of Contract Documents and Acceptability of Work

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 Limitations on Engineer's Authority and Responsibilities

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 Compliance with Safety Program

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 Amending and Supplementing Contract Documents

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3)

other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.

2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.
3. *Field Orders:* Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 Owner-Authorized Changes in the Work

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 Unauthorized Changes in the Work

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 Change of Contract Price

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).
- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
 - 1. a mutually acceptable fixed fee; or
 - 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 Change of Contract Times

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 Change Proposals

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.
 - 1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
 - 2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
 - 3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change

Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 Execution of Change Orders

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 - 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 Notification to Surety

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – CLAIMS

12.01 Claims

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
 - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
 - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision

under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.
 - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval:* If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim:* If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results:* If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 Cost of the Work

- A. *Purposes for Determination of Cost of the Work:* The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
 5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
 - g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:
1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers,

architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.
- D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.
- E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances*: Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 Access to Work

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 Tests, Inspections, and Approvals

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.
- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 Defective Work

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.

- C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 Acceptance of Defective Work

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 Uncovering Work

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 Owner May Stop the Work

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 Owner May Correct Defective Work

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
 - 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
 - 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
 - 1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
 - 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon

Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

- c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
- 3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
- 4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
- 5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
- 6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. the Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. the Contract Price has been reduced by Change Orders;
 - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - l. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate

written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 Contractor's Warranty of Title

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 Substantial Completion

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's

risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 Partial Use or Occupancy

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
 - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 Final Inspection

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work,

or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 Final Payment

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect

to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

- C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 Waiver of Claims

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 Correction Period

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such other adjacent areas;
 - 2. correct such defective Work;
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the

defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 Owner May Suspend Work

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 Owner May Terminate for Cause

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 Owner May Terminate For Convenience

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 Contractor May Stop Work or Terminate

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 Methods and Procedures

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
 2. agree with the other party to submit the dispute to another dispute resolution process; or
 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 Giving Notice

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 Computation of Times

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 Cumulative Remedies

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 Limitation of Damages

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 No Waiver

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 Survival of Obligations

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 Controlling Law

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 Headings

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

- End of General Conditions -

Supplementary Conditions

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC C-700 (2013 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

SC-5.03. Add the following new Paragraph immediately after Paragraphs 5.02.B:

- C. The following reports of explorations and tests of subsurface conditions at or contiguous to the Site are known to Owner:
 - 1. Report dated April 25, 2018, prepared by Terracon Inc., Albuquerque, NM, entitled "Geotechnical Engineering Report – SSCAFCA Lomas Negras Arroyo Phase 2, Stormwater Detention Facility, Saratoga Drive NE Road and Lomas Negras Arroyo Sandoval County New Mexico". The Technical Data contained in such report upon whose accuracy Contractor may rely are those indicated in the definition of Technical Data in the General Conditions.
 - 2. None
- D. The following drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) are known to Owner:
 - 1. None
- E. Copies of reports and drawings itemized in SC-5.03.C and SC-5.03.D that are included with Bidding Documents. These reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which the Contractor may rely as identified and established above are incorporated therein by reference. Contractor is not entitled to rely upon other information and data utilized by Engineer in the preparation of the Drawings and Specifications.

SC-5.06. Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:

- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.
- B. Not used.

SC-6.03. Add the following new paragraph immediately after Paragraph 6.03.J:

- K. The limits of liability for insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

Workers' Compensation, and related coverages:

- a. State: Statutory
- b. Applicable Federal
(e.g., Longshoremen's) Statutory
- c. Employer's Liability \$ 500,000

Contractor's General Liability under Paragraphs 5.04.A.3 through A.6 of the General Conditions which shall include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody, and control of the Contractor:

- a. General Aggregate \$ 2,000,000
- b. Products - Completed
Operations Aggregate \$ 1,000,000
- c. Personal and Advertising
Injury \$ 1,000,000
- d. Each Occurrence
(Bodily Injury and
Property Damage) \$ 1,000,000
- e. Property Damage liability
insurance will provide
Explosion, Collapse, and
Underground coverages where
applicable.
- f. Excess or Umbrella Liability
 - 1) General Aggregate \$ 5,000,000
 - 2) Each Occurrence \$ 5,000,000

Automobile Liability under Paragraph 5.04.A.6 of the General Conditions:

- a. Bodily Injury:
 - Each Person \$ 1,000,000
 - Each Accident \$ 1,000,000
- b. Property Damage:
 - Each Accident \$ 1,000,000
- c. Combined Single Limit of \$ 1,000,000

The Contractual Liability coverage required by paragraph 5.04.B.4 of the General Conditions shall provide coverage for not less than the following amounts:

- a. Bodily Injury:
 - Each Person \$ 2,000,000
 - Each Accident \$ 2,000,000
- b. Property Damage:
 - Each Accident \$ 2,000,000
 - Annual Aggregate \$ 2,000,000

SC-7.02 Add the following new paragraph as 7.02.C

- C. Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

SC-10.03 Add the following new paragraph immediately after Paragraph 10.03.A:

- B. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.
1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.
 2. Schedule: Review the progress schedule, schedule of Shop Drawings and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.
 3. Conferences and Meeting: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes therefore.
 4. Liaison:
 - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
 5. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
 6. Shop Drawings and Samples:
 - a. Record date of receipt of Samples and Contractor-approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.

7. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
8. Review of Work and Rejection of Defected Work:
 - a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
9. Inspections, Tests, and System Start-ups:
 - a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
 - b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.
10. Records:
 - a. Prepare a daily report or keep a diary or log book, recording Contractor's hour on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.
 - b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of material and equipment.
 - c. Maintain records for use in preparing Project documentation.
11. Reports:
 - a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.
 - b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
 - c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.
12. Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer,

noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

13. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

14. Completion:

- a. Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.
- b. Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.
- c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the Work.

- C. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work.
5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
6. Participate in specialized field or laboratory test or inspections conducted off-site by others except as specifically authorized by Engineer.
7. Accept Shop Drawing or Sample submittal from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

SC-13.03.E Delete Paragraph 13.3.E in its entirety and insert the following in its place:

- E. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:

1. If the extended price of a particular item of Unit Price Work amounts to 5 percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 20 percent from the estimated quantity of such item indicated in the Agreement; and
2. If there is no corresponding adjustment with respect to any other item of Work; and
3. If Contractor believes that Contractor has incurred additional expense as a result thereof, Contractor may submit a Change Proposal, or if Owner believes that the quantity variation

entitles Owner to an adjustment in the unit price, Owner may make a Claim, seeking an adjustment in the Contract Price.

SC-15.01.D.1 Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

D. Payment Becomes Due

1. NOTICE OF EXTENDED PAYMENT PROVISION: This contract allows the owner to make payment with 45 days of an undisputed request for payment.
2. Forty-five days after the presentation of the application of payment to owner with engineer's recommendation, the amount recommended (subject to owner set-offs) will become due, and when due will be paid by owner to contractor.

- End of Supplementary Conditions -

State and Federal Wage Rates

General Decision Number: NM180047 01/05/2018 NM47

Superseded General Decision Number: NM20170047

State: New Mexico

Construction Type: Highway

Counties: Bernalillo, Sandoval, Torrance and Valencia
Counties in New Mexico.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.35 for calendar year 2018 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.35 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2018. The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/05/2018

* SUNM2011-001 08/25/2011

	Rates	Fringes
CARPENTER (Including Form Work)		
Bernalillo.....	\$ 13.73	0.44
Sandoval, Torrance, and		
Valencia.....	\$ 13.70	0.44
CEMENT MASON/CONCRETE FINISHER		
Bernalillo.....	\$ 15.35	0.26
Sandoval, Torrance, and		
Valencia.....	\$ 15.58	0.26
ELECTRICIAN (Including		

Traffic Signalization & Installation).....	\$ 25.91	9.45
IRONWORKER, REINFORCING.....	\$ 22.61	6.03
LABORER		
Common or General		
Bernallilo, Torrance, and		
Valencia.....	\$ 11.82	0.35
Sandoval.....	\$ 11.85	0.35
Traffic Control (Includes		
Flagger and Cone Setter)....	\$ 14.27	0.35
POWER EQUIPMENT OPERATOR:		
Backhoe.....	\$ 20.92	3.62
Bobcat/Skid Loader		
Bernallilo.....	\$ 14.73	0.26
Sandoval, Torrance,		
Valencia.....	\$ 14.91	0.26
Broom Sweeper.....	\$ 16.67	1.57
Excavator/Trackhoe.....	\$ 20.10	0.26
Loader (Front End)		
Bernallilo.....	\$ 16.78	0.26
Sandoval, Torrance,		
Valencia.....	\$ 16.59	0.26
Oiler		
Bernallilo, Sandoval,		
Torrance, & Valencia.....	\$ 22.08	8.72
Trencher.....	\$ 15.22	0.26
TRUCK DRIVER		
Dump Truck		
Bernallilo.....	\$ 14.46	0.26
Sandoval, Torrance,		
Valencia.....	\$ 14.51	0.26
Water Truck.....	\$ 13.51	1.51

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic

violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion

date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request

review and reconsideration from the Wage and Hour Administrator
(See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the
interested party's position and by any information (wage
payment data, project description, area practice material,
etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an
interested party may appeal directly to the Administrative
Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

TYPE "A" - STREET, HIGHWAY, UTILITY & LIGHT ENGINEERING**Effective January 1, 2018**

Decision number SA-18-1841-A

Trade Classification	Base Rate	Fringe Rate
Bricklayer/Blocklayer/Stonemason	23.52	8.84
Carpenter/Lather	24.00	9.97
Cement Mason	17.42	6.35
Ironworker	26.50	15.30
Painter (Brush/Roller/Spray)	16.75	6.28
Plumber/Pipefitter	28.95	12.23
Electricians (outside)		
Groundman	22.36	11.56
Equipment Operator	32.08	14.09
Lineman/Wireman or Tech	37.75	15.57
Cable Splicer	41.53	16.56
Laborers		
Group I	11.96	5.55
Group II	12.26	5.55
Group III	12.66	5.55
Operators		
Group I	16.94	6.33
Group II	17.69	6.33
Group III	17.80	6.33
Group IV	17.88	6.33
Group V	18.00	6.33
Group VI	18.14	6.33
Group VII	18.52	6.33
Group VIII	18.75	6.33
Group IX	25.70	6.33
Group X	28.60	6.33
Truck Drivers		
Group I	16.00	7.17
Group II	16.00	7.17
Group III	16.00	7.17
Group IV	16.00	7.17

NOTE: All contractors are required to pay **SUBSISTENCE, ZONE AND INCENTIVE PAY** according to the particular trade. Details are located in a PDF attachment at WWW.DWS.STATE.NM.US. Search Labor Relations/Labor Information/Public Works/Prevailing Wage Rates.

***Contractor shall pay the higher of the two prevailing wages from the State and Federal wage decisions for each labor category who performs work on the project. ***

-End of Wage Rates -

Construction Forms

Notice to Proceed

NOTICE TO PROCEED⁸

**SOUTHERN SANDOVAL COUNTY
ARROYOFLOOD CONTROL AUTHORITY
(SSCAFCA)**

Owner: _____ Owner's Contract No.: **TBD** _____

Contractor: _____ Contractor's Project No.: **TBD** _____

Engineer: **Smith Engineering Company** Engineer's Project No.: **115121-02**

Project: **LOMITAS NEGRAS PHASE 2**

Effective Date of Contract: **TBD** _____

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **TBD** _____.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date. In accordance with the Agreement, the date of Substantial Completion is **TBD** _____, and the date of readiness for final payment is **TBD** _____.

Before starting any Work at the Site, Contractor must comply with the following:
[Note any access limitations, security procedures, or other restrictions]

Owner: **SOUTHERN SANDOVAL COUNTY ARROYOFLOOD CONTROL AUTHORITY (SSCAFCA)**

Authorized Signature

By: _____

Title: _____

Date Issued: _____

Copy: **Smith Engineering Company**

⁸ EJCDC® C-550, Notice to Proceed. Prepared and published 2013

Payment Application



ENGINEERS JOINT CONTRACT
DOCUMENTS COMMITTEE

Contractor's Application for Payment No. _____

Application Period:	Application Date:
To (Owner):	Via (Engineer):
Project:	Contract:
Owner's Contract No.:	Contractor's Project No.:
	Engineer's Project No.:

Application For Payment

Change Order Summary

Approved Change Orders			
Number	Additions	Deductions	
			1. ORIGINAL CONTRACT PRICE..... \$
			2. Net change by Change Orders..... \$
			3. Current Contract Price (Line 1 + 2)..... \$
			4. TOTAL COMPLETED AND STORED TO DATE (Column F total on Progress Estimates)..... \$
			5. RETAINAGE:
			a. <input checked="" type="checkbox"/> X Work Completed..... \$
			b. <input checked="" type="checkbox"/> X Stored Material..... \$
			c. Total Retainage (Line 5.a + Line 5.b)..... \$
			6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5.c)..... \$
			7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application).... \$
			8. AMOUNT DUE THIS APPLICATION..... \$
			9. BALANCE TO FINISH, PLUS RETAINAGE (Column G total on Progress Estimates + Line 5.c above)..... \$
TOTALS			
NET CHANGE BY			
CHANGE ORDERS			

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:
 (1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;
 (2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all Liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such Liens, security interest, or encumbrances); and
 (3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor Signature

By:	Date:
-----	-------

Payment of: \$ _____
 (Line 8 or other - attach explanation of the other amount)

is recommended by: _____
 (Engineer) (Date)

Payment of: \$ _____
 (Line 8 or other - attach explanation of the other amount)

is approved by: _____
 (Owner) (Date)

Approved by: _____
 Funding or Financing Entity (if applicable) (Date)

9

⁹ EJCDC® C-620 Contractor's Application for Payment © 2013

Contractor's Application

Stored Material Summary Contractor's Application

Contractor's Application

Payment
Application
-146-

Work Change Directive

10

Work Change Directive No.

Date of Issuance:

Effective Date:

Owner: SSCAFCA

Owner's Contract No.: **TBD**

Contractor: **TBD**

Contractor's Project No.: **TBD**

Engineer: Smith Engineering

Engineer's Project No.: 115121-02

Project: Lomitas Negras Phase 2

Contract Name: **TBD**

Contractor is directed to proceed promptly with the following change(s):

Description:

Attachments: *[List documents supporting change]*

Purpose for Work Change Directive:

Directive to proceed promptly with the Work described herein, prior to agreeing to changes on Contract Price and Contract Time, is issued due to: *[check one or both of the following]*

☐ Non-agreement on pricing of proposed change.

☐ Necessity to proceed for schedule or other Project reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price \$ [increase] [decrease].

Contract Time days [increase] [decrease].

Basis of estimated change in Contract Price:

☐ Lump Sum

☐ Unit Price

☐ Cost of the Work

☐ Other

RECOMMENDED:

AUTHORIZED BY:

RECEIVED:

By: _____
Engineer (Authorized Signature)

By: _____
Owner (Authorized Signature)

By: _____
Contractor (Authorized Signature)

Title:

Title:

Title:

Date:

Date:

Date:

Approved by Funding Agency (if applicable)

By: _____ Date: _____

Title:

¹⁰ EJCDC® C-940, Work Change Directive. Prepared and published 2013

Change Order

11

Change Order No.

Date of Issuance:

Effective Date:

Owner: SSACFCA

Owner's Contract No.: TBD

Contractor: TBD

Funding Project No.: N/A

Engineer: Smith Engineering Company

Engineer's Project No.: 115121-02

Project: Lomitas Negras Phase 2

Contract Name: TBD

The Contract is modified as follows upon execution of this Change Order:

Description

Attachments:

CHANGE IN CONTRACT PRICE (w/o NMGR)

CHANGE IN CONTRACT TIMES

[note changes in Milestones if applicable]

Original Contract Price:

Original Contract Times:

\$

Substantial Completion:

Ready for Final Payment:

days

[Increase] [Decrease] from previously approved Change Orders
No. ___ to No. ___:

[Increase] [Decrease] from previously approved Change Orders

No. ___ to No. ___:

\$

Substantial Completion:

Ready for Final Payment:

days

Contract Price prior to this Change Order:

Contract Times prior to this Change Order:

\$

Substantial Completion:

Ready for Final Payment:

days

[Increase] of this Change Order:

[Increase] [Decrease] of this Change Order:

\$

Substantial Completion:

Ready for Final Payment:

days

Contract Price incorporating this Change Order:

Contract Times with all approved Change Orders:

\$

Substantial Completion:

Ready for Final Payment:

days or dates

RECOMMENDED:

ACCEPTED:

ACCEPTED:

By: _____
Engineer (if required)

By: _____
Owner (Authorized Signature)

By: _____
Contractor (Authorized Signature)

Title: _____
Date: _____

Title: _____
Date: _____

Title: _____
Date: _____

Approved by Funding Agency (if applicable)

By: _____ Date: _____

Title: _____

¹¹ EJCDC® C-941, Change Order. Prepared and published 2013



Field Order

12

Field Order No. 1

Date of Issuance:

Effective Date:

Owner: SSCAFCA

Owner's Contract No.: TBD

Contractor: TBD

Funding Project No.: N/A

Engineer: Smith Engineering Company

Engineer's Project No.: 115121-02

Project: Lomitas Negras Phase 2

Contract Name: TBD

Contractor is hereby directed to promptly execute this Field Order, issued in accordance with General Conditions Paragraph 11.01, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification(s):

Drawing(s) / Detail(s)

Description:

Attachments:

ISSUED:

RECEIVED:

By:

By:

Engineer (Authorized Signature)

Contractor (Authorized Signature)

Title: Project Manager/Engineer of Record

Title:

Date:

Date:

Copy to: Owner

¹² EJCDC® C-942, Field Order. Prepared and published 2013



Certificate of Substantial Completion

CERTIFICATE OF SUBSTANTIAL COMPLETION¹³

Owner: **SOUTHERN SANDOVAL COUNTY**
ARROYOFLOOD CONTROL AUTHORITY
(SSCAFCA)

Owner's Contract No.: **TBD**

Contractor: **TBD**

Contractor's Project No.: **TBD**

Engineer: **Smith Engineering Company**

Engineer's Project No.: **115121-02**

Project: **LOMITAS NEGRAS PHASE 2**

This [preliminary] [final] Certificate of Substantial Completion applies to:

- ☐ All Work ☐ The following specified portions of the Work:

Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work shall be as provided in the Contract, except as amended as follows: *[Note: Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.]*

- Amendments to Owner's responsibilities: ☐ None
☐ As follows
- Amendments to Contractor's responsibilities: ☐ None
☐ As follows:

The following documents are attached to and made a part of this Certificate: [punch list; others]

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract.

EXECUTED BY ENGINEER:

RECEIVED:

RECEIVED:

By: (Authorized signature) By: Owner (Authorized Signature) By: Contractor (Authorized Signature)

¹³ EJCDC® C-625, Certificate of Substantial Completion. Prepared and published 2013



LOMITAS NEGRAS PHASE 2

SPECIFICATIONS

SOUTHERN SANDOVAL COUNTY ARROYO FLOOD
CONTROL AUTHORITY

IFB # 2018-07

November 2018
Smith Project No.: 115121-02

TECHNICAL SPECIFICATIONS FOR THE CONSTRUCTION OF LOMITAS NEGRAS PHASE 2

1. ALL WORK DETAILED IN THIS PROJECT IS TO BE PERFORMED, EXCEPT AS OTHERWISE STATED IN THE SUPPLEMENTAL SPECIFICATIONS WHICH IS PROVIDED HEREIN, IN ACCORDANCE WITH THE NEW MEXICO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION - 2006.
 - a. The New Mexico Standard Specifications for Public Works Construction - 2006 is available at Albuquerque Reprographics 4716 McLeod NE Albuquerque, NM 87109 (505) 884-0862 FAX (505) 883-6452 <http://www.abqrepro.com>. Please call ahead to ensure they will be able to fill your order.
 - b. New Mexico State Department of Transportation Standard Specifications for Highway and Bridge Construction – 2014 available at http://dot.state.nm.us/content/dam/nmdot/Plans_Specs_Estimates/2014_Specs_For_Highway_And_Bridge_Construction.pdf.
2. If alternative manufacturers other than the pre-approved manufacturers are proposed for any specified items, the CONTRACTOR/bidder must supply a submittal; after the effective date of the agreement. Although the brands listed herein are the preferred brands, it is not the intent of the OWNER for these specifications to be proprietary; equals will be evaluated in accordance with comparable quality, construction, strength, durability, and suitability for the purpose intended, and are listed for the purpose of describing the standard of quality performance and characteristics.

STANDARD SPECIFICATIONS

NEW MEXICO STANDARD SPECIFICATIONS
FOR PUBLIC WORKS CONSTRUCTION 2006
SEE ATTACHED TABLE OF CONTENTS.

The New Mexico Standard Specifications for Public Works Construction - 2006 is available at
Albuquerque Reprographics 4716 McLeod NE Albuquerque, NM 87109 (505) 884-0862 FAX (505) 883-6452
<http://www.abqrepro.com>. Please call ahead to ensure they will be able to fill your order.

SECTION 100 MATERIALS

<u>Section No.</u>	<u>Title</u>
100	Materials
101	Portland Cement Concrete
102	Steel Reinforcement
103	Epoxy-Coated Steel Reinforcement
105	Concrete Curing Compound
106	Cement Mortar and Grout
107	Joint Filler and Sealant Material
108	Brick
109	Riprap Stone
111	Colored Portland Cement Concrete
112	Paving Asphalt (Asphalt Cement)
113	Emulsified Asphalts
114	Asphalt Paving Hot Recycling
115	Slurry Seal Materials
116	Asphalt Concrete
117	Asphalt Rejuvenating Agents
118	Hydrated Lime Mineral Filler
119	Paving Fabrics
121	Plastic Pipe
122	Plastic Liner Plate
123	Reinforced Concrete Pipe
124	Reinforced Concrete Pressure Pipe
125	Vitrified Clay Pipe
127	Steel Water Pipe
128	Concrete Cylinder Pipe
129	Ductile Iron Pipe
130	Gray Iron and Ductile Iron Fittings
135	Corrugated Metal Pipe and Arches (Steel)
136	Structural Steel Plate for Pipe, Arches, and Pipe Arches
137	Corrugated Aluminum Pipe and Arches
138	Structural Aluminum Plate for Pipe, Arches, Pipe Arches, and Box Culverts
139	Structural and Rivet Steel, Rivets, Bolts, Pins and Anchor Bolts
143	Galvanizing
145	Lumber
146	Wood Preservatives
150	Timber Piles
151	Steel Piles
152	Concrete Piles
157	Paint
160	Steel Castings
161	Gray Iron Castings
162	Aluminum Castings
170	Electronic Marker Disks

SECTION 200 EARTHWORK

<u>Section No.</u>	<u>Title</u>
201	Clearing and Grubbing
202	Roadway Excavation
204	Fill Construction
205	Borrow Material
207	Lean Fill Construction
210	Open Area Land Leveling

SECTION 300 STREETS AND RELATED WORK

<u>Section No.</u>	<u>Title</u>
301	Subgrade Preparation
302	Aggregate Base Course Construction
303	Subbase Preparation
304	Lime Treated Subgrade and/or Subbase
305	Cement Treated Base
306	Bituminous Stabilized Base and Surfacing
307	Plant Mix Bituminous Treated Base (Asphalt Treated Base)
308	Natural Gravel Surfacing for Unpaved Roadways
320	Utility and Monument Access Cover Adjustments
328	Quite Asphalt Concrete Pavement
329	Plant Mix Seal Coat
330	Asphalt Emulsion Slurry Seal
331	Asphalt Concrete Overlay
332	Heater-Remix Resurfacing
333	Fog Seal Coat
334	Seal Coat and Chips and Precoated Chip Seal Coat
335	Paving Fabric Installation
336	Asphalt Concrete Pavement
337	Portland Cement Concrete Pavement
340	Portland Cement Concrete Curbs, Gutters, Walks, Driveways, Alley, Intersections, and Median Paving
341	Extruded Asphalt Curb
342	Soil Stabilization
343	Removal and Disposal of Existing Pavements, Curbs, Gutters, Sidewalks, and Driveways
344	Cold Milling of Pavement Surfaces
346	Textured Concrete
347	Brick Sidewalk
348	Brick Pavement Surface
349	Concrete Curing

SECTION 400 TRAFFIC CONTROL

<u>Section No.</u>	<u>Title</u>
401	Concrete Wall and Metal Barriers
410	Fences
420	General Clauses for Traffic Signal and Street Lighting Systems
421	Signal and Lighting
422	Signal and Lighting Standards
423	Foundations for Signal and Lighting Installations
424	Electrical Conduit
425	Pull Boxes, Splice Cabinets and Manholes
426	Wiring
427	Signal Assemblies

428	Vehicle, Pedestrian, and Emergency Vehicle Detectors
429	Traffic Signal Controllers
430	Removal of Traffic Signal Pressure Detector
431	Beacons and Special Signal Equipment
432	Luminaries
440	Reflectorized Painted Pavement Markings
441	Retroreflective Preformed Plastic Pavement Markings
443	Pavement Marking Removal
450	Traffic Signs and Sign Structures

SECTION 500 STRUCTURES

<u>Section No.</u>	<u>Title</u>
501	Excavation and Backfill for Structures
502	Driving Piles
503	Subdrainage
510	Concrete Structures
511	Pneumatically Applied Concrete
512	Precast Prestressed Members
520	Steel Structures
530	Timber Structures and Timber Construction
540	Concrete Block Masonry Structures
541	Brick Masonry Structures
550	Metal Railings

SECTION 600 OPEN CHANNELS, DIKES, OR DAMS

<u>Section No.</u>	<u>Title</u>
601	Earthwork for Open Channels, Dikes or Dams
602	Portland Cement Fly Ash Concrete for Channel Lining and Dike or Dam Surfacing
603	Riprap Surface Treatment
604	Flexible Soil Matting
610	Gabions

SECTION 700 TRENCHING AND BORING FOR UTILITIES

<u>Section No.</u>	<u>Title</u>
701	Trenching Excavation and Backfill
710	Boring, Drilling and Jacking

SECTION 800 WATER TRANSMISSION, COLLECTOR, DISTRIBUTION AND SERVICE LINES

<u>Section No.</u>	<u>Title</u>
801	Installation of Water Transmission, Collector and Distribution Lines
802	Installation of Water Service Lines

SECTION 900 SANITARY AND STORM SEWER FACILITIES

<u>Section No.</u>	<u>Title</u>
901	Sanitary Sewer Collector and Interceptor Facilities
905	Sanitary Sewer Service Lines

910	Storm Sewer Pipe Installations
915	Storm Sewer Drainage Appurtenances
920	Sanitary and Storm Sewer Manholes
925	Vacuum Sewer Collector, Interceptor & Force Main Facilities

SECTION 1000 LANDSCAPING

<u>Section No.</u>	<u>Title</u>
1001	Landscape Irrigation
1005	Plantings
1010	Grass Sodding
1011	Turf Grass Seeding
1012	Native Grass Seeding
1015	Trash and Litter Receptacles

SECTION 1200 BARRICADING AND TEMPORARY TRAFFIC CONTROL

<u>Section No.</u>	<u>Title</u>
1200	Barricading and Temporary Traffic Control

SECTION 1500 MISCELLANEOUS ITEMS

<u>Section No.</u>	<u>Title</u>
1501	Monuments
1502	Submittals

SECTION 2000 STANDARD DETAIL DRAWINGS

<u>Section No.</u>	<u>Title</u>
2100	Standard Details for Sewer
2200	Standard Details for Drainage
2300	Standard Details for Water
2400	Standard Details for Paving
2500	Standard Details for Traffic
2800	Standard Details for Temporary Traffic Control

SECTION 3000 BIBLIOGRAPHY

<u>Section No.</u>	<u>Title</u>
3010	Abbreviations and Definitions

NMDOT STANDARD SPECIFICATIONS

NEW MEXICO STATE DEPARTMENT OF
TRANSPORTATION STANDARD SPECIFICATIONS
FOR HIGHWAY AND BRIDGE CONSTRUCTION 2006
SEE ATTACHED TABLE OF CONTENTS.

New Mexico State Department of Transportation Standard Specifications for Highway and Bridge Construction –
2014 available at

http://dot.state.nm.us/content/dam/nmdot/Plans_Specs_Estimates/2014_Specs_For_Highway_And_Bridge_Construction.pdf.

DIVISION 100 – GENERAL PROVISIONS

- 101: Abbreviations, Symbols, Terms, and Definitions
- 102: Bidding Requirements and Conditions
- 103: Award and Execution of Contract
- 104: Scope of Work
- 105: Control of Work
- 106: Control of Materials
- 107: Legal Relations, Environmental Requirements, and Responsibility to the Public
- 108: Prosecution and Progress
- 109: Measurement and Payment

DIVISION 200 – EARTHWORK

- 201: Clearing and Grubbing
- 203: Excavation, Borrow, and Embankment
- 206: Excavation and Backfill for Culverts and Minor Structures
- 207: Subgrade Preparation
- 208: Linear Grading
- 209: Blading and Reshaping
- 210: Excavation and Backfill for Major Structures
- 213: Obliterating Old Road

DIVISION 300 – BASES

- 302: Processing, Placing, and Compacting Existing Pavement
- 303: Base Course
- 306: Portland Cement or Lime Treated Subgrade

DIVISION 400 – SURFACE TREATMENTS AND PAVEMENTS

- 401: Pavement Smoothness Measurement
- 402: Asphalt Materials, Hydrated Lime, and Anhydrite Based Material
- 403: Open Graded Friction Course (Non-QLA)
- 403-A: Warm Mix Asphalt - Open Graded Friction Course (Non-QLA)
- 404: Rubberized Open Graded Friction Course
- 405: Detour Pavements

DIVISION 500 – STRUCTURES

- 501: Driven Bearing Piles
- 502: Drilled Shafts
- 504: Load Testing of Bearing Piles
- 505: Pile Integrity Testing
- 506: Mechanically Stabilized Earth Retaining Structures
- 509: Portland Cement Concrete Mix Designs
- 510: Portland Cement Concrete
- 511: Concrete Structures
- 512: Superstructure Concrete
- 514: Concrete Barrier Railings for Bridges

515: Reinforced Concrete for Minor Structures
516: Flowable Fill
517: Precast Concrete Structures
518: Pre-Stressed Concrete Members
519: Shotcrete
520: Non-Shrink Grout for Post-Tensioned Bridge Members
521: Non-Shrink Mortar
522: Chemical Adhesive Anchors
523: Cementitious-Grouted Dowels and Anchors
529: Pier and Abutment Bearing Modification
530: Bridge Deck and PCCP Preparation for Repair
531: Permanent Anti-Graffiti Protective Coating
532: Penetrating Water Repellent Treatment
533: Concrete Structure Repair
534: Epoxy Injection
535: Crack Sealing Using Low-Viscosity, Gravity-Fed Sealers
536: Polymer Concrete Bridge Deck Overlay
537: Polyester Concrete Bridge Deck Overlay
540: Steel Reinforcement
541: Steel Structures
542: High-Strength Bolts
543: Metal Railing
544: Protective Coating of New Structural Steel
545: Protective Coating of Miscellaneous Structural Steel
546: Recoating Structures
547: Safety and Environmental Requirements for Painting Operations
550: Treated Timber
560: Elastomeric Bearing Pads
561: Elastomeric Compression Joint Seals
562: Bridge Joint Strip Seals
563: Polymer Bridge Joint Seals
564: Preformed Closed Cell Foam Bridge Joint Seals
570: Pipe Culverts
571: Structural Plate Structures
572: Cast-In-Place Concrete Pipe

DIVISION 600 – MISCELLANEOUS CONSTRUCTION

601: Removal of Structures and Obstructions
602: Slope and Erosion Protection Structures
603: Temporary Erosion and Sediment Control
604: Soil and Drainage Geotextiles
605: Drains
606: Metal and Concrete Wall Barrier
607: Fence
608: Sidewalks, Drive Pads and Concrete Median Pavement
609: Curb and Gutter
610: Cattle Guards
613: Cleaning of Culverts and Drainage Structures
614: Pipe Casing
617: Vibration Monitoring and Video Taping
618: Traffic Control Management
619: Headgates and Flapgates for Irrigation Ditches
620: Selective/Non-Selective Herbicide Application
621: Mobilization
622: Field Laboratories and Field Offices
623: Drop Inlets
624: Wire Mesh for Slope Stabilization
626: Scaling of Rock Slopes
630: Glare Shields

631: Rumble Strips
632: Revegetation
660: Excavation, Trenching and Backfilling for Utilities
662: Manholes
663: Utility Items
664: Landscape Planting
667: Rest Area and Miscellaneous Landscaping Items

DIVISION 700 – TRAFFIC CONTROL DEVICES

701: Traffic Signs and Structures
702: Construction Traffic Control Devices
703: Traffic Markers
704: Pavement Markings
705: General Requirements for Traffic Signal and Highway Lighting Systems
706: Signal and Lighting Systems
707: Signal and Lighting Standards
708: Foundations for Signal and Lighting Installations
709: Rigid Electrical Conduit
710: Pull Boxes and Splice Cabinets
711: Wiring
712: Signal Assemblies
713: Detectors
714: Traffic Signal Controllers
715: Beacons and Temporary Signal Equipment
716: Luminaires
720: Vehicular Impact Attenuator Units
721: Pavement Marking Removal

DIVISION 800 – CONSTRUCTION STAKING AND POST CONSTRUCTION PLANS

801: Construction Staking by the Contractor
802: Post Construction Plans

DIVISION 900 – QUALITY CRITERIA

Division Contents
901: Quality Control/Quality Assurance (QC/QA)

SUPPLEMENTAL SPECIFICATIONS

SECTION – NAME	
GENERAL REQUIREMENTS	
1503	MOBILIZATION
1504	NPDES COMPLIANCE
1505	CONTROL OF STORMWATER AND NUISANCE FLOW
1506	CONSTRUCTION STAKING
1507	TESTING AND QUALITY ASSURANCE
1508	PROJECT RECORD DOCUMENTS
1510	PROJECT SIGN
CONCRETE STRUCTURES and SOIL CEMENT	
511.6	CONCRETE STRUCTURES
513	SOIL CEMENT - APPENDIX D (Geotechnical Report, April 25, 2018)
STORM DRAIN & MANHOLE	
662.1	STRUCTURAL PLASTIC TRASH RACK (STORMRAX)
OTHER ITEMS	
1012	NATIVE GRASS SEEDING
GEOTECHNICAL REPORT	
GEOTECHNICAL REPORT	Geotechnical Engineering Report - SSCAFCA Lomitas Negras Arroyo – Phase 2 Stormwater Detention Facility Saratoga Drive NE Road and Lomitas Negras Arroyo Sandoval County, New Mexico April 25, 2018. Prepared by Terracon Consultants Inc., Albuquerque New Mexico

Supplemental Specifications

General Requirements

SUPPLEMENTAL TECHNICAL SPECIFICATION

SECTION 1503

MOBILIZATION

621.1 DESCRIPTION

This work shall consist of preparatory and final work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to and from the project site; for the establishment of all offices, buildings and other facilities necessary for work on the project; and, for all other work and operations which must be performed or costs incurred prior to beginning work on the project.

621.2 MOBILIZATION ADMINISTRATION REQUIREMENTS

621.2.1 DEFINITIONS

The following definitions shall apply:

- a) Total original contract amount shall mean the total amount bid as compensation for the contract.
- b) Total original contract amount less mobilization and demobilization shall mean the total amount bid as compensation for the contract less the amounts bid for mobilization.

621.2.2 GENERAL

It is the intent of this specification to provide for the Contractor to:

- a) Receive 100% of the amount bid for mobilization by the time the Contractor has performed 10% of the total original contract amount bid less the amount bid for mobilization.

621.2.3 PAYMENT PROCEDURES FOR MOBILIZATION

The following will apply in effecting mobilization payments:

- a) When the Contractor is eligible for payment of less than 5% of the total original contract amount bid less mobilization, the Contractor will be paid 25% of the amount bid for mobilization.
- b) When the Contractor is eligible for payment of from 5% to less than 10% of the total original amount bid less mobilization, the Contractor will be paid 50% of the amount bid for mobilization minus any mobilization amount already paid.
- c) When the Contractor is eligible for payment of 10% or more of the total original contract amount less mobilization, the Contractor will be paid 100% of the amount bid for mobilization minus any mobilization amount already paid.

621.2.4 PAYMENT CALCULATIONS

P_M	=	Mobilization Payment
M	=	Total amount bid for Mobilization
f_M	=	Mobilization payment percentage factor
	=	0.25, or 0.50, or 1.0, as applicable
P_M	=	M x f_M

EXAMPLE 1 **MOBILIZATION**

Total Original Contract Amount Bid	\$110,000
Amount Bid for Mobilization	\$ 5,000
Total Original Contract Amount Less Mobilization	\$105,000

Percent of Work Completed	f _M	M	P _M
<5% of \$102,000	0.25	x 5,000	= \$1,250
>5% to <10% of \$102,000	0.50	x 5,000	= \$2,500*
≥10% of \$102,000	1.00	x 5,000	= \$5,000*
*minus previously paid amounts			

621.3 METHOD OF MEASUREMENT

Mobilization will be measured by lump sum unit.

621.4 BASIS OF PAYMENT

Mobilization will be paid for at the contract price per Mobilization Bid Item. The amount Bid for Mobilization shall not exceed 5% of the Total Base Bid.

No additional payments will be made for demobilization and remobilization due to shutdowns or suspensions of the work or for other mobilization and demobilization activities required to complete the contract.

SUPPLEMENTAL TECHNICAL SPECIFICATION

SECTION 1504

NPDES COMPLIANCE

630.1 SCOPE OF WORK

The work under this section includes compliance with the U.S. Environmental Protection Agency (EPA), National Pollutant Discharge Elimination System (NPDES) Regulations for Storm Water Discharges from construction sites. A Storm Water Pollution Prevention Plan (SWPPP). This work consists of developing and maintaining this plan to control erosion, pollution, sediment and runoff during the construction of the project.

630.2 MEASUREMENT AND PAYMENT

630.2.1 UNIT PRICE BID PROPOSALS: For Unit Price Bid Proposals, NPDES compliance shall be paid for as follows:

630.2.1.1 Fifteen (15) percent of the Lump Sum unit price amount shall be paid after the Contractor has completed an EPA Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under a NPDES General Permit, or a Low Erosivity Waiver (LEW) form, if applicable. A copy of the EPA acceptance of the NOI or LEW must be delivered to the Owner. All required erosion control measures sufficient to begin construction must also be in place. This will be defined in the plan specifications and/or the SWP3.

630.2.1.2 Payment for an additional sixty (60) percent of the Lump Sum unit price amount shall be prorated based on the Actual Percent Complete on the *Application for Payment* as approved by the Architect, Engineer or Landscape Architect. For example, if the Contractor is 20% complete, the contractor can take the 20% (0.2) and multiply it by half of the Lump Sum unit price amount, and receive that portion.

In order to receive payments, the field inspection forms must be sent in with the *Application for Payment* each month. If there are deficiencies maintaining or implementing the SWP3 and its Best Management Practices (BMPs), the payment will be withheld until the deficiencies are corrected.

630.2.1.3 The remaining twenty-five (25) percent of the Lump Sum unit price amount will be based on the completion and submittal to EPA of an EPA Notice of Termination (NOT) of Coverage Under a NPDES General Permit for Storm Water Discharges Associated with Construction Activity, and BMP removal. A copy of the NOT acceptance verification from EPA must be delivered to the Owner. BMPs must be removed as defined in the plan specifications or SWP3. This is done in case there are some BMPs that must remain until final stabilization is met, and that there are no more NPDES concerns for the Contractor.

END OF SECTION

SUPPLEMENTAL TECHNICAL SPECIFICATION

SECTION 1505

CONTROL OF STORM WATER AND NUISANCE FLOW

1505.1 DESCRIPTION

This work covers the control of storm and nuisance flow water in the vicinity of this project.

1505.2 CONSTRUCTION REQUIREMENTS

All permanent work shall be performed in areas free from water. The CONTRACTOR shall construct and maintain all dikes and drainage ditches necessary for the elimination of water from work areas and shall furnish, install, maintain, and operate all necessary pumping and other dewatering equipment required for dewatering the various work areas. Two (2) types of flow can be expected;

- 1) Continuous or intermittent flow through the main arroyo;
- 2) Local sheet flow from adjacent properties or adjacent streets.

The CONTRACTOR is responsible for adequacy of the scheme or plans, or for furnishing all equipment, labor and materials necessary for dewatering the work areas and breaking up and removing such ice or snow as may have formed or settled in the work area. The CONTRACTOR shall be fully responsible for all dewatering operations, and the cost of all dewatering operations shall be included in the lump sum price for this work. The CONTRACTOR shall also be responsible for removal of any sediment deposited by storm and nuisance water, and the cost of sediment removal work shall be included in the lump sum price for this work.

In the event that storm flow, snowmelt or other water flows overtop the Contractor's diversion method, the Contractor will be responsible for any and all damage, including damage to the existing channel and any damage to new work and is responsible for immediate resolution and repair in a manner acceptable to SSACFCA.

Diversion methods may be by use of sand bag diversion channels, sand bag dams, pumping or piping around or over the work areas, or any method or combination.

1505.3 BASIS OF PAYMENT

The bid item for this effort will be on a Lump Sum (LS) basis. Providing and maintaining the diversion and care of water, regardless of the amount of water actually handled, shall be paid for as follows:

Payment for protection of project from water will be made as a percentage of the dollar amount of work completed to date minus the Mobilization bid item and Protection of the Project From Water During Construction bid item.

<u>Pay Item</u>	<u>Pay Unit</u>
Protection of Project from Water During Construction	LS

END OF SECTION

SUPPLEMENTAL TECHNICAL SPECIFICATION

SECTION 1506

CONSTRUCTION STAKING

1506.1 DESCRIPTION

This work consists of construction staking lines, grades, and layouts by the Contractor in accordance with the plans and specifications and as directed by the Engineer for the control and completion of the project.

1506.2 MATERIALS

The Contractor shall furnish all stakes, templates, straightedges, surveying equipment and other devices necessary for establishing, checking, marking, and maintaining points, including P.I.'s, P.C.'s, P.T.'s, and lines, grades and layouts. As directed by the Engineer, points shall be referenced so that they may later be re-established.

1506.3 CONSTRUCTION REQUIREMENTS

Local Survey Control has been set for vertical and horizontal control throughout the construction area. These stakes and marks shall constitute the field control by and in accordance with which the Contractor shall establish other necessary controls and perform the work.

The Contractor shall be responsible for all other control, slope stakes, cut stakes, offset stakes, bench marks, blue tops or other staking necessary for proper execution of the work, or as requested by the Project Manager, to assure compliance with the plans.

1506.4 CONSTRUCTION SURVEYS

The contractor shall obtain and pay for the services of a Professional Surveyor registered in the State of New Mexico to perform surveys of earthwork quantities, during and at the completion of the project construction. These surveys shall consist of the following phases.

- Phase 1: A cross section survey, with no greater than 50 foot spacing, to determine the location of existing ground prior to construction after clearing and grubbing and after removal of the trash and debris. Cross section data collected shall be of sufficient spacing, including all breaks in the terrain to be able to create an original ground digital terrain model (DTM). The "original ground" DTM shall be submitted to the Engineer for review and acceptance prior to proceeding with excavation, embankment or export of excess material. Cross section data must be sufficient to determine earthwork quantities.
- Phase 2: Cross-section and location surveys that may be made during the excavation and backfill construction for the purposes of verifying the contractor's work. Where shown, the excavation dimensions (pay limits for unclassified excavation, backfill and sub-excavation) shown on the plans shall be used to determine the excavation cross-section for payment to the contractor. The cross-section data must be sufficient to verify the limits of excavation.
- Phase 3: A cross-section survey, at the same locations as the cross-sections in Phase 1 to determine the location of the finish grade at the completion of construction.
- Phase 4: The Phase 4 Survey will be completed during construction to demonstrate compliance with

the design grades shown on the plan set. Phase 4 Survey will also include the update and completion of as-builts for the project and the submittal on a weekly basis of as-builts on a set of the construction drawings, to the satisfaction of the Project Manager.

All surveys must be certified by the Professional Surveyor and include complete documentation. Cross sections of the Phase 1, 2 and 3 surveys and the pay limit for excavation as shown on the plans must be used by the Professional Surveyor to compute the quantity of excavation, subject to the provisions for measurement in Section 203. Volume shall be based on the "average end area" computation. All computations of excavation and backfill must be submitted to the Engineer in sufficient detail. This submittal shall be such that methods and computations can be fully verified and are subject to approval by the Engineer. The Contractor shall also submit the electronic survey point files, including break lines, in a format compatible with Civil3D such that the Engineer can use the data for verification of cut/fill quantities.

At the end of the Project, Smith Engineering Company Inc. will transcribe the as-built information provided by the Contractor onto the mylar record drawing. The Contractor's Professional Surveyor will be required to stamp, sign and certify the information shown on the mylar As-Built drawings.

1506.5 METHOD OF MEASUREMENT

Submit a construction-staking schedule of values as part of Construction Progress Meetings or monthly progress schedule to the Project Manager for approval.

1506.6 BASIS OF PAYMENT

Pay Item	Pay Unit
Construction Staking by the Contractor	Lump Sum

SSCAFCA will make partial payments in accordance with the approved construction-staking schedule of values.

END OF SECTION

SUPPLEMENTAL TECHNICAL SPECIFICATION

SECTION 1507

TESTING AND QUALITY ASSURANCE

1507.1 GENERAL

- A. This Section includes testing and quality control measures required on this project. The Section is additional to requirements specified for testing and quality assurance in the standard specifications and other supplemental specifications.
- B. Materials and equipment are subject to inspection, sampling, and testing before acceptance of the work.

1507.2 RELATED WORK

- A. General and Supplemental General Conditions of the Contract.

1507.3 REFERENCES AND DEFINITIONS

- A. All materials and equipment shall be tested, by the CONTRACTOR, pursuant to their technical specification (unless otherwise specified herein) and the manufacturer's recommendations.
- B. Structure shall include but is not limited to: parking lots, pavement, sidewalk, curb and gutter, foundations, structural concrete, piping, wet-wells, manholes, retaining walls, junction boxes, and buildings.

1507.4 SUBMITTALS

- A. Test Reports from tests performed by independent testing firm: Submit for acceptance, complete test reports from approved independent testing laboratories certifying that product conforms to performance characteristics and testing requirements specified herein and in other supplemental/standard specifications. Independent firm to submit reports to the ENGINEER and CONTRACTOR, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- B. Test Reports from tests performed by CONTRACTOR: Submit for acceptance, complete test reports from CONTRACTOR certifying that product conforms to performance characteristics and testing requirements specified herein and in other supplemental/standard specifications.

1507.5 QUALITY ASSURANCE

- A. Quality Assurance/Control of Installation – The CONTRACTOR shall:
 - 1. Comply fully with manufacturers' instructions, including each step in sequence.

2. Request clarifications from ENGINEER before proceeding should manufacturers' instructions conflict with Contract Documents.
3. Request clarification from ENGINEER before proceeding should specified reference standards conflict with Contract Documents. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.
4. Comply with specified standards as a minimum quality for the work except when more stringent specified tolerances, codes, or requirements indicate higher standards or more precise workmanship are required.
5. Make sure work is performed by qualified persons.
6. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

B. Testing Laboratory Services

1. Reports will be submitted by the independent firm to the ENGINEER and CONTRACTOR, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

1507.6 TESTING METHODS

Testing methods shall comply with ASTM Standards and as specified in the technical specifications for the project.

1507.7 EXECUTION

A. Testing Laboratory Services

1. The CONTRACTOR will employ and pay for services of an independent testing firm to perform testing.
2. The independent firm will perform tests and other services specified in individual Specification Sections and as required by the OWNER.
3. CONTRACTOR shall:
 - a) Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
 - b) Notify ENGINEER and independent firm 8 hours prior to expected time for operations requiring services.
 - c) Make arrangements with independent firm and pay for additional samples and tests required for CONTRACTOR'S use.

B. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the ENGINEER. No additional payment will be made for re-testing due to failing tests.

1507.8 TESTING FREQUENCY AND TYPE OF TESTING

Frequency and type of testing shall be per the requirements listed in the specifications for each type of Work. The Engineer may increase and/or add testing for any Work items. The Testing Allowance will be adjusted for increases in testing by Section 1507.9.D.

1507.9 MEASUREMENT AND PAYMENT

Testing shall be paid for as an allowance on a Lump Sum basis. The Contractor may request percent of LS cost payments during construction, however, the Contractor shall provide actual testing lab invoices as back-up for the percent complete that is being requested in a Pay Application.

Testing allowances are provided as part of the project and invoiced for testing will be paid for through this allowance.

Costs included in testing price include:

- A. Cost of engaging an independent testing firm, execution of tests by the testing firm, and reporting results by the testing firm.
- B. Costs of incidental labor and facilities required to assist testing firm.
- C. Costs of testing laboratory services used by CONTRACTOR separate from Contract Document requirements
- D. Costs of re-testing due to failure of previous tests will be included in the cost for testing and no additional payment will be made for this work.

The CONTRACTOR shall submit two copies of the testing firm's invoice to OWNER with Pay Application. Reimbursement to the Contractor will be for actual invoiced costs and no mark-up will be added to this invoice. The Contractor shall receive reimbursement for actual invoice of testing firm upon certification that payment has been made to the testing laboratory. Payment will be made at the next application for payment from OWNER.

END OF SECTION

SUPPLEMENTAL TECHNICAL SPECIFICATION

SECTION 1508

PROJECT RECORD DOCUMENTS

1508.1 GENERAL

This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

1508.2 RECORD DRAWINGS

Record Prints: Maintain one set of red-lined prints of the Contract Drawings and Shop Drawings. These prints shall be updated no less frequently than once per week. These prints will be reviewed for verification of updates by the construction observer on a regular basis, depending on the length of the contract. Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with ENGINEER.

- 1508.2.1** Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Mark whichever drawing is most capable of showing field conditions fully. Require individual or entity who obtained record data, whether individual or entity is Installer, SUB-CONTRACTOR, or similar entity, to prepare the marked-up Record Prints.
- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
- 1508.2.2** Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-references on the Contract Drawings.
- 1508.2.3** Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- 1508.2.4** Note Construction Change Directive numbers (field orders or Request for Information changes), alternate numbers, Change Order numbers, and similar identification, where applicable.
- 1508.2.5** Verification of current record prints status will be included in the monthly payment approval process that will be noted by the construction's observer's field reports.

1508.3 RECORD SPECIFICATIONS

Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later. Note related Change Orders, field order notes, Request for Information (RFI) notes, Record Product Data, and Record Drawings where applicable.

1508.4 MISCELLANEOUS RECORD SUBMITTALS

Assemble Certifications, Lab Test Reports, and Field Test Reports required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1508.5 SUBMITTALS

See New Mexico Standard Specifications For Public Works Construction Section 1502.

1508.6 RECORDING AND MAINTENANCE

- 1508.6.1** Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur.
- 1508.6.2** Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. It is not advisable to use Project Record Documents for construction purposes. Provide access to Project Record Documents for Engineer's reference on the project site.

1508.7 MEASUREMENT AND PAYMENT

The cost of project record documents shall be incidental to the Work and no separate payment shall be made for this effort. However, the Project Record Documents shall be reviewed per Section 1508.2.5 and they shall be updated prior to pay applications being processed.

END OF SECTION

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 1510
PROJECT SIGN

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. The CONTRACTOR shall provide, erect, and maintain for the duration of the construction project one identification sign at each construction site. The CONTRACTOR shall also provide, erect and maintain additional signs as necessary for Storm Water Pollution Prevention Plan (SWPPP) and labor notification.

1.2 RELATED SECTIONS

- A. General and Supplemental General Conditions of the Contract and Division 1.
- B. Section 103: Submittal Procedures

1.3 REFERENCES

- A. Where all or part of a Federal, American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), American Water Works Association (AWWA), New Mexico Standard Specifications for Public Works Construction, etc., standard is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 PERFORMANCE REQUIREMENTS

- A. SWPPP Sign
 - 1. If a SWPPP is required, a sign or other notice must be posted conspicuously near the main entrance of the construction site. If displaying near the main entrance is infeasible, the notice can be posted in a local public building such as the town hall or public library. The sign or other notice must contain the following information.
 - 2. A copy of the completed Notice of Intent as submitted to the EPA Stormwater Notice Processing Center; and
 - 3. If the location of the SWPPP or the name and telephone number of the contact person for scheduling SWPPP viewing times has changed (i.e., is different than that submitted to EPA in the NOI), the current location of the SWPPP and name and telephone number of a contact person for scheduling viewing times.
 - 4. For linear projects, the sign or other notice must be posted at a publicly accessible location near the active part of the construction projects (e.g., where a pipeline project crosses a public road).
- B. Labor Sign
 - 1. A sign shall also include all notification and sign requirements from the following so that they are weather tight.

- a. Equal employment opportunity poster
- b. Federal and State wage rate information
- c. Safety posters
- d. Official announcements and notices

C. Project Sign

1. SIGN DIMENSIONS: 1200 mm x 2400 mm x 19 mm (approx. 4' x 8' x ¾")
Plywood Panel (APA RATED A-B GRADE-EXTERIOR)
2. Sign shall be white background with black letters
3. Final information regarding CONTRACTOR will be supplied after the project has been awarded.
- 4.



[2']

LOMITAS NEGRAS PHASE 2

[3'] **SOUTHERN SANDOVAL
COUNTY ARROYO
FLOOD CONTROL
AUTHORITY**

ENGINEER

SMITH ENGINEERING COMPANY
2201 SAN PEDRO NE BLDG 4 SUITE 200
ALBUQUERQUE, NM 87110
(TELEPHONE Nº. 505-884-0700)

[1-1/2"]

[1-1/2"]

[1"]

[1"]

[1"]

CONTRACTOR

(NAME)

(ADDRESS)

(CITY, STATE, ZIP CODE)

(TELEPHONE Nº. 505-000-0000)

SSCAFCA

1041 COMMERCIAL DR. SE
RIO RANCHO NM, 87124

[1-1/2"]

[1-1/2"]

[1"]

[1"]

(TELEPHONE Nº. 505-892-5266

[1"]

[1"]

FUNDING

[CONTRACT AWARD AMOUNT]

[21/2"]

[1-1/2" wide red outline, with rounded corners @ interior box]

1.5 SUBMITTALS

- A. General: Submit listed submittals in accordance with conditions of the Contract and STS 103.
- B. Shop drawings: Submit clear, concise drawing showing model number, size, arrangement and configuration of all products specified. Minimum sheet size is 8.5" X 11".

1.6 QUALITY ASSURANCE

- A. Sign Paint (Primer, Paint and Finishes): The paint used for the sign shall be specifically designated for exterior use. It shall resist weathering and fading for the indicated construction schedule.

1.7 DELIVERY, STORAGE AND HANDLING

- A. The CONTRACTOR is responsible for the safe storage of the equipment until it is incorporated in the completed project.
- B. The material and equipment shall be stored and handled per the manufacturer's recommendations.

PART 2 PRODUCTS

2.1 MATERIALS

- A. The sign(s) shall be painted on one side with a background color of white not smaller than 4' x 8', marine grade plywood.

PART 3 EXECUTION

3.1 CONTRACTOR'S RESPONSIBILITY

- A. The CONTRACTOR is responsible for furnishing and installing the PRODUCT including all site preparation, and other items necessary for the proper installation and operation of the PRODUCT.

3.2 EXAMINATION

- A. Examine all products for compliance with this section.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Immediately correct all deficiencies and conditions which would cause improper execution of Work specified in this Section and subsequent Work.
- C. Verify that the PRODUCT dimensions are correct and project conditions are suitable for installation. Do not proceed with installation until conditions deficiencies have been corrected.

- D. Proceeding with Work specified in this Section shall be interpreted to mean that all conditions were determined to be acceptable prior to start of Work.

3.3 INSTALLATION

- A. Each sign shall be mounted on two 4" x 4" posts, with the bottom of the sign at least four feet above grade. The identification sign shall be mounted level and at the location designated by the Architect/ENGINEER or the OWNER'S Project Manager.
- B. Keep signs and supports clean. Repair deterioration and damage.
- C. Remove signs, framing, supports, and foundations to a depth of 2 feet upon completion of the project. Restore the area to a condition equal to or better than before construction.
- D. The signs shall be salvaged to the OWNER or disposed of by the CONTRACTOR at the OWNER's direction at the end of the construction project.

END OF SECTION 1510

Supplemental Specifications

Concrete Structures and Soil Cement

SUPPLEMENTAL TECHNICAL SPECIFICATION

SECTION 511.6

CONCRETE STRUCTURES

GENERAL NOTE –

This specification was adopted from the NMDOT Standard Specification 511. All references to the NMDOT or requirements for approval from the State or the NMDOT shall be ignored. The only changes applied to the NMDOT Standard Specification is that rebar is included in the pay item for structural concrete.

511.1 DESCRIPTION

This Work consists of constructing concrete box Culverts, headwalls, retaining walls, abutments, bents, piers, slabs, girders, and Incidental Structures requiring the use of concrete, except pre-stressed members.

511.2 MATERIALS

511.2.1 General

Use concrete mixes that have been designed in accordance with Section 509 and approved for use on NMDOT Projects by the State Materials Bureau for the freeze/thaw risk zone in which the Project is located. A higher risk zone concrete may be substituted.

511.2.2 Joint Sealing Materials

Provide premolded expansion joint sealing Material in accordance with the Contract. Provide nonextruding and resilient expansion joint filler in accordance with AASHTO M 153. Provide preformed asphalt expansion joint filler in accordance with AASHTO M 213. Provide elastomeric compression joint seals in accordance with Section 561, "Elastomeric Compression Joint Seals."

511.2.3 Curing Material

Use curing material in accordance with 510.2.3.

511.2.3.2 Certificates of Compliance for Curing Materials

Submit a Certificate of Compliance in accordance with Section 106, "Control of Materials".

511.2.4 Steel Reinforcement

Provide steel reinforcing bars and epoxy-coated steel reinforcing bars in accordance with Section 540, "Steel Reinforcement."

511.3 CONSTRUCTION REQUIREMENTS

511.3.1 Concrete Placement

Concrete shall be placed and tested for compliance with the Project Specifications in accordance with Section 510.

511.3.2 Falsework and Falsework Foundation

Construct Superstructure in accordance with Section 511, "Concrete Structures," and Section 512, "Superstructure Concrete."

Design, construct, and maintain falsework and falsework foundation to provide the required strength and rigidity, and to support loads without settlement. Have a professional Engineer licensed in the State of New Mexico design the falsework and its foundation. The design of the falsework and foundation will be required if one (1) or more of the following conditions apply:

1. If the height of the Structure is greater than ten (10) ft, (excluding concrete Culverts with bottom slabs);
2. Where the supported span is greater than 15 ft;
3. Where traffic, other than workmen involved in constructing the Structure, will travel under the falsework.

Section 511.6: Concrete Structures

Page 1 Place the falsework

on an adequate foundation. The maximum foundation bearing pressure is 2,000 pounds per square foot unless a Geotechnical investigation indicates a higher value can be used. Provide methods for measuring settlement or movement of falsework and forms under load. If falsework shows settlement of no greater than 3/8 inch of the vertical supports, stop the Work and correct the settlement or movement.

If pilings are used for falsework, pull or cut off falsework pilings. Ensure the cut-off elevations are one (1) ft below the low water level, natural ground, or bottom of proposed channel.

If required, submit Plans for falsework to the State Bridge Engineer for approval. Submit proposed changes to existing Structures required for maintenance of traffic to the Project Manager for approval. The approval process may require up to 38 Days.

511.3.3 Form Construction

Make forms mortar tight and sufficiently rigid to prevent deformation due to the pressure of the concrete and other loads incidental to the construction operations, including vibration. Construct and maintain forms to prevent the joints from opening. Construct and maintain forms used on surfaces in public view with a smooth surface of uniform color and texture. Do not weld reinforcing or Structural Steel, except as required in the Contract.

Remove loose dirt, laitance and miscellaneous debris from the bottom of the forms before placing concrete.

Fillet forms and chamfer them 3/4 inch, unless required otherwise in the Contract, and give them a bevel or draft for easy removal of projections such as girders and copings.

511.3.3.1 Form Lumber

Use lumber that is planed on at least one (1) side and the two (2) edges for exposed concrete surfaces. Place the planed face so that it will be the formed surface for the concrete being placed.

511.3.3.2 Metal Ties

Construct metal ties and anchorages within the forms to permit the removal of a portion of the tie connections without damaging the concrete and provide at least 1/2 inch depth of cover from the concrete surface.

511.3.3.3 Surface Treatment of Forms

Ensure that all forms have been properly treated with an approved form release agent before placing reinforcing steel. Ensure that forms have been properly wetted before placing concrete.

Do not use form oil that adheres to or discolors the concrete.

511.3.3.4 Metal Forms

Provide metal forms thick enough to prevent bending and maintain their shape. Use countersunk bolts and rivet heads. Use clamps, pins, and other connecting devices designed to hold forms rigidly together and for removal without damaging the concrete. Use metal forms that have a smooth surface and line up properly.

The Contractor may use metal forms that remain part of the Structure in accordance with the Contract or as approved by the State Bridge Engineer. Use permanent steel Bridge deck forms in accordance with Section 512.3.4.1, "Permanent Steel Deck Forms."

511.3.3.5 Reuse of Forms

Continuously maintain the shape, strength, rigidity, water tightness, and surface smoothness of reused forms. Resize warped or bulged lumber before reusing it.

511.3.4 Temperature and Weather Limitations

Keep the concrete mixture temperature between 50 °F to 90 °F at the time of placement.

511.3.4.1 Cold Weather Concrete

Do not place concrete directly onto any surface that is less than 40 °F unless otherwise approved by the Project Manager. Do not place concrete on frozen ground.

Place cold weather concrete in accordance with ACI 306, *Cold Weather Concreting*.

If placing concrete at or below air temperatures of 35 °F, provide suitable enclosures and heating devices. Vent exhaust from combustion type heating devices outside the placing area so that the exhaust fumes can not come in contact with the freshly placed concrete.

Ensure the concrete surface temperatures never fall below 45 °F during placement and the first three (3) Days after placing. Do not let the surface temperature fall below 40 °F during the next four (4) Days after placing, or until the in-place strength determined by the *Maturity Method*, as described in Section 510, "Portland Cement Concrete" indicates that 75% of the design strength is achieved.

Monitor the minimum concrete temperatures at various locations including edges and corners of slabs or other Structures and check immediately before placing insulating material over the concrete.

If heating the aggregates or water, use heating methods and Equipment that can heat the Material uniformly. Do not heat the Materials to more than 110 °F. During the heating or mixing process, do not add cement to water and aggregate combinations that are hotter than 90 °F.

If air temperatures are likely to fall below 35 °F during the placement or curing periods, submit a cold weather concreting and curing plan to the Project Manager for approval by the State Concrete Engineer before concrete placement. Allow 14 Days for review. Ensure that the plan details the methods and Equipment to maintain the required concrete temperatures.

Information submitted will include, but not be limited to:

- Whether or not outside heating sources will be used (and how the exhaust will be vented away from the fresh concrete);
- What the target mix temperature will be;
- How the concrete will be protected from the ambient conditions;
- How soon after the placement the protection from the ambient conditions will be implemented;
- Who will be responsible for insuring that the proper protection from the environment is properly implemented;
- How the actual temperature of the concrete will be monitored;
 - How often will this be checked;
 - Who will do the checking;
- What actions will be taken if the temperatures fall below the target points;
- Who will be responsible for taking the necessary actions;
- Who the contact will be if Department Personnel need to talk transmit notices or information about the cold weather conditions.

511.3.4.2 Hot Weather Concrete

Place hot weather concrete in accordance with ACI 305, *Hot Weather Concreting*.

511.3.4.3 Wind Break

If a wind break is used, the wind break shall be a minimum height of eight (8) ft- 0 inches and constructed in a perimeter enclosing the Bridge deck, approach slabs, sleeper footings and/or transition slabs (if applicable). All areas of the freshly placed concrete must be protected by the wind break. The nature and type of windbreak to be used shall be approved by the Project Manager prior to placement of any Superstructure concrete.

511.3.4.4 Fogging System

If a fogging system is used, a water fog shall be continuously applied over the surface of the freshly placed concrete in such a manner that the entire surface is kept at a relative humidity of 90% or greater and the surface of concrete is kept at an evaporation potential of 0.15 pound/square foot/hour or less, as determined from Figure 511.3.3.5:1. The evaporation potential shall be determined prior to fogging and outside the wind protection, and continuously monitored with evaporation potential measurements taken and recorded at least once every five (5) min throughout the entire placement and continuing until the concrete curing system has been completely installed. If a wind break and/or fogging are being used, obtain these readings from the protected area at a height of approximately five (5) feet above the protected concrete.

The area to be fogged shall be the entire area of the freshly placed concrete, which has not had the final finish applied. This fog shall be delivered through a network of nozzles, which are properly spaced to provide a uniform fog at the surface of the concrete. The nozzles used shall be of the type, which atomizes the water so that there are no visually discernible droplets of water. The area of coverage from each nozzle shall overlap all adjacent nozzle coverage by at least one (1) ft. It shall be demonstrated prior to the placement of the concrete that the intended system is capable of delivering the required fogging environment for at least twice the anticipated required time. Do not finish or otherwise mix any of the fogging water into the fresh concrete.

The intended system must be properly field tested and approved by the State Materials Bureau before being used on any Superstructure concrete. Fogging shall continue until the surface is covered with an approved curing compound. The wet burlap shall not be applied over the curing compound until the Superstructure concrete can receive the wet burlap and any placement loads without deformation.

The use of a Mono-Molecular Film (MMF) evaporation retarder shall only be used in strict accordance with the manufacturer's recommendations. If used, it shall be applied, and no further finishing efforts will be permitted in any location that has received the MMF. Under no circumstances shall the MMF be used as a finishing aid in the working of the concrete surface.

DO not place concrete until the Project Manager approves the reinforcing steel and forms. Ensure that forms are clean and free of rust, grease, and other Deleterious Material immediately before placing the concrete. Remove wooden form spacers immediately before placing concrete in that area. Vibrate the concrete during placement to force the coarse aggregate from external surfaces and to bring mortar against the forms to produce a smooth finish significantly free of water, air pockets, and honeycombs.

Place concrete in girders, walls, and other similar Structures in horizontal layers. Ensure that the concrete is not too thick for the vibrator to consolidate and merge it with the previous layer. Do not pour concrete layers deeper than two (2) ft.

Do not place concrete faster than the rate used for the design of the forms. Adjust the rate for the temperature of the concrete being placed.

511.3.4.5 Rate of Evaporation Limitations (applies to Bridge decks, approach slabs, Sidewalks, curbs, CBC (top and bottom slabs), slipped formed concrete Structures, all PCCP, structural shotcrete, and concrete slope paving) (review listing of Structures- how to match top paragraph)

Do not place concrete unless the average combination of air temperature, temperature of fresh concrete, relative humidity, and wind velocity (Evaporation Potential) at the site over any ten (10) minute period is less than 0.20 lb per square foot per hour in accordance with Figure 512.3.7.5:1, "Surface Evaporation from Concrete," by using a continuous reading computerized weather station set to intervals not greater than five (5) minutes apart. Measurements of the wind speed, relative humidity and ambient air temperature used to determine the Surface Evaporation from the Concrete shall be taken at a height of approximately five (5) feet above the deck. Utilize an automated system that does not require any human support or effort after its initial set-up. Continue obtaining and recording the Surface Evaporation from the Concrete after all of the concrete has been placed until the final curing system has been physically applied.

Do not place concrete during periods of high air temperature, low humidity, or high winds unless one (1) or more of the following measures have been taken upon by the Contractor at his expense and maintained to the satisfaction of the Project Manager to reduce the rate of evaporation to within the specified rate:

1. Erect windbreaks to reduce the wind velocity over the concrete surface;
2. Place concrete during nighttime or early morning hours;
3. Use cool aggregate and mixing water to lower the fresh concrete temperature during hot weather;
4. Increase the relative humidity at the site with a fog spray; or
5. Protect the concrete with temporary wet coverings during an appreciable Delay between placing and finishing.

511.3.5.1 Chutes and Troughs

Avoid segregation of the Materials and the displacement of the reinforcement when placing the concrete. Use metal or metal-lined open troughs and chutes; do not use aluminum. All tools used for the moving and/or spreading of the concrete shall be square pointed tools. Do not use round nose shovels and spreading tools.

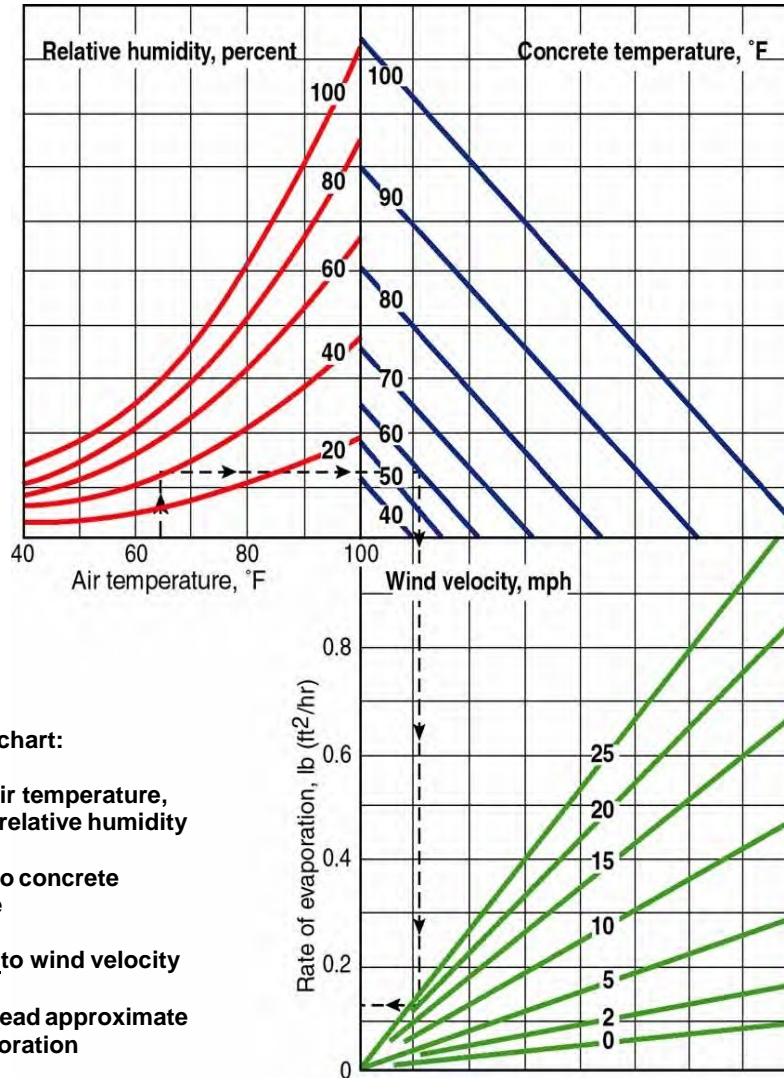
Where the Contract requires steep slopes, equip the chutes with baffle boards or use short lengths that reverse the direction of movement.

Keep chutes, troughs, and pipes clean and free of hardened concrete by thoroughly flushing with water after each pour. Discharge the water used for flushing away from the placed concrete.

Do not allow concrete to free fall for more than five (5) ft, unless confined by closed chutes or pipes. For walls equal to or less than 10-inch-thick, such as Culvert walls, concrete may have a free fall of less than nine (9) ft.

Fill each part of the form by placing the concrete as close to the final position as possible. Vibrate the concrete during placement to force the coarse aggregate back from the forms and around the reinforcement without displacing the bars. After the concrete's initial set, do not jar the forms or place strain on the ends of projecting reinforcement.

Figure 511.3.3.5:1
Surface Evaporation from Concrete



To use this chart:

1. Enter with air temperature, move up to relative humidity
2. Move right to concrete temperature
3. Move down to wind velocity
4. Move left; Read approximate rate of evaporation

511.3.5.2 Concrete Pumping

If placing concrete by pumping, install pumping Equipment so that vibrations resulting from the operation do not damage the concrete being placed. Obtain Project Manager approval before using concrete pumping Equipment.

Before placing the concrete, clean the Equipment thoroughly. Operate the Equipment so that it pumps a continuous flow of concrete without air pockets and without an appreciable loss of slump or entrained air.

Control the loss of entrained air by one (1) or more of the following methods:

1. Tie the end of the pump hose so that the discharge end is pointing upward, forming

- a "J" at the end of the hose;
2. Install a series of four (4) consecutive elbows to form a 360° loop;
 3. Reduce the diameter of the end of the pump line; or
 4. Limit the enclosed angle of the boom arms to an angle of 135° or more.

Make sure that the discharge of the concrete from the pump is as close as possible to the bottom of the structure being placed, but in no case shall it be allowed to drop a distance greater than four (4) feet.

Do not use aluminum pipe. Do not add water to the concrete during pumping. If water is added at the pump hopper to clear a clogged pump, dispose of the concrete in the hopper and the line.

511.3.5.3 Conveyers and Belts

The Contractor may use conveyor belts to transport the concrete from the point of delivery to the point of placement. If using multiple belts, ensure that the drop from one (1) belt to the next is no greater than 18 inches. At the end of the last belt, do not allow the concrete to free-fall more than four (4) ft. Ensure that the concrete coming off the end of any belt is not being segregated. If segregation occurs, slow down the speed of the belt until segregation no longer occurs.

511.3.5.4 Placing Concrete Under Water

If placing concrete under water, submit a mix design and procedure plan to the Project Manager. The Project Manager may require up to 30 Days to approve them. Allow time in the schedule to accommodate this approval process.

511.3.5.5 Vibrating/Consolidation

Unless otherwise directed by the Project Manager, and excluding drilled shafts, compact concrete with suitable mechanical vibrators operating within the concrete. During concrete placement, keep enough personnel, vibrators, and other tools available to assure adequate consolidation. If necessary, supplement vibrating with hand spading with suitable tools to assure proper consolidation. If using vibrators, use procedures in accordance with ACI 309.

Do not use a "jitterbug" or any other flat tool that could cause concrete segregation.

Use approved vibrators that can transmit vibration at frequencies up to 10,000 vpm. Provide vibrators that have each been certified within the last 90 Days to provide 8,000 to 10,000 vpm.

Operate vibrators to consolidate the concrete thoroughly around the reinforcement and embedded fixtures and into corners and angles of the forms. Do not use vibrators to make concrete flow or run. Vibrate long enough to accomplish consolidation, but do not vibrate so long to cause segregation or air bubbles. Insert the vibrators vertically into the concrete, and immediately withdraw upward along the same line with the opposite motion. Do not drag the vibrator horizontally across the placing area.

When operating vibrators, avoid contact with reinforcing bars, particularly epoxy coated reinforcing bars or bars that extend into concrete that has taken an initial set. If vibrating concrete in areas reinforced with epoxy-coated bars, cover the vibrators with nonmetallic sleeves to prevent damage to the epoxy coating.

511.3.5.6 Sequence of Placement and Application of Load

Do not place superimposed loads on or against load carrying members, floor slabs, or retaining walls until the concrete reaches 80% of specified **compressive strength but no less than 2,500 psi**, as determined by the *Maturity Method*, in accordance with Section 510.3.5.2, "In-Place Concrete Strength Measurements." Concrete box Culverts and

CBC wingwalls shall not be backfilled until specified compressive strength has been achieved. Submit a concrete placement schedule to the Project Manager upon request. Plan and schedule concrete placement to prevent damage to previously placed concrete or to the curing or protection systems of previously placed concrete.

The following applies to concrete placement scheduling:

1. The Contractor may erect reinforcement and formwork for walls, columns, and pier caps 24 h after placement of footings or floor slab concrete;
2. Unless otherwise provided, the Contractor may concrete columns, walls, and pier caps, 48 h after placement of footing or floor slab concrete;
3. Do not set beams or girders, or place Superstructure concrete until Substructure forms have been stripped sufficiently to determine the quality of the concrete;
4. Do not place the load of the Superstructure on the Substructure until the Substructure concrete has been in place for at least 14 Days or until in-place strength measured by the *Maturity Method* indicates that the concrete has attained the design strength;
5. Ensure that the concrete has achieved sufficient strength as determined by the *Maturity Method* in accordance with the form design before placing concrete for integral horizontal members, such as pier caps or roof slabs;
6. Place the vertical members at least seven (7) Days before mounting friction collars or falsework brackets that will support the weight of horizontal members. Ensure that the vertical members have attained the specified strength before applying loads, unless the Department approves otherwise;
7. Limit monolithic casting of walls and deck slabs of concrete box Culverts to Culverts that are six (6) ft high or less. Construct box Culvert walls higher than six (6) ft in accordance with this subsection;
8. If the strength gain of the concrete is retarded, the District Construction Engineer may extend the waiting periods. Conduct construction operations in a manner that does not damage the previously placed concrete.

511.3.5.7 Supplementary Lighting

Do not mix, place, or finish concrete when the natural light is insufficient without using an adequate artificial lighting system, approved by the Project Manager. Test the lighting system at least one (1) Day before placing the concrete to assure that the system will provide sufficient light, without shadows or dark areas for placing, testing and finishing concrete. Ensure that the lights do not create a hazard for traffic on adjacent Roadways or Detours.

511.3.6 Removal of Forms

Do not remove the forms until the concrete is strong enough to avoid damage by removing the forms, and the temperature differential between the concrete surface to be exposed and the core of the concrete Structure is less than 10 °F per inch.

If in-place strength tests in accordance with Section 510.3.5.2, "In-Place Concrete Strength Measurements," are not used to control field operations remove forms in accordance with Table 511.3.5:1, "Timetable for Removal of Forms," not counting those Days when the temperature is below 40 °F.

Table 511.3.5:1
Timetable for Removal of Forms

Structural component	Minimum time for removal
Bottom of beams	14 Days
Bridge decks ^a	seven (7) Days
Floor slabs	seven (7) Days
CBC Floors	seven (7) Days
CBC Covers	seven (7) Days
Walls	24 h
Columns	48 h
Sides of beams	24 h
All other parts	24 h

^aAdditional requirements of Section 512, "Superstructure Concrete," shall apply.

If one (1) of the test methods in Section 510.3.5.2, "In-Place Concrete Strength Measurements," is used to control the field operations, the Contractor may remove forms from the bottom of beams and floor slabs when the concrete reaches 75% of the design compressive strength.

511.3.7 Joints

Make construction joints in concrete Structures in accordance with the Plans, unless otherwise directed or approved by the Project Manager.

If the concrete placement is interrupted and additional construction joints are required, place the additional joints in planes perpendicular to the principal lines of stress, and at points of minimum shear, as approved by the Project Manager.

Roughen the joint surface to increase the bond with future concrete, except in areas near the forms.

511.3.7.1 Keyed Joints

Mechanically bond construction joints with keys formed by beveled strips embedded in the surface of the concrete. Make the keys from 1 3/8 inch to 1 1/2 inch deep. Place the keys centrally within the thickness of the joint. Ensure that the keys have a width that is one-third of the depth of the smallest dimension of the joint. The keys do not need to exceed the clear distance between reinforcing mats or be greater than 8 inches. Provide raised keys in accordance with the Plans.

511.3.7.2 Bonding New Concrete to Existing

If bonding new and existing concrete, retighten the forms before depositing new concrete on or against the hardened concrete. Roughen the surface of the hardened concrete without loosening the aggregate or damaging the concrete on the surface. Thoroughly clean the surface of foreign matter and laitance.

Have an approved private testing Laboratory measure the water vapor being transmitted through the concrete surface in accordance with ASTM F 1869. Do not place new concrete on existing concrete if the water vapor exceeds five (5) lb per 1,000 ft² per 24 h.

Provide a bonding agent at the interface between the hardened and fresh concrete by covering the cleaned and saturated surfaces with a coating of mortar, neat cement grout, or an approved bonding agent. Place the new concrete before the grout reaches an initial set. If using an approved bonding agent, follow the manufacturer's instructions. Do not use a bonding agent that is water soluble or is delivered in a water-based solution. Place the concrete continuously from joint to joint and finish the face edges of exposed joints in accordance with the Plans.

511.3.7.3 Water Stops and Flashings

Provide and place water stops and flashings. Splice or solder water stops and flashings to form continuous watertight joints.

511.3.7.4 Joint Fillers

Accurately shape the pre-formed joint filler to fit adjacent concrete and hold the filler firmly in place to prevent formation of concrete fins under and between sections of the Material.

511.3.8 Miscellaneous Construction

511.3.8.1 Setting of Bearings

Ensure the surfaces on which metal masonry plates and elastomeric bearing pads will rest are flat and on level planes. If using elastomeric bearing pads finish the Bridge seats slightly high and grind to the correct elevation.

If it is necessary to adjust the elevation of a bearing upward, make the adjustment by placing full size shim plates. If it is necessary to adjust the elevation of a bearing downward, make the adjustment by diamond grinding to a level plane-bearing surface. Do not use grout to level or adjust elevation.

If placing a bearing surface below the level of adjacent concrete, ensure water drains away from the masonry plate or elastomeric bearing pad.

Finish sections of Bridge seats on abutments or piers on both sides of bearing assemblies to drain, with a slope of from 1/16 inch to 1/8 inch per foot. Correct depressions that retain water.

511.3.8.2 Waterproofing

If required in the Contract, protect the backsides of abutment backwalls and wingwalls by waterproofing. The Contract defines the vertical and horizontal limits of the waterproofing. Select a membrane type waterproofing system from the Department's *Approved Products List*.

511.3.9 Finishing

Perform finishing after removing forms in accordance with the Contract.

511.3.9.1 Exposed Surfaces

The Department considers "exposed surfaces" as surfaces that are not buried in the ground or permanently covered by the fill, or against which the fill is not permanently placed. However, the Department does not consider the inside surfaces of concrete box drainage Culverts and concrete box girders, and the bottom side of concrete Bridge decks as "exposed surfaces."

511.3.9.2 Class 1, Ordinary Surface Finish

Apply a Class 1 finish to exposed surfaces as a final finish or before a Class 2, Rubbed Surface Finish, or a Class 4, Special Surface Finish.

A Class 1 finish includes the removal of rods, bolts, or other form ties to at least 1/2 inch deep from the face of the concrete. Fill tie holes and honeycombs with mortar composed of one (1) part cement and two (2) parts sand; use the same brand and type of cement as used in the concrete.

Remove objectionable fins, bulges, and projections by rubbing with carborundum bricks or by other methods approved by the Project Manager. If necessary, clean the entire surface. Keep such surfaces in an acceptable condition until final Acceptance of the Work.

Apply a Class 1 finish to surfaces buried in the ground or permanently against the fill, except that form ties may be cut off even with the concrete surface, and fins, minor bulges, projections, stains, and discolorations do not need to be removed.

Unless specified otherwise in the Contract, apply a Class 1 finish to the front faces of backwalls of abutments, the top surfaces of Bridge seats on piers and abutments, and concrete curtain walls between pier pilings.

Apply a Class 1 finish to the inside surfaces of concrete box drainage Culverts, except as noted in Section 511.3.8.3, "Class 2, Rubbed Surface Finish."

511.3.9.3 Class 2, Rubbed Surface Finish

Apply a Class 2 finish to concrete surfaces generally exposed to public view.

The Contract may specify a Class 4, Special Surface Finish with selected colors, for various components or parts of components. If the Contract specifies a Class 4, Special Surface Finish, apply a Class 2 finish first, unless otherwise approved by the Project Manager.

A Class 2 finish consists of a Class 1 finish, then thoroughly wetting the surface and applying a mortar.

Apply a thin mortar, composed of one (1) part cement and four (4) parts sand, and rub it into holes and pockets; use the same brand and type of cement as used in the concrete. Use sand passing a No. 16 sieve. Allow the mortar to remain until it has set sufficiently to prevent removal by subsequent rubbing operations. Rub the surface with a No. 25 to No. 30 carborundum brick, then, rub with burlap to remove excess mortar. If the completed rubbed surface does not look uniform, make a final finish by wet rubbing with a No. 30 carborundum brick.

Apply Class 2 finish to the following:

1. Outside vertical surfaces of Bridge decks;
2. Outside surfaces of exterior girders, curb and rail posts seen in elevation view;
3. Curb tops, post tops, inside faces of curbs, and faces of hand rails;
4. Exposed surfaces of pier columns and caps;
5. Abutment wingwalls and Bridge seats one (1) ft below final grade;
6. Bridge rehabilitation Projects with existing slope paving;
7. Top surface of slope paving (tops of Bridge seats require only a Class 1 finish);
8. Exposed surfaces of barrier railings on Bridges or concrete box Culverts;
9. Exposed surfaces of miscellaneous concrete Structures extending above Shoulder line grade and inside walls of concrete underpass Structures.
10. Concrete box Culverts used for drainage, on the soffit and streamside faces of headwalls and wingwalls, and for six (6) inches down the back side of wingwalls; and
11. The interiors of sidewalls to one (1) ft back from the face of the Culvert at the tops of the sidewalls and extending on a 45° line downward and inward.

511.3.9.4 Class 3, Float Finish

Apply a Class 3 finish to upper surfaces not formed, such as tops of walls, parapets, tops of slabs and bottom slabs of box Culverts, copings and Bridge seats, except tops of Bridge decks, Sidewalks, or curbs.

A Class 3 finish consists of placing an excess amount of concrete in the forms and striking off this excess concrete with a template, forcing the coarse aggregate below the surface. After striking off the concrete, thoroughly work the surface with a wooden, cork, or canvas float without adding water or cement. Before the final finish has set, use a fine brush to remove surface film and to produce a fine grain, smooth, sanded texture.

511.3.9.5 Class 4, Special Surface Finish

Apply a Class 4 finish on new Structures over the Class 2 finish, unless directed otherwise by the Project Manager. If applying a Class 4 finish, apply it throughout the Structure and on adjacent Structures for concrete surfaces where the Contract specifies a Class 2 finish. If repairing existing Structures, apply a Class 4 finish to the entire surface of the repaired components.

For a Class 4 finish use Materials from the Department's *Approved Product List* for special surface finish on concrete Structures. Use the same Material and methods for surfaces the Contract requires to receive a Class 4 finish.

Submit sample panels for each type of Class 4 finish, showing colors and texture to the Project Manager at least 30 Days before beginning finishing operations for approval by the Landscape Architect. Unless otherwise shown in the Contract, use sample panels that are at least one (1) ft x one (1) ft.

If applying a Class 4 finish and penetrating water repellent on a concrete surface, allow the penetrating water repellent to cure for at least seven (7) Days before applying the Class 4 finish.

511.3.9.6 Penetrating Water Repellent Treatment Solution

Saturate the exposed surfaces of the following concrete Structures with a penetrating water repellent treatment in accordance with Section 532, "Penetrating Water Repellent Treatment;"

1. Bridge wingwalls;
2. Front and side face of abutment Bridge seats;
3. Front faces of abutment backwalls;
4. Top surfaces of Bridge seats on piers and abutments;
5. Pier columns, stem walls and vertical surfaces of pier caps;
6. Top and vertical side surfaces of Bridge decks, except in the areas where using epoxy Bridge deck overlays;
7. Top surfaces of concrete approach slabs;
8. Concrete barrier railings;
9. Concrete wall barriers; and
10. Sidewalks, curbs and gutters on Structures.

Extend treatment to at least one (1) ft below the final groundline.

Do not treat the underside of pier caps, sides, and end surfaces of concrete approach slabs.

511.3.10 Curing

Use curing methods in accordance with Table 511.3.9:1, "Curing of Concrete Structures," unless the Contract specifies otherwise.

For Structures with formed surfaces such as barrier walls, barrier railings on Bridges, wingwalls, or parapets on Bridges or box Culverts, remove the forms, finish the concrete, and resume curing with Method 2. Do not pause curing for more than two (2) h. Keep the

concrete surface moist throughout the finishing and curing operations.

For other formed vertical surfaces, the Contractor may strip or partially strip forms before the end of the specified seven (7) Day curing period, if the Contractor immediately resumes curing by Method 2.

Cure construction joints in box Culverts, Bridge Substructures and Superstructures, and other concrete Structures with wet burlap for seven (7) Days, or until covered with the next lift of concrete. Alternatively, cure these Structures with Method 1, provided that the surfaces are sandblasted and thoroughly cleaned before placing the new concrete.

**Table 511.3.10:1
Curing of Concrete Structures**

Method designation	Curing method description
Method 1	Water curing
Method 2	Curing compound
Method 3	Form curing
Method 4	Combination of Method 1 and Method 2
Structure description	Curing methods
Bridge decks ^a	4
Approach slabs	4
Concrete curbs, gutters and Sidewalks	1 or 2 Top surfaces of:
Pier caps, abutment Bridge seats	1 or 2
Wingwalls and parapet walls	1 or 2 Other concrete ^b 1, 2, or 3
^a See Section 512.3.10.1, "Curing," for additional curing requirements for Bridge decks.	
^b Unless the Contract specifies otherwise.	

The Contractor shall not apply curing compound to surfaces that will receive a Class 2 or Class 4 finish, unless the Contractor sandblasts and thoroughly cleans the surfaces before applying the finish.

If the Department allows the Contractor to choose the curing method, the Contractor shall obtain the approval of the Project Manager before beginning curing operations. During curing operations, keep unsprayed surfaces wet.

511.3.10.1 Method 1, Water Curing

Keep the concrete Structures thoroughly and continuously wet and covered for at least seven (7) Days. Place and anchor covers, mats, and sheeting to ensure continuous contact with the concrete surfaces.

The Contractor may temporarily remove the cover of surfaces that require a rubbed finish for finishing, but shall restore the cover as soon as possible.

Cover concrete slabs as soon as possible with a double layer of clean, wet burlap or cotton mats, or other moisture retaining Material approved by the Project Manager. Next cover the concrete slab with white plastic sheeting. The Project Manager will determine the suitability of burlap or cotton mats for reuse, based on the cleanliness and absorptive ability of the Materials.

Soak burlap in a solution of water and a small amount of detergent. Drain the burlap and cotton mats and lay them flat with no wrinkles on the deck surface. Ensure that adjacent strips of burlap and cotton mats overlap at least 12 inches. Once in place, lightly fog-spray the burlap and cotton mats with water. Regularly re-wet the burlap or cotton mats so that they are not allowed to become dry.

Completely cover the concrete slab with burlap and cotton mats and the plastic sheeting. If the slabs are on grade, extend the mats at least twice the slab's thickness beyond the edges of the slab, and make sure that the entire exposed surface of the concrete is protected. If the slab is a Bridge deck, place the mats and plastic to fully protect exposed edges and unformed surfaces of the concrete.

511.3.10.2 Method 2, Curing Compound

For slabs, Bridge decks and other flatwork, apply the curing compound to the fresh concrete after as soon after finishing as allowed by manufacturer.

Thoroughly mix the membrane forming curing compound within an hour of use and agitate it during spraying operations. Do not apply the curing compound in rainy conditions.

Apply the curing compound under pressure with an atomizing-type spray nozzle. Uniformly cover the entire surface area at a rate of at least one (1) gal per 175 ft². Use spray Equipment with enough pressure to force the curing compound to leave the nozzle as a fine mist. If the nozzle becomes plugged, immediately clear the nozzle before continuing the application. Do not continue to spray curing compound through a nozzle that has become plugged or obstructed.

Apply the curing compound by first spraying back and forth in one (1) direction until a uniform covering has been achieved. Then spray back and forth in a direction perpendicular to the first application until a second, uniform covering has been achieved. Ensure that the entire curing surface has been uniformly covered with two (2) coatings of curing compound. Do not apply the curing compound to exposed reinforcing steel or construction joints.

Protect all surfaces covered with curing compound for seven (7) Days after application. Provide walkways and mats for workmen, Material, and Equipment.

Do not use a curing compound that exhibits separation, segregation, or skimming.

511.3.10.3 Method 3, Form Curing

Leave forms in place for at least seven (7) Days. Keep the forms moist during the curing period and replenish the system with water spray to maintain a continuously moist condition. Cure exposed surfaces with Methods 1 or 2.

511.3.10.4 Method 4, Combination of Curing Compound and Water Curing

Apply Method 2 curing first.

When the concrete is hard enough that burlap or cotton mats can be placed without marring the concrete surface, apply Method 1 curing directly over the emulsion coated surface.

511.3.10.5 Equipment and Personnel Readiness

Show the Project Manager that curing Material and Equipment (including backup sprayers and mixers) are in working order, at least one (1) Day before concrete placement.

511.3.9.6 Temperature Requirements for Storage and Application

Store curing compounds in protected areas away from weather and extreme temperatures. Dispose of compounds that have been frozen in storage. Apply curing compounds when the temperature of the compound is between 50 °F and 95 °F.

511.4 METHOD OF MEASUREMENT

The Department will measure all pay items using the dimensions shown in the Contract or approved modifications.

511.5 BASIS OF PAYMENT

Pay Item	Pay Unit
<i>Structural Concrete Includes Rebar, Class_____</i>	Cubic Yard
<i>Structural Concrete, Class_____, ____inch</i>	Square Yard
<i>Substructure Concrete, Class_____</i>	Cubic Yard
<i>Special Surface Finish</i>	Square Foot
<i>Waterproofing</i>	Square Foot
<i>Wind Break</i>	Lump Sum
<i>Fogging System</i>	Lump Sum

The Department will pay for Class 4, special surface finish only for existing concrete. Payment for the Class 4, special surface finish on new concrete is included in the payment for the new concrete.

511.5.1 Work Included in Payment

The following Work and items will be considered as included in the payment for the main item(s) and will not be measured or paid for separately: waterstops and flashings, waterproofing membranes for new concrete surfaces, premolded and preformed bituminous joint fillers, concrete required to fill overbreakage in excavation when footings or walls are cast against vertical or horizontal faces of excavation, and installation of drains and weep holes.

Wind Break and Fogging System will be paid for only if the Plans list these items in the Estimated Quantities table.

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April 25, 2018 ■ Terracon Project No. 66175192



**SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 513
SOIL CEMENT
APPENDIX D**

SUPPLEMENTAL TECHNICAL SPECIFICATION

SECTION 513

SOIL CEMENT

513.1 DESCRIPTION

The work shall consist of furnishing, transporting, placing and compacting and curing soil-cement for the embankments associated with the main branch, flow diversion structure, south tributary, and emergency spillway where shown on the project plans, and as specified herein.

513.2 MATERIALS

513.2.1 CEMENT FOR SOIL CEMENT

Portland cement shall comply with Section 509 Subsection 509.2.2 of the NMDOT Standard Specifications for Highway and Bridge Construction, 2014 Edition, referred hereafter as the Standard Specifications. The use or substitution of fly ash for any portion of the cementitious materials shall not be allowed. Air Quality Permitting for Soil Cement Batch Plant is not required by the City of Rio Rancho.

513.2.2 WATER

Water shall comply with Section 509 for Portland cement as provided in the Standard Specifications

513.2.3 AGGREGATE

The soil used in the soil-cement mix shall come from the on-site borrow areas (excavated arroyo floor and surrounding areas) identified in the project grading plans. Soils shall meet the following gradation.

<u>Sieve Size</u>	<u>Percent Passing (Dry Weight)</u>
1-1/2"	100%
3/4"	90% - 100%
#4	70% - 100%
#200	3% - 25%

The soil aggregate shall be non-plastic (NP) and exhibit no liquid limit. Clay and silt lumps larger than one-half (1/2) inch shall be unacceptable, and screening will be required whenever this type of material is encountered.

513.3 PROPORTIONING

A preliminary mix design has been developed and is presented in "Geotechnical Engineering Report for the SCAFCA Lomitas Negras Arroyo - Phase 2", prepared by Terracon Consultants, Inc, dated April 25, 2018.

The Contractor shall submit the materials for testing. The design mix shall be based on the compressive strength of specimens molded in accordance with ASTM D1632, cured seven (7) days at 100% relative humidity at 73.4° ±3°, soaked in water for four (4) hours, then tested in compression (ASTM D1633).

A minimum of three (3) different cement contents shall be tested to determine the cement necessary to develop seven (7) day compression strength of 1,000 pounds per square inch (psi). The design cement

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content shall be two (2) percent more than the percentage required to attain 1,000 psi. In no case will a cement content less than 12 percent of the dry weight of the soil-aggregate be approved.

In addition, the following additional tests may be run by the testing laboratory to establish cement amounts:

- a. AASHTO - T-134
- b. ASTM-D1633 - Compressive strength of Molded Soil Cement Cylinders

The Contractor shall use the soil aggregate, cement content, and moisture content determined by the SSCAFCA Field Services Director/Engineer in accordance with laboratory tests. The Contractor shall allow a minimum of ten (10) days for the cement content results. During the course of the work, the SSCAFCA Field Services Director/Engineer may require the Contractor to adjust the soil-cement mix portions whenever necessary in order to achieve the minimum design strength shown in durability and other physical properties test results. The contractor may have to blend the different on-site soils to maintain ideal soil properties as specified below and avoid cement overrun. Blending shall require constructing separate stockpiles for materials to be blended. Blending shall be performed by the methods to achieve a uniform soil-cement mix as approved by the SSCAFCA Field Services Director/Engineer.

Water shall be added to the soil-cement mix to produce a moisture content of the material after processing of not less than minus 1% from optimum moisture content nor more than 2% above optimum moisture content as determined by the testing laboratory. Testing during the project may require frequent adjustment of water added in order to achieve the specified moisture content. In no case will moist soil aggregate be utilized which would cause the maximum moisture content to be exceeded.

513.4 MIX DESIGN

Contractor shall use the mix design provided in the "Geotechnical Engineering Report for the SSCAFCA Lomas Negras Arroyo - Phase 2", prepared by Terracon Consultants, Inc, dated April 25, 2018. The mix shall include using the designated on-site borrow soils for aggregate mixed with Type II Portland Cement. The cement content of the mix shall start at 14% and based on test results may be adjusted, but shall not be less than 12%. Seven (7) day samples will be taken to monitor output. The amount of cement thus determined by laboratory testing shall continue to be monitored throughout the life of the project with modification as required to meet existing field conditions.

513.5 Not Used

513.6 CONSTRUCTION REQUIREMENTS

513.6.1 REQUIRED CONTRACTOR SUBMITTALS

Prior to the start of construction, the Contractor shall submit, in writing for approval, the following items:

1. The type of compaction equipment to be used.
2. The number and type of watering equipment to be used.
3. The method used to keep surfaces continuously moist until subsequent layers of soil cement are placed.
4. The method used to cure permanently exposed surfaces.
5. The method of plant calibration.

Such approval shall not relieve the Contractor of the responsibility of achieving the desired result of constructing sound soil-cement, free from defects, according to the Specifications and project plans.

513.6.1.1 TEST SECTION

Prior to the placement of soil-cement, the Contractor shall construct a test section. The purpose of the test section is to demonstrate the suitability of the Contractor's equipment, methods and personnel. The test section shall be a minimum of two (2) lifts in height and of thickness as specified on plans, fifty (50) feet in length and a minimum of eight (8) feet in width. The site of the test section shall be approved by the SSCAFCA Field Services Director/Engineer. The test section shall also demonstrate the lift edge treatment to be used. The SSCAFCA Field Services Director/Engineer shall approve all equipment, methods and personnel after completion of the test section. The SSCAFCA Field Services Director/Engineer will verify the completed Soil-Cement Test Section. Testing will be done by the approved Testing Laboratory.

513.6.2 PREPARATION

Before soil-cement placement begins, the area to receive soil-cement shall be graded and shaped to lines and grades as shown on the plans or specified by the SSCAFCA Field Services Director/Engineer. The subgrade shall be prepared and compacted to a minimum of ninety-five percent (95%) of the maximum density as determined by ASTM D 1557.

Immediately prior to placement of the soil-cement mixture, the subgrade shall be moistened if necessary. Soft or yielding subgrade shall be corrected and made stable before soil cement placement proceeds. Subgrade preparation for soil cement shall be incidental to soil cement.

513.6.3 (Not Used)**513.6.4 MIXING**

Soil-cement shall be central-plant mixed in an approved twin shaft, continuous-flow or batch-type pug mill or shall be mixed in a traveling pug mill single or multiple transverse shaft plant. The Plant shall be equipped with screening, feeding, and metering devices that will add the soil, cement, and water into the mixer in the specified quantities. The mixing time shall be that time which is required to secure a homogeneous, intimate, uniform mixture of the soil, stabilizer, and water. Soil and cement shall be mixed sufficiently to prevent cementitious balls from forming when water is added. The plant shall be located in the confines of the SSCAFCA's property or an approved alternate site.

Free and safe access to the plant must be provided to the SSCAFCA Field Services Director/Engineer at all times for observation of the plant's operation, and for sampling the soil-cement mixture and its components. If the actual quantities of the mix vary more than two (2) percent by weight of the specified quantities, the SSCAFCA Field Services Director/Engineer may require the Contractor to make changes in the plant operation and equipment as will provide accuracy within two (2) percent by weight. Calibration of the plant equipment will be done daily at the start of operations, or as otherwise directed by the SSCAFCA Field Services Director/Engineer.

The Contractor shall take precaution during filling of cement silo and mixing soil cement to prevent flying cement dust. Conveyors shall be covered.

513.6.5 SCALES

Unless the plant is equipped with suitable scales to measure the cement and aggregate feeds, the Contractor shall furnish and install a set of truck scales at the plant location to monitor plant output. All scales shall be calibrated and certified by the Contractor and approved by the SSCAFCA Field Services Director/Engineer at least forty-eight (48) hours prior to the start of production. Each scale shall be

calibrated to an accuracy of plus/minus two (2) percent. Scales shall be inspected and calibrated as often as the SSCAFCA Field Services Director / Engineer deems necessary to assure their accuracy.

513.6.6 REQUIRED MOISTURE

The moisture content of the mix shall be adjusted as needed to meet the specified moisture content.

513.6.7 HANDLING

The soil-cement mixture, if transported, shall be transported from the batching/mixing site to the project in clean equipment provided with suitable protective devices in unfavorable weather. The total elapsed time between the addition of cement to the mixture and the start of compaction shall be the minimum possible. In no case should the total elapsed time exceed forty-five (45) minutes. (This time may be reduced by the SSCAFCA Field Services Director/Engineer when the air temperature exceeds 90°F, or when there is a breeze or wind which promotes rapid drying of the soil-cement mixture.)

The Contractor shall take all necessary precautions to avoid damage to completed soil-cement by the equipment, and to avoid the deposition of raw earth or foreign materials between layers of soil-cement. Earth ramps crossing completed soil-cement must have at least two (2) foot compacted thickness. Where ramps are constructed over soil-cement that is not to grade, all foreign materials and the uppermost one (1) inch of the previously placed soil-cement mixture must be removed prior to continuation of the soil-cement construction.

513.6.8 PLACING

Soil cement shall not be placed unless the combination of air temperature, temperature of fresh soil cement, relative humidity, and wind velocity at the site are such that the rate of evaporation is less than 0.20 pounds per square foot as determined from the Surface Evaporation Graph in Section 513 of this specification.

The mixture shall be placed on the moistened subgrade or previously completed soil-cement material, with spreading equipment that will produce layers of such widths and thicknesses as are necessary for compaction to the required dimensions of the completed soil-cement layers. If the Contractor can demonstrate the ability to compact thicker layers for their full depth, the SSCAFCA Field Services Director/Engineer may waive this requirement.

Each successive layer shall be placed as soon as practicable after the preceding layer is completed and accepted. Bonding grout is required when placing against cement or on soil cement that has set for over 12 hours or is dried out (see Section 513.11 Bonding Grout). This requirement may be waived if the surface is left sufficiently rough and clean to provide a mechanical bond as determined by the Project Manager. This will require indentations provided with a sheepfoot compactor/roller at least 1" deep in dimension, or equivalent means and method. Prior to placement of soil cement, all loose material shall be mechanically broomed/swept or blown off the surface. Muddy material that adheres to the soil cement may need to be scrubbed and washed off at the direction of the SSCAFCA Field Services Director/Engineer.

All soil-cement surfaces that will be in contact with succeeding layers of soil-cement shall be kept continuously moist by fog spraying, shading or wet covering until placement of the subsequent layer, provided that the Contractor will not be required to keep such surfaces continuously moist for a period longer than seven (7) days.

Mixing shall not proceed when the soil aggregate or the area on which the soil-cement is to be placed is frozen. Soil-cement shall not be mixed or placed when the air temperature is below 45°F (7°C), unless the air temperature is at least 40°F (4°C) and rising. Compacted soil-cement shall be protected from freezing

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by a method approved by the SCAFCA Field Services Director/Engineer for a minimum period of seven (7) days. Areas damaged by freezing shall be removed and replaced at no cost to SCAFCA.

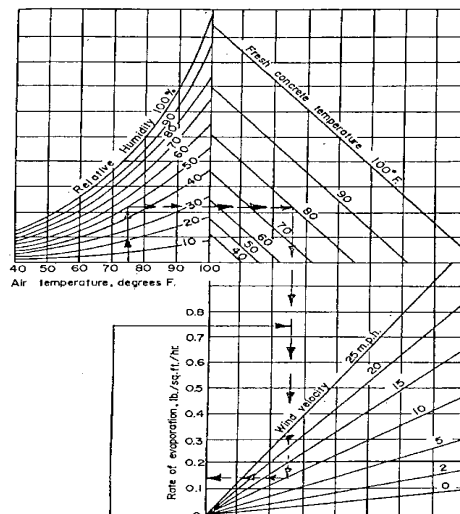
513.6. 9 COMPACTION

Soil-cement shall be uniformly compacted to a minimum of 95 percent of maximum density as determined by ASTM D558. Wheel rolling with only hauling equipment shall not be an acceptable method for the compaction process.

At the start of compaction operations, the mixture shall be in a uniform, loose condition throughout its full depth. Its moisture content shall be as specified in Section 513.3 herein. No section shall be left undisturbed for longer than thirty (30) minutes during compaction operations. Compaction of each layer shall be done in such a manner as to produce a dense surface, free of compaction planes, and no longer than forty-five (45) minutes from the time cement is added to the mixture. Whenever the Contractor's compaction operation utilizes smooth wheel or rubber tired rollers to produce a smooth top surface, the top surface of the completed layer, if smooth, shall be longitudinally scarified to a depth of at least 1/4 inch, at a spacing of not greater than 1 inch on center, with a spike tooth instrument, prior to subsequent placement of additional soil-cement layers. The requirement for scarification may be waived by the SCAFCA Field Services Director/Engineer if the compaction equipment utilized produces a surface of sufficient roughness that adequate bonding between soil-cement layers is achieved.

SUPERSTRUCTURE CONCRETE

FIGURE 513
SURFACE EVAPORATION FROM CONCRETE



Typical Reading Direction for:-

Air Temperature = 75° F.
Relative Humidity = 50%
Concrete Temperature = 80° F.
Wind Velocity = 10 MPH

513.7 FINISHING

After compaction, the soil-cement shall not be trimmed or shaped except as necessary to remove loose soil-cement and where shown on the drawings. The final finish of the exposed soil-cement lining shall be in a "stair-step" configuration where and as shown on the drawings with the provisions that the "stair steps" constructed at the minimum built dimensions and to the "theoretical slope line" indicated on the project plans. See the project plans for locations where vertical faces and/or slope trimming are required. The total elapsed time allowed for finishing after the addition of cement to the soil-cement mixture shall not exceed 2-1/2 hours.

513.7.1 CURING

Temporarily exposed surfaces shall be kept moist as specified in Subsection 513.6.8.

Care must be exercised to ensure that no curing material other than water is applied to the surfaces that will be in contact with succeeding layers.

Permanently exposed surfaces shall be kept in a moist condition for seven (7) days or the exposed surface can be covered with a suitable protective curing material. Any damage to the protective covering within seven (7) days shall be repaired at no cost to SSCAFCA.

Regardless of the curing material used, the permanently exposed surfaces shall be kept moist until the protective cover is applied. Such protective cover is to be applied as soon as practicable, with a maximum time limit of twenty-four (24) hours between the finishing of the surface and the application of the protective cover or membrane.

The soil-cement shall be protected from freezing (if applicable) for seven (7) days after construction by covering the exposed surface with loose earth, concrete blankets, straw, or other suitable material approved by the SSCAFCA Field Services Director/Engineer.

513.7.2 CONSTRUCTION JOINTS

At the end of each day's work, or whenever construction operations are interrupted for more than two (2) hours, a 15 degree minimum skew traverse construction joint shall be formed by cutting back into the completed work to form a full-depth vertical face as directed by the SSCAFCA Field Services Director/Engineer. If construction joints are formed at more than one layer, the construction joint for each layer shall be staggered at 8 feet horizontally from the construction joint of the layer below.

513.7.3 MAINTENANCE

The Contractor shall be required, within the limits of his Contract, to maintain the soil-cement in good condition until all work is completed and accepted. Maintenance shall include immediate repairs of any defects that may occur. This work shall be done by the Contractor at his own expense and repeated as often as necessary. Unsatisfactory work not meeting project specifications shall be replaced for the full depth of a layer.

513.7.4 INSPECTION AND TESTING

The SSCAFCA Field Services Director/Engineer, with the assistance and cooperation of the Contractor, shall make such observations and tests as he deems necessary to verify that the Contractor's work is in conformance with the Contract documents. These observations and tests may include, but shall not be limited to: (1) the taking of test samples of the soil-cement and its individual components at all stages of processing and after completion, and (2) the close observation of the operation of all equipment used on

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the work. Only those materials, machines, and methods meeting these requirements of the Contract documents shall be used by the Contractor.

Testing, by the Project Manager, for proper compaction shall be done on at least every other lift of compacted soil-cement at any location chosen by the testing personnel. If the lift being tested does not meet the minimum 95 percent density/compaction requirements, the area must be reworked until it meets project specifications or be removed and replaced at the Contractor's expense. The Contractor shall not continue soil cement placement on any soil-cement lift which has not met project specifications until such time as that lift has been reworked, retested, and has met project requirements.

513.8 MEASUREMENT AND PAYMENT

513.8.1 MEASUREMENT

This work shall be measured by the following:

- (1) In cubic yards of completed-in-place soil-cement and used for tests by the SSCAFCA Field Services Director/Engineer or Testing Laboratory and:
- (2) In tons of cement incorporated into the soil-cement used in accordance with the computation below and for tests by the SSCAFCA Field Services Director/Engineer.

Any waste of soil cement materials by the Contractor during the handling, mixing, placing, operations, etc. or any use of materials in excess of quantities and percentages specified, or any use by the Contractor's own testing shall not be paid for.

Soil cement will be measured as the number of cubic yards of soil cement mixes satisfactorily placed within the finish lines of the structures and the excavation pay lines, as applicable, as indicated on the project plans and/or specified herein.

513.8.2 PAYMENT

The work shall be paid for at the Contract Unit Price per cubic yard of soil-cement and at the Contract Unit Price per ton of cement furnished, multiplied by the quantities obtained in accordance with Subsection 513.8.1.

Such payment shall constitute full reimbursement for all work necessary to complete the soil-cement structure, dewatering, watering, mixing, placing, compacting, curing, and all other incidental operations. Such payment shall also constitute reimbursement for assistance with inspection and testing that SSCAFCA may require.

Items governed by this section shall include:

<u>ITEM</u>	<u>UNIT</u>
Soil Cement	Cubic Yard
Portland Cement for Soil Cement	Ton

513.9 STOCKPILE OF AGGREGATE

Soil/aggregate stockpile shall be constructed on level, firm ground free of brush, trees, stumps, roots, rubbish, debris, and other objectionable or deleterious materials and shall be located as to provide a distance of not less than twenty (20) feet from the outside bottom edge of the conical stockpile built up

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under the processing plant conveyor or any other existing stockpile. The stockpile shall be constructed in layers; each layer not exceeding three (3) feet in thickness. Ramps formed for stockpile construction shall be of the same material as that being stockpiled, and will be considered a part of the stockpile. Before steepening a ramp, any contaminated surface material shall be removed.

Stockpiled material should be thoroughly mixed throughout its depth, width, and length before utilization. The material should be homogeneous and uniform in color, gradation and moisture throughout.

Stockpiled material shall conform to the requirements of Subsection 513.3 – PROPORTIONING.

Stockpile sampling will be done by the SSSAFCA Field Services Director/Engineer after the required amount of soil aggregate for soil-cement placement, has been excavated and stockpiled. After the stockpile has been sampled and approved, no material will be added to it without concurrence by the SSSAFCA Field Services Director/Engineer.

Stockpile(s) shall be completed at least eight (8) days prior to start of soil-cement production.

513.10 TESTING

513.10.1 SAMPLING

Samples of soil-cement for quality control moisture content and laboratory compaction tests shall be taken directly from the area being constructed as scheduled or periodic intervals during construction. The samples shall be representative of the material being placed and compacted.

513.10.2 LABORATORY COMPACTION TESTS

The optimum moisture content-maximum density relationship shall be determined in accordance with ASTM D558. Gradation tests shall be performed on each laboratory compaction test sample in accordance with ASTM D422.

513.10.3 Not used

513.10.4 COMPRESSIVE STRENGTH TEST

Compressive strength specimens shall be molded from field samples material and tested in a manner described in Section 513.3.

513.10.5 MOISTURE CONTENT

The frequency of moisture contents tests as determined by nuclear methods shall not be less than five (5) tests per 1,000 cubic yards of compacted soil cement.

513.10.6 DENSITY TESTS

513.10.6.1 NUCLEAR METHODS

The frequency of nuclear density tests (ASTM D6938) shall not be less than five (5) tests for each 1,000 cubic yards of compacted soil cement. Tests shall be by the single probe, direct transmission method only. A minimum of two (2) one-point compaction tests shall be run on every 10 nuclear tests to confirm the estimated maximum dry density. The materials for the one-point compaction test shall be obtained from the location of the nuclear gauge test. Frequency of laboratory compaction tests shall not be less than 1 test for each 1,000 cubic yards of compacted soil-cement fill.

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513.10.6.2 TITRATION TESTING – (Deleted)

513.10.6.3 COMPRESSIVE STRENGTH TESTING

Frequency shall be one (1) test for every one-point compaction test, or a minimum of one per day. The sample shall be obtained from the location of the nuclear gauge test.

513.10.6.4 FAILING QUALITY CONTROL TESTS

Failing quality control tests will not be considered in above frequency of quality control sampling and testing.

513.11 BONDING GROUT

Prior to placing soil-cement against concrete or existing soil cement, a bonding grout should be vigorously mechanically broomed into the exposed concrete channel lining to displace all air films and cover all surfaces, including the vertical faces, to a uniform thickness of 1/8 to 1/4 inch.

The grout should consist of one (1) part Portland cement, and about 1/2 part water to give a thick paint-like consistency. In hot, dry weather the surface of the old concrete can be dampened by light fogging but the grout should not be applied to an extremely wet surface or when hollows and rough areas contain free water. Excess water can be removed with compressed air. In no case should the grout be allowed to dry to a whitish appearance before the soil-cement is placed. Bonding grout will be used on any soil cement that has set more than 12 hours or that has dried out on the surface, as determined by the SCAFCA Field Services Director/Engineer.

END OF SECTION

Supplemental Specifications

Storm Drain and Manhole

SUPPLEMENTAL TECHNICAL SPECIFICATION

SECTION 662.1

STRUCTURAL PLASTIC TRASH RACK (STORMRAX)

MATERIAL

The resin used for Structural Plastic Trash is glass reinforced HDPE (High Density Polyethylene). Virgin material must be used to ensure that all of the expected mechanical properties are maintained throughout the life of the Trash Rack. The added rigidity provided by the glass must meet maximum deflection values as shown below. In addition, the glass content must not cause the material to become brittle even in cold temperatures (-0 degrees F). The grid used to manufacture Trash Racks must conform to the following mechanical properties:

Loading Rating:	2030 lbs. /sq. ft.
Ultimate Yield Strength:	1855 lbs. /sq. ft.
Maximum Deflection (@90 degrees F):	<2.00 inches (over a 22" x 22" area)

UV CONSIDERATIONS

Due to the fact that Trash Tacks are continually exposed to radiation, UV protection must be incorporated into the resin to prevent premature degradation of the plastic material. Therefore, the UV protection must meet or exceed ASTM D2565-99

COLORANT CONSIDERATIONS

The colorant must be homogeneous and must not fade, run, discolor or deteriorate when exposed to sunlight and/or the elements for the life of the Trash Rack.

MOUNTING CONSIDERATIONS

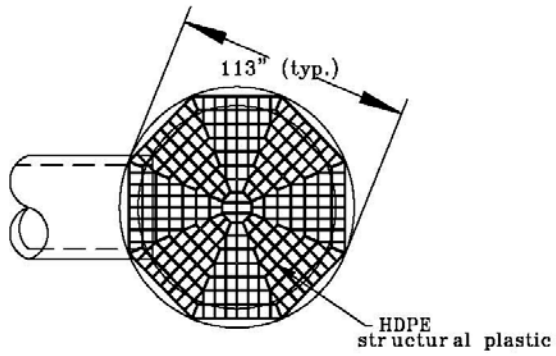
Each Trash Rack design must account for both the physical and hydraulic factors that the Trash Rack is expected to see during its intended product life. Mounting locations must be determined by taking into account the hydraulic dynamic force factors for each individual application. Failure to use the pre-drilled holes (as supplied by the manufacturer) could result in product breakdown, malfunction and/or collapse. All mounting hardware (3/8" x 3" steel anchor bolt) is included with each rack.

PHYSICAL PROPERTIES

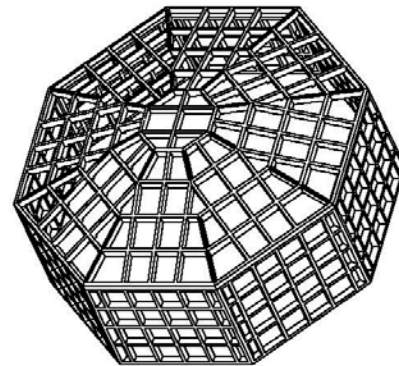
Grid material is 1 1/2" thick with 5/8" webbing 6" on center, producing a 4 3/4" square opening. Anti-vortex plates must be available for whenever hydraulic calculations dictate their use. Access door(s) must be available for easier access to larger structure/stairs. All metal stiffeners must be made from steel and powder-coated to prevent corrosion.

SUPPLIER

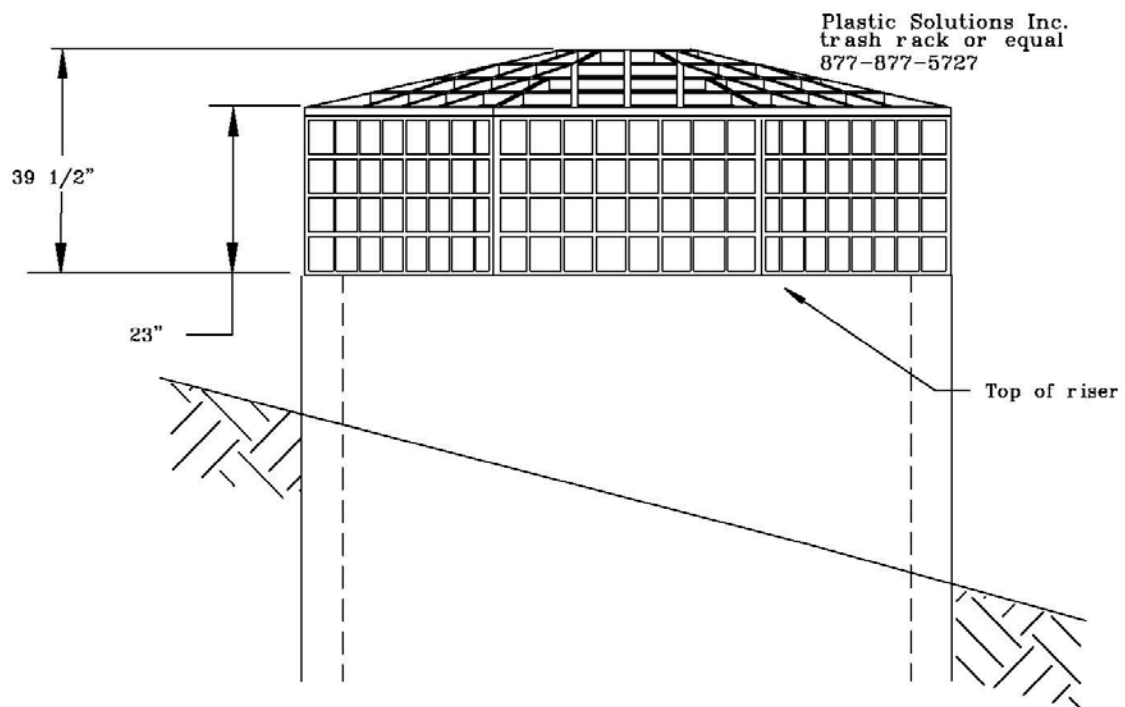
This StormRax Pyramid Series Trash Rack is supplied by Plastic Solutions Inc.



Top View



Trash Rack Assembly



Elev. A

NOTE: CUSTOM SIZES AVAILABLE UPON REQUEST

PART NO	96" PYRAMID TRASH RACK WITH CONCRETE RISER	 PLASTIC SOLUTIONS INC.	P.O. Box 4386 Winchester VA 22604 877-877-5727 www.plastic-solution.com
PYD 96			

Supplemental Specifications

Other Items

SUPPLEMENTAL TECHNICAL SPECIFICATION

SECTION 1012

NATIVE GRASS SEEDING

1. In the NM Standard Specifications **Section 1012**, subsection **1012.4 MATERIALS** delete paragraphs **1012.4.1.1** and **1012.4.1.2** in their entirety and replace with the following:

Grass Seed Mix shall include the following species and rates:

Indian Rice Grass:	5 lbs / acre
Galleta:	5 lbs / acre
Sideoats Gramma:	5 lbs / acre
Blue Gramma	5 lbs / acre
Sand Dropseed:	5 lbs / acre

Total grass seed mix application rate at 25.0 lbs / acre

Wildflower Seed Mix shall include the following species and rates:

Globemallow	1 lb / acre
Purple Aster	1 lb / acre
Blue Flax	1 lb / acre
Mexican Hat	1 lb / acre
Blanket Flower	1 lb / acre

Total wildflower seed mix application rate at 5.0 lbs / acre

Seed rate is given in pounds of pure live seed (P.L.S.) per acre.

2. In subsection **1012.6 SEEDING** delete paragraph **1012.6.2 Seed Application** in its entirety and replace with the following:

“Seed application shall be Hydro Seeding.”

END OF SECTION

Supplemental Specifications

Geotechnical Report

Geotechnical Engineering Report

**SSCAFCA Lomas Negras Arroyo – Phase 2
Stormwater Detention Facility
Saratoga Drive NE Road and Lomas Negras Arroyo
Sandoval County, New Mexico**

April 25, 2018

Terracon Project No. 66175192

Prepared for:

Smith Engineering Company
Albuquerque, New Mexico

Prepared by:

Terracon Consultants, Inc.
Albuquerque, New Mexico

Offices Nationwide
Employee-Owned

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Geotechnical ■ Environmental ■ Construction Materials ■ Facilities

April 25, 2018



Smith Engineering Company
2201 San Pedro Drive NE
Building 4, Suite 200
Albuquerque, Mexico 87110

Attn: Mr. Pat L. Stovall, P.E., CFM
Team Leader/Vice President
P: (505) 884-0700
E: pats@smithengineering.pro

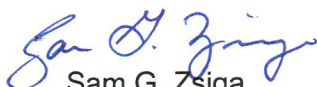
Re: Geotechnical Engineering Report
SSCAFCA Lomas Negras Arroyo - Phase 2
Storm Water Detention Facility
Saratoga Drive NE and Lomas Negras Arroyo
Sandoval County, New Mexico
Terracon Project No. 66175192

Dear Mr. Stovall:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering services for the above referenced project. These services were performed in general accordance with our Proposal Number P66175192 dated August 30, 2017 and the Smith Engineering Company Professional Subconsultant Agreement dated December 14, 2017. This geotechnical engineering report presents the results of the subsurface exploration and provides geotechnical recommendations concerning improvements and earthwork for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.


Sam G. Zsiga
Staff Engineer


Michael E. Anderson, P.E.
Principal

Copies to: Addressee (1 via email, 3 via mail)



Terracon Consultants, Inc. 4905 Hawkins NE Albuquerque, New Mexico 87109
P [505] 797 4287 F [505] 797 4288 terracon.com

Geotechnical

Environmental

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EXECUTIVE SUMMARY

This geotechnical executive summary should be used in conjunction with the entire report for design and/or construction purposes. It should be recognized that specific details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled General Comments should be read for an understanding of the report limitations.

A geotechnical exploration has been performed for the proposed SSCAFCA Lomitas Negras Arroyo – Phase 2 Storm Water Detention Facility located at Saratoga Drive NE and the Lomitas Negras Arroyo in Sandoval County, New Mexico. Terracon's geotechnical scope of work included the advancement of four (4) test borings to approximate depths of 31-½ to 51-½ feet below existing site grades. In addition, six (6) surface soil samples were obtained within and along the proposed detention pond.

Based on the information obtained from our subsurface exploration, the sites are suitable for the proposed improvements. The following geotechnical considerations were identified:

Site Soils: The site soils generally consisted of sand with varying amounts of silt and gravel and silt with varying amounts of sand and gravel. Groundwater was not encountered in any the borings at the time of drilling. The on-site soils are suitable for use as foundation soil and backfill for the proposed reinforced concrete pipe (RCP) outlet.

Soil Liquefaction: The existing soils located at or near existing ground surface elevation below the proposed embankment have a non- to low liquefaction potential. Based upon the planned depth of excavation and the proposed construction, the majority of the existing loose surficial and subsurface soils will be removed during construction. Therefore, it is our opinion that the embankment (berm) will not be susceptible to liquefaction.

Embankment Stability: Based upon constructing the berm as engineered fill meeting the material properties outlined in this report and the existing subsurface soil conditions, the factors of safety (FOS) for end of construction, rapid drawdown, seismic and full steady state conditions are summarized below:

Design Section		FACTOR OF SAFETY (FOS)					
		End of Construct Dry	Steady State	Rapid Drawdown	Seismic	Seismic Steady State	Seismic Rapid Drawdown
Upstream Slope	Max 10 Feet High	2.8	2.3	1.4	1.7	1.3	1.1
Downstream Slope	Max 6 Feet High	3.1	2.3	2.3	2.1	1.5	1.5
Backslope	Max 44 feet High	2.0	2.0	1.9	1.4	1.3	1.3

The stability analysis indicates that the proposed embankment slopes meet the minimum factor of safety.

Soil Cement: Soil cement can be used to mitigate erosion and/or scour associated with the detention pond. Based upon the subsurface soils and the laboratory compressive strength test results, we recommend that a minimum of 12 percent cement by dry weight be used in the design. In addition, a minimum 7-day compressive strength of 1,000 psi should be achieved for the soil cement mixture.

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Erosion: To reduce erosion potential, we recommend that rip-rap, shotcrete and/or soil cement be incorporated into the design in areas of flowing water including the rundown along the back slope of the drainage facility.

Foundations: The proposed reinforced concrete pipe (RCP) outlet structure at the site may be supported by a mat foundation bearing on engineered embankment fill or prepared subgrade. The on-site soils are suitable for use as foundation soil for the proposed RCP outlet.

Backfill and Pipe Support: On-site sand soils are suitable for use as backfill, embedment and pipe foundation support.

Earthwork on the project should be observed and evaluated by Terracon or a qualified geotechnical engineer. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, and other geotechnical conditions exposed during construction.

**GEOTECHNICAL ENGINEERING REPORT
SSCAFCA LOMITAS NEGRAS ARROYO – PHASE 2
STORM WATER DETENTION FACILITY
SARATOGA DRIVE NE AND LOMITAS NEGRAS ARROYO
SANDOVAL COUNTY, NEW MEXICO**

**Terracon Project No. 66175192
April 25, 2018**

1.0 INTRODUCTION

This report presents the results of our geotechnical engineering services performed for the SSCAFCA Lomitas Negras Arroyo – Phase 2 Storm Water Detention Facility located at Saratoga Drive NE and the Lomitas Negras Arroyo in Sandoval County, New Mexico. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- | | |
|--|--------------------------------------|
| ■ subsurface soil conditions | ■ groundwater conditions |
| ■ earthwork | ■ liquefaction |
| ■ embankment slope stability | ■ corrosion potential |
| ■ seismic considerations | ■ embankment material specifications |
| ■ suitability of borrow source materials | ■ embankment construction |
| ■ soil cement specifications | ■ erosion considerations |

Our geotechnical engineering scope of work for this project included the advancement of four (4) test borings to approximate depths of 31-½ to 51-½ feet below existing site grades. In addition, six (6) surface soil samples were obtained within and along the proposed detention pond.

Logs of the borings along with a Site Location Map and Boring Location Plan (Exhibit A1 and A2) are included in Appendix A of this report. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included in Appendix B of this report. Descriptions of the field exploration and laboratory testing are included in their respective appendices.

2.0 PROJECT INFORMATION

2.1 Project Description

ITEM	DESCRIPTION
Site layout	Refer to the Site Location Map and Boring Location Plan (Exhibit A1 and A2 in Appendix A)
Proposed construction	Storm water detention facility with principal and emergency spillways, flow diversion structure (wall) and hard lining (soil cement) at selected locations along the facility. The principal spillway will consist of a vertical walled reinforced concrete box structure connected to a 36-inch diameter corrugated metal pipe (CMP) or reinforced concrete pipe (RCP) as the outlet.
Office of State Engineer (OSE) dam size classification	Small
OSE dam classification	Non-Jurisdictional
OSE hazard potential classification	Low
Embankment height	Maximum of 6 feet tall at the lowest downstream toe of slope Maximum of 10 feet tall at the lowest upstream toe of slope
Maintenance road width across downstream embankment	Minimum – 12 feet
Storage capacity	Approximately 100 acre-feet
Finished floor elevation (Upstream side of berm)	5,188 feet 5,186.5 feet at base of principal spillway
Finished top of embankment/emergency spillway elevation	5,198 feet
Grading	Maximum cut depths – approximately 35 to 40 feet Maximum fill depths for embankment – approximately 6 feet
Maximum slope configurations	<u>Detention Pond Berm & Sideslopes:</u> Approximately 3:1 (Horizontal:Vertical) <u>Flow Diversion Structure:</u> Approximately 2:1 (Horizontal:Vertical)

ITEM	DESCRIPTION
OSE Slope stability factors of safety (FOS)	Steady-state long-term stability – 1.5 Operation drawdown conditions – 1.5 Rapid drawdown conditions – 1.2 End of construction – 1.2 Seismic – 1.1
Drained conditions	48 to 72 hours after storm event
Proposed berm (upstream and downstream embankment soil)	Pond bottom/floor excavation
Soil cement	Minimum 7-day compressive strength of 1,000 psi
Materials Specifications	New Mexico Standard Specifications for Public Works Construction (NMSSPWC) (2006 Edition)

2.2 Site Location and Description

ITEM	DESCRIPTION
Location	At the intersection of Saratoga Drive NE and the Lomitas Negras Arroyo in Sandoval County, New Mexico Latitude: 35.278907; Longitude: -106.628970
Existing improvements	Natural arroyos/drainages
Surrounding developments	North: Vacant undeveloped parcels and low density residential East: Saratoga Road South: Vacant undeveloped parcels and low density residential West: Vacant undeveloped parcels
Current ground cover	Soil and vegetation
Existing topography	Gently to moderately sloping down to the east and southeast
Elevation difference	Approximately 40 to 45 feet from the east to west end of the detention pond facility

3.0 SUBSURFACE CONDITIONS

3.1 Regional Geology

The project area is located in an area known locally as the "west mesa". This area constitutes a series of cut terraces which parallel the Rio Grande River on its west side, and a broad upland surface about 600 feet above the river which borders the terraces on the west. The "west mesa" was formed by upfaulted blocks which constitute the highlands of the Rio Puerco and much of the Rio Puerco Valley. The Rio Grande Valley is a small part of an interconnected series of north-

south aligned grabens and structural basins which have subsided between mountain and highland uplifts comprising the Rio Grande rift.

3.2 Site Geology

The soils on the "west mesa" were deposited as eolian dune sand, alluvial fan material and recent arroyo deposits. Basalt flows are also present. Older sediments of the Santa Fe Group can be found beneath the more recent materials. Santa Fe Group materials consist of beds of consolidated to loosely consolidated sediments locally interbedded with volcanic rocks. The soils typically consist of clean to silty sands with gravel and cobble lenses. Erratic clay layers are also present. Calcareous cemented deposits of sand, gravel and clay are present in outcrop and in the subsurface in various areas. The combined thickness of the Santa Fe Group and recent alluvium increases towards the Rio Grande River. Recent alluvium ranges in thickness from approximately zero to 200 feet.

3.3 Geologic Hazards

Based upon review of geologic maps, our site reconnaissance, our experience in the general area, and the current and previous site uses, landslides, colluvial soils, fault zones, slicken-slides, have not been mapped at the project site.

3.4 Seismic and Liquefaction Hazards

Four (4) were identified within a six (6) kilometer radius of the site. The faults are younger than 750,000 years old.

The typical subsurface conditions that are susceptible to liquefaction are very loose to loose non-plastic sand soils that have been recently deposited or placed, along with a groundwater condition near the surface and considerable earth shaking. Based upon the relative density (N blow counts) and the low amount of fines (less than about 20 to 25%), the existing surface and soils located at the base of the proposed embankment (berm) will have a non- to low liquefaction potential. Due to the subsurface soils, planned depth of excavation, placement of engineered fill for construction of the embankment (berm) and the embankment material consisting of non-plastic sand, it is our opinion that the embankment (berm) will not be susceptible to liquefaction. (Kishida, 1969, and Youd and Idriss, 1998).

3.5 Typical Subsurface Profile

Specific conditions encountered at the boring locations are indicated on the individual boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual. Details for each of the borings can

be found on the boring logs included in Appendix A of this report. Based on the results of the borings, subsurface soil conditions on the project site can be generalized as follows:

Description	Approximate Depth to Bottom of Stratum (feet)	Material Encountered	Consistency/Density
Stratum 1	13 to 51-½	Sand. The silt and gravel content varies. None to strong cementation	Very Loose to Very Dense
Stratum 2	23 and 46-½	Silt* The sand and gravel content varies. None to strong cementation	Hard

*Encountered in Boring No. B-01

Laboratory tests were conducted on selected soil samples and the test results are presented in Appendix B.

The subsurface soils encountered within the borings were non-plastic in plasticity. These soils classify as SP-SM, SM, and ML in accordance with the Unified Soil Classification System (USCS).

The surface soils encountered within the hand auger borings were non-plastic in plasticity. These soils classify as SP, SP-SM, and SM in accordance with the Unified Soil Classification System (USCS).

Direct shear tests were performed on undisturbed subsurface soil samples. The results of the direct shear testing performed on the undisturbed samples under saturated conditions indicated residual friction angles ranging from about 31 to 45 degrees and apparent cohesion values ranging from 0 to 219 pounds per square foot (psf).

Laboratory test results indicate that the subsurface soil samples exhibit soluble sulfate concentrations of 2 to 20 mg/kg, soluble chloride values of non-detect to 22 mg/kg, resistivity values ranging from 1,990 to 6,130 ohm-cms and pH values of 8.5 to 8.7.

The moisture-density relationship testing performed on a composite sample of the native soils and for varying soil cement mixes from the proposed on-site borrow areas are summarized below:

Soil Type (USCS)	Percent Cement (dry weight)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
Silty Sand (SM)	None	116.2	10.9
	8	124.7	7.9
	11	126.8	7.4
	14	129.3	7.6

Laboratory compressive strength test results for the soil-cement mixtures from a composite sample from the proposed pond floor (cut area) compacted to approximately 95% maximum dry density in accordance with ASTM D558 indicated the following:

Soil Type (USCS)	Percent Cement (dry weight)	7-Day Compressive Strength (psi) ASTM D1633
Silty Sand (SM)	8	320
	11	590
	14	1,020

3.6 Groundwater

Groundwater was not observed in the test borings at the time of field exploration, nor when checked upon completion of drilling. These observations represent groundwater conditions at the time of the field exploration and may not be indicative of other times, or at other locations. Groundwater conditions can change with varying seasonal and weather conditions, and other factors.

Fluctuations in groundwater levels can best be determined by implementation of a groundwater monitoring plan. Such a plan would include installation of groundwater monitoring wells, and periodic measurement of groundwater levels over a sufficient period of time.

4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

4.1 Geotechnical Considerations

The site appears suitable for the proposed construction based upon geotechnical conditions encountered in the test borings.

Based upon constructing the berm as engineered fill meeting the material properties outlined in this report and the existing subsurface soil conditions, the stability analysis indicates that the

proposed embankment slopes meet the minimum factor of safety for end of construction, rapid drawdown, seismic and full steady state conditions.

The native site soils consisted predominantly of sand with varying amounts of silt and gravel. If seepage losses need to be minimized, we recommend that the on-site silty sands used as fill material for embankment (berm) construction.

Based upon the relative density (N blow counts) and the relatively low amount of fines, the existing surface and soils located at the base of the proposed embankment (berm) will have a non- to low liquefaction potential. Due to the subsurface soils, planned depth of excavation, placement of engineered fill for construction of the embankment (berm) and the embankment material consisting of non-plastic sand, it is our opinion that the embankment (berm) will not be susceptible to liquefaction.

The proposed principal and emergency spillway structures and flow diversion structure can be supported on a mat or spread/continuous footing foundation system bearing on engineered embankment fill material or a zone of recompacted soils.

Soil cement can be used to mitigate erosion and/or scour associated with the detention pond. We recommend that a minimum of 12 percent cement by dry weight be used in the design. In addition, a minimum 7-day compressive strength of 1,000 psi should be achieved for the soil cement mixture.

To reduce erosion potential, we recommend that rip-rap, shotcrete and/or soil cement be incorporated into the design in areas of flowing water including the rundown along the back slope of the drainage facility.

The on-site soils are suitable for use as embedment, foundation soil and backfill for the proposed flow diversion structure, principal spillway structure, emergency spillway, corrugated metal pipe (CMP) or reinforced concrete pipe (RCP) outlet structure.

Geotechnical engineering recommendations for foundation support and other earth connected phases of the project are outlined below. The recommendations contained in this report are based upon the results of field and laboratory testing (which are presented in Appendices A and B), engineering analyses, and our current understanding of the proposed project.

4.2 Earthwork

The following presents recommendations for site preparation, excavation, subgrade preparation and placement of engineered fills on the project. The recommendations presented for design and construction of earth supported elements are contingent upon following the recommendations

outlined in this section. The New Mexico Standard Specifications for Public Works Construction (2006 Edition), referred hereafter as the Specifications, should be used for the project.

Earthwork, site preparation, and excavations should be performed in accordance with Section 200, *Earthwork* of the Specifications.

Earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project.

4.2.1 Site Preparation

Site preparation should be performed in accordance with Section 201, *Clearing and Grubbing*, of the Specifications.

Strip and remove existing vegetation, debris, and other deleterious materials from proposed embankment and shotcrete slope paving areas. Exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

Stripped materials consisting of vegetation and organic materials should be wasted from the site, or used to revegetate landscaped areas or exposed slopes after completion of grading operations. If it is necessary to dispose of organic materials on-site, they should be placed in non-structural areas, and in fill sections not exceeding 5 feet in height.

The site should be initially graded to create a relatively level surface to receive fill (where applicable), and to provide for a relatively uniform thickness of fill beneath proposed foundations.

Evidence indicating the potential presence of other underground utilities adjacent to the project sites was observed during the field operations. If utilities or fills or other underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

4.2.2 Excavation

Excavation should be performed in accordance with Section 202, *Roadway Excavation*, Section 204, *Fill Construction*, Section 205, *Borrow Material*, and Section 701, *Trenching, Excavation and Backfill*, of the Specifications.

It is anticipated that excavations for the proposed construction can be accomplished with conventional earthmoving equipment.

Based on the results from the soil borings, we do not anticipate groundwater control measures will be necessary in excavations up to about 51-½ feet below the arroyo.

4.2.3 Subgrade Preparation

Subgrade preparation should be conducted in accordance with Section 301, *Subgrade Preparation*, of the Specifications.

4.2.4 Fill Materials and Placement

Embankment construction should be performed in accordance with Section 204, *Fill Construction*, and Section 205, *Borrow Material*, of the Specifications.

All fill materials should be inorganic soils free of vegetation, debris, and fragments larger than six inches in size. Pea gravel or other similar non-cementitious, poorly-graded materials should not be used as fill or backfill without the prior approval of the geotechnical engineer.

Clean on-site soils or approved imported materials may be used as fill material for the following:

- general site grading
- backfill
- soil cement
- foundations
- embankment

Imported soils (if required) for use as embankment fill material should conform to low volume change materials as indicated in the following specifications:

<u>Gradation</u>	<u>Percent Finer by Weight (ASTM C 136)</u>
3"	100
No. 4 Sieve	50-100
No. 200 Sieve	25 (min) and 55 (max)
■ Liquid Limit	35 (max)
■ Plasticity Index	20 (max)
Friction Angle	34 (min)

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Fill lifts should not exceed eight (8) inches loose thickness.

4.2.5 Pipe Embedment and Foundation Support Soils

Pipe embedment and support, soils should follow Section 701 of the Specifications.

Based on the most recent Specifications, Section 700, Table 701.3A, the soil materials encountered in the soil borings are generally classified as the following:

USCS Soil Classification	Embedment Soils Classifications, Table 701.3A
SP, SP-SM	Class II
SM	Class III
CL, ML	Class IV

Class II, III, and IV soils are generally satisfactory for pipe embedment and foundation support.

4.2.6 Soil Cement

Soil cement can be used to mitigate erosion and/or scour associated with the detention pond. The soil cement should be considered in areas subjected to flows associated with the North Tributary, Main Arroyo, areas along the west side of the new detention pond and at the principal and emergency spillway outfall areas.

Based upon the subsurface soils conditions and the laboratory compressive strength test results, we recommend that a minimum of 12 percent cement by dry soil weight be used. In addition, we recommend that a minimum 7-day compressive strength of 1,000 psi be achieved for the soil cement mixture. Formal mix designs should be performed to confirm the minimum cement percentage to achieve the minimum compressive strength requirement.

The soil cement should be constructed in horizontal layers not exceeding 6 to 12 inch thick lifts and wide enough to allow for construction compaction equipment (minimum of 5 feet wide) to allow for uniform compaction. Slopes should be constructed no steeper than 3:1 (horizontal:vertical), excluding the flow diversion structure that can be constructed at 2:1. The soil cement should extend below estimated design scour depth. The contractor will be responsible for the means and methods to attain uniform compaction and placement requirements.

The materials, mix design, placement, construction and quality control/assurance should be in accordance with the Supplemental Technical Specifications – Section 513 Soil cement in Appendix D.

4.2.7 Compaction Requirements

Recommended compaction and moisture content criteria for engineered fill or pipe backfill materials per Section 202, *Roadway Excavation*, Section 204, *Fill Construction*, Section 205, *Borrow Material*, and Section 701, *Trenching, Excavation and Backfill*, of the Specifications are as follows:

Material Type and Location	Per the Modified Proctor Test (AASHTO T180/ASTM D 1557)		
	Minimum Compaction Requirement (%)	Range of Moisture Contents for Compaction	
		Minimum	Maximum
On-site or approved imported fill soils:			
Embankment	95	-3%	+3%
Foundation support	95	-3%	+3%
Structure backfill	95	-3%	+3%
Utility trench backfill	90*	-3%	+3%
Utility pipe embedment	90	-3%	+3%

*Should be increased to 95% in structural or pavement areas

4.2.8 Grading and Drainage

Positive drainage and erosion protection should be provided during construction and maintained throughout the life of the project.

4.2.9 Corrosion Potential

Results of soluble sulfate testing indicate 2 to 20 mg/kg soluble sulfate concentrations. Based upon the test results, ASTM Type I or I/II Portland cement is suitable for all concrete on and below grade. Concrete should be designed in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

Laboratory test results indicate that the subsurface soil samples exhibit soluble chloride values of non-detect to 22 mg/kg, resistivity values ranging from 1,990 to 6,130 ohm-cms and pH values of 8.5 to 8.7. Criteria published by the Cast Iron Pipe Research Institute indicates that the near surface subgrade soils generally have a moderate corrosive potential to cause corrosion to buried ferrous materials. Review of data published by the National Association of Corrosion Engineers indicates that the resistivity places the soils in the mildly to moderately corrosive category. If there is concern regarding pipe corrosion, the use of PVC or poly-wrap should be considered. These test results should be used to determine the corrosion potential of metal pipes and/or conduits.

4.2.10 Construction Considerations

Construction of the reinforced concrete pipe (RCP) or corrugated metal pipe (CMP) outlet should be performed in accordance with Section 910, *Storm Sewer Pipe Installations* and Section 915, *Storm Sewer Drainage Appurtenances*, of the Specifications.

Based upon the subsurface conditions determined from the geotechnical exploration, excavations into the on-site soils will likely encounter caving soils. However, the stability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. If unstable conditions

develop, workability may be improved by scarifying and drying. Overexcavation of wet zones and replacement with granular materials may be necessary. Lightweight excavation equipment may be required to reduce subgrade pumping.

Use of lime, fly ash, kiln dust or cement could also be considered as a stabilization technique. Laboratory evaluation is recommended to determine the effect of chemical stabilization on subgrade soils prior to construction.

The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. Excavations should be sloped or shored in the interest of safety following local and federal regulations, including current OSHA excavation and trench safety standards.

4.3 Embankment Stability Analysis

4.3.1 Global Stability

Global stability of the embankment and slopes was performed as part of this analysis. The computer program SLIDE by RocScience was used to model the critical failure surfaces using Modified Bishop's approach for circular failure geometry. Cross sections were developed from project grading plans.

Soil strength data used in our analysis was based upon the results of the field and laboratory testing programs and is presented on the individual slope stability profile. The soil information, slope stability profiles, and cross sections are included in Appendix C. The following soil properties were used in the analysis:

Material Name	Estimated Unit Weight (pcf)	Cohesion (psf)	Friction Angle (degrees)
Sand 1	120	0.02	30/34*
Sand 2	120	0.02	34
Berm Fill	120	50	34

*Higher value associated with backslope area

Based on the cross sections provided and soil parameters developed, results of the End-Of-Construction global slope stability analysis are as follows:

Design Section		FACTOR OF SAFETY (FOS)					
		End of Construct Dry	Steady State	Rapid Drawdown	Seismic	Seismic Steady State	Seismic Rapid Drawdown
Upstream Slope	Max 10 Feet High	2.8	2.3	1.4	1.7	1.3	1.1

Design Section		FACTOR OF SAFETY (FOS)					
		End of Construct Dry	Steady State	Rapid Drawdown	Seismic	Seismic Steady State	Seismic Rapid Drawdown
Downstream Slope	Max 6 Feet High	3.1	2.3	2.3	2.1	1.5	1.5
Backslope	Max 44 feet High	2.0	2.0	1.9	1.4	1.3	1.3

The stability analysis indicates that the soil profiles meet the minimum factors of safety.

4.3.2 Liquefaction Analysis

Based upon our analysis, the existing shallow surface and subsurface soils located at and below the base of the proposed embankment (berm) have a low to moderate liquefaction potential. Due to the subsurface soil conditions, planned depth of excavation, placement of engineered fill for construction of the embankment (berm) and the embankment material consisting of non-plastic sand material, it is our opinion that the embankment (berm) will not be susceptible to liquefaction.

4.4 Foundation Recommendations

The proposed principal spillway, emergency spillway, and flow diversion structure can be supported by a mat or continuous footing foundation system bearing on engineered embankment fill or native soils. Design recommendations for foundations for the proposed structures and related structural elements are presented in the following paragraphs.

4.4.1 Design Recommendations

DESCRIPTION	VALUE
Foundation Type	Mat Foundation Continuous Footings
Bearing Material	<u>Principal/Emergency Spillways</u> – Two (2) feet of recompact soils <u>Flow Diversion Structure</u> – Three (3) feet of recompact soils
Allowable Bearing Pressure	<u>Principal/Emergency Spillways</u> - 2,000 psf <u>Flow Diversion Structure</u> – 2,000 psf
Modulus of Subgrade Reaction	200 pci
Minimum Embedment Depth Below Finished Grade	Exterior: 18 inches*
Total Estimated Settlement	1 inch

*Along with adequate scour protection where needed

Finished grade is defined as the lowest adjacent grade within five (5) feet of the foundation. The allowable foundation bearing pressures apply to dead loads plus design live load conditions. The design bearing pressure may be increased by one-third when considering total loads that include wind or seismic conditions. The weight of the foundation concrete below grade may be neglected in dead load computations.

Footings should be proportioned to reduce differential foundation movement. Proportioning on the basis of equal total settlement is recommended; however, proportioning to relative constant dead-load pressure will also reduce differential settlement between adjacent footings. Additional foundation movements could occur if water from any source infiltrates the foundation soils; therefore, proper drainage should be provided in the final design and during construction.

Footings and foundations should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. The use of joints at openings or other discontinuities in masonry walls is recommended.

Foundation excavations, subgrade preparation, and engineered fill placement operations (if applicable) should be observed by the geotechnical engineer. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

4.4.2 Construction Considerations

The foundations should bear on engineered embankment fill or a zone of recompacted soils as outlined above. Areas of loose soils may be encountered at foundation bearing depth after excavation is completed for footings. When such conditions exist beneath planned foundation areas, the subgrade soils should be surficially compacted prior to placement of the foundation system. If sufficient compaction cannot be achieved in-place, the loose/soft soils should be removed and replaced as backfill. For placement of backfill below foundations, the excavation should be widened laterally, at least eight inches for each foot of fill placed below foundation bearing elevations.

4.5 Lateral Earth Pressures

4.5.1 Design Recommendations

For soils above any free water surface, recommended equivalent fluid pressures for unrestrained foundation elements when using on-site soils as backfill are:

ITEM	SOIL TYPE	VALUE
Active Case	On-site or imported sand and silt	35 psf/ft

ITEM	SOIL TYPE	VALUE
Passive Case	On-site or imported sand and silt	410 psf/ft
At-Rest Case	On-site or imported sand and silt	55 psf/ft
Coefficient of Base Friction	All soils	0.35 ¹
Soil Friction Resistance	All soils	0.80

¹Note: The coefficient of base friction should be reduced to 0.30 when used in conjunction with passive pressure.

Backfill over the principal spillway, CMP and RCP structures should be compacted to densities specified in the Earthwork section of this report. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers or other lightweight compactors.

4.6 Seismic Considerations

4.6.1 Seismic Site Classification

DESCRIPTION	VALUE
2009 NEHRP Recommended Seismic Provisions ¹	C ²
Site Latitude	N 35.27969°
Site Longitude	W 106.63015°
S _{Ms} Spectral Acceleration for a Short Period	0.581g
S _{M1} Spectral Acceleration for a 1-Second Period	0.241g
S _{Ds} Spectral Acceleration for a Short Period	0.387g
S _{D1} Spectral Acceleration for a 1-Second Period	0.161g
F _a Site Coefficient for a Short Period	1.200
F _v Site Coefficient for a 1-Second Period	1.654

¹ Note: In general accordance with the 2009 NEHRP, Chapter 20. NEHRP Site Class is based on the average characteristics of the upper 100 feet of the subsurface profile.

² Note: The 2009 NEHRP requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope does not include the required 100 foot soil profile determination. Borings extended to a maximum depth of 51-½ feet, and this seismic site class definition considers that medium dense or denser soil continues below the maximum depth of the subsurface exploration. Additional exploration to deeper depths would be required to confirm the conditions below the current depth of exploration.

5.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

APPENDIX A
FIELD EXPLORATION

SITE LOCATION

Lomitas Negras Arroyo ■ Sandoval County, NM
April 25, 2018 ■ Terracon Project No. 66175192

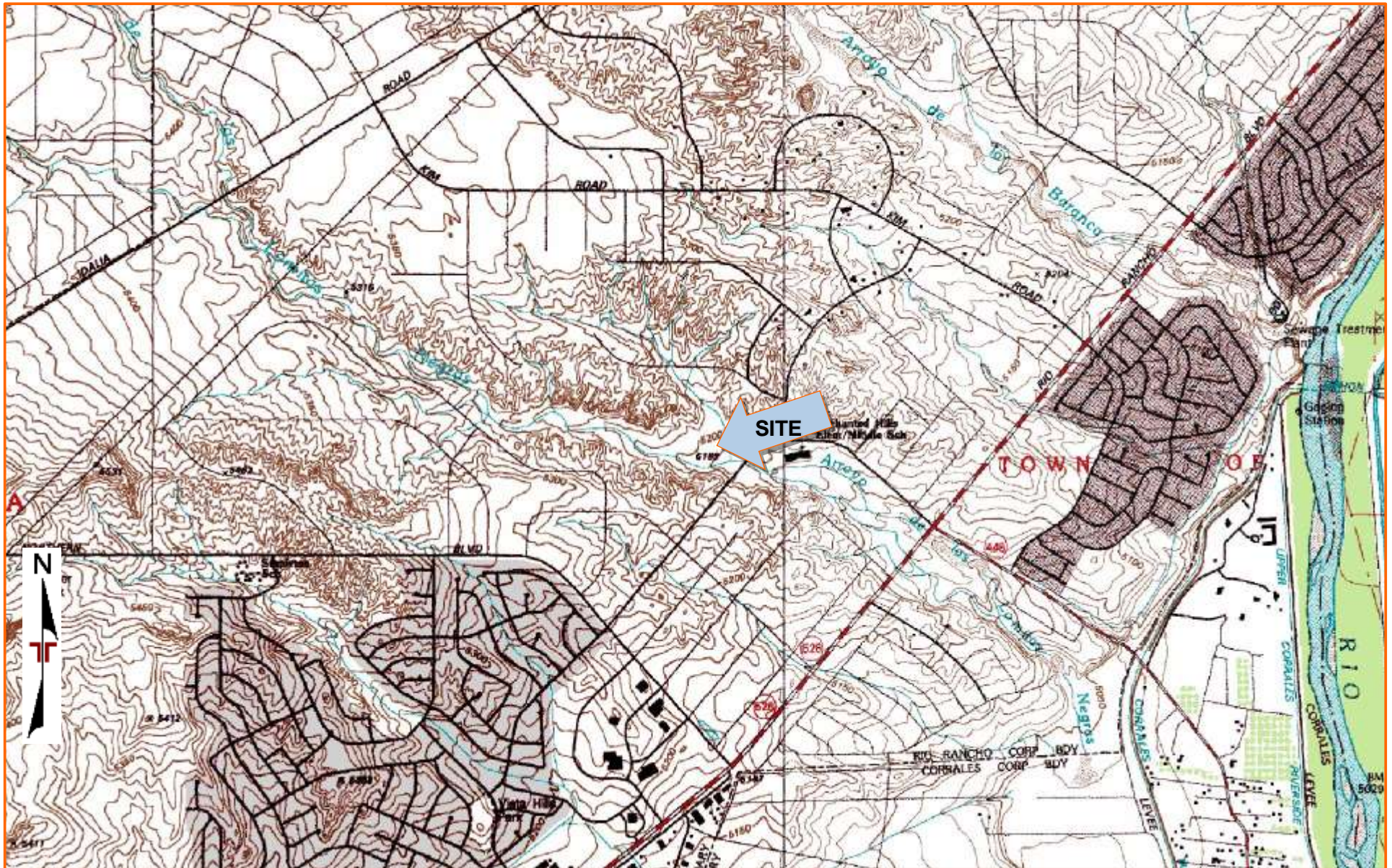


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT
INTENDED FOR CONSTRUCTION PURPOSES

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: LOMA MACHETE, NM (1/1/1990) and BERNALILLO, NM
(1/1/1990).

EXPLORATION PLAN

Lomitas Negras Arroyo ■ Sandoval County, NM

April 25, 2018 ■ Terracon Project No. 66175192

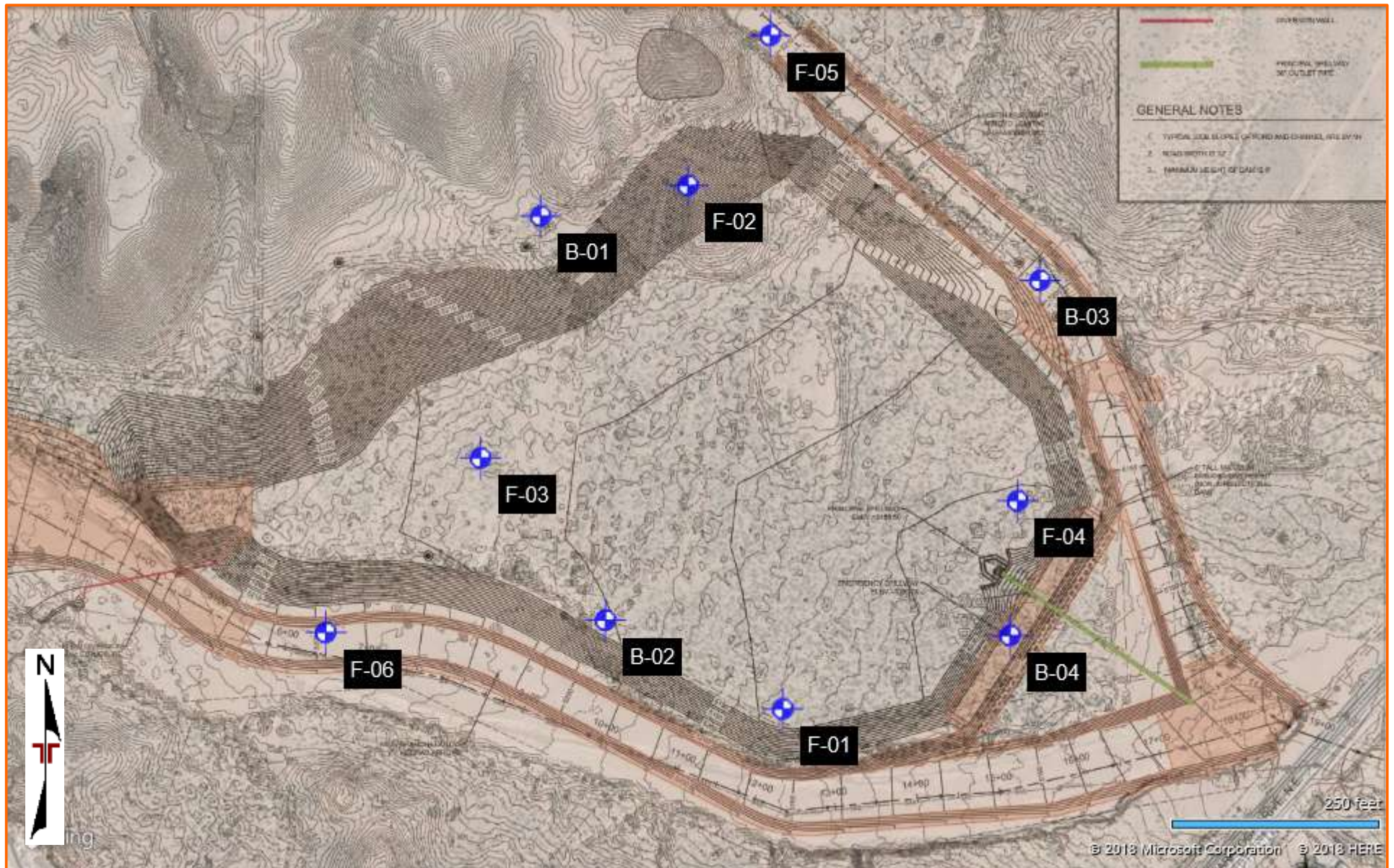


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT
INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY
MICROSOFT BING MAPS

Field Exploration Description

A total of four (4) borings were advanced at the site on January 17, 2018. The borings were drilled to depths ranging from approximately 31-½ to 51-½ feet below the ground surface. In addition, six (6) surface soil samples were obtained within and along the proposed detention pond. The exploration locations are shown on the attached Site Location Map and Boring Location Plan, Exhibits A1 and A2. The test borings and surface soil samples were located as follows:

Boring Designation	Location	Depths (feet)
B-01	Cut Slope	46-½
B-02	Floor/Bottom	31-½
B-03	Embankment	31-½
B-04	Fill Embankment/Berm	51-½
F-01 thru F-04	Floor/Bottom	1
F-05	North Arroyo	1
F-06	Main/South Arroyo	1

The test borings were advanced with a truck-mounted CME-75 drill rig utilizing 7-½ inch outside diameter hollow-stem augers. The surface samples were obtained using a portable hand auger.

The borings were located in the field by using existing site features. The latitude and longitude readings were taken at each boring location using a hand held GPS unit. Elevations were determined at each boring location based upon interpolation of contours on the grading plan provided by SEC. The accuracy of boring locations and elevations should only be assumed to the level implied by the method used.

Lithologic logs of the borings were recorded by the Terracon representative during the drilling operations. At selected intervals, samples of the subsurface materials were taken by driving split-spoon or ring-barrel samplers.

Penetration resistance measurements were obtained by driving the split-spoon and ring-barrel samplers into the subsurface materials with a 140-pound automatic hammer falling 30 inches. The penetration resistance value is a useful index in estimating the consistency or relative density of materials encountered.

A CME automatic SPT hammer was used to advance the split-barrel sampler in the borings performed on this site. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

Groundwater conditions were evaluated in the borings at the time of site exploration. Due to safety considerations, the existing borings were backfilled with native soils.

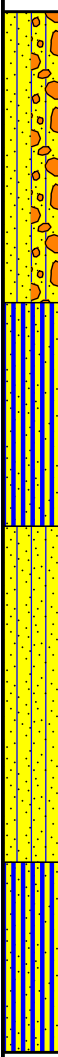
BORING LOG NO. B-01

Page 1 of 1

PROJECT: SSACFCA Lomitas Negras Arroyo - Phase II

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

SITE: Saratoga Dr NE and Lomitas Negras Arroyo
Sandoval County, NM

GRAPHIC LOG	LOCATION See Exhibit A-2		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS		PERCENT FINES
	DEPTH	ELEVATION (Ft.)							LL-PL-PI		
	SILTY SAND WITH GRAVEL (SM) , brown, very loose to dense										
			5	X	4-4-4 N=8		3		NP	20	
				X	2-1-2 N=3		3				
			10	X	8-16-23 N=39		5				
13.0		5206	15	X	72		3	92			
SANDY SILT (ML) , trace gravel, brown to light brown, hard, none to strong cementation			20	X	18-33-50/5"		9		NP	54	
23.0		5196	25	X	10-19-50/4"		5				
SILTY SAND (SM) , trace gravel, light brown to brown, very dense, strong cementation			30	X	30-50/5"		5		NP	32	
			35	X	36-50/5"		6				
38.0		5181	40	X	19-23-41 N=64		16		NP	54	
SANDY SILT (ML) , trace gravel, brown to light brown, hard, weak to strong cementation			45	X	9-23-50/3"						
46.5		5172.5	Boring Terminated at 46.5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Terracon
4905 Hawkins St NE
Albuquerque, NM

Boring Started: 01-17-2018

Boring Completed: 01-17-2018

Drill Rig: CME-75

Driller: EDI

Project No.: 66175192

Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 66175192.GPJ TERRACON DATATEMPLATE.GDT 4/20/18

BORING LOG NO. B-02

Page 1 of 1

PROJECT: SSCAFCA Lomas Negras Arroyo - Phase II

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

SITE: Saratoga Dr NE and Lomas Negras Arroyo
Sandoval County, NM

GRAPHIC LOG	LOCATION See Exhibit A-2	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
	Latitude: 35.27837° Longitude: -106.62989°							LL-PL-PI	
	DEPTH	ELEVATION (Ft.)							
	SILTY SAND (SM) , trace gravel, light brown, medium dense to very dense, none to moderate cementation								
				X	26-23-17 N=40	3		NP	16
				X	8-8-9 N=17	3			
				X	19	2	110		
				X	13-18-20 N=38	3			
				X	50/5"	3		NP	20
			X	12-23-22 N=45	3				
			X	11-18-25 N=43	3		NP	17	
Boring Terminated at 31.5 Feet									
Stratification lines are approximate. In-situ, the transition may be gradual.									
Hammer Type: Automatic									
Advancement Method: Hollow Stem Auger			See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any).			Notes:			
Abandonment Method: Boring backfilled with soil cuttings upon completion.			See Appendix C for explanation of symbols and abbreviations.						
WATER LEVEL OBSERVATIONS						Boring Started: 01-17-2018		Boring Completed: 01-17-2018	
						Drill Rig: CME-75		Driller: EDI	
						Project No.: 66175192		Exhibit: A-5	



THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 66175192.GPJ TERRACON DATATEMPLATE.GDT 4/20/18

BORING LOG NO. B-03

Page 1 of 1

PROJECT: SSACFCA Lomas Negras Arroyo - Phase II

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

SITE: Saratoga Dr NE and Lomas Negras Arroyo
Sandoval County, NM

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 35.27948° Longitude: -106.62815°		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
	DEPTH	ELEVATION (Ft.)							LL-PL-PI	
	SILTY SAND (SM) , trace gravel, brown, medium dense									
			5		X	12-11-7 N=18	3		NP	15
						39	2	113		
	8.0	5193								
	POORLY GRADED SAND WITH SILT (SP-SM) , trace gravel, brown, dense		10		X	10-18-19 N=37	3		NP	8
			15		X	7-18-22 N=40	2			
	18.0	5183								
	SILTY SAND (SM) , brown, medium dense to dense		20		X	8-11-12 N=23	4		NP	16
			25		X	7-11-14 N=25	5			
	31.5	5169.5	30		X	11-13-20 N=33	6		NP	24
Boring Terminated at 31.5 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Terracon
4905 Hawkins St NE
Albuquerque, NM

Boring Started: 01-17-2018

Boring Completed: 01-17-2018

Drill Rig: CME-75

Driller: EDI

Project No.: 66175192

Exhibit: A-6

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 66175192.GPJ TERRACON_DATATEMPLATE.GDT 4/20/18

BORING LOG NO. B-04

Page 1 of 1

PROJECT: SSACFCA Lomitas Negras Arroyo - Phase II

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

SITE: Saratoga Dr NE and Lomitas Negras Arroyo
Sandoval County, NM

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 35.27832° Longitude: -106.62827°		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
	DEPTH	ELEVATION (Ft.)							LL-PL-PI	
	SILTY SAND (SM) , trace gravel, brown, medium dense									
			5			7-5-5 N=10	2		NP	15
						7-9-10 N=19	2			
	8.0	5188								
	POORLY GRADED SAND WITH SILT (SP-SM) , trace gravel, brown, dense									
			10			10-19-21 N=40	2		NP	6
	13.0	5183								
	SILTY SAND (SM) , trace gravel, brown, dense to very dense, moderate cementation									
			15			56	2	100		
			20			10-15-21 N=36	4		NP	27
			25			12-18-25 N=43	5			
			30			49-24-24 N=48	5		NP	27
			35			11-18-22 N=40	4			
			40			10-16-19 N=35				
			45			19-27-27 N=54				
			50			15-29-30 N=59				
	51.5	5144.5								
	Boring Terminated at 51.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

WATER LEVEL OBSERVATIONS

Terracon
4905 Hawkins St NE
Albuquerque, NM

Boring Started: 01-17-2018

Boring Completed: 01-17-2018

Drill Rig: CME-75

Driller: EDI

Project No.: 66175192

Exhibit: A-7

BORING LOG NO. F-01

Page 1 of 1


PROJECT: SSCAFCA Lomas Negras Arroyo - Phase II

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

SITE: Saratoga Dr NE and Lomas Negras Arroyo
Sandoval County, NM

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 35.27808° Longitude: -106.62918°		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
	DEPTH	ELEVATION (Ft.)							LL-PL-PI	
	1.0	5198					1		NP	9
	POORLY GRADED SAND WITH SILT (SP-SM) , trace gravel, light brown Boring Terminated at 1 Foot									

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.	Notes:	
Abandonment Method: Boring backfilled with soil cuttings upon completion.			
WATER LEVEL OBSERVATIONS		Boring Started: 01-17-2018	Boring Completed: 01-17-2018
		Drill Rig: CME-75	Driller:
		Project No.: 66175192	Exhibit: A-8

BORING LOG NO. F-02

Page 1 of 1


PROJECT: SS CAFCA Lomitas Negras Arroyo - Phase II

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

SITE: Saratoga Dr NE and Lomitas Negras Arroyo
Sandoval County, NM

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 35.27979° Longitude: -106.62956°		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
	DEPTH	ELEVATION (Ft.)							LL-PL-PI	
	1.0	5223					1		NP	14
	SILTY SAND (SM) , trace gravel, light brown									
	Boring Terminated at 1 Foot									

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.	Notes:	
Abandonment Method: Boring backfilled with soil cuttings upon completion.			
WATER LEVEL OBSERVATIONS		Boring Started: 01-17-2018	Boring Completed: 01-17-2018
		Drill Rig: CME-75	Driller:
		Project No.: 66175192	Exhibit: A-9





BORING LOG NO. F-03

Page 1 of 1


PROJECT: SSCAFCA Lomas Negras Arroyo - Phase II

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

SITE: Saratoga Dr NE and Lomas Negras Arroyo
Sandoval County, NM

GRAPHIC LOG	LOCATION See Exhibit A-2			DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
	Latitude: 35.2789° Longitude: -106.63039°									LL-PL-PI	
DEPTH		ELEVATION (Ft.)									
  	1.0	POORLY GRADED SAND WITH SILT (SP-SM) , trace gravel, light brown		5206				1		NP	11
Boring Terminated at 1 Foot											

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.	Notes:	
Abandonment Method: Boring backfilled with soil cuttings upon completion.			
WATER LEVEL OBSERVATIONS	 <p>4905 Hawkins St NE Albuquerque, NM</p>	Boring Started: 01-17-2018	Boring Completed: 01-17-2018
		Drill Rig: CME-75	Driller:
		Project No.: 66175192	Exhibit: A-10

BORING LOG NO. F-04

Page 1 of 1


PROJECT: SSCAFCA Lomas Negras Arroyo - Phase II

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

SITE: Saratoga Dr NE and Lomas Negras Arroyo
Sandoval County, NM

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 35.27876° Longitude: -106.62824°		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
	DEPTH	ELEVATION (Ft.)							LL-PL-PI	
	1.0	5197					2		NP	16
	SILTY SAND (SM) , trace gravel, light brown Boring Terminated at 1 Foot									

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.	Notes:	
Abandonment Method: Boring backfilled with soil cuttings upon completion.			
WATER LEVEL OBSERVATIONS		Boring Started: 01-17-2018	Boring Completed: 01-17-2018
		Drill Rig: CME-75	Driller:
		Project No.: 66175192	Exhibit: A-11

Page 1 of 1

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

GRAPHIC LOG	LOCATION See Exhibit A-2		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS
	Latitude: 35.28028° Longitude: -106.62923°								LL-PL-PI
DEPTH	Surface Elev.: 5211 (Ft.)								
	ELEVATION (Ft.)								

1.0	POORLY GRADED SAND (SP) , trace gravel, light brown	5210					1		NP
Boring Terminated at 1 Foot									

Advancement Method:	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any).	Notes:
Abandonment Method: Boring backfilled with soil cuttings upon completion.	See Appendix C for explanation of symbols and abbreviations.	

Terracon
4905 Hawkins St NE
Albuquerque, NM



Boring Completed: 01-17-2018

Driller:

Exhibit: A-12

Page 1 of 1

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM













GRAPHIC LOG	LOCATION See Exhibit A-2		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
	DEPTH	ELEVATION (Ft.)							LL-PL-PI	
	1.0	POORLY GRADED SAND (SP) , trace gravel, light brown	5204				1		NP	4
		Boring Terminated at 1 Foot								

Advancement Method:	See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.	Notes:	
Abandonment Method: Boring backfilled with soil cuttings upon completion.			
WATER LEVEL OBSERVATIONS	 <p>4905 Hawkins St NE Albuquerque, NM</p>	Boring Started: 01-17-2018	Boring Completed: 01-17-2018
		Drill Rig: CME-75	Driller:
		Project No.: 66175192	Exhibit: A-13

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 66175192.GPJ TERRACON_DATATEMPLATE.GDT 4/20/18

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING				WATER LEVEL		Water Initially Encountered	FIELD TESTS	(HP) Hand Penetrometer
						Water Level After a Specified Period of Time		(T) Torvane
						Water Level After a Specified Period of Time		(b/f) Standard Penetration Test (blows per foot)
					Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.			N N value
								(PID) Photo-Ionization Detector
								(OVA) Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS	RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
	Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-Value Blows/Ft.
	Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1
	Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4
	Medium Dense	10 - 29	19 - 58	Medium-Stiff	1,000 to 2,000	4 - 8
	Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 15
	Very Dense	> 50	≥ 99	Very Stiff	4,000 to 8,000	15 - 30
				Hard	> 8,000	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term(s) of other constituents</u>	<u>Percent of Dry Weight</u>
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

<u>Major Component of Sample</u>	<u>Particle Size</u>
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

<u>Descriptive Term(s) of other constituents</u>	<u>Percent of Dry Weight</u>
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

<u>Term</u>	<u>Plasticity Index</u>
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A					Soil Classification	
					Group Symbol	Group Name ^B
Coarse Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines ^C	Cu ≥ 4 and 1 ≤ Cc ≤ 3 ^E		GW	Well-graded gravel ^F
			Cu < 4 and/or 1 > Cc > 3 ^E		GP	Poorly graded gravel ^F
		Gravels with Fines: More than 12% fines ^C	Fines classify as ML or MH		GM	Silty gravel ^{F,G,H}
			Fines classify as CL or CH		GC	Clayey gravel ^{F,G,H}
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines ^D	Cu ≥ 6 and 1 ≤ Cc ≤ 3 ^E		SW	Well-graded sand ^I
			Cu < 6 and/or 1 > Cc > 3 ^E		SP	Poorly graded sand ^I
		Sands with Fines: More than 12% fines ^D	Fines classify as ML or MH		SM	Silty sand ^{G,H,I}
			Fines classify as CL or CH		SC	Clayey sand ^{G,H,I}
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots on or above “A” line ^J		CL	Lean clay ^{K,L,M}
			PI < 4 or plots below “A” line ^J		ML	Silt ^{K,L,M}
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay ^{K,L,M,N}
			Liquid limit - not dried			Organic silt ^{K,L,M,O}
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above “A” line		CH	Fat clay ^{K,L,M}
			PI plots below “A” line		MH	Elastic Silt ^{K,L,M}
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay ^{K,L,M,P}
			Liquid limit - not dried			Organic silt ^{K,L,M,Q}
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

^A Based on the material passing the 3-inch (75-mm) sieve

^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

^C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

^D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

$$^E Cu = D_{60}/D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

^F If soil contains $\geq 15\%$ sand, add "with sand" to group name.

^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^H If fines are organic, add "with organic fines" to group name.

^I If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.

^J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

^L If soil contains $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.

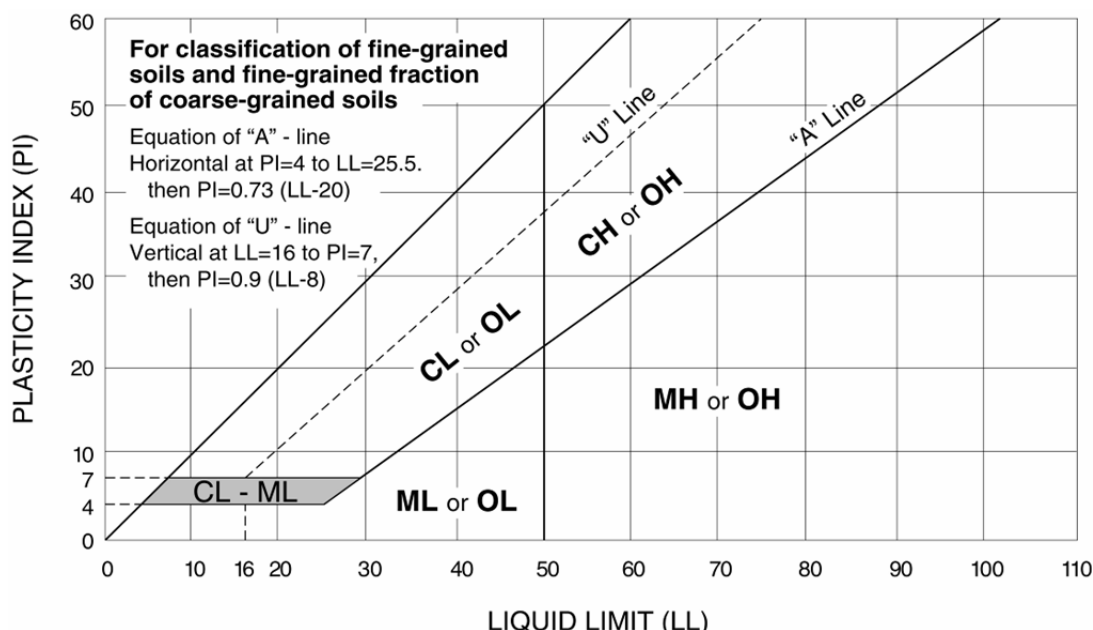
^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.

^N $PI \geq 4$ and plots on or above "A" line.

^O $PI < 4$ or plots below "A" line.

^P PI plots on or above "A" line.

^Q PI plots below "A" line.



APPENDIX B

LABORATORY TESTING

Geotechnical Engineering Report

SSCAFCA Lomas Negras Arroyo – Phase 2 ■ Sandoval County, New Mexico

April 25, 2018 ■ Terracon Project No. 66175192



Laboratory Testing

Samples retrieved during the field exploration were taken to the laboratory for further observation by the project geotechnical engineer and were classified in accordance with the Unified Soil Classification System (USCS) described in Appendix A. At that time, the field descriptions were confirmed or modified as necessary and an applicable laboratory testing program was formulated to determine engineering properties of the subsurface materials.

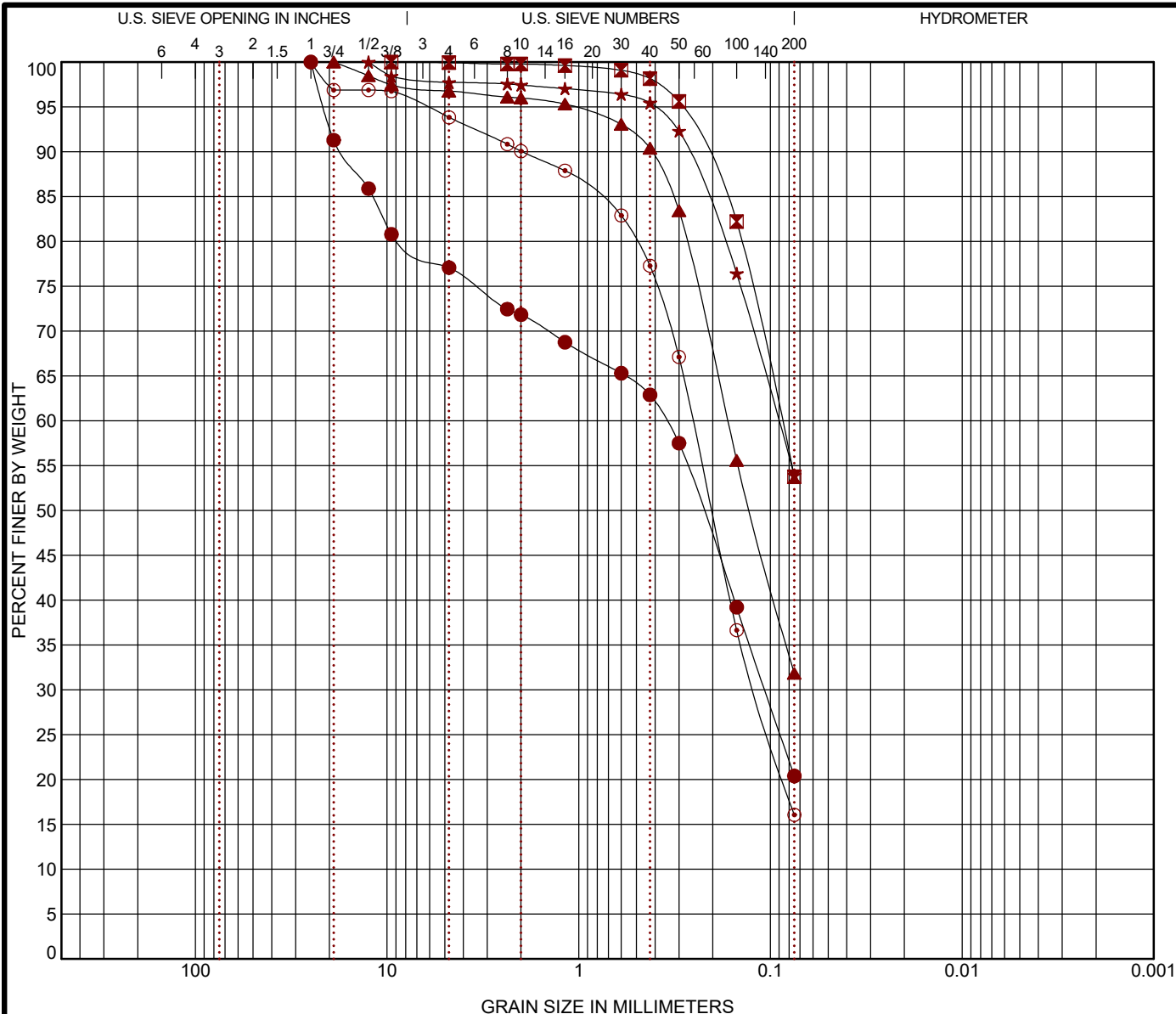
Laboratory tests were conducted on selected soil samples and the test results are presented in this appendix. The laboratory test results were used for the geotechnical engineering analyses, and the development of foundation and earthwork recommendations. Laboratory tests were performed in general accordance with the applicable ASTM, local or other accepted standards.

Selected soil samples obtained from the site were tested for the following engineering properties:

- | | |
|---------------------|------------------------------------|
| ■ Sieve Analysis | ■ In-situ Dry Density |
| ■ Atterberg Limits | ■ In-situ Water Content |
| ■ Direct Shear | ■ Soluble Sulfates |
| ■ pH | ■ Maximum density optimum moisture |
| ■ Soluble chlorides | ■ Soil cement compressive strength |
| ■ Resistivity | |

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID		Depth	USCS Classification				WC (%)	LL	PL	PI	Cc	Cu
●	B-01	2.5 - 4	SILTY SAND with GRAVEL (SM)				3	NP	NP	NP		
☒	B-01	20 - 21.4	SANDY SILT (ML)				9	NP	NP	NP		
▲	B-01	30 - 30.9	SILTY SAND (SM)				5	NP	NP	NP		
★	B-01	40 - 41.5	SANDY SILT (ML)				16	NP	NP	NP		
⊙	B-02	2.5 - 4	SILTY SAND (SM)				3	NP	NP	NP		
	Boring ID	Depth	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Gravel	%Sand	%Silt	%Fines	%Clay	
●	B-01	2.5 - 4	25	0.353	0.107		22.9	56.7		20.4		
☒	B-01	20 - 21.4	9.5	0.087			0.1	46.2		53.8		
▲	B-01	30 - 30.9	19	0.167			3.2	64.9		31.8		
★	B-01	40 - 41.5	12.5	0.09			2.3	43.8		53.9		
⊙	B-02	2.5 - 4	25	0.255	0.12		6.2	77.8		16.1		

PROJECT: SSCAFCA Lomitas Negras Arroyo
- Phase II

SITE: Saratoga Dr NE and Lomitas Negras
Arroyo
Sandoval County, NM

Terracon
4905 Hawkins St NE
Albuquerque, NM

PROJECT NUMBER: 66175192

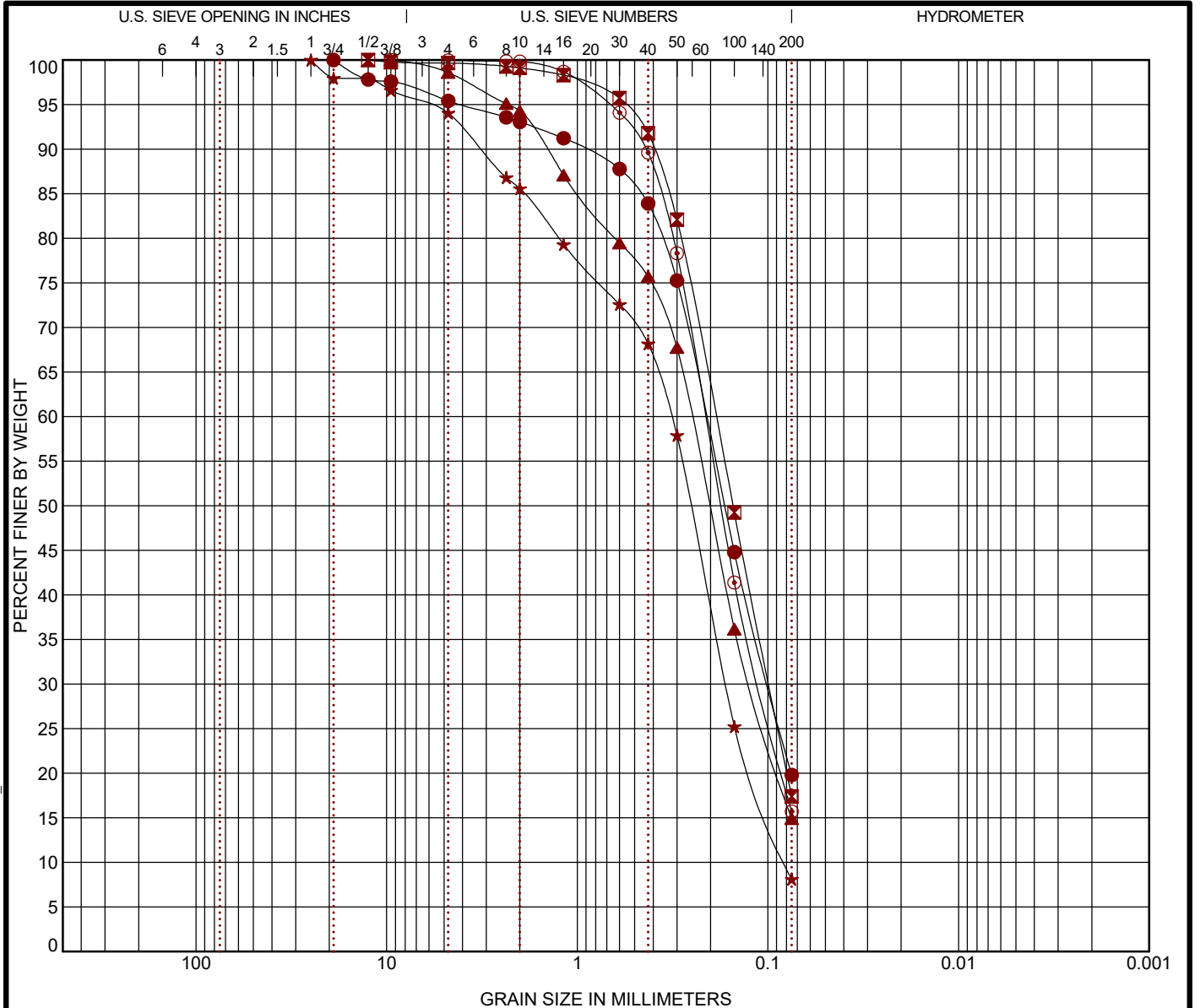
CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

EXHIBIT: B-2

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 66175192.GPJ TERRACON DATATEMPLATE.GDT 4/20/18



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID			Depth	USCS Classification				WC (%)	LL	PL	PI	Cc	Cu
●	B-02	20 - 20.4	SILTY SAND (SM)				3	NP	NP	NP			
⊠	B-02	30 - 31.5	SILTY SAND (SM)				3	NP	NP	NP			
▲	B-03	2.5 - 4	SILTY SAND (SM)				3	NP	NP	NP			
★	B-03	10 - 11.5	POORLY GRADED SAND with SILT (SP-SM)				3	NP	NP	NP	1.06	3.98	
⊙	B-03	20 - 21.5	SILTY SAND (SM)				4	NP	NP	NP			
Boring ID			Depth	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Gravel	%Sand	%Silt	%Fines	%Clay	
●	B-02	20 - 20.4	19	0.212	0.1			4.6	75.6		19.8		
⊠	B-02	30 - 31.5	12.5	0.188	0.099			0.3	82.3		17.4		
▲	B-03	2.5 - 4	9.5	0.253	0.123			1.4	83.7		14.9		
★	B-03	10 - 11.5	25	0.322	0.166	0.081		6.0	85.9		8.1		
⊙	B-03	20 - 21.5	9.5	0.213	0.11			0.0	84.3		15.7		

PROJECT: SSCAFCA Lomitas Negras Arroyo
- Phase II

SITE: Saratoga Dr NE and Lomitas Negras
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Sandoval County, NM

Terracon
4905 Hawkins St NE
Albuquerque, NM

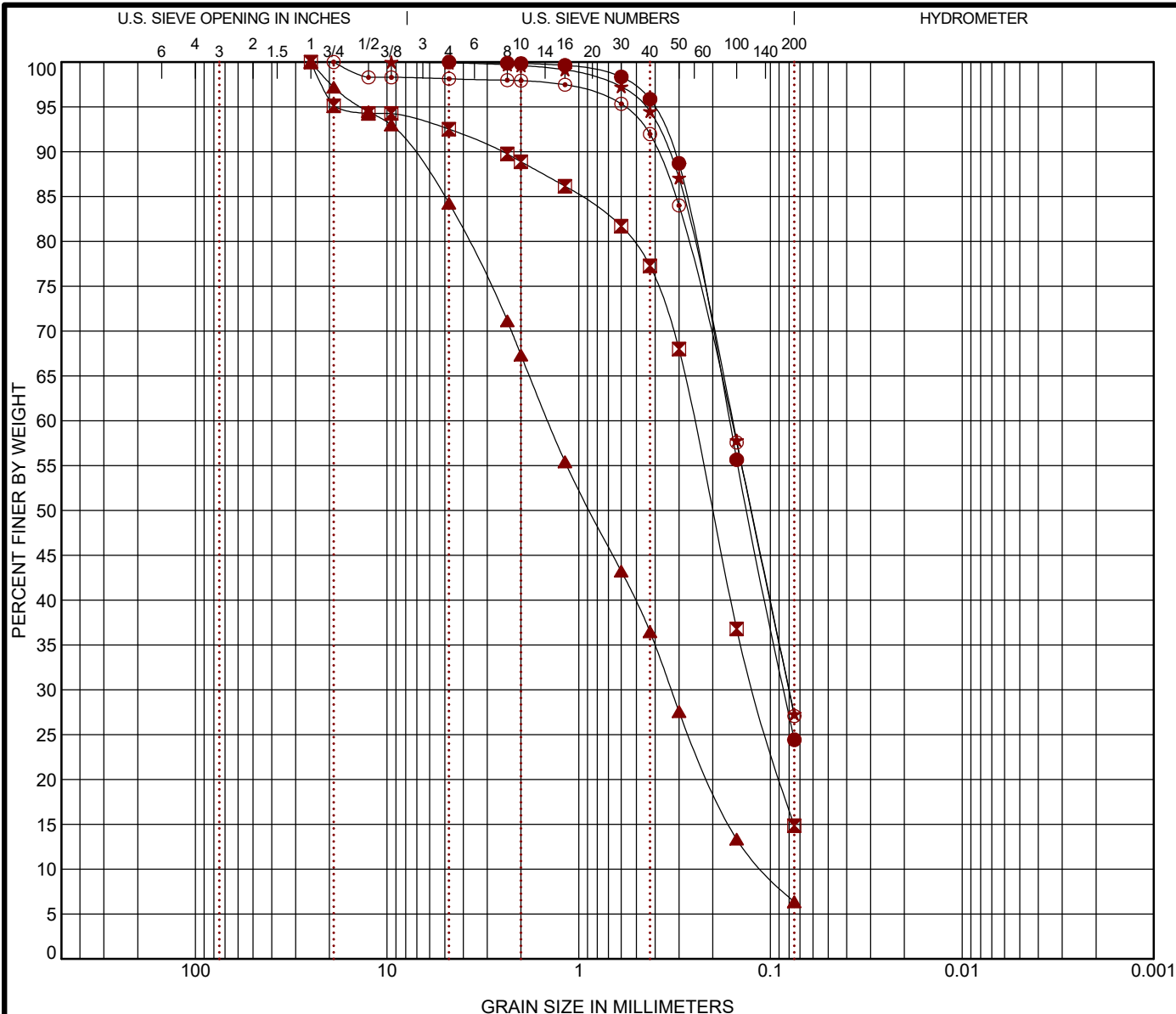
PROJECT NUMBER: 66175192

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

EXHIBIT: B-3

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID		Depth	USCS Classification				WC (%)	LL	PL	PI	Cc	Cu
●	B-03	30 - 31.5	SILTY SAND (SM)				6	NP	NP	NP		
✠	B-04	2.5 - 4	SILTY SAND (SM)				2	NP	NP	NP		
▲	B-04	10 - 11.5	POORLY GRADED SAND with SILT and GRAVEL (SP-SM)				2	NP	NP	NP	0.70	13.43
★	B-04	20 - 21.5	SILTY SAND (SM)				4	NP	NP	NP		
⊙	B-04	30 - 31.5	SILTY SAND (SM)				5	NP	NP	NP		
Boring ID		Depth	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Gravel	%Sand	%Silt	%Fines	%Clay	
●	B-03	30 - 31.5	4.75	0.164	0.085		0.0	75.6		24.4		
✠	B-04	2.5 - 4	25	0.251	0.121		7.5	77.7		14.8		
▲	B-04	10 - 11.5	25	1.446	0.33	0.108	15.7	77.9		6.4		
★	B-04	20 - 21.5	9.5	0.158	0.08		0.1	72.6		27.3		
⊙	B-04	30 - 31.5	19	0.16	0.08		1.9	71.1		27.1		

PROJECT: SSCAFCA Lomitas Negras Arroyo
- Phase II

SITE: Saratoga Dr NE and Lomitas Negras
Arroyo
Sandoval County, NM

Terracon
4905 Hawkins St NE
Albuquerque, NM

PROJECT NUMBER: 66175192

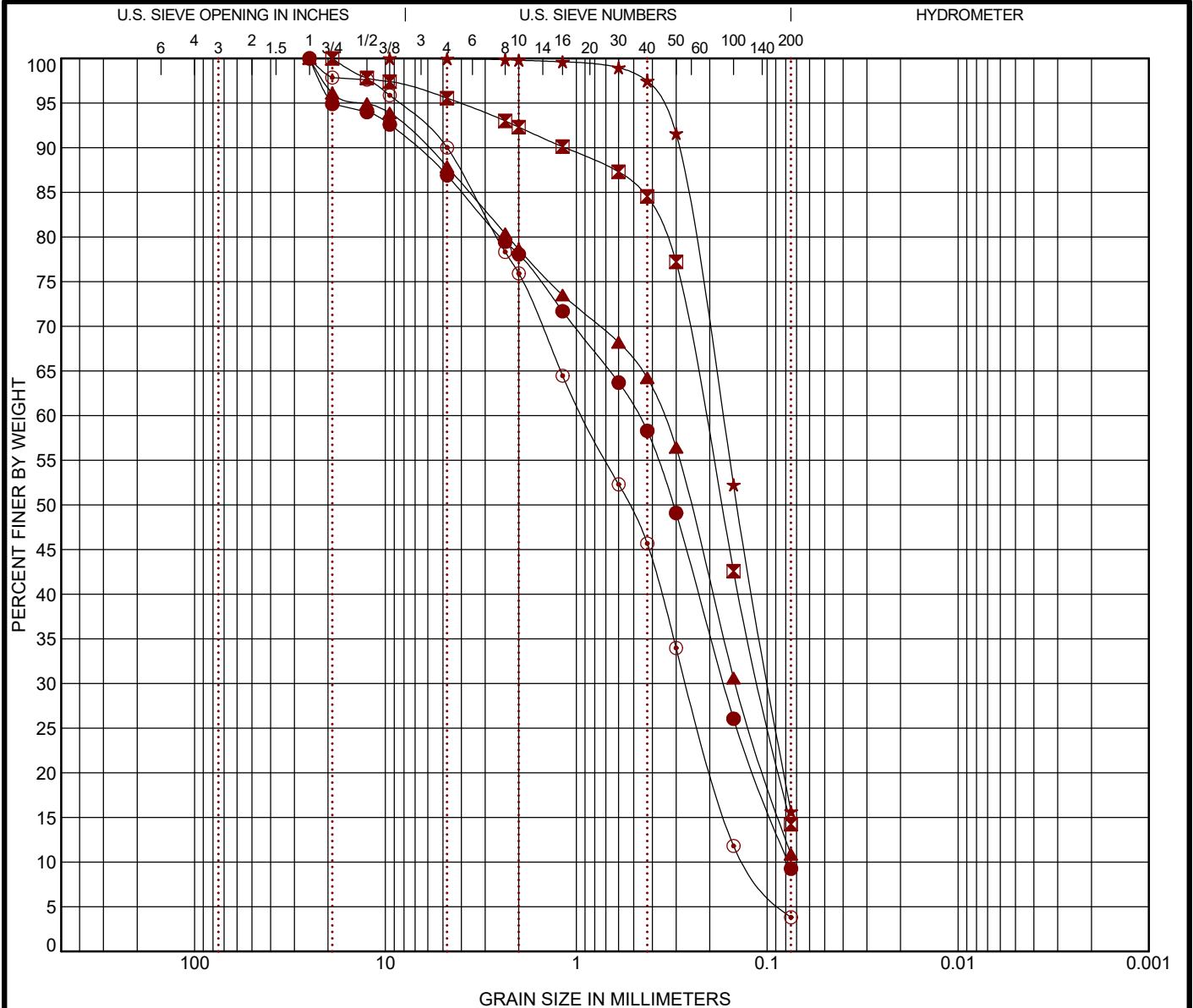
CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

EXHIBIT: B-4

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 66175192.GPJ TERRACON DATATEMPLATE.GDT 4/20/18



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID		Depth	USCS Classification				WC (%)	LL	PL	PI	Cc	Cu
●	F-01	0 - 1	POORLY GRADED SAND with SILT (SP-SM)				1	NP	NP	NP	0.78	6.13
☒	F-02	0 - 1	SILTY SAND (SM)				1	NP	NP	NP		
▲	F-03	0 - 1	POORLY GRADED SAND with SILT (SP-SM)				1	NP	NP	NP	0.84	4.84
★	F-04	0 - 1	SILTY SAND (SM)				2	NP	NP	NP		
◎	F-05	0 - 1	POORLY GRADED SAND (SP)				1	NP	NP	NP	0.59	7.18
Boring ID		Depth	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Gravel	%Sand	%Silt	%Fines	%Clay	
●	F-01	0 - 1	25	0.474	0.169	0.077	13.1	77.6		9.3		
☒	F-02	0 - 1	19	0.213	0.11		4.4	81.3		14.3		
▲	F-03	0 - 1	25	0.352	0.147		12.1	77.0		10.9		
★	F-04	0 - 1	9.5	0.172	0.098		0.1	84.3		15.7		
◎	F-05	0 - 1	25	0.921	0.265	0.128	10.0	86.2		3.8		

PROJECT: SSCAFCA Lomitas Negras Arroyo
- Phase II

SITE: Saratoga Dr NE and Lomitas Negras
Arroyo
Sandoval County, NM

Terracon
4905 Hawkins St NE
Albuquerque, NM

PROJECT NUMBER: 66175192

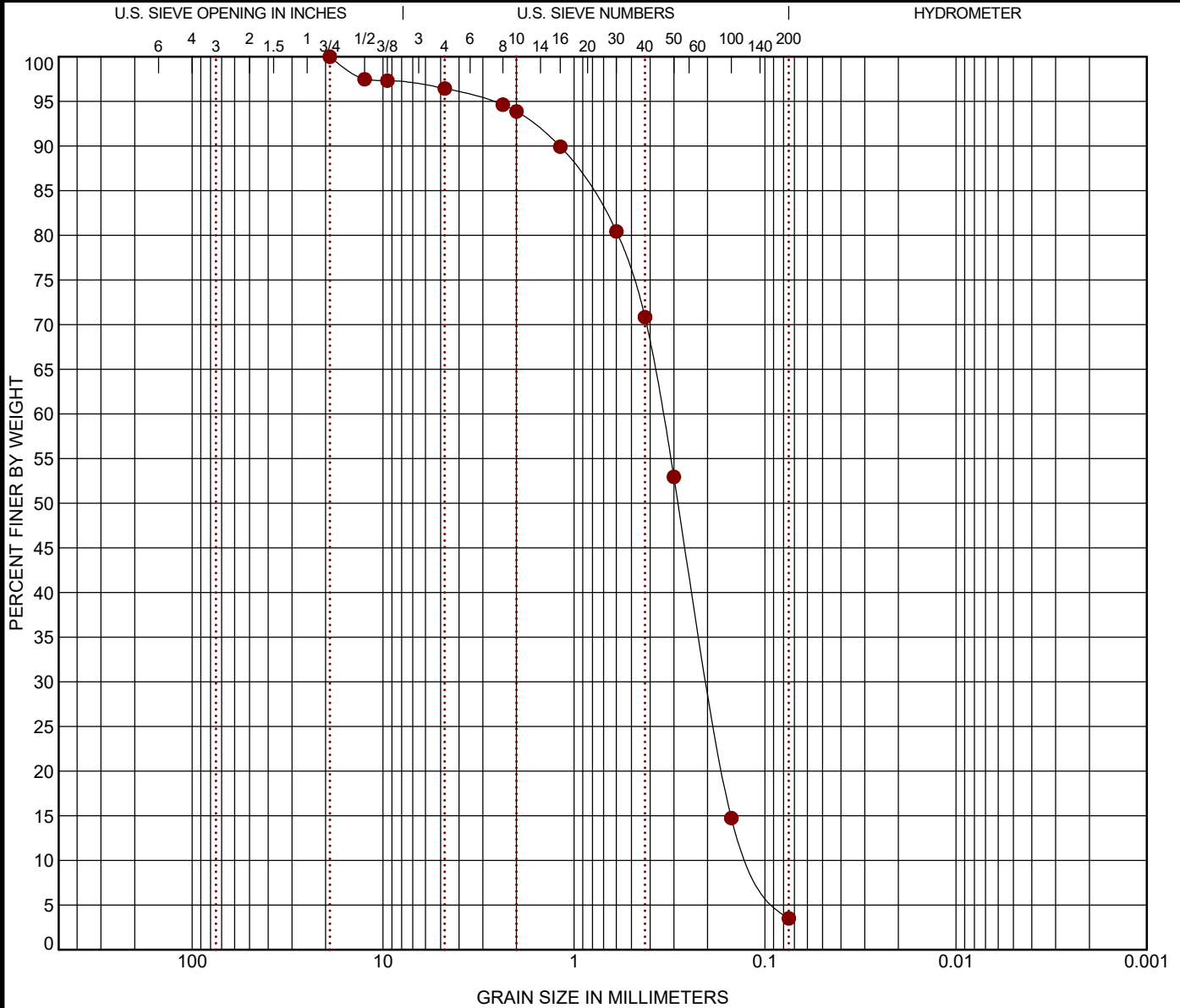
CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

EXHIBIT: B-5

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 66175192.GPJ TERRACON DATATEMPLATE.GDT 4/20/18



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID	Depth	USCS Classification				WC (%)	LL	PL	PI	Cc	Cu
● F-06	0 - 1	POORLY GRADED SAND (SP)				1	NP	NP	NP	1.02	3.07

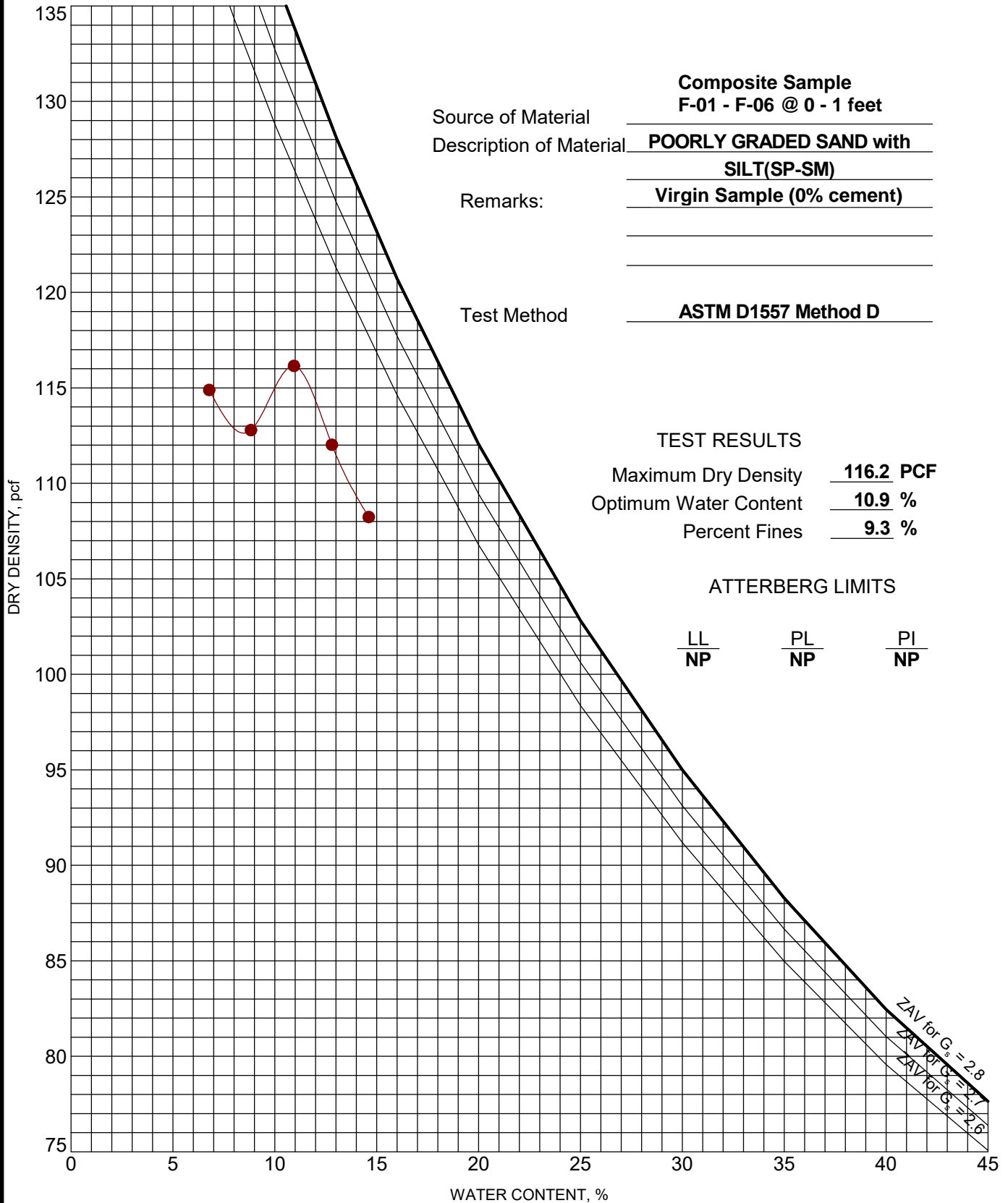
Boring ID	Depth	D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Gravel	%Sand	%Silt	%Fines	%Clay
● F-06	0 - 1	19	0.344	0.198	0.112	3.6	92.9		3.5	

PROJECT: SSCAFCA Lomitas Negras Arroyo - Phase II	 4905 Hawkins St NE Albuquerque, NM	PROJECT NUMBER: 66175192
SITE: Saratoga Dr NE and Lomitas Negras Arroyo Sandoval County, NM		CLIENT: Smith Engineering Co., Inc. Albuquerque, NM
		EXHIBIT: B-6

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 66175192.GPJ TERRACON DATATEMPLATE.GDT 4/24/18



PROJECT: SSCAFCA Lomitas Negras Arroyo
- Phase II

SITE: Saratoga Dr NE and Lomitas Negras
Arroyo
Sandoval County, NM

Terracon
4905 Hawkins St NE
Albuquerque, NM

PROJECT NUMBER: 66175192

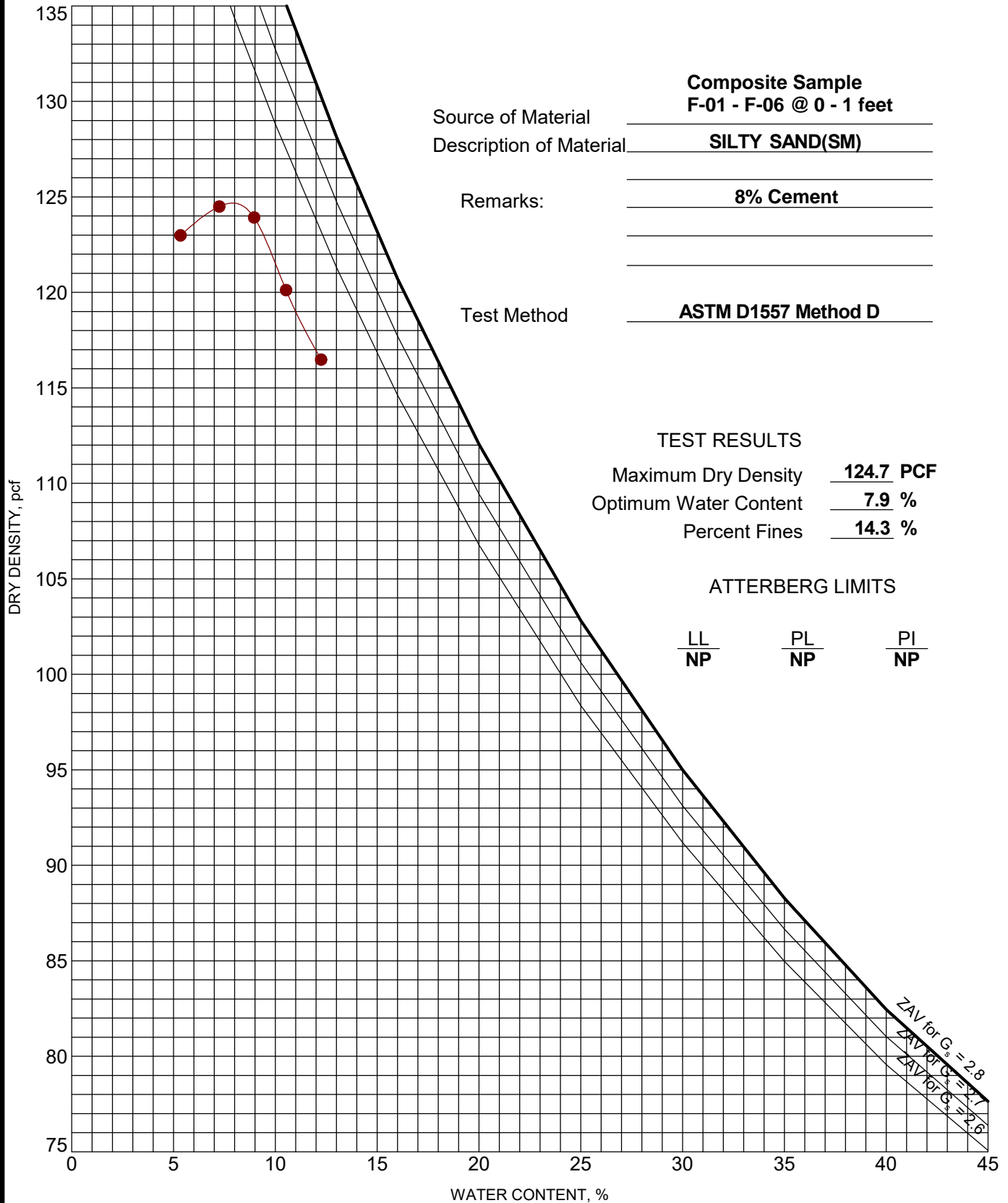
CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

EXHIBIT: B-7

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 66175192.GPJ TERRACON DATATEMPLATE.GDT 4/24/18



PROJECT: SSCAFCA Lomitas Negras Arroyo
- Phase II

SITE: Saratoga Dr NE and Lomitas Negras
Arroyo
Sandoval County, NM

Terracon
4905 Hawkins St NE
Albuquerque, NM

PROJECT NUMBER: 66175192

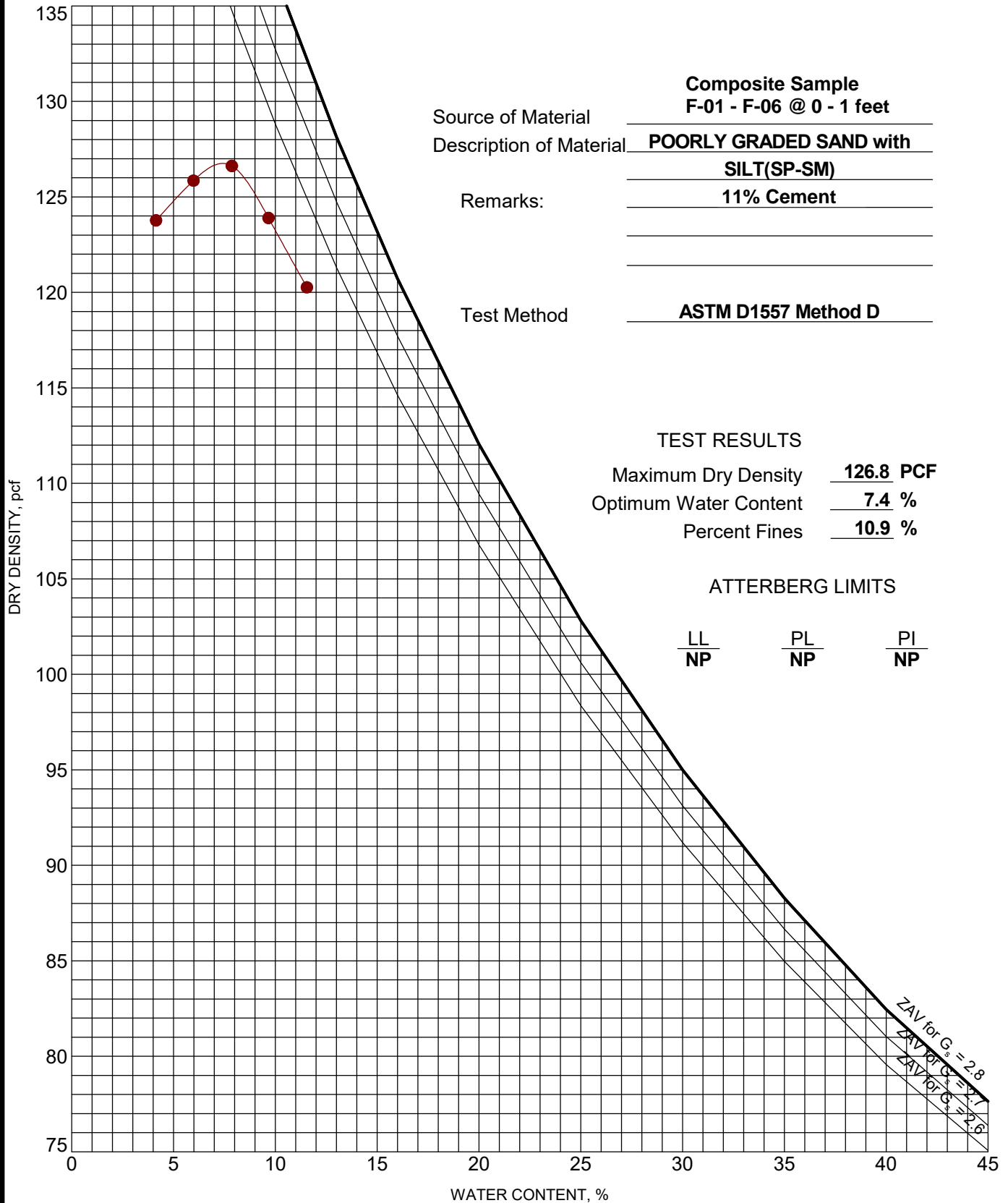
CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

EXHIBIT: B-8

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 66175192.GPJ TERRACON DATATEMPLATE.GDT 4/24/18



PROJECT: SSCAFCA Lomitas Negras Arroyo - Phase II

SITE: Saratoga Dr NE and Lomitas Negras Arroyo
Sandoval County, NM

Terracon
4905 Hawkins St NE
Albuquerque, NM

PROJECT NUMBER: 66175192

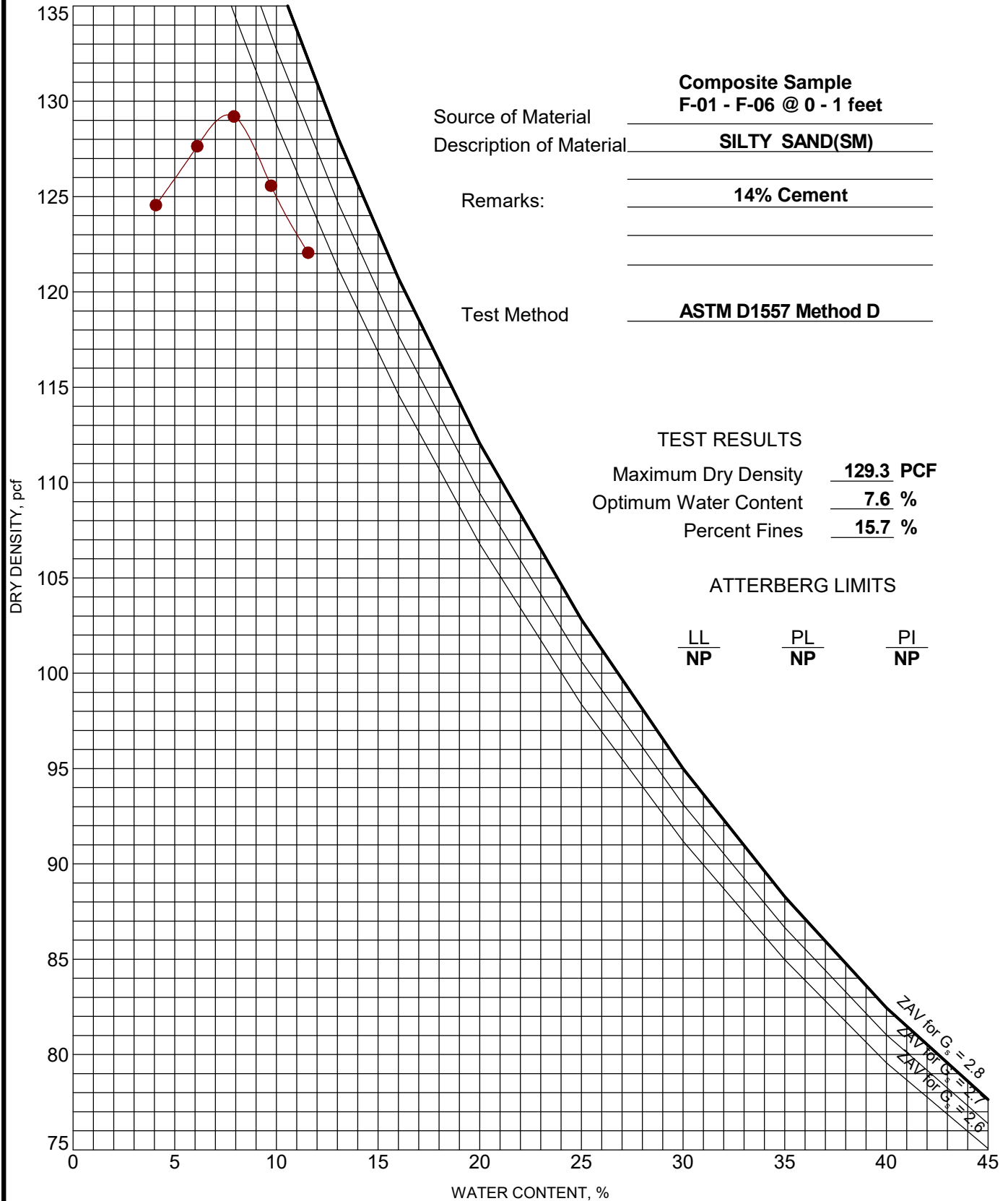
CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

EXHIBIT: B-9

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. COMPACTION - V2 66175192.GPJ TERRACON DATATEMPLATE.GDT 4/24/18



Source of Material Composite Sample
 Description of Material F-01 - F-06 @ 0 - 1 feet
 Remarks: SILTY SAND(SM)
14% Cement
 Test Method ASTM D1557 Method D

TEST RESULTS
 Maximum Dry Density 129.3 PCF
 Optimum Water Content 7.6 %
 Percent Fines 15.7 %

ATTERBERG LIMITS

LL	PL	PI
NP	NP	NP

PROJECT: SSCAFCA Lomitas Negras Arroyo
 - Phase II

SITE: Saratoga Dr NE and Lomitas Negras
 Arroyo
 Sandoval County, NM

Terracon
 4905 Hawkins St NE
 Albuquerque, NM

PROJECT NUMBER: 66175192

CLIENT: Smith Engineering Co., Inc.
 Albuquerque, NM

EXHIBIT: B-10



PROJECT: Lomitas Negras Arroyo Phase II
LOCATION: Sandoval County, NM
MATERIAL: On-site Detention Pond Floor/Duke City-Redi Mix Cement
SOIL SOURCE: Proposed Cut Area from Detention Pond Floor

JOB NO: 66175192
WORK ORDER NO: 66175192
LAB NO: 1438
DATE SAMPLED: 4/3/18

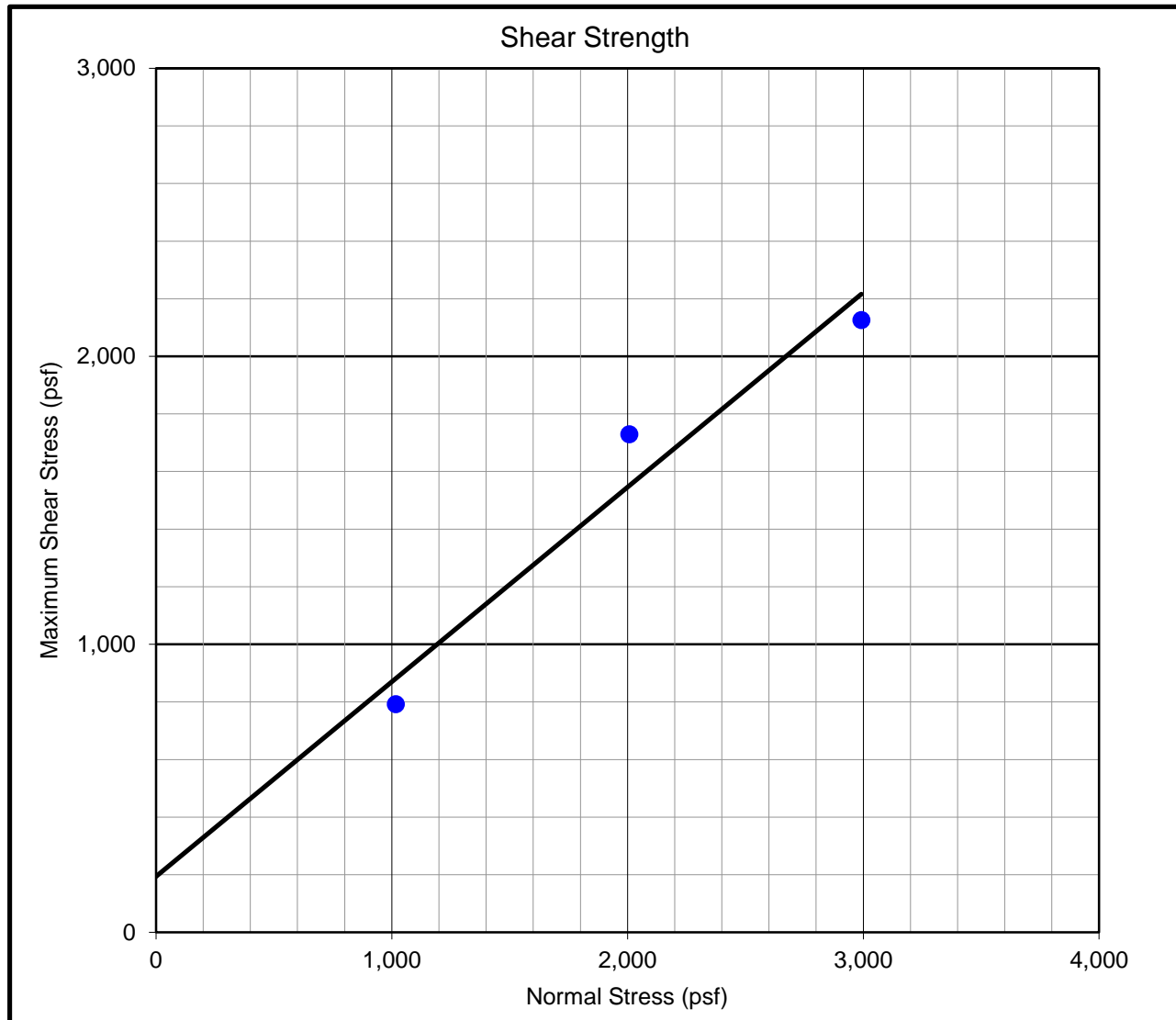
**SOIL CEMENT PLUGS COMPRESSIVE STRENGTH
ASTM D1632 AND D1633 METHOD A - AS APPLICABLE**

SAMPLE ID	WET SAMPLE WEIGHT (g)	MOISTURE (%)	DRY DENSITY (pcf)	DIAMETER (in)	CEMENT CONTENT (%)	MAX LOAD (lbs)	STRENGTH (psi)	AGE IN DAYS
8% Cement								
8A	1,938	7.2%	119.6	4.00	8.0	3,860	310	7
8B	1,944	7.2%	120.0	4.00	8.0	3,960	320	7
8C	1,967	7.3%	121.3	4.00	8.0	4,170	330	7
AVERAGE STRENGTH (psi):							320	
11% Cement								
11A	1,956	6.8%	121.2	4.00	11.0	7,510	600	7
11B	1,963	6.8%	121.5	4.00	11.0	7,640	610	7
11C	1,946	6.9%	120.4	4.00	11.0	6,840	540	7
AVERAGE STRENGTH (psi):							580	
14% Cement								
14A	1,978	7.1%	122.1	4.00	14.0	12,550	1000	7
14B	1,990	7.2%	122.8	4.00	14.0	13,120	1040	7
14C	1,976	7.2%	121.9	4.00	14.0	12,645	1010	7
AVERAGE STRENGTH (psi):							1,020	

REVIEWED BY M Anderson

SOIL DIRECT SHEAR RESULTS

Sample Location: B-1 @ 15.0'

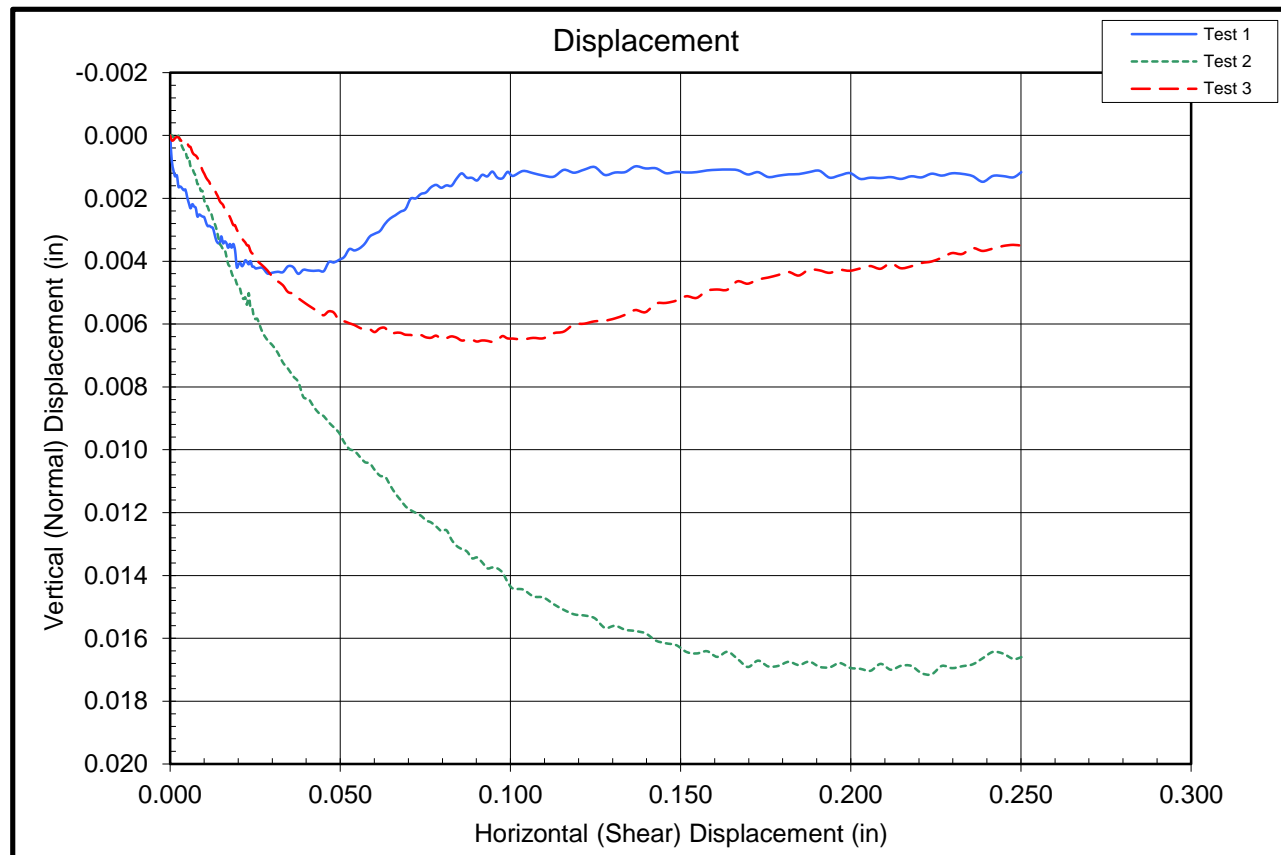
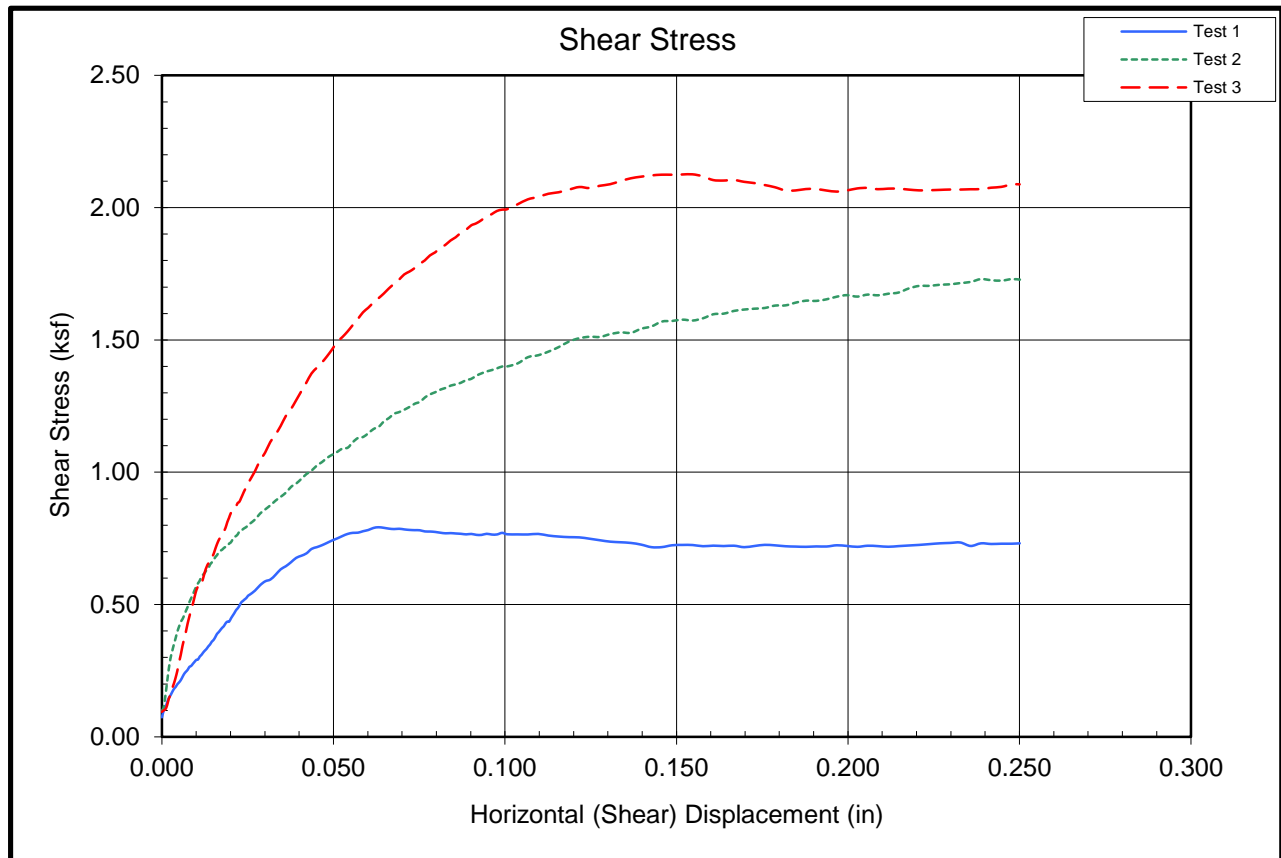


Test Parameters										
Sample Information				Test Stresses		Initial Conditions			Final Conditions	
Test #	Sample Lab ID	Depth (ft)	Diameter (in)	Normal (psf)	Max Shear (psf)	Height (in)	Moisture (%)	Density (pcf)	Height (in)	Moisture (%)
1	A	15	2.41	1,017.5	792.2	1.00	3.3	111.2	1.00	22.1
2	B	15	2.41	2,007.0	1,730.0	1.00	3.3	105.1	0.98	17.1
3	C	10	2.41	2,991.5	2,125.9	1.00	3.3	103.1	1.00	17.5

Notes and Special Test Conditions										

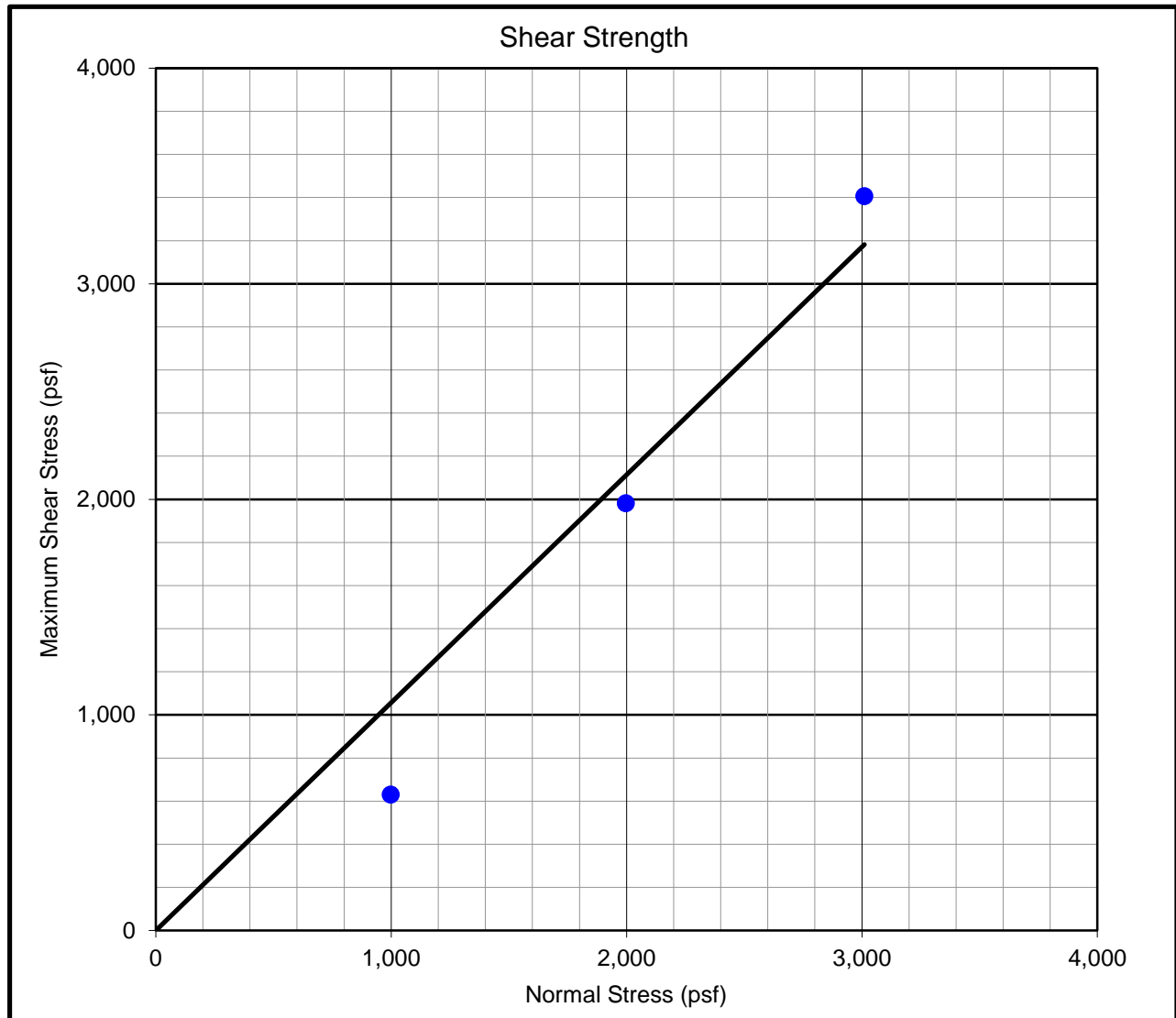
Project Information	
Project Name	SSCAFCA Lomita Negras Arroyo- Phase II
Location	Saratoga Rd and Lomitas Negras Arroyo
Client	Smith Engineering Co., Inc.
Project #	66175192

Test Results	
Friction Angle (°)	34
Cohesion (psf)	194
Shear Rate (in/min)	0.005



SOIL DIRECT SHEAR RESULTS

Sample Location: B-2 @ 10.0'

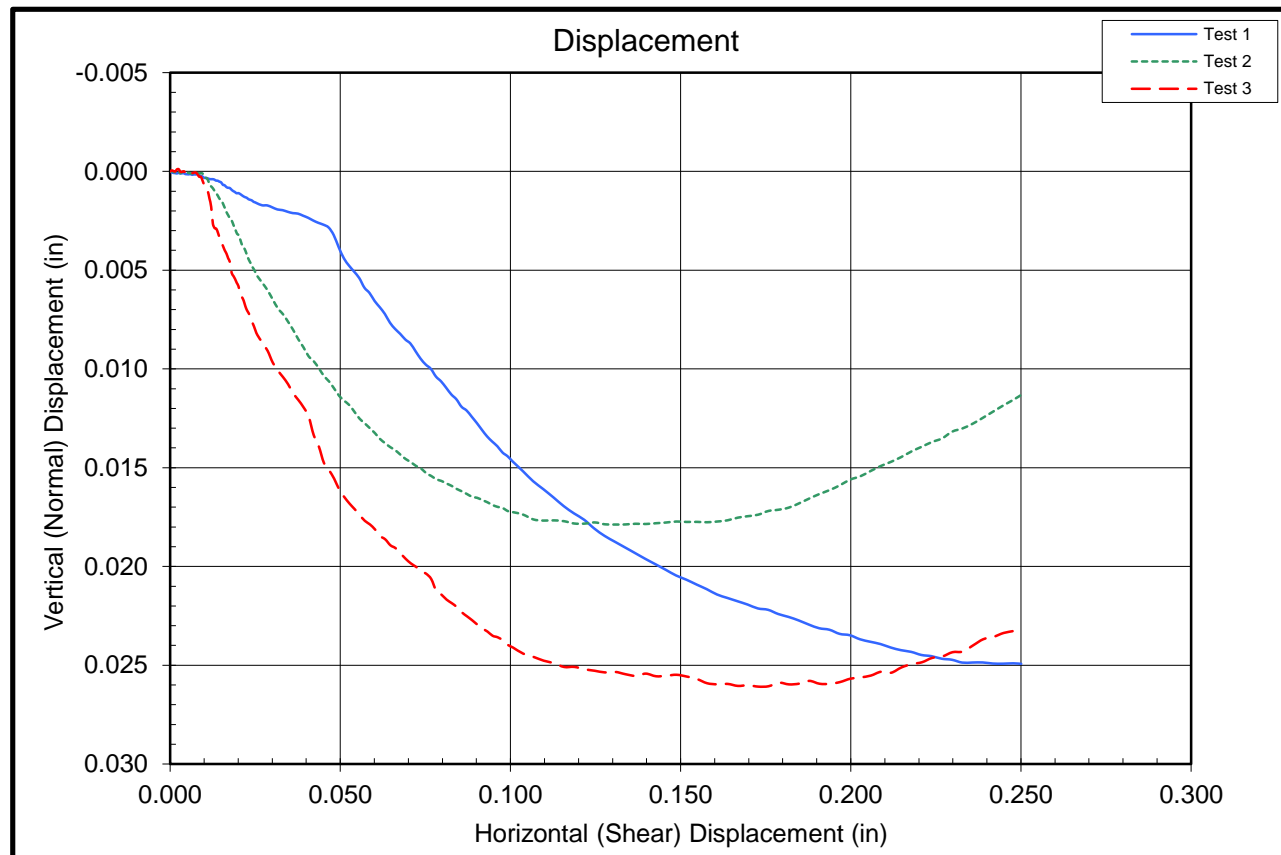
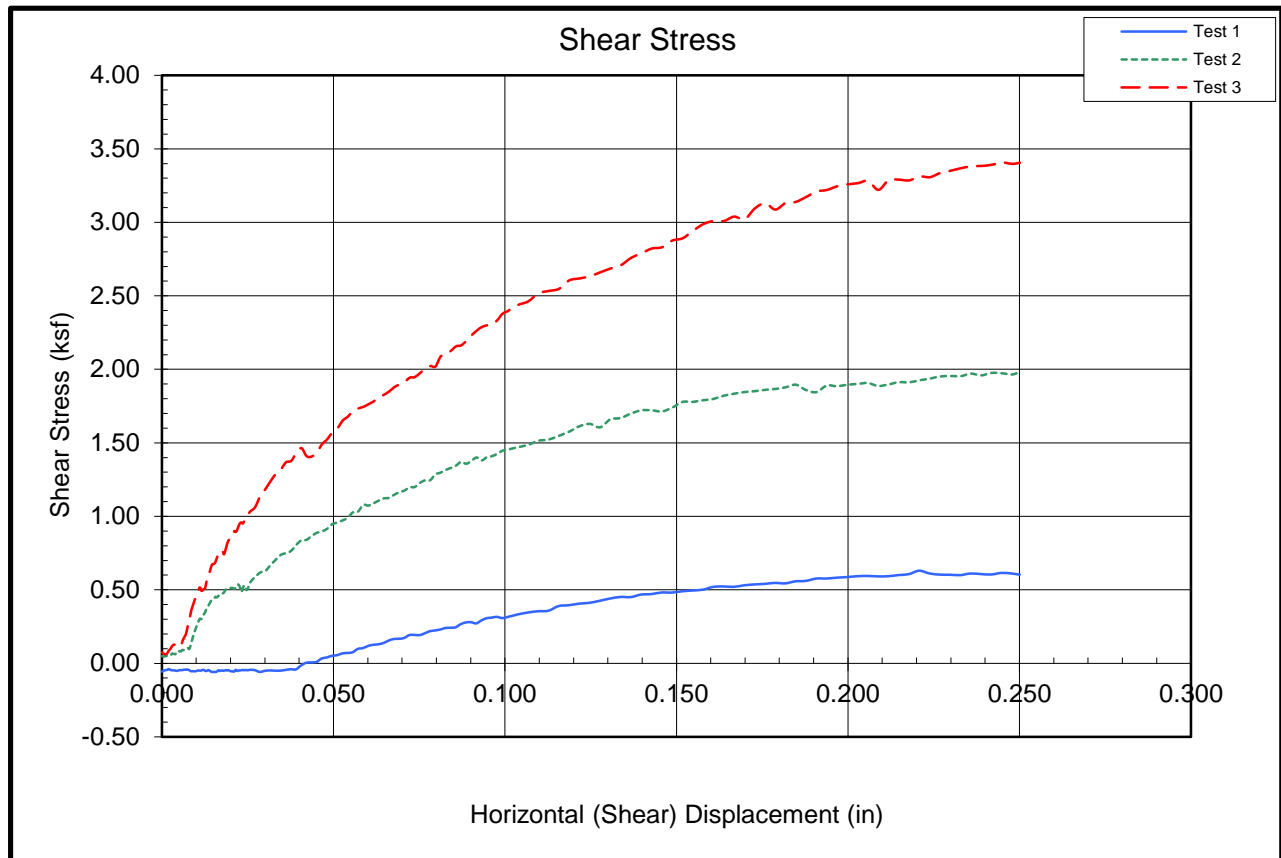


Test Parameters										
Sample Information				Test Stresses		Initial Conditions			Final Conditions	
Test #	Sample Lab ID	Depth (ft)	Diameter (in)	Normal (psf)	Max Shear (psf)	Height (in)	Moisture (%)	Density (pcf)	Height (in)	Moisture (%)
1	A	10	2.41	998.3	630.5	1.00	1.6	104.2	0.98	19.7
2	B	10	2.41	1,996.3	1,982.7	1.00	1.6	106.0	0.99	15.7
3	C	10	2.41	3,010.5	3,407.1	1.00	1.6	100.1	0.98	12.4

Notes and Special Test Conditions

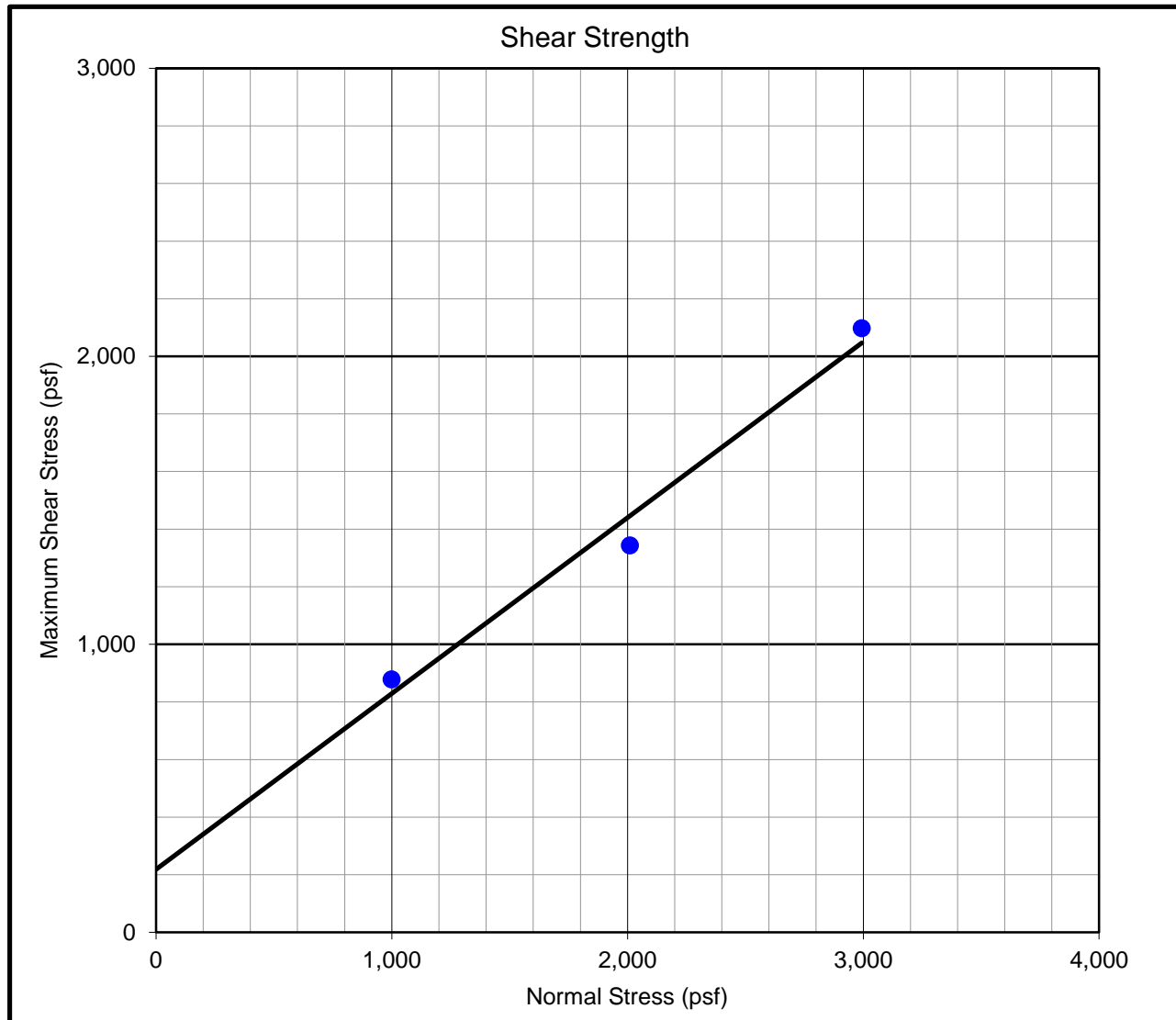
Project Information	
Project Name	SSCAFCA Lomita Negras Arroyo- Phase II
Location	Saratoga Rd and Lomitas Negras Arroyo
Client	Smith Engineering Co., Inc.
Project #	66175192

Test Results	
Friction Angle (°)	45
Cohesion (psf)	0
Shear Rate (in/min)	0.005



SOIL DIRECT SHEAR RESULTS

Sample Location: B-3 @ 15.0'

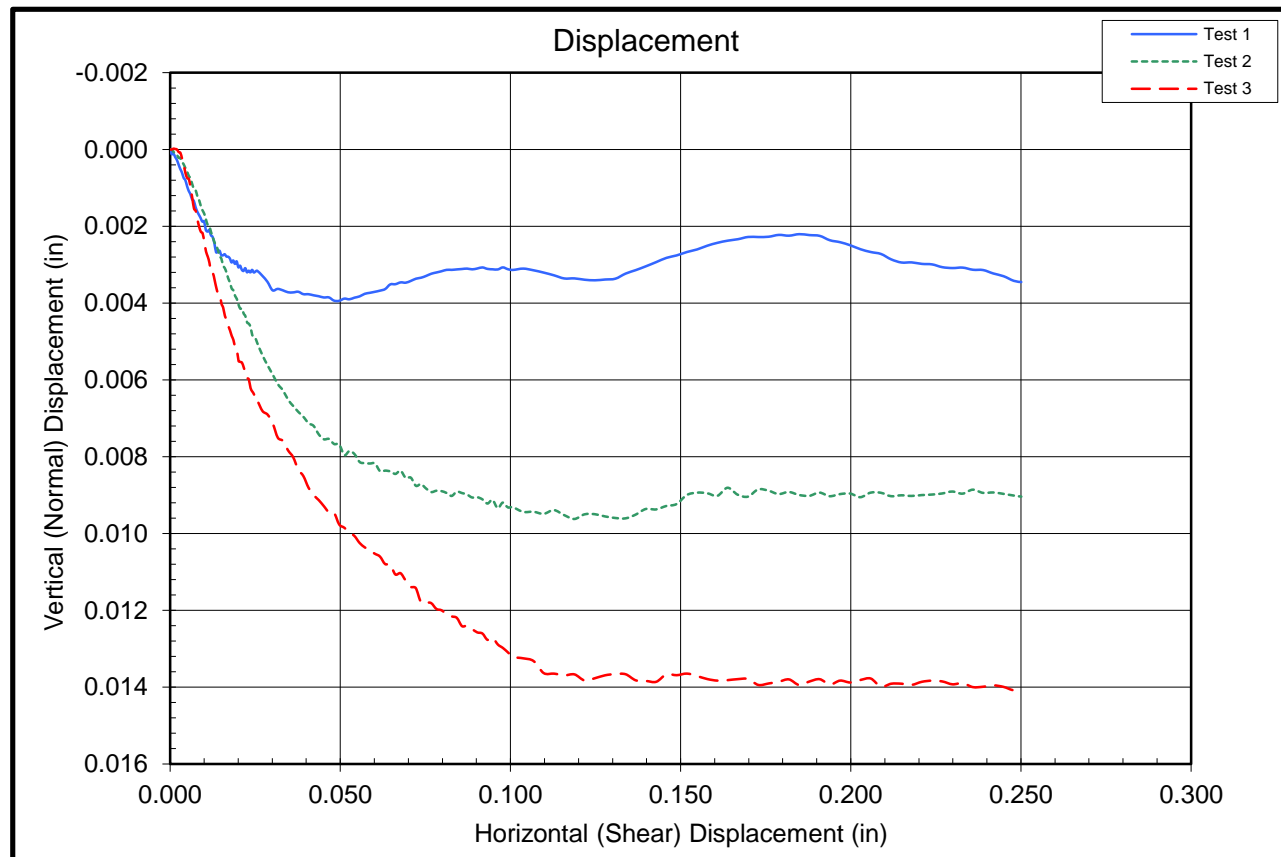
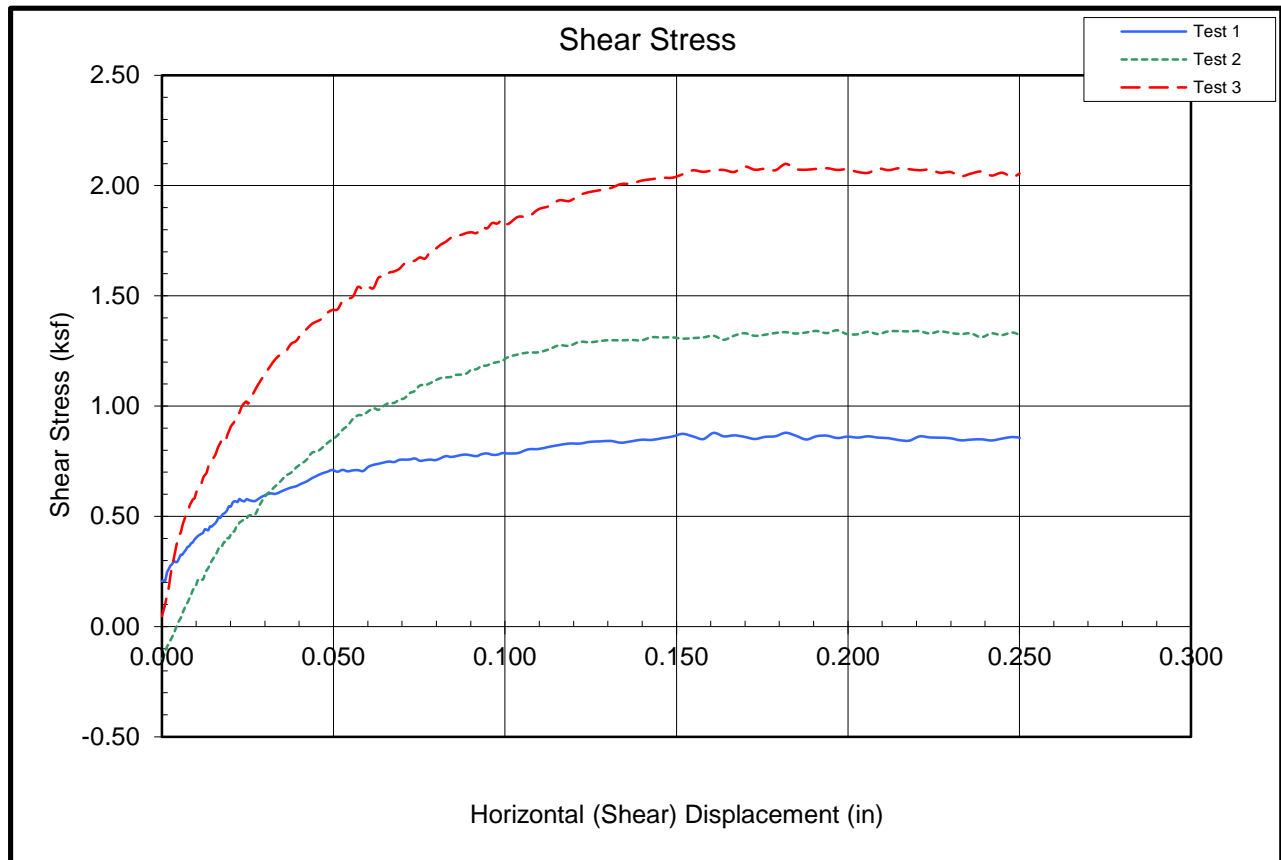


Test Parameters										
Sample Information				Test Stresses		Initial Conditions			Final Conditions	
Test #	Sample Lab ID	Depth (ft)	Diameter (in)	Normal (psf)	Max Shear (psf)	Height (in)	Moisture (%)	Density (pcf)	Height (in)	Moisture (%)
1	A	15	2.41	999.4	879.1	1.00	2.3	108.6	1.00	19.4
2	B	15	2.41	2,009.6	1,343.8	1.00	2.3	108.1	0.99	15.4
3	C	15	2.41	2,993.8	2,098.2	1.00	2.3	110.5	0.99	15.9

Notes and Special Test Conditions										

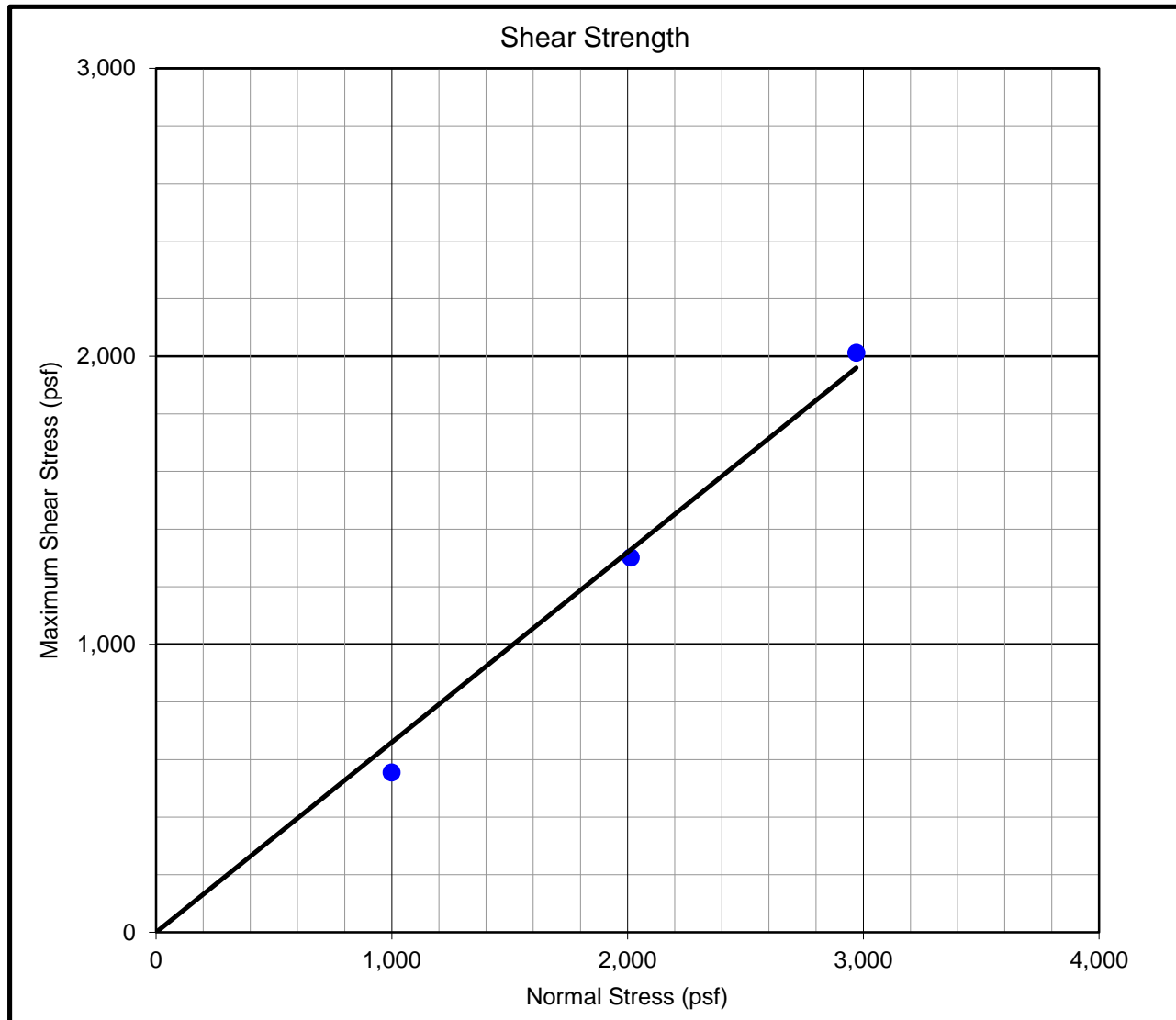
Project Information	
Project Name	SSCAFCA Lomita Negras Arroyo- Phase II
Location	Saratoga Rd and Lomitas Negras Arroyo
Client	Smith Engineering Co., Inc.
Project #	66175192

Test Results	
Friction Angle (°)	31
Cohesion (psf)	219
Shear Rate (in/min)	0.005



SOIL DIRECT SHEAR RESULTS

Sample Location: B-4 @ 15.0'

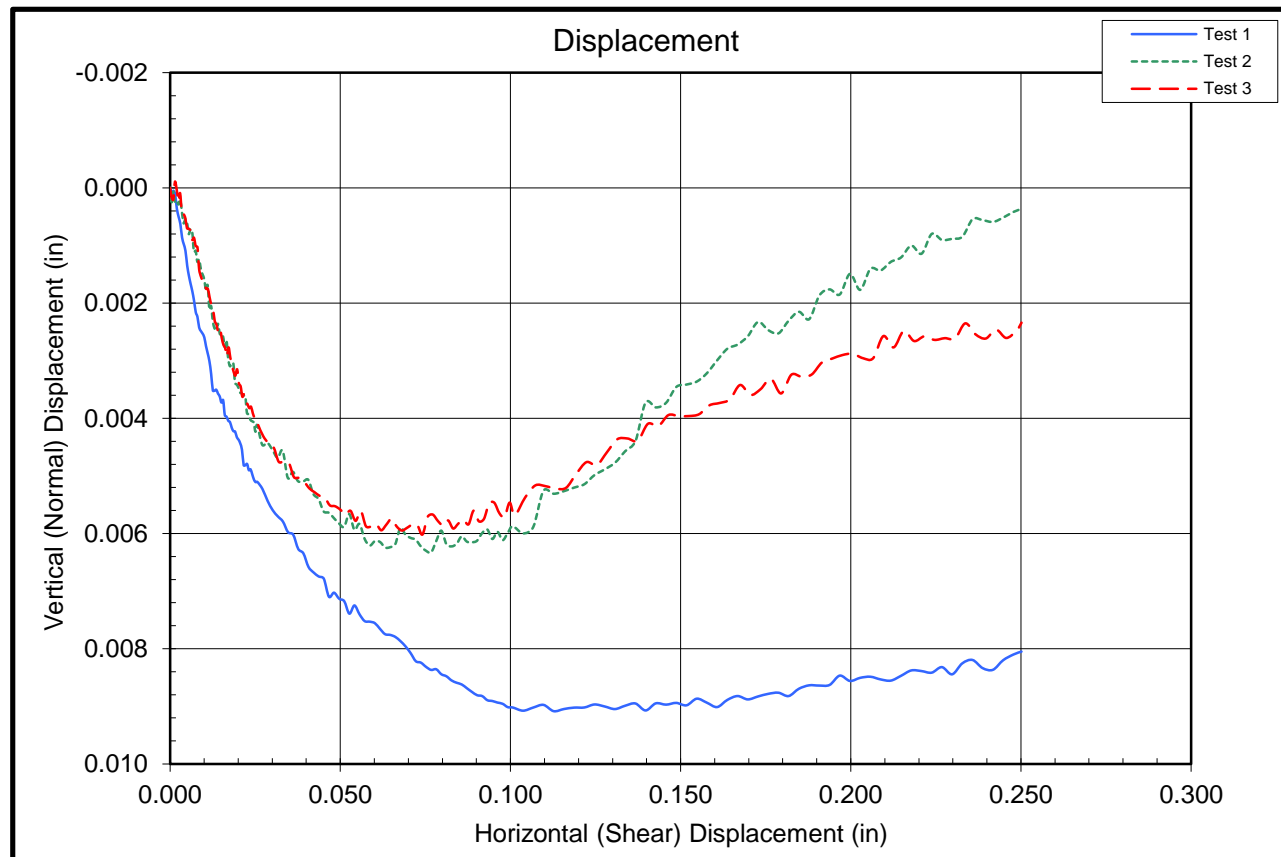
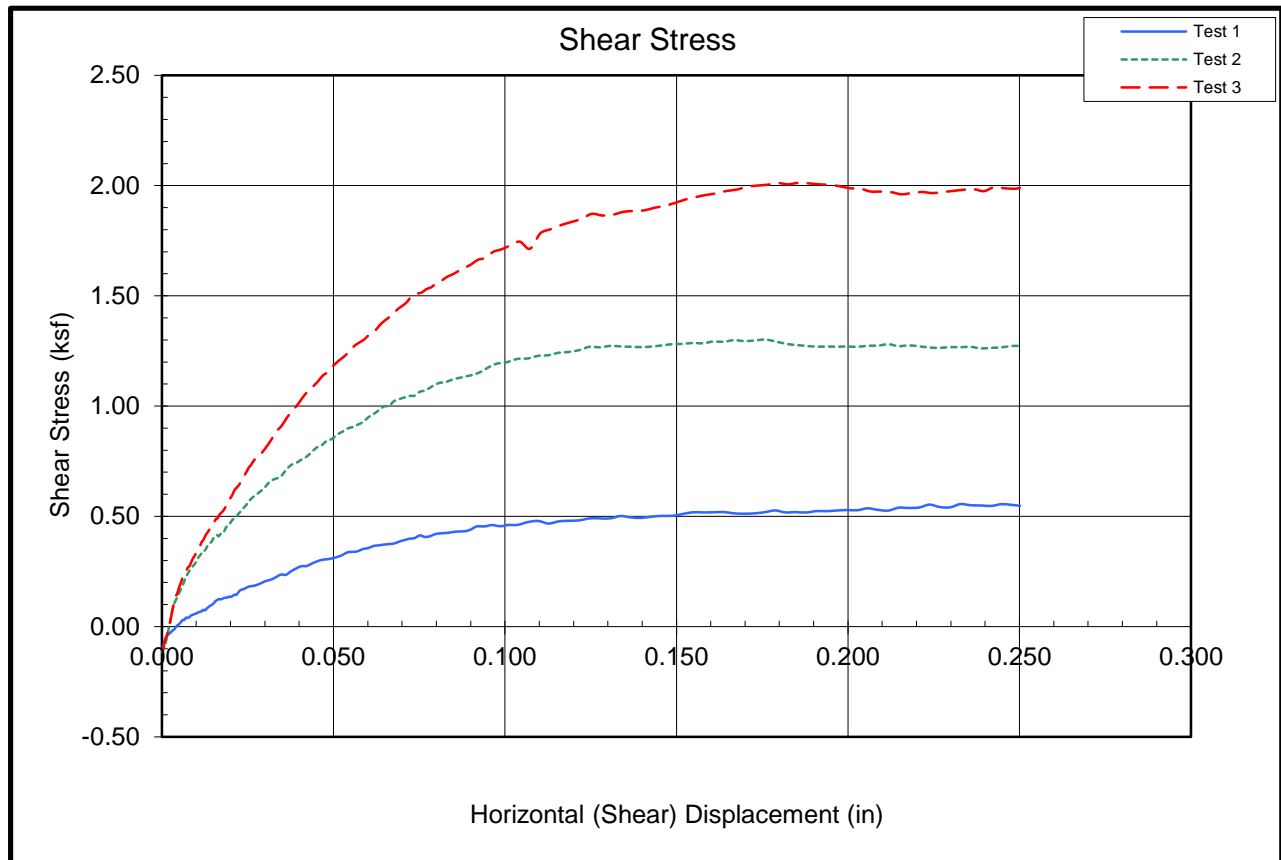


Test Parameters										
Sample Information				Test Stresses		Initial Conditions			Final Conditions	
Test #	Sample Lab ID	Depth (ft)	Diameter (in)	Normal (psf)	Max Shear (psf)	Height (in)	Moisture (%)	Density (pcf)	Height (in)	Moisture (%)
1	A	10	2.41	999.0	555.7	1.00	2.0	100.9	0.99	20.5
2	B	10	2.41	2,013.1	1,301.8	1.00	2.0	100.3	1.00	22.9
3	C	15	2.41	2,970.0	2,012.4	1.00	2.0	98.5	1.00	23.7

Notes and Special Test Conditions
Samples A, B, and C were remolded due samples being disturbed.

Project Information	
Project Name	SSCAFCA Lomita Negras Arroyo- Phase II
Location	Saratoga Rd and Lomitas Negras Arroyo
Client	Smith Engineering Co., Inc.
Project #	66175192

Test Results	
Friction Angle (°)	34
Cohesion (psf)	0
Shear Rate (in/min)	0.005



Summary of Laboratory Results

Sheet 1 of 2

Sheet 1 of 2													
BORING ID	Depth	USCS Classification and Soil Description	Compressive Strength (psf)	Liquid Limit	Plastic Limit	Plasticity Index	% <#200 Sieve	% Gravel	% Sand	% Silt	% Clay	Water Content (%)	Dry Density (pcf)
B-01	2.5 - 4	SILTY SAND with GRAVEL(SM)		NP	NP	NP	20.4	22.9	56.7			3.4	
B-01	5 - 6.5											2.5	
B-01	10 - 11.5											5.4	
B-01	15 - 16											3.3	92.2
B-01	20 - 21.42	SANDY SILT(ML)		NP	NP	NP	53.8	0.1	46.2			9.2	
B-01	25 - 26.33											4.8	
B-01	30 - 30.92	SILTY SAND(SM)		NP	NP	NP	31.8	3.2	64.9			5.0	
B-01	35 - 35.92											5.9	
B-01	40 - 41.5	SANDY SILT(ML)		NP	NP	NP	53.9	2.3	43.8			15.7	
B-01	45 - 46.25												
B-02	2.5 - 4	SILTY SAND(SM)		NP	NP	NP	16.1	6.2	77.8			3.0	
B-02	5 - 6.5											3.3	
B-02	10 - 11											1.6	110.0
B-02	15 - 16.5											3.4	
B-02	20 - 20.42	SILTY SAND(SM)		NP	NP	NP	19.8	4.6	75.6			3.4	
B-02	25 - 26.5											3.3	
B-02	30 - 31.5	SILTY SAND(SM)		NP	NP	NP	17.4	0.3	82.3			3.4	
B-03	2.5 - 4	SILTY SAND(SM)		NP	NP	NP	14.9	1.4	83.7			2.7	
B-03	5 - 6											2.3	113.0
B-03	10 - 11.5	POORLY GRADED SAND with		NP	NP	NP	8.1	6.0	85.9			2.7	
		SILT(SP-SM)											
B-03	15 - 16.5											2.2	
B-03	20 - 21.5	SILTY SAND(SM)		NP	NP	NP	15.7	0.0	84.3			4.2	
B-03	22												
B-03	25 - 26.5											5.1	
B-03	30 - 31.5	SILTY SAND(SM)		NP	NP	NP	24.4	0.0	75.6			5.9	
B-04	2.5 - 4	SILTY SAND(SM)		NP	NP	NP	14.8	7.5	77.7			2.3	
B-04	5 - 6.5											1.7	
B-04	10 - 11.5	POORLY GRADED SAND with SILT		NP	NP	NP	6.4	15.7	77.9			1.7	
		and GRAVEL(SP-SM)											
B-04	15 - 16											2.0	99.8
B-04	20 - 21.5	SILTY SAND(SM)		NP	NP	NP	27.3	0.1	72.6			4.4	
B-04	25 - 26.5											4.8	
B-04	30 - 31.5	SILTY SAND(SM)		NP	NP	NP	27.1	1.9	71.1			4.9	
B-04	35 - 36.5											4.1	
B-04	40 - 41.5												
B-04	45 - 46.5												
B-04	50 - 51.5												
F-01	0 - 1	POORLY GRADED SAND with		NP	NP	NP	9.3	13.1	77.6			1.1	
		SILT(SP-SM)											
F-02	0 - 1	SILTY SAND(SM)		NP	NP	NP	14.3	4.4	81.3			1.2	
F-03	0 - 1	POORLY GRADED SAND with		NP	NP	NP	10.9	12.1	77.0			1.1	
PROJECT: SSCAFCA Lomitas Negras Arroyo - Phase II			<div>Terracon</div> <div>4905 Hawkins St NE</div> <div>Albuquerque, NM</div>				PROJECT NUMBER: 66175192						
SITE: Saratoga Dr NE and Lomitas Negras Arroyo Sandoval County, NM							CLIENT: Smith Engineering Co., Inc. Albuquerque, NM						
							EXHIBIT: B-20						

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. OLD-LAB SUMMARY: USCS-NO ASSIGNMENT 66175192.GPJ TERRACON_DATATEMPLATE.GDT 4/25/18

Summary of Laboratory Results

Sheet 2 of 2

BORING ID	Depth	USCS Classification and Soil Description	Compressive Strength (psf)	Liquid Limit	Plastic Limit	Plasticity Index	% <#200 Sieve	% Gravel	% Sand	% Silt	% Clay	Water Content (%)	Dry Density (pcf)
		SILT(SP-SM)											
F-04	0 - 1	SILTY SAND(SM)		NP	NP	NP	15.7	0.1	84.3			1.8	
F-05	0 - 1	POORLY GRADED SAND(SP)		NP	NP	NP	3.8	10.0	86.2			0.6	
F-06	0 - 1	POORLY GRADED SAND(SP)		NP	NP	NP	3.5	3.6	92.9			0.5	

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. OLD-LAB SUMMARY: USCS-NO ASSIGNMENT 66175192.GPJ TERRACON_DATATEMPLATE.GDT 4/25/18

PROJECT: SSCAFCA Lomitas Negras Arroyo
- Phase II

SITE: Saratoga Dr NE and Lomitas Negras
Arroyo
Sandoval County, NM

Terracon
4905 Hawkins St NE
Albuquerque, NM

PROJECT NUMBER: 66175192

CLIENT: Smith Engineering Co., Inc.
Albuquerque, NM

EXHIBIT: B-21



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 06, 2018

Mike Anderson

Terracon

4905 Hawkins, NE

Albuquerque, NM 87109

TEL: (505) 797-4287

FAX (505) 797-4288

RE: SSCAFCA Lomitas Negras Arroyo

OrderNo.: 1801C22

Dear Mike Anderson:

Hall Environmental Analysis Laboratory received 3 sample(s) on 1/25/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1801C22

Date Reported: 2/6/2018

CLIENT: Terracon

Client Sample ID: B-01 @ 25

Project: SS CAFCA Lomitas Negras Arroyo

Collection Date: 1/17/2018

Lab ID: 1801C22-001

Matrix: SOIL

Received Date: 1/25/2018 11:06:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	22	1.5		mg/Kg	1	1/30/2018 7:34:55 PM	36261
Sulfate	20	1.5		mg/Kg	1	1/30/2018 7:34:55 PM	36261
RESISTIVITY AND EC SOIL							Analyst: JRR
Resistivity	1990	1.00		Ohms * cm	1	1/31/2018 10:20:00 AM	36274
SM4500-H+B: PH							Analyst: JRR
pH	8.53			pH Units	1	1/31/2018 2:01:00 PM	R48811

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1801C22

Date Reported: 2/6/2018

CLIENT: Terracon

Client Sample ID: B-02 @ 5

Project: SS CAFCA Lomitas Negras Arroyo

Collection Date: 1/17/2018

Lab ID: 1801C22-002

Matrix: SOIL

Received Date: 1/25/2018 11:06:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	1.5		mg/Kg	1	1/30/2018 7:47:20 PM	36261
Sulfate	5.5	1.5		mg/Kg	1	1/30/2018 7:47:20 PM	36261
RESISTIVITY AND EC SOIL							Analyst: JRR
Resistivity	6130	1.00		Ohms * cm	1	1/31/2018 10:20:00 AM	36274
SM4500-H+B: PH							Analyst: JRR
pH	8.66			pH Units	1	1/31/2018 2:01:00 PM	R48811

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1801C22

Date Reported: 2/6/2018

CLIENT: Terracon

Client Sample ID: B-04 @ 5

Project: SS CAFCA Lomitas Negras Arroyo

Collection Date: 1/17/2018

Lab ID: 1801C22-003

Matrix: SOIL

Received Date: 1/25/2018 11:06:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	16	1.5		mg/Kg	1	1/30/2018 9:14:11 PM	36270
Sulfate	2.0	1.5		mg/Kg	1	1/30/2018 9:14:11 PM	36270
RESISTIVITY AND EC SOIL							Analyst: JRR
Resistivity	3040	1.00		Ohms * cm	1	1/31/2018 10:20:00 AM	36274
SM4500-H+B: PH							Analyst: JRR
pH	8.54			pH Units	1	1/31/2018 2:01:00 PM	R48811

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1801C22

06-Feb-18

Client: Terracon
Project: SSCAFCA Lomitas Negras Arroyo

Sample ID	MB-36261		SampType: mblk		TestCode: EPA Method 300.0: Anions					
Client ID:	PBS		Batch ID: 36261		RunNo: 48793					
Prep Date:	1/30/2018		Analysis Date: 1/30/2018		SeqNo: 1570157		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								
Sulfate	ND	1.5								

Sample ID	LCS-36261		SampType: lcs		TestCode: EPA Method 300.0: Anions					
Client ID:	LCSS		Batch ID: 36261		RunNo: 48793					
Prep Date:	1/30/2018		Analysis Date: 1/30/2018		SeqNo: 1570158		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.1	90	110			
Sulfate	28	1.5	30.00	0	92.1	90	110			

Sample ID	MB-36270		SampType: mblk		TestCode: EPA Method 300.0: Anions					
Client ID:	PBS		Batch ID: 36270		RunNo: 48793					
Prep Date:	1/30/2018		Analysis Date: 1/30/2018		SeqNo: 1570191		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								
Sulfate	ND	1.5								

Sample ID	LCS-36270		SampType: lcs		TestCode: EPA Method 300.0: Anions					
Client ID:	LCSS		Batch ID: 36270		RunNo: 48793					
Prep Date:	1/30/2018		Analysis Date: 1/30/2018		SeqNo: 1570192		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	91.0	90	110			
Sulfate	27	1.5	30.00	0	91.6	90	110			

Sample ID	1801C22-003AMS		SampType: ms		TestCode: EPA Method 300.0: Anions					
Client ID:	B-04 @ 5		Batch ID: 36270		RunNo: 48793					
Prep Date:	1/30/2018		Analysis Date: 1/30/2018		SeqNo: 1570196		Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	31	1.5	15.00	15.98	98.1	60.8	141			
Sulfate	29	1.5	30.00	1.958	91.1	71.9	115			

Sample ID	1801C22-003AMSD		SampType:	msd		TestCode:	EPA Method 300.0: Anions				
Client ID:	B-04 @ 5		Batch ID:	36270		RunNo:	48793				
Prep Date:	1/30/2018		Analysis Date:	1/30/2018		SeqNo:	1570197		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Value above quantitation range
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Detection Limit
S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1801C22

06-Feb-18

Client: Terracon

Project: SSCAFCA Lomitas Negras Arroyo

Sample ID	1801C22-003AMSD	SampType:	msd	TestCode:	EPA Method 300.0: Anions					
Client ID:	B-04 @ 5	Batch ID:	36270	RunNo:	48793					
Prep Date:	1/30/2018	Analysis Date:	1/30/2018	SeqNo:	1570197	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	30	1.5	15.00	15.98	94.7	60.8	141	1.70	20	
Sulfate	29	1.5	30.00	1.958	91.4	71.9	115	0.285	20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: TER-Alb

Work Order Number: 1801C22

RcptNo: 1

Received By: Dennis Suazo 1/25/2018 11:06:00 AM

Completed By: Dennis Suazo 1/25/2018 1:08:44 PM

Reviewed By: JMO

1/25/18

Dennis Suazo

Dennis Suazo

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Client

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☐ No ☒ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels? Yes ☒ No ☐
(Note discrepancies on chain of custody)
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met? Yes ☒ No ☐
(If no, notify customer for authorization.)

of preserved
bottles checked
for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: _____ Date: _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	13.9	Good	Not Present			

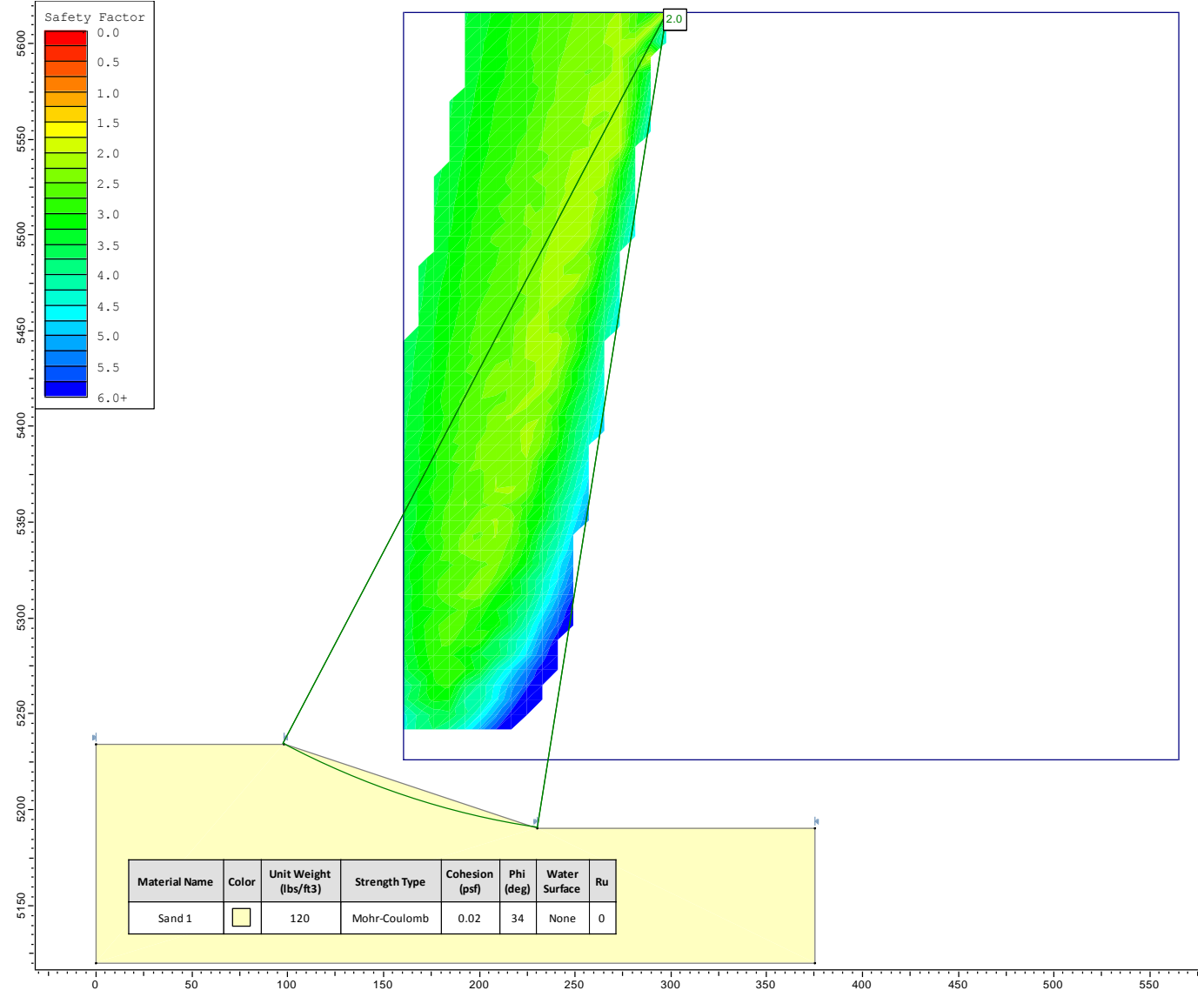
Geotechnical Engineering Report

SSCAFCA Lomitas Negras Arroyo – Phase 2 ■ Sandoval County, New Mexico

April 25, 2018 ■ Terracon Project No. 66175192



APPENDIX C
SLOPE STABILITY



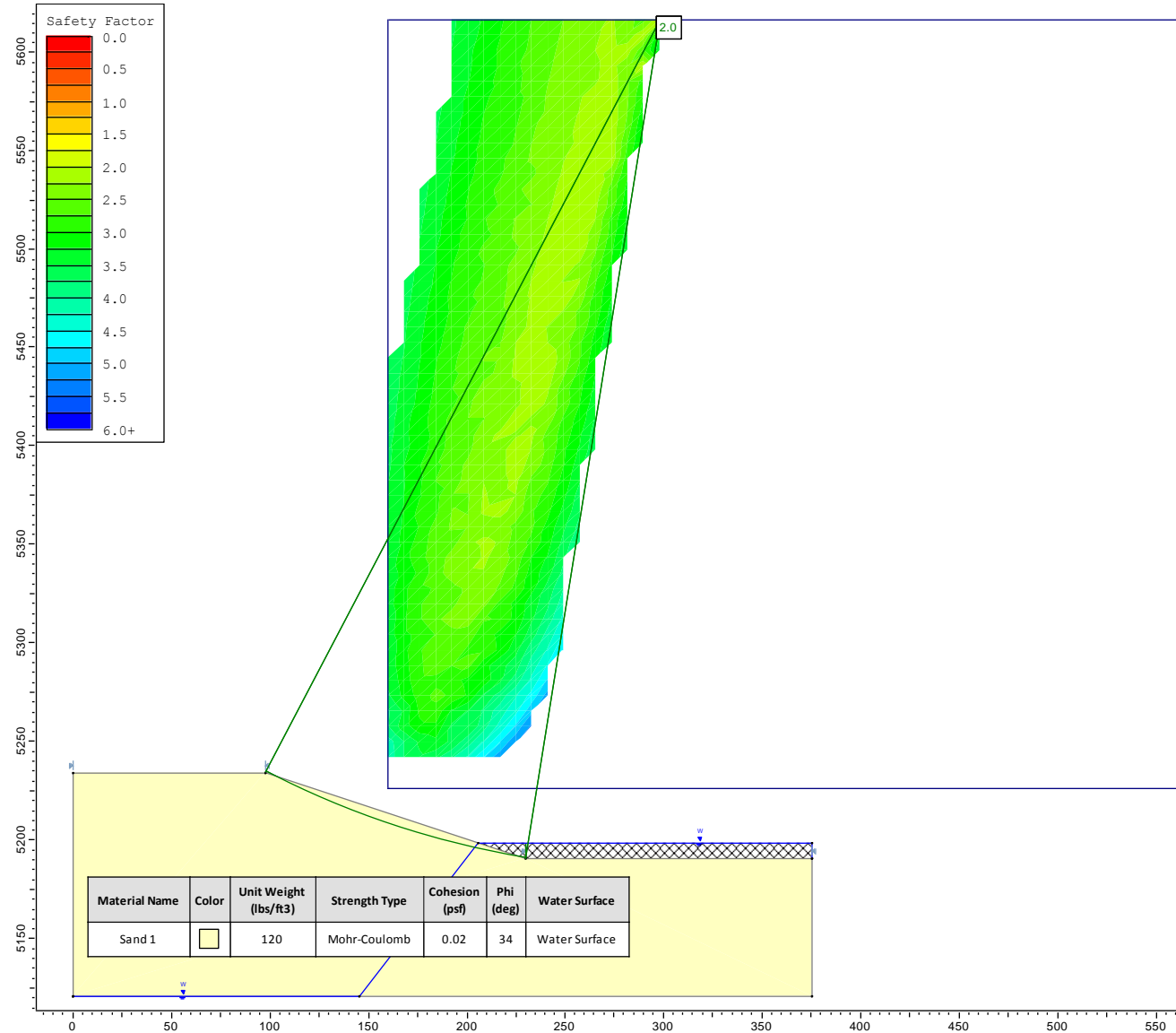
NW Cut Slope
Max Height 44 Feet
Slope 3H : 1V

Project Mgr:	MEA	Project No.	66175192
Drawn By:	MJD	Scale:	As Shown
Checked By:	MEA	File No.	
Approved By:	MEA	Date:	3/2018

Terracon
Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109
Phone: 505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
SSCAFCA Lomitas Negras Arroyo – Phase II
Saratoga Road and Lomitas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C1



NW Cut Slope
With Water
(Steady State)
Max Height 44 Feet
Slope 3H : 1V

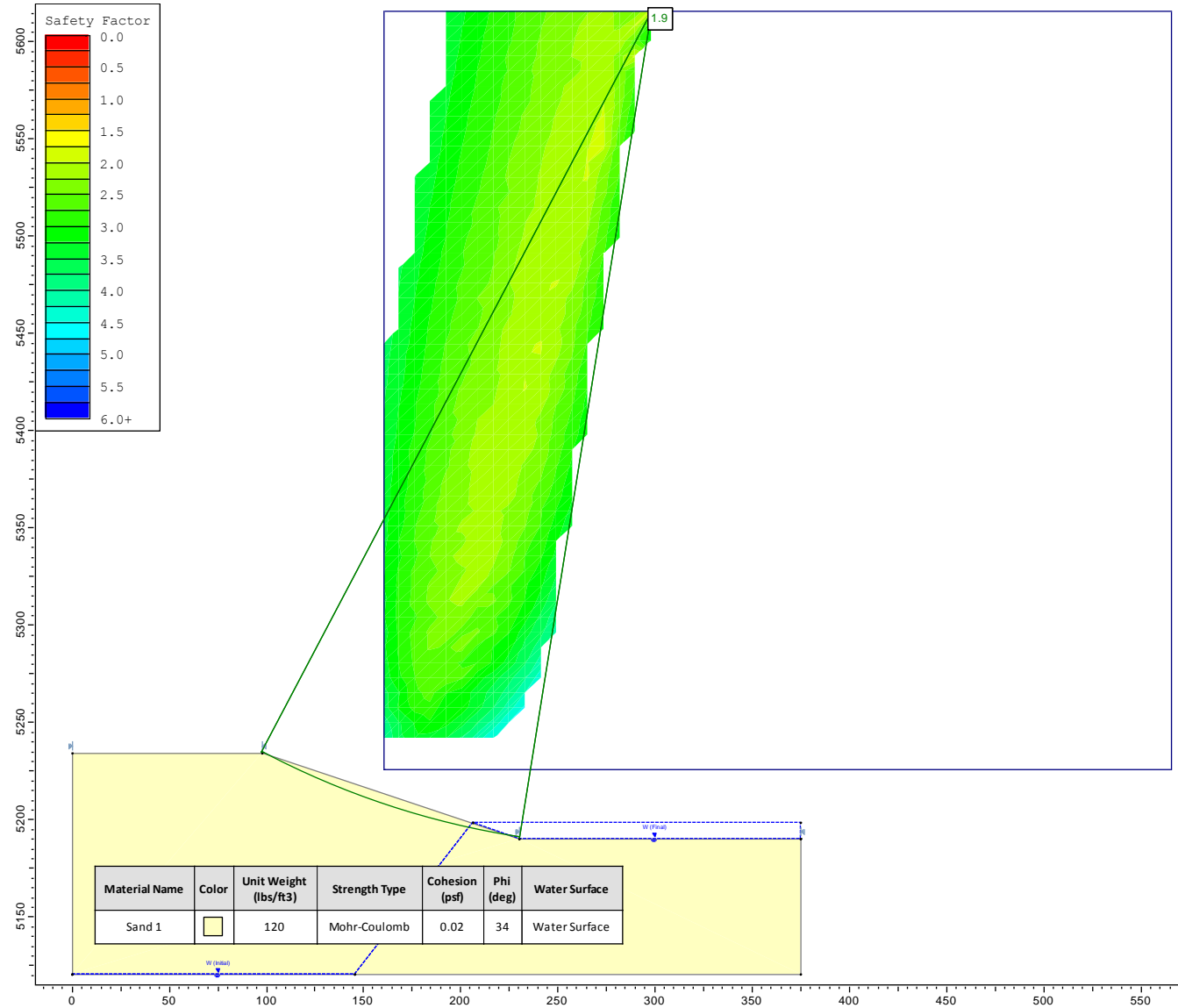
Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA

Project No. 66175192
Scale: As Shown
File No.
Date: 3/2018

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Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109
Phone: 505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
SSCAFCA Lomas Negras Arroyo – Phase II
Saratoga Road and Lomas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C2



NW Cut Slope
With Water
(Rapid Drawdown)
Max Height 44 Feet
Slope 3H : 1V

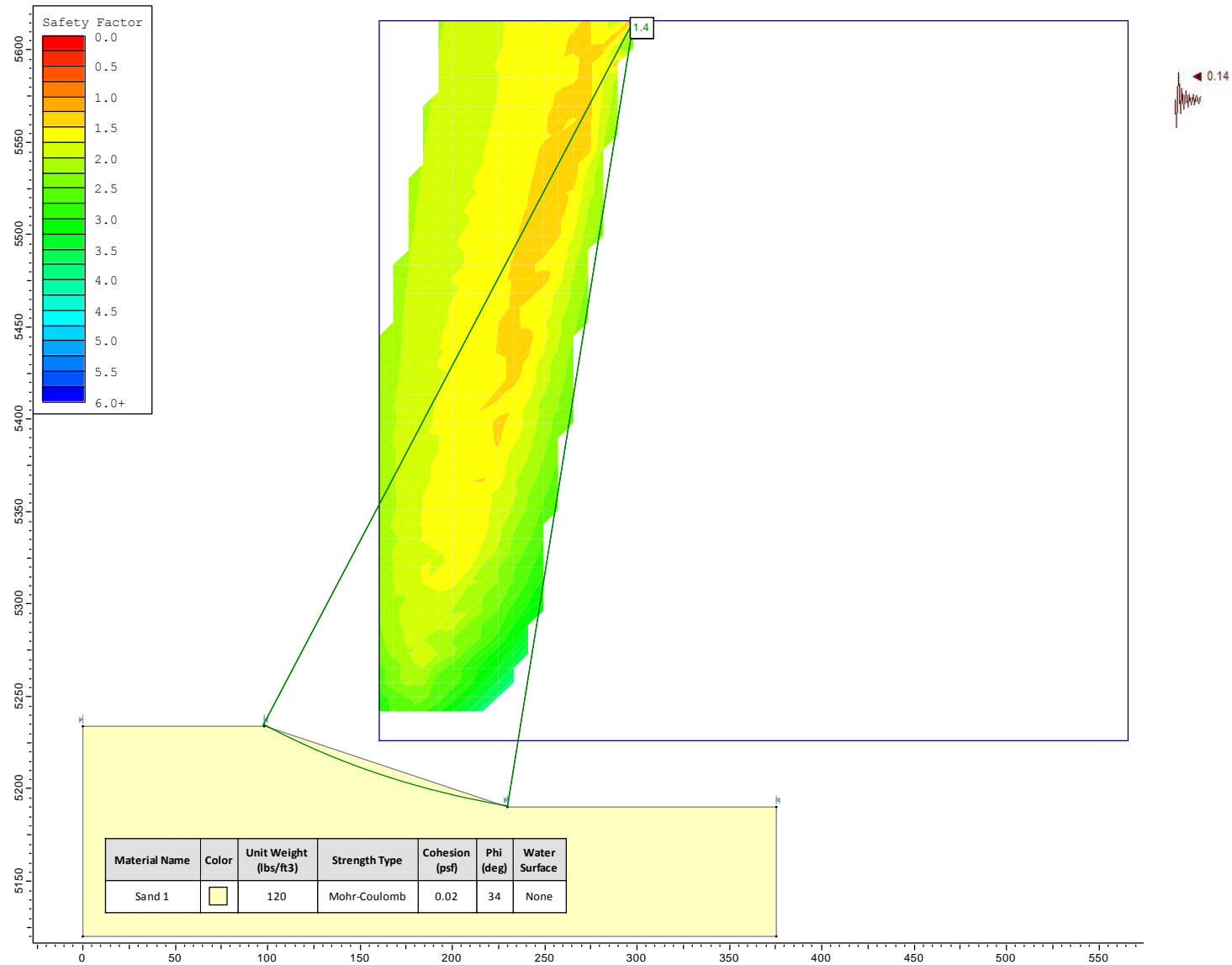
Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA

Project No. 66175192
Scale: As Shown
File No.
Date: 3/2018

Terracon
Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109
Phone: 505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
SSCAFCA Lomitas Negras Arroyo – Phase II
Saratoga Road and Lomitas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C3



NW Cut Slope
Seismic
Max Height 44 Feet
Slope 3H : 1V

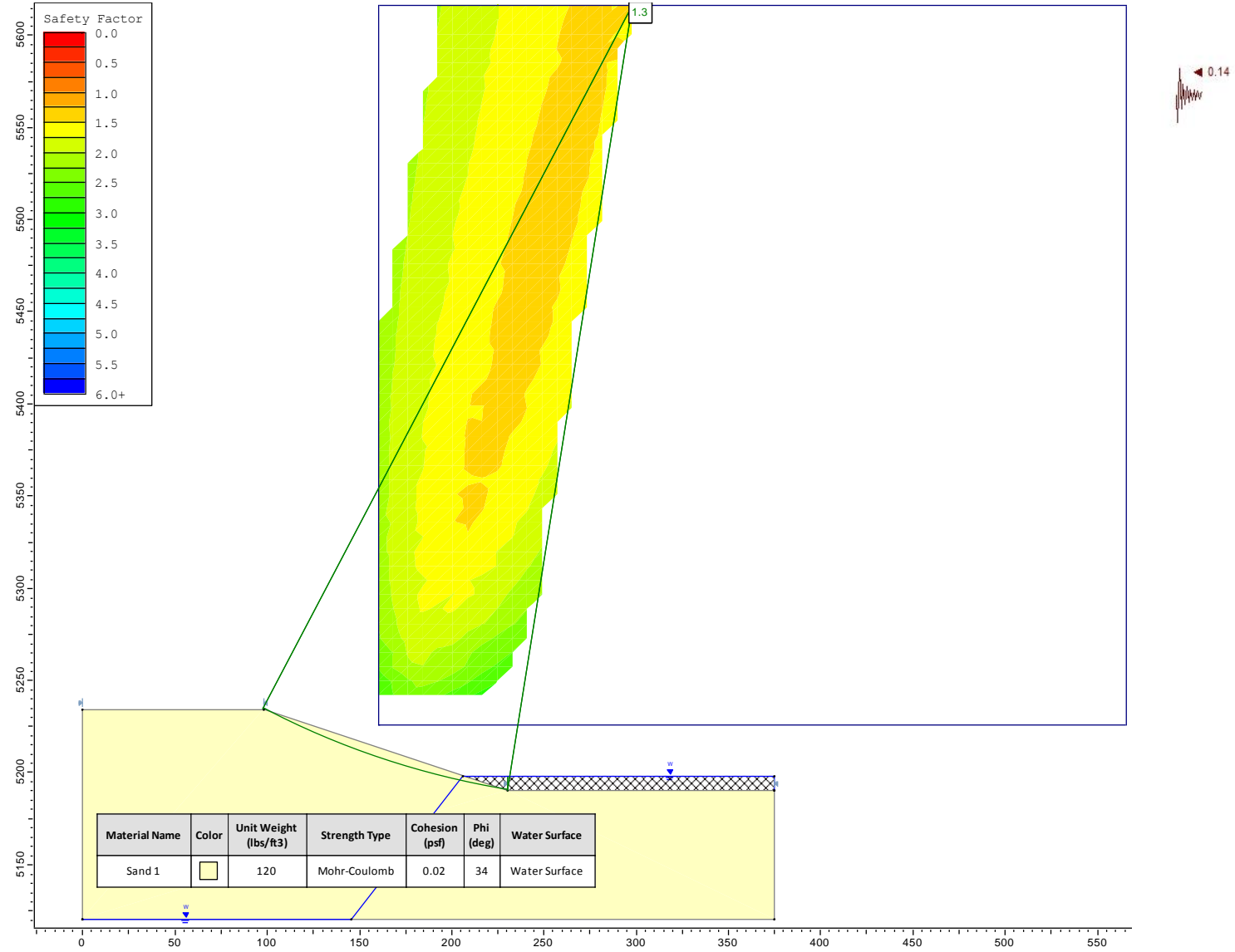
Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA

Project No. 66175192
Scale: As Shown
File No.
Date: 3/2018

Terracon
Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109
Phone: 505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
SSCAFCA Lomitas Negras Arroyo – Phase II
Saratoga Road and Lomitas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C4



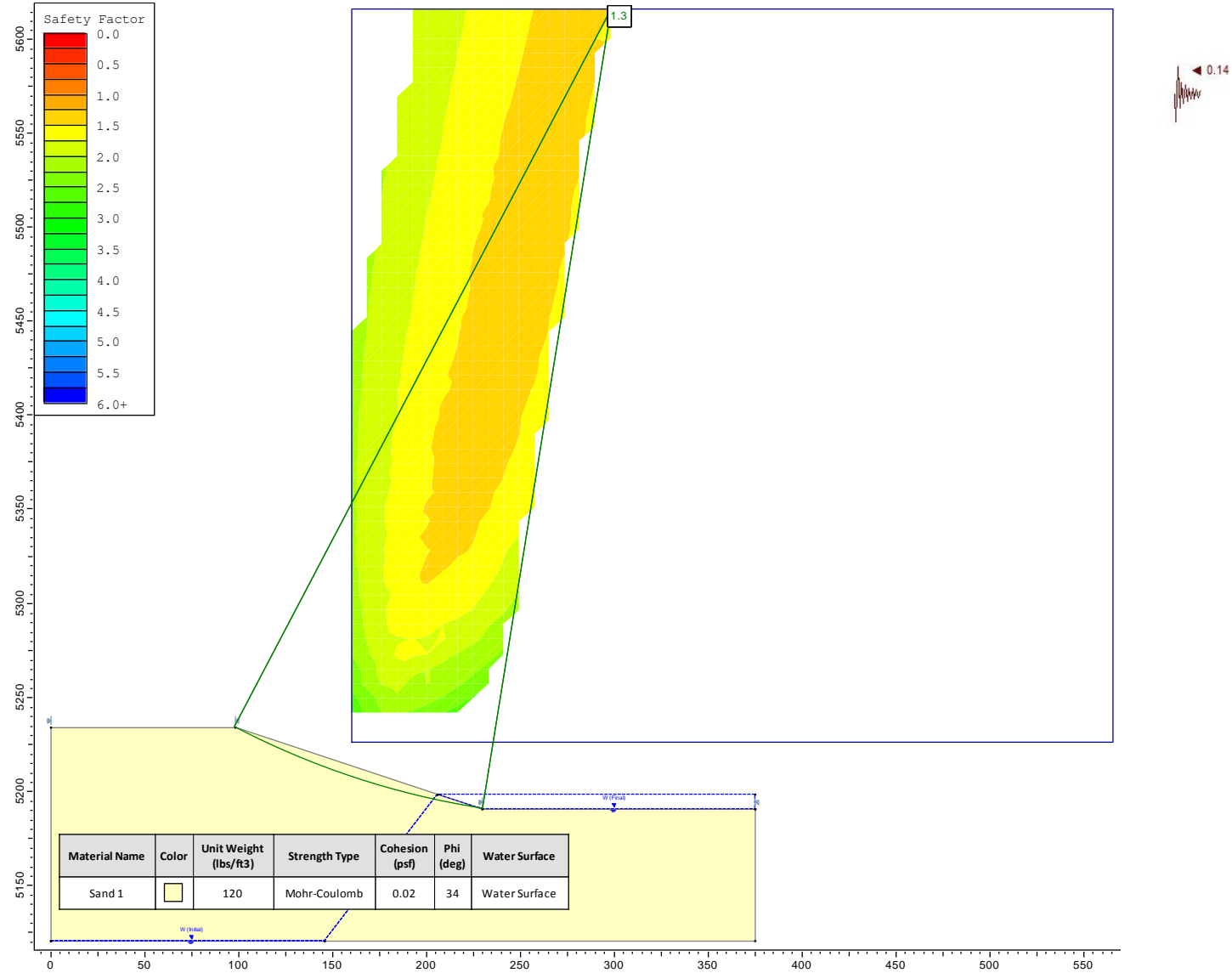
NW Cut Slope
Seismic with Water
(Steady State)
Max Height 44 Feet
Slope 3H : 1V

Project Mgr:	MEA	Project No.	66175192
Drawn By:	MJD	Scale:	As Shown
Checked By:	MEA	File No.	
Approved By:	MEA	Date:	3/2018

Terracon
Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109
Phone: 505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
SSCAFCA Lomitas Negras Arroyo – Phase II
Saratoga Road and Lomitas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C5



NW Cut Slope
Seismic with Water
(Rapid Drawdown)
Max Height 44 Feet
Slope 3H : 1V

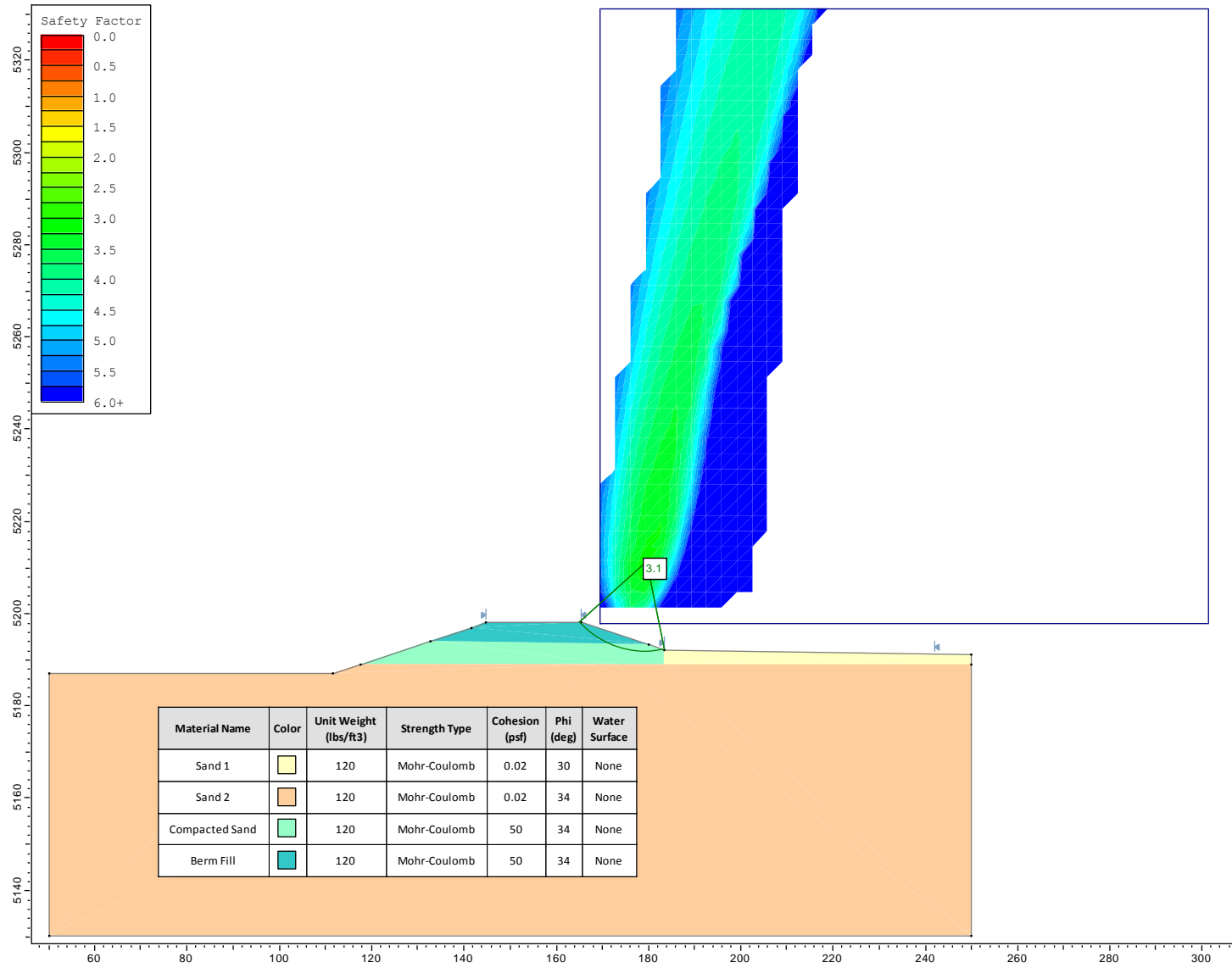
Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA

Project No. 66175192
Scale: As Shown
File No.
Date: 3/2018

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Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109
Phone: 505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
SSCAFCA Lomitas Negras Arroyo – Phase II
Saratoga Road and Lomitas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C6



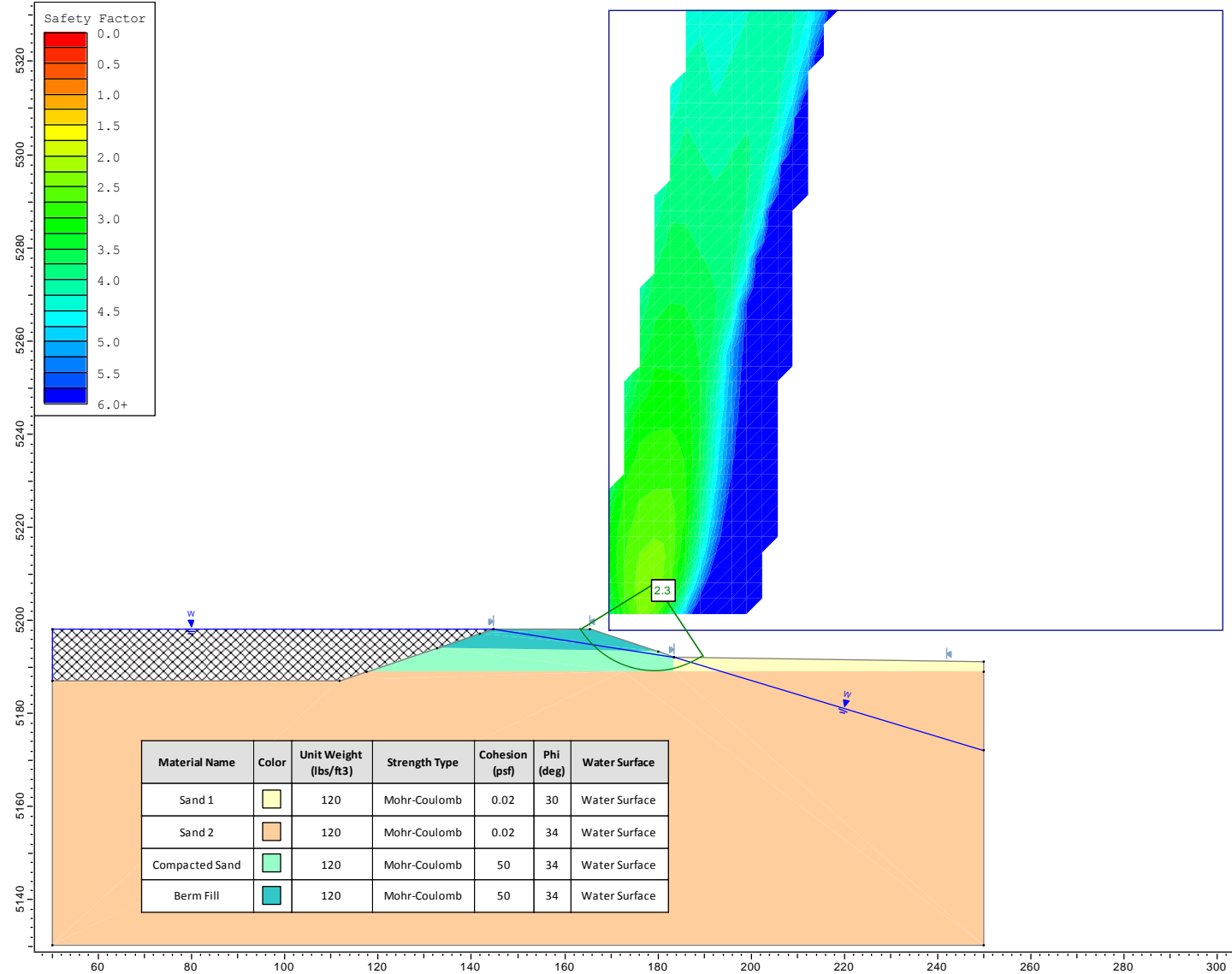
Berm Downstream
Slope
Max Height 6 Feet
Slope 3H : 1V

Project Mgr:	MEA	Project No.	66175192
Drawn By:	MJD	Scale:	As Shown
Checked By:	MEA	File No.	
Approved By:	MEA	Date:	3/2018

Terracon
Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109
Phone: 505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
SSCAFCA Lomitas Negras Arroyo – Phase II
Saratoga Road and Lomitas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C7



Berm Downstream Slope
With Water (Steady
State)
Max Height 6 Feet
Slope 3H : 1V

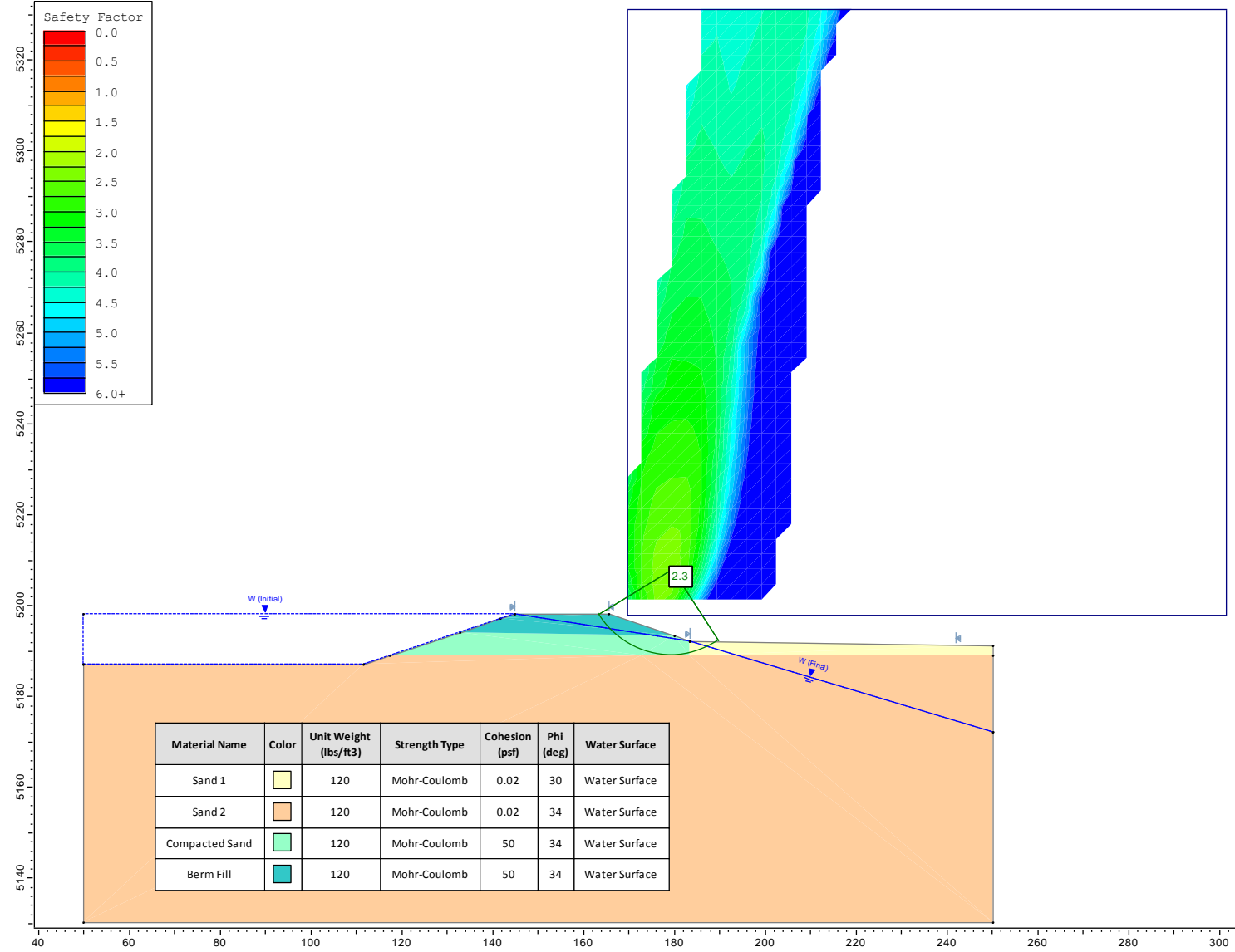
Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA

Project No. 66175192
Scale: As Shown
File No.
Date: 3/2018

Terracon
Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109
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SLOPE STABILITY ANALYSIS
SSCAFCA Lomitas Negras Arroyo – Phase II
Saratoga Road and Lomitas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C8



Berm Downstream Slope
With Water
(Rapid Drawdown)
Max Height 6 Feet
Slope 3H : 1V

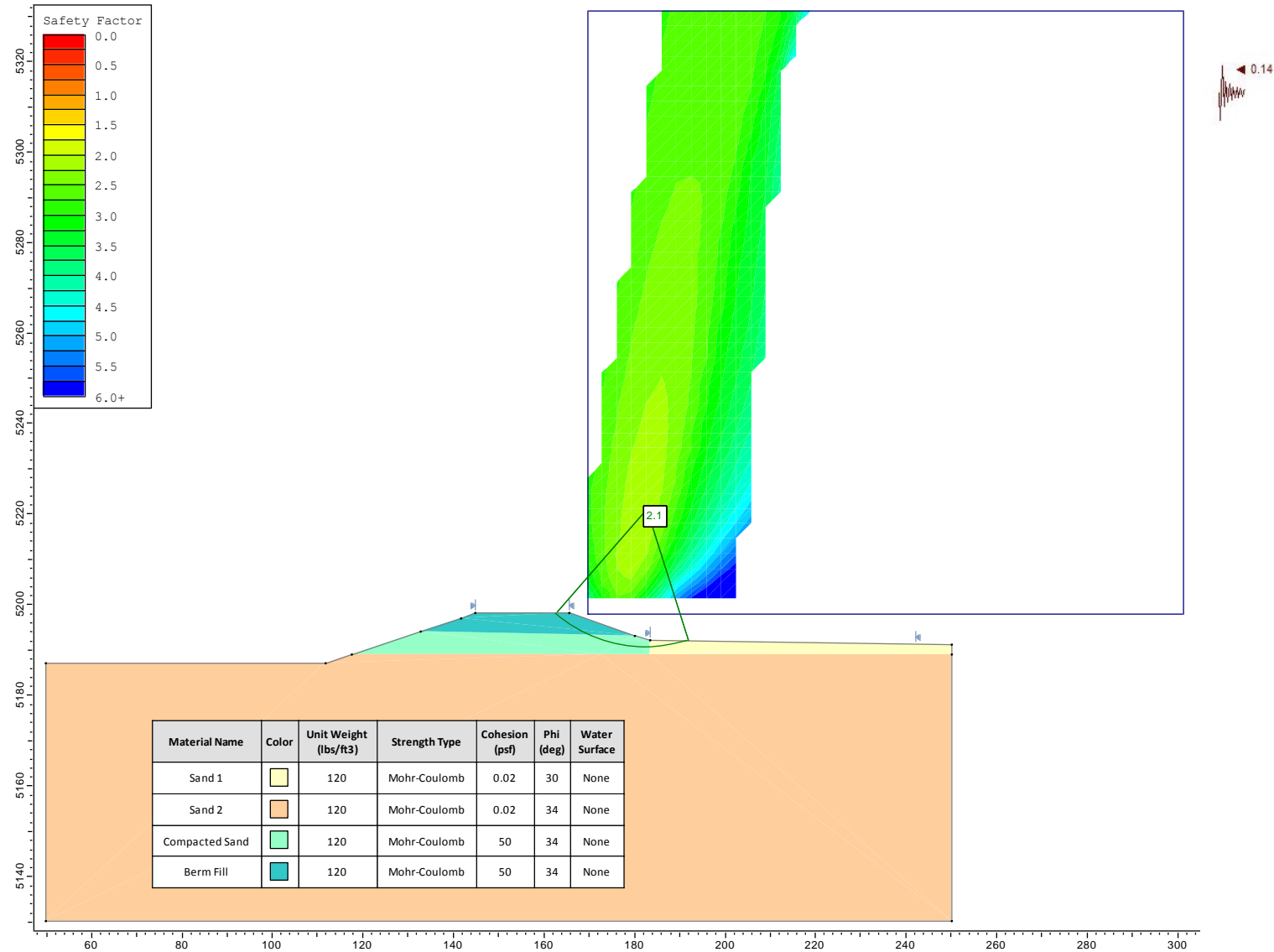
Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA

Project No. 66175192
Scale: As Shown
File No.
Date: 3/2018

Terracon
Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109
Phone: 505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
SSCAFCA Lomitas Negras Arroyo – Phase II
Saratoga Road and Lomitas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C9



Berm Downstream Slope
Seismic
Max Height 6 Feet
Slope 3H : 1V

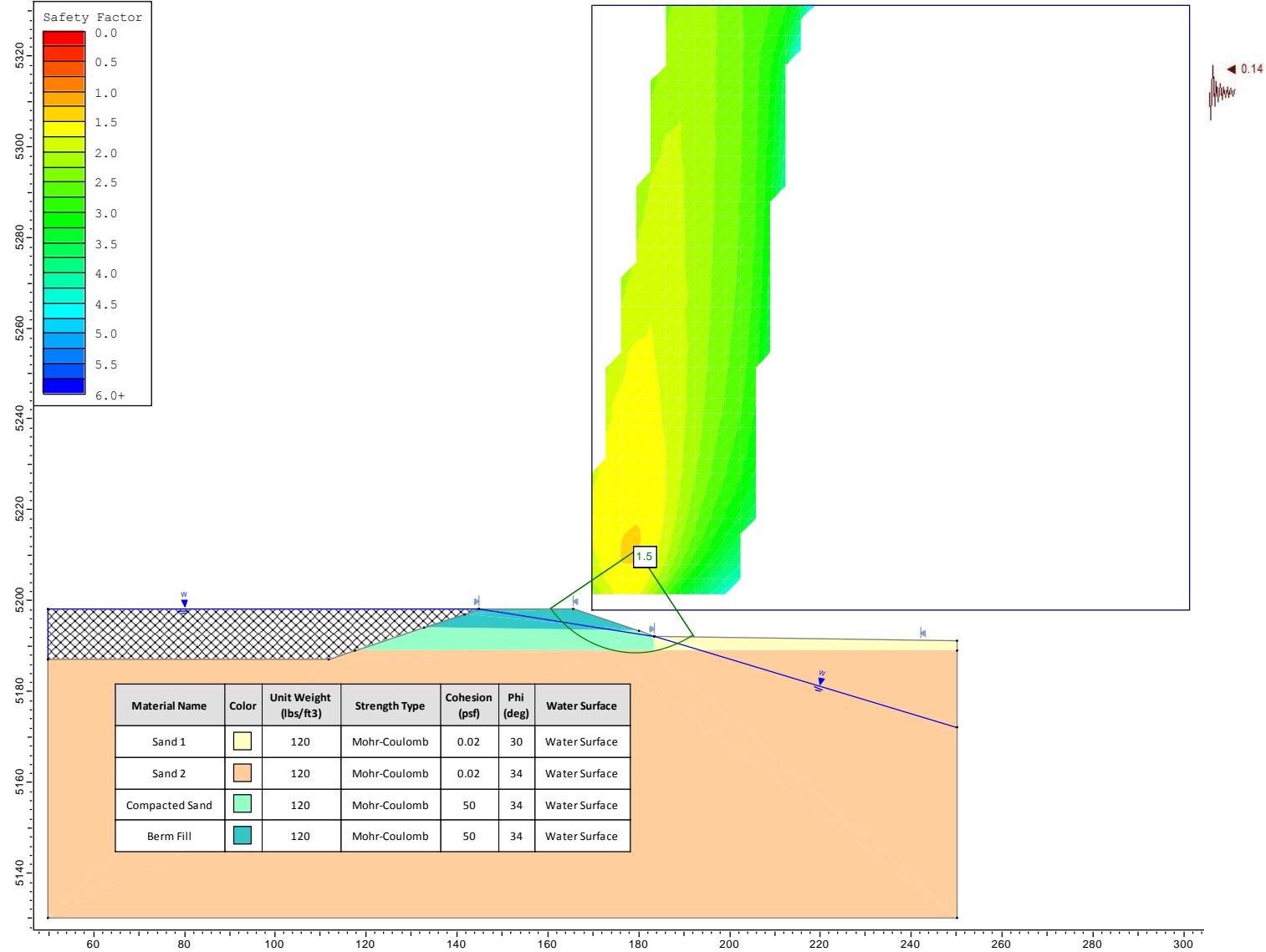
Project Mgr:	MEA
Drawn By:	MJD
Checked By:	MEA
Approved By:	MEA

Project No.	66175192
Scale:	As Shown
File No.	
Date:	3/2018

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FIG. No.
C10



Berm Downstream Slope
Seismic with Water
(Steady State)
Max Height 6 Feet
Slope 3H : 1V

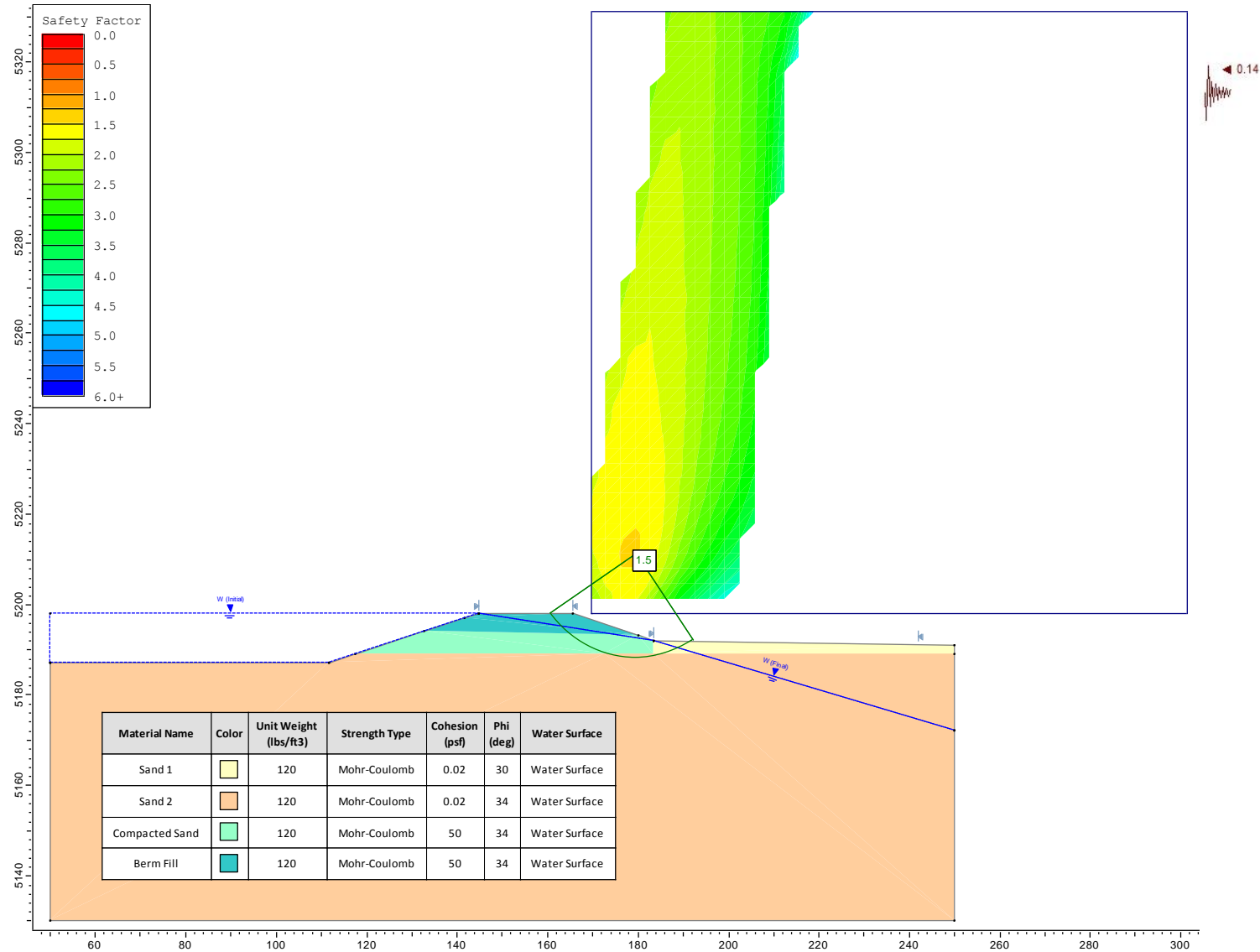
Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA

Project No. 66175192
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Albuquerque, New Mexico 87109
Phone: 505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
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Rio Rancho, New Mexico

FIG. No.
C11



Berm Downstream Slope
Seismic with Water
(Rapid Drawdown)
Max Height 6 Feet
Slope 3H : 1V

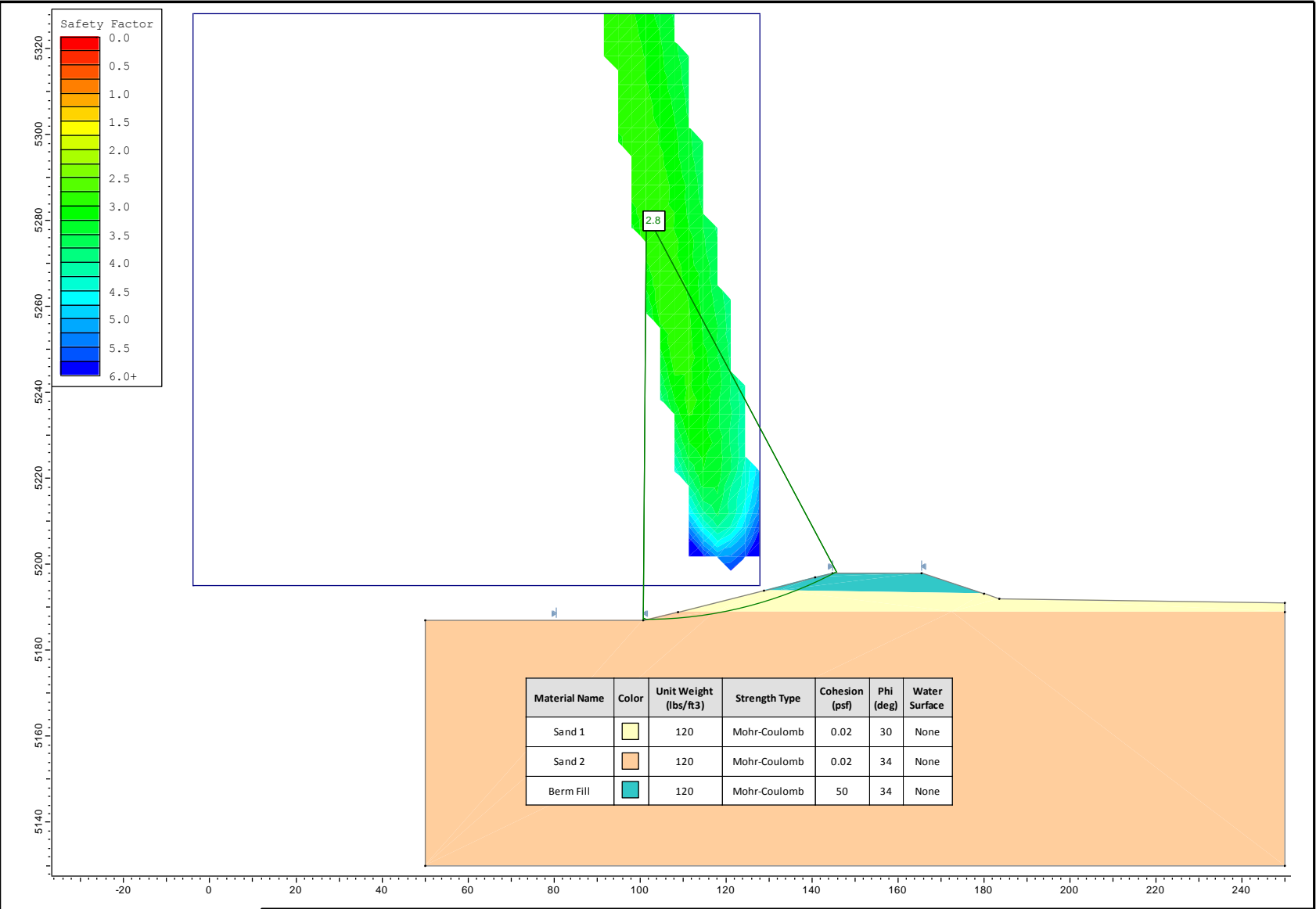
Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA




Project No. 66175192
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4905 Hawkins St. NE
Albuquerque, New Mexico 87109
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SLOPE STABILITY ANALYSIS
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FIG. No.
C12



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface
Sand 1		120	Mohr-Coulomb	0.02	30	None
Sand 2		120	Mohr-Coulomb	0.02	34	None
Berm Fill		120	Mohr-Coulomb	50	34	None

Berm Upstream Slope
Max Height 11 Feet
Slope 3H : 1V

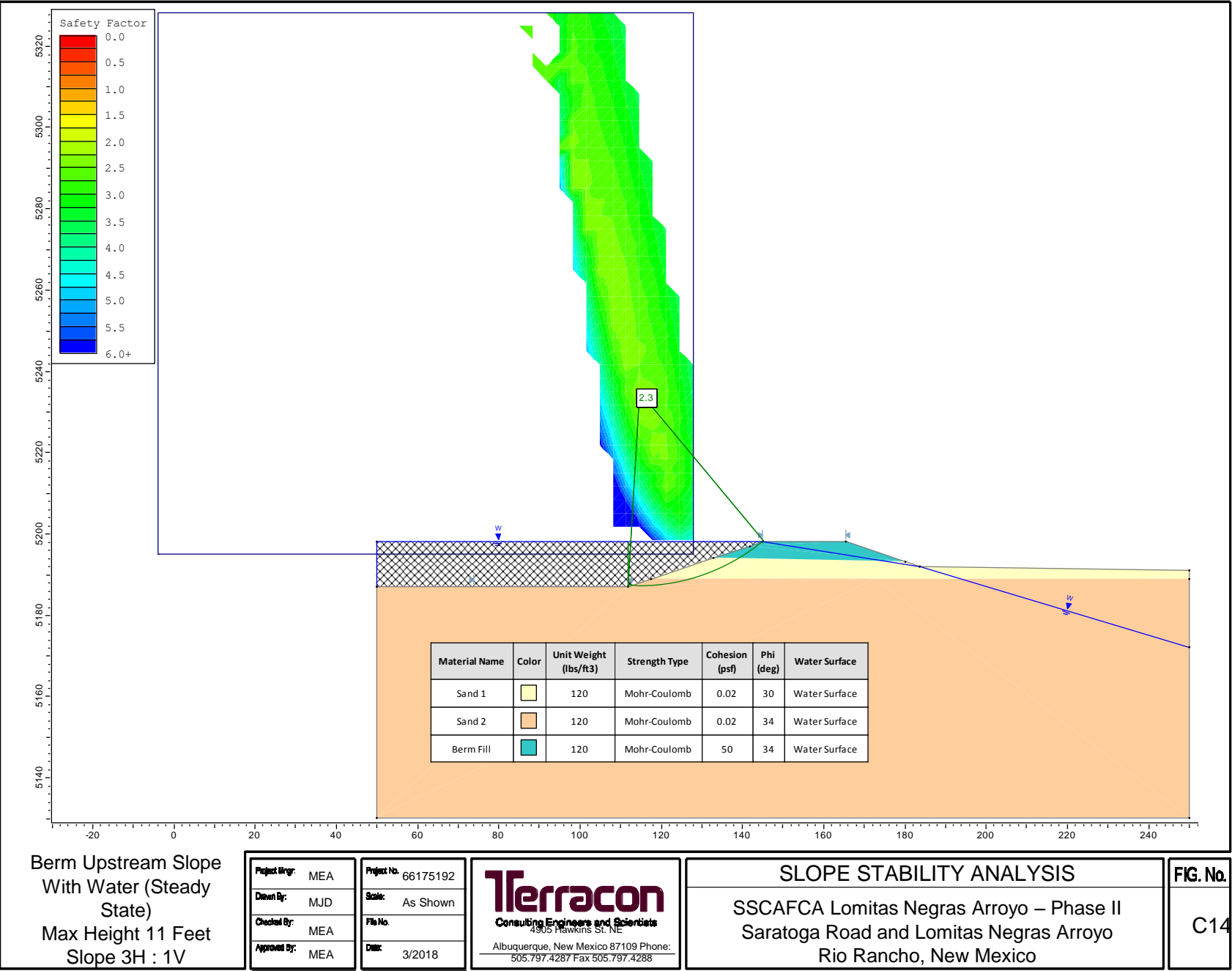
Project Mgr:	MEA
Drawn By:	MJD
Checked By:	MEA
Approved By:	MEA

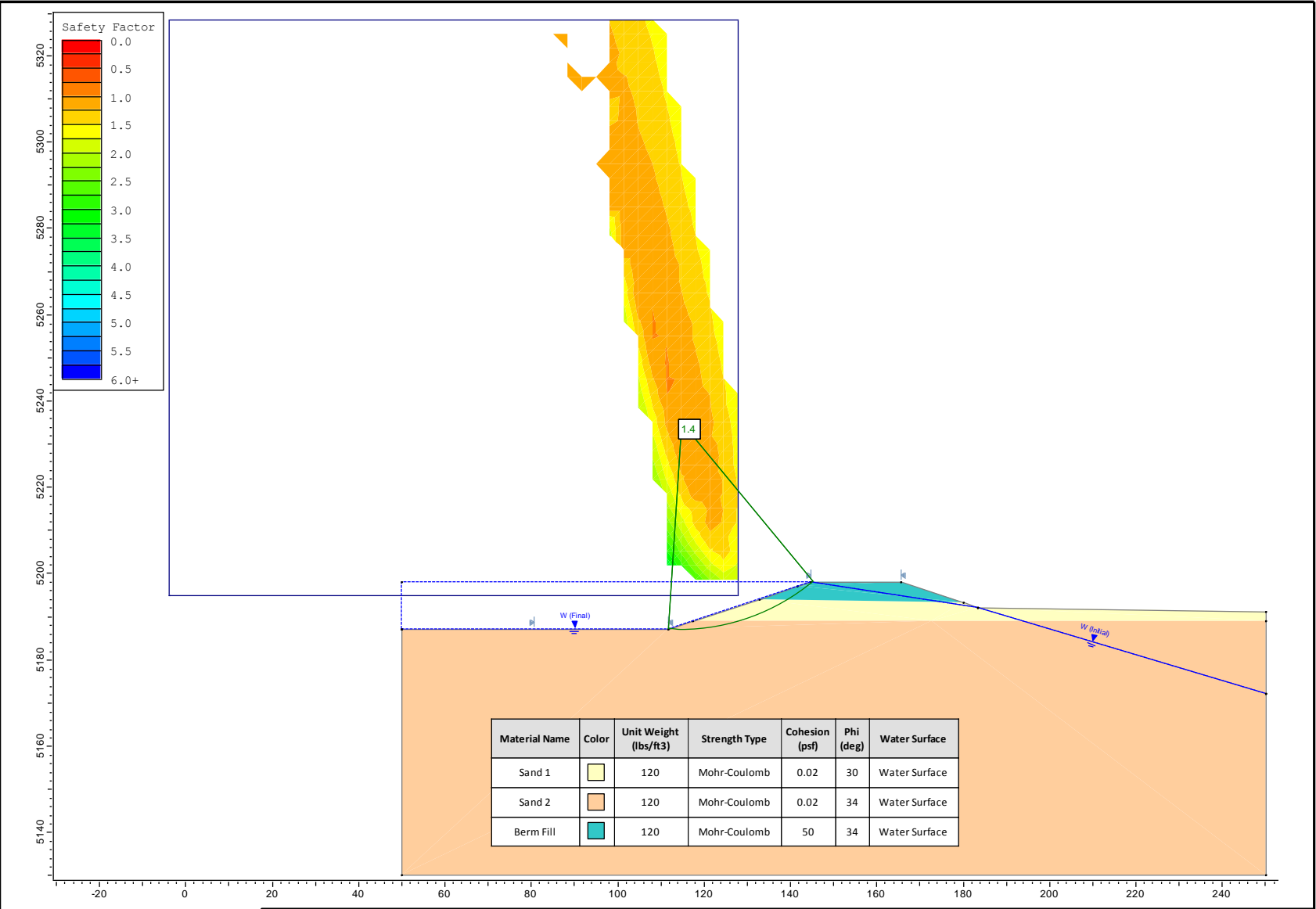
Project No.	66175192
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4905 Hawkins St. NE
Albuquerque, New Mexico 87109 Phone: 505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
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FIG. No.
C13





Berm Upstream Slope
With Water (Rapid
Drawdown)
Max Height 11 Feet
Slope 3H : 1V

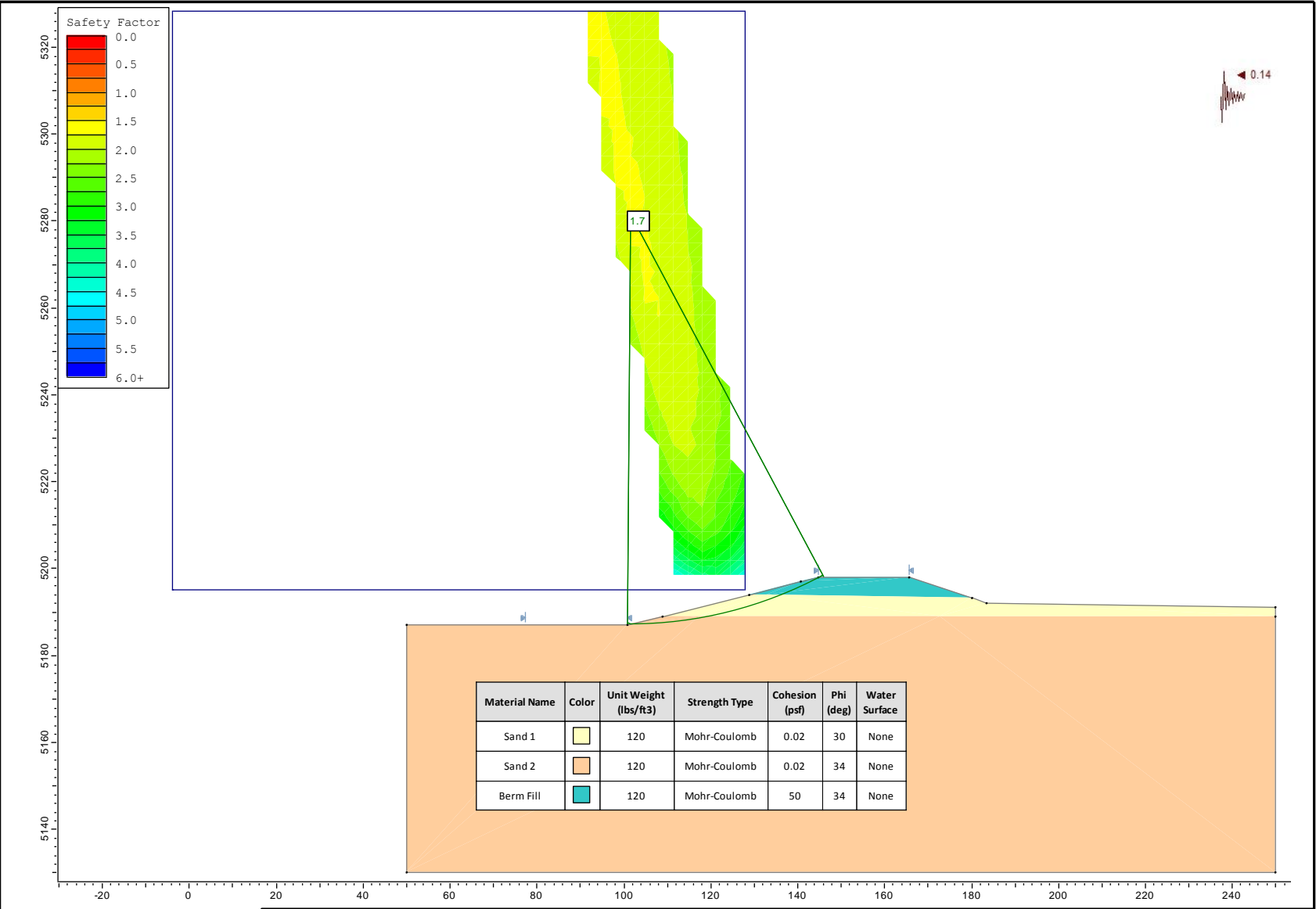
Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA

Project No. 66175192
Scale: As Shown
File No.
Date: 3/2018

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4905 Hawkins St. NE
Albuquerque, New Mexico 87109 Phone:
505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
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FIG. No.
C15



Berm Upstream Slope
Seismic
Max Height 11 Feet
Slope 3H : 1V

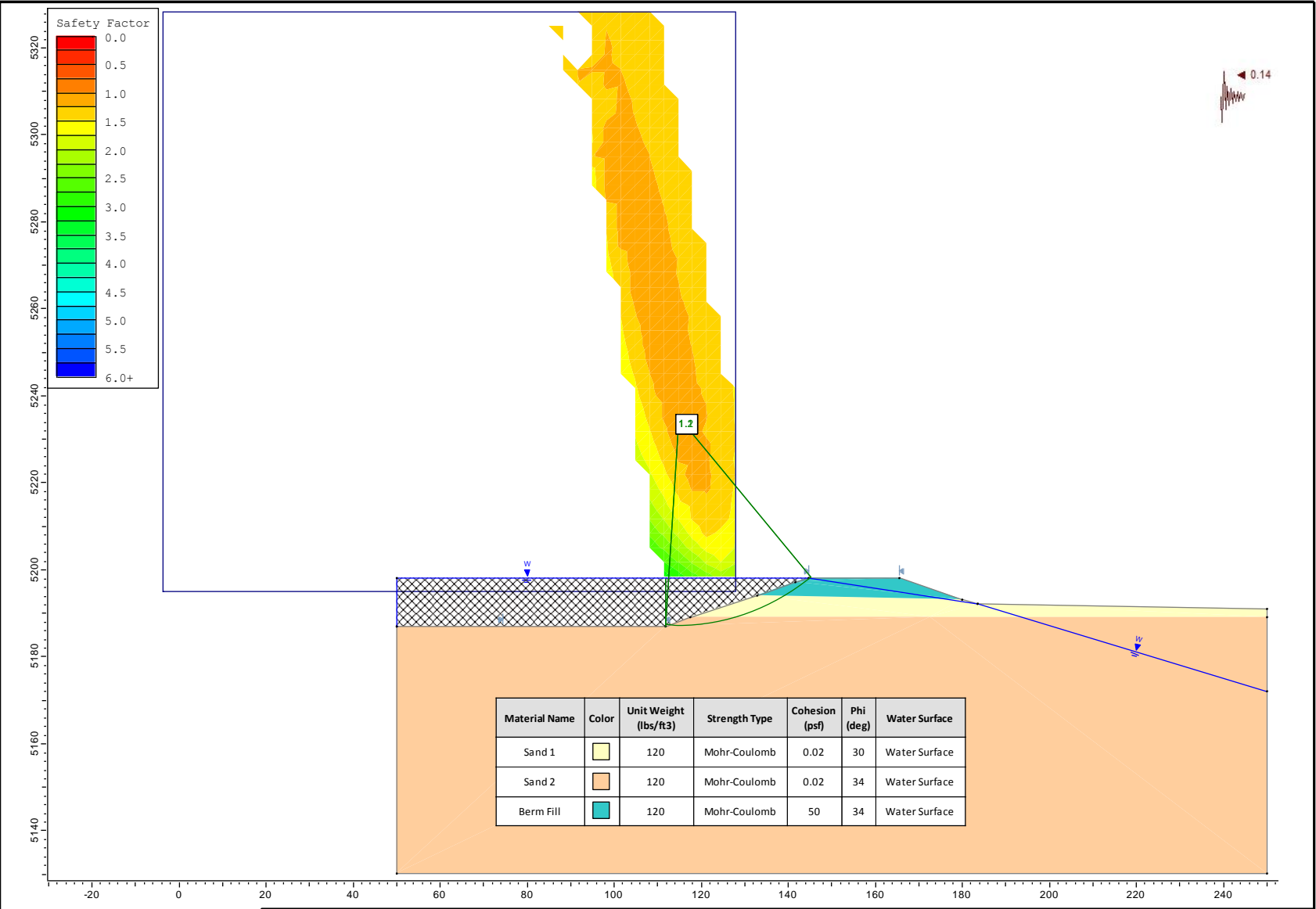
Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA

Project No. 66175192
Scale: As Shown
File No.
Date: 3/2018

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Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109 Phone:
505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
SSCAFCA Lomitas Negras Arroyo – Phase II
Saratoga Road and Lomitas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C16



Berm Upstream Slope
Seismic with Water
(Steady State)
Max Height 11 Feet
Slope 3H : 1V

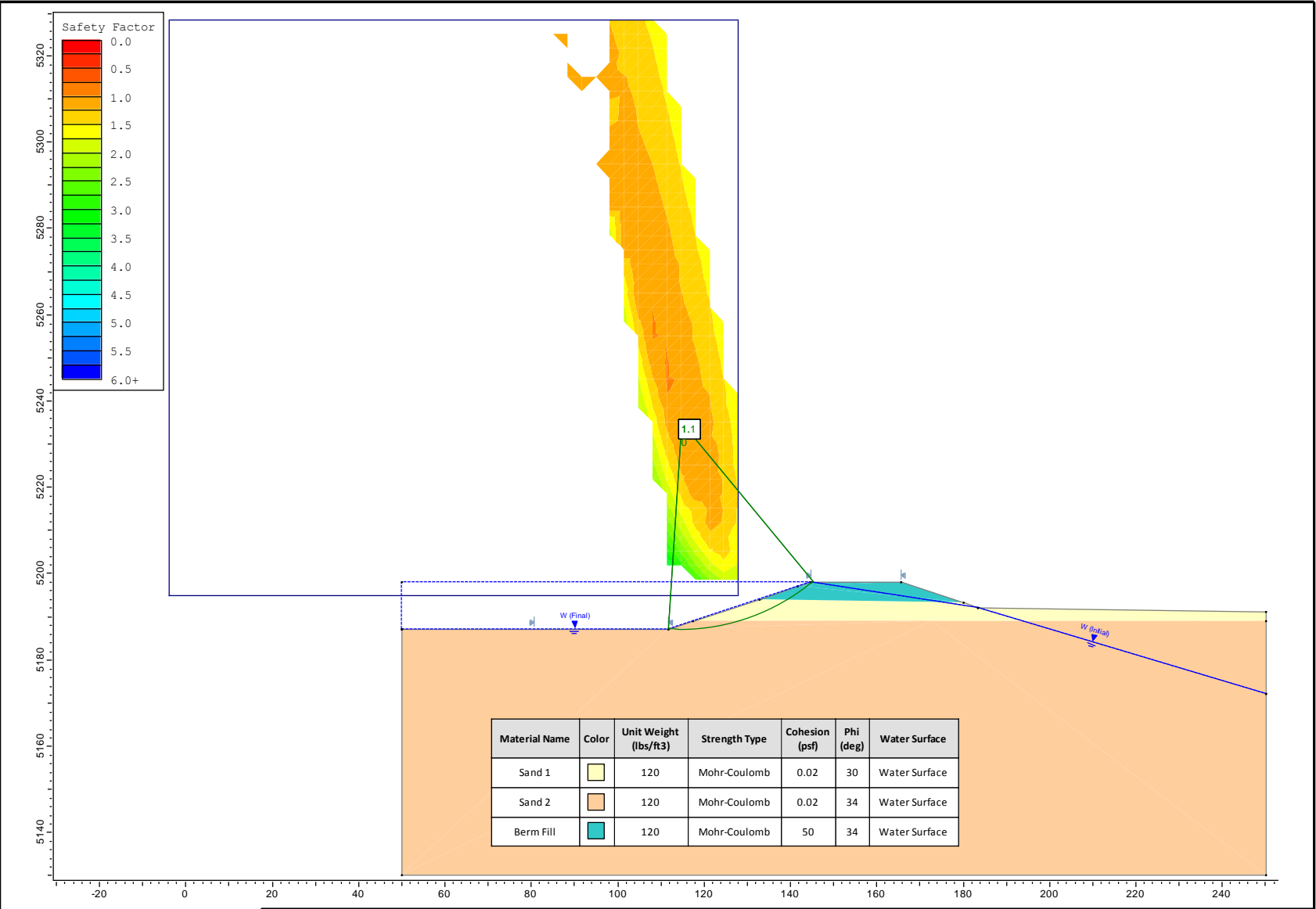
Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA

Project No. 66175192
Scale: As Shown
File No.
Date: 3/2018

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Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109 Phone:
505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
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Saratoga Road and Lomitas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C17



Berm Upstream Slope
Seismic with Water
(Rapid Drawdown)
Max Height 11 Feet
Slope 3H : 1V

Project Mgr: MEA
Drawn By: MJD
Checked By: MEA
Approved By: MEA

Project No. 66175192
Scale: As Shown
File No.
Date: 3/2018

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Consulting Engineers and Scientists
4905 Hawkins St. NE
Albuquerque, New Mexico 87109 Phone:
505.797.4287 Fax 505.797.4288

SLOPE STABILITY ANALYSIS
SSCAFCA Lomitas Negras Arroyo – Phase II
Saratoga Road and Lomitas Negras Arroyo
Rio Rancho, New Mexico

FIG. No.
C18

APPENDIX D
SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 513 SOIL CEMENT

SUPPLEMENTAL TECHNICAL SPECIFICATION

SECTION 513

SOIL CEMENT

513.1 DESCRIPTION

The work shall consist of furnishing, transporting, placing and compacting and curing soil-cement for the embankments associated with the main branch, flow diversion structure, south tributary, and emergency spillway where shown on the project plans, and as specified herein.

513.2 MATERIALS

513.2.1 CEMENT FOR SOIL CEMENT

Portland cement shall comply with Section 509 Subsection 509.2.2 of the NMDOT Standard Specifications for Highway and Bridge Construction, 2014 Edition, referred hereafter as the Standard Specifications. The use or substitution of fly ash for any portion of the cementitious materials shall not be allowed. Air Quality Permitting for Soil Cement Batch Plant is not required by the City of Rio Rancho.

513.2.2 WATER

Water shall comply with Section 509 for Portland cement as provided in the Standard Specifications

513.2.3 AGGREGATE

The soil used in the soil-cement mix shall come from the on-site borrow areas (excavated arroyo floor and surrounding areas) identified in the project grading plans. Soils shall meet the following gradation.

<u>Sieve Size</u>	<u>Percent Passing (Dry Weight)</u>
1-1/2"	100%
3/4"	90% - 100%
#4	70% - 100%
#200	3% - 25%

The soil aggregate shall be non-plastic (NP) and exhibit no liquid limit. Clay and silt lumps larger than one-half (1/2) inch shall be unacceptable, and screening will be required whenever this type of material is encountered.

513.3 PROPORTIONING

A preliminary mix design has been developed and is presented in "Geotechnical Engineering Report for the SCAFCA Lomitas Negras Arroyo - Phase 2", prepared by Terracon Consultants, Inc, dated April 25, 2018.

The Contractor shall submit the materials for testing. The design mix shall be based on the compressive strength of specimens molded in accordance with ASTM D1632, cured seven (7) days at 100% relative humidity at 73.4° ±3°, soaked in water for four (4) hours, then tested in compression (ASTM D1633).

A minimum of three (3) different cement contents shall be tested to determine the cement necessary to develop seven (7) day compression strength of 1,000 pounds per square inch (psi). The design cement

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content shall be two (2) percent more than the percentage required to attain 1,000 psi. In no case will a cement content less than 12 percent of the dry weight of the soil-aggregate be approved.

In addition, the following additional tests may be run by the testing laboratory to establish cement amounts:

- a. AASHTO - T-134
- b. ASTM-D1633 - Compressive strength of Molded Soil Cement Cylinders

The Contractor shall use the soil aggregate, cement content, and moisture content determined by the SSCAFCA Field Services Director/Engineer in accordance with laboratory tests. The Contractor shall allow a minimum of ten (10) days for the cement content results. During the course of the work, the SSCAFCA Field Services Director/Engineer may require the Contractor to adjust the soil-cement mix portions whenever necessary in order to achieve the minimum design strength shown in durability and other physical properties test results. The contractor may have to blend the different on-site soils to maintain ideal soil properties as specified below and avoid cement overrun. Blending shall require constructing separate stockpiles for materials to be blended. Blending shall be performed by the methods to achieve a uniform soil-cement mix as approved by the SSCAFCA Field Services Director/Engineer.

Water shall be added to the soil-cement mix to produce a moisture content of the material after processing of not less than minus 1% from optimum moisture content nor more than 2% above optimum moisture content as determined by the testing laboratory. Testing during the project may require frequent adjustment of water added in order to achieve the specified moisture content. In no case will moist soil aggregate be utilized which would cause the maximum moisture content to be exceeded.

513.4 MIX DESIGN

Contractor shall use the mix design provided in the "Geotechnical Engineering Report for the SSCAFCA Lomas Negras Arroyo - Phase 2", prepared by Terracon Consultants, Inc, dated April 25, 2018. The mix shall include using the designated on-site borrow soils for aggregate mixed with Type II Portland Cement. The cement content of the mix shall start at 14% and based on test results may be adjusted, but shall not be less than 12%. Seven (7) day samples will be taken to monitor output. The amount of cement thus determined by laboratory testing shall continue to be monitored throughout the life of the project with modification as required to meet existing field conditions.

513.5 Not Used

513.6 CONSTRUCTION REQUIREMENTS

513.6.1 REQUIRED CONTRACTOR SUBMITTALS

Prior to the start of construction, the Contractor shall submit, in writing for approval, the following items:

1. The type of compaction equipment to be used.
2. The number and type of watering equipment to be used.
3. The method used to keep surfaces continuously moist until subsequent layers of soil cement are placed.
4. The method used to cure permanently exposed surfaces.
5. The method of plant calibration.

Such approval shall not relieve the Contractor of the responsibility of achieving the desired result of constructing sound soil-cement, free from defects, according to the Specifications and project plans.

513.6.1.1 TEST SECTION

Prior to the placement of soil-cement, the Contractor shall construct a test section. The purpose of the test section is to demonstrate the suitability of the Contractor's equipment, methods and personnel. The test section shall be a minimum of two (2) lifts in height and of thickness as specified on plans, fifty (50) feet in length and a minimum of eight (8) feet in width. The site of the test section shall be approved by the SSCAFCA Field Services Director/Engineer. The test section shall also demonstrate the lift edge treatment to be used. The SSCAFCA Field Services Director/Engineer shall approve all equipment, methods and personnel after completion of the test section. The SSCAFCA Field Services Director/Engineer will verify the completed Soil-Cement Test Section. Testing will be done by the approved Testing Laboratory.

513.6.2 PREPARATION

Before soil-cement placement begins, the area to receive soil-cement shall be graded and shaped to lines and grades as shown on the plans or specified by the SSCAFCA Field Services Director/Engineer. The subgrade shall be prepared and compacted to a minimum of ninety-five percent (95%) of the maximum density as determined by ASTM D 1557.

Immediately prior to placement of the soil-cement mixture, the subgrade shall be moistened if necessary. Soft or yielding subgrade shall be corrected and made stable before soil cement placement proceeds. Subgrade preparation for soil cement shall be incidental to soil cement.

513.6.3 (Not Used)**513.6.4 MIXING**

Soil-cement shall be central-plant mixed in an approved twin shaft, continuous-flow or batch-type pug mill or shall be mixed in a traveling pug mill single or multiple transverse shaft plant. The Plant shall be equipped with screening, feeding, and metering devices that will add the soil, cement, and water into the mixer in the specified quantities. The mixing time shall be that time which is required to secure a homogeneous, intimate, uniform mixture of the soil, stabilizer, and water. Soil and cement shall be mixed sufficiently to prevent cementitious balls from forming when water is added. The plant shall be located in the confines of the SSCAFCA's property or an approved alternate site.

Free and safe access to the plant must be provided to the SSCAFCA Field Services Director/Engineer at all times for observation of the plant's operation, and for sampling the soil-cement mixture and its components. If the actual quantities of the mix vary more than two (2) percent by weight of the specified quantities, the SSCAFCA Field Services Director/Engineer may require the Contractor to make changes in the plant operation and equipment as will provide accuracy within two (2) percent by weight. Calibration of the plant equipment will be done daily at the start of operations, or as otherwise directed by the SSCAFCA Field Services Director/Engineer.

The Contractor shall take precaution during filling of cement silo and mixing soil cement to prevent flying cement dust. Conveyors shall be covered.

513.6.5 SCALES

Unless the plant is equipped with suitable scales to measure the cement and aggregate feeds, the Contractor shall furnish and install a set of truck scales at the plant location to monitor plant output. All scales shall be calibrated and certified by the Contractor and approved by the SSCAFCA Field Services Director/Engineer at least forty-eight (48) hours prior to the start of production. Each scale shall be

calibrated to an accuracy of plus/minus two (2) percent. Scales shall be inspected and calibrated as often as the SSCAFCA Field Services Director / Engineer deems necessary to assure their accuracy.

513.6.6 REQUIRED MOISTURE

The moisture content of the mix shall be adjusted as needed to meet the specified moisture content.

513.6.7 HANDLING

The soil-cement mixture, if transported, shall be transported from the batching/mixing site to the project in clean equipment provided with suitable protective devices in unfavorable weather. The total elapsed time between the addition of cement to the mixture and the start of compaction shall be the minimum possible. In no case should the total elapsed time exceed forty-five (45) minutes. (This time may be reduced by the SSCAFCA Field Services Director/Engineer when the air temperature exceeds 90°F, or when there is a breeze or wind which promotes rapid drying of the soil-cement mixture.)

The Contractor shall take all necessary precautions to avoid damage to completed soil-cement by the equipment, and to avoid the deposition of raw earth or foreign materials between layers of soil-cement. Earth ramps crossing completed soil-cement must have at least two (2) foot compacted thickness. Where ramps are constructed over soil-cement that is not to grade, all foreign materials and the uppermost one (1) inch of the previously placed soil-cement mixture must be removed prior to continuation of the soil-cement construction.

513.6.8 PLACING

Soil cement shall not be placed unless the combination of air temperature, temperature of fresh soil cement, relative humidity, and wind velocity at the site are such that the rate of evaporation is less than 0.20 pounds per square foot as determined from the Surface Evaporation Graph in Section 513 of this specification.

The mixture shall be placed on the moistened subgrade or previously completed soil-cement material, with spreading equipment that will produce layers of such widths and thicknesses as are necessary for compaction to the required dimensions of the completed soil-cement layers. If the Contractor can demonstrate the ability to compact thicker layers for their full depth, the SSCAFCA Field Services Director/Engineer may waive this requirement.

Each successive layer shall be placed as soon as practicable after the preceding layer is completed and accepted. Bonding grout is required when placing against cement or on soil cement that has set for over 12 hours or is dried out (see Section 513.11 Bonding Grout). This requirement may be waived if the surface is left sufficiently rough and clean to provide a mechanical bond as determined by the Project Manager. This will require indentations provided with a sheepfoot compactor/roller at least 1" deep in dimension, or equivalent means and method. Prior to placement of soil cement, all loose material shall be mechanically broomed/swept or blown off the surface. Muddy material that adheres to the soil cement may need to be scrubbed and washed off at the direction of the SSCAFCA Field Services Director/Engineer.

All soil-cement surfaces that will be in contact with succeeding layers of soil-cement shall be kept continuously moist by fog spraying, shading or wet covering until placement of the subsequent layer, provided that the Contractor will not be required to keep such surfaces continuously moist for a period longer than seven (7) days.

Mixing shall not proceed when the soil aggregate or the area on which the soil-cement is to be placed is frozen. Soil-cement shall not be mixed or placed when the air temperature is below 45°F (7°C), unless the air temperature is at least 40°F (4°C) and rising. Compacted soil-cement shall be protected from freezing

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Terracon

by a method approved by the SSCAFCA Field Services Director/Engineer for a minimum period of seven (7) days. Areas damaged by freezing shall be removed and replaced at no cost to SSCAFCA.

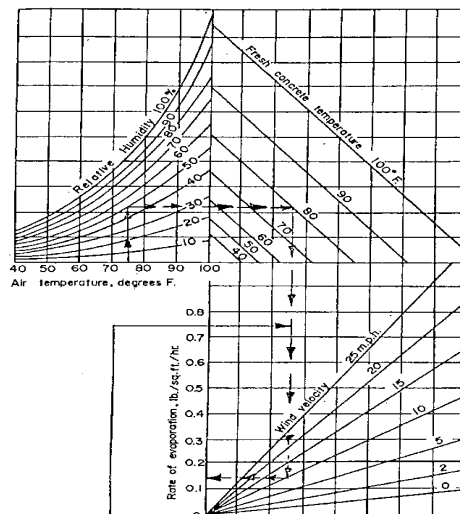
513.6. 9 COMPACTION

Soil-cement shall be uniformly compacted to a minimum of 95 percent of maximum density as determined by ASTM D558. Wheel rolling with only hauling equipment shall not be an acceptable method for the compaction process.

At the start of compaction operations, the mixture shall be in a uniform, loose condition throughout its full depth. Its moisture content shall be as specified in Section 513.3 herein. No section shall be left undisturbed for longer than thirty (30) minutes during compaction operations. Compaction of each layer shall be done in such a manner as to produce a dense surface, free of compaction planes, and no longer than forty-five (45) minutes from the time cement is added to the mixture. Whenever the Contractor's compaction operation utilizes smooth wheel or rubber tired rollers to produce a smooth top surface, the top surface of the completed layer, if smooth, shall be longitudinally scarified to a depth of at least 1/4 inch, at a spacing of not greater than 1 inch on center, with a spike tooth instrument, prior to subsequent placement of additional soil-cement layers. The requirement for scarification may be waived by the SSCAFCA Field Services Director/Engineer if the compaction equipment utilized produces a surface of sufficient roughness that adequate bonding between soil-cement layers is achieved.

SUPERSTRUCTURE CONCRETE

FIGURE 513
SURFACE EVAPORATION FROM CONCRETE



Typical Reading Direction for:-

Air Temperature = 75° F.
Relative Humidity = 50%
Concrete Temperature = 80° F.
Wind Velocity = 10 MPH

513.7 FINISHING

After compaction, the soil-cement shall not be trimmed or shaped except as necessary to remove loose soil-cement and where shown on the drawings. The final finish of the exposed soil-cement lining shall be in a "stair-step" configuration where and as shown on the drawings with the provisions that the "stair steps" constructed at the minimum built dimensions and to the "theoretical slope line" indicated on the project plans. See the project plans for locations where vertical faces and/or slope trimming are required. The total elapsed time allowed for finishing after the addition of cement to the soil-cement mixture shall not exceed 2-1/2 hours.

513.7.1 CURING

Temporarily exposed surfaces shall be kept moist as specified in Subsection 513.6.8.

Care must be exercised to ensure that no curing material other than water is applied to the surfaces that will be in contact with succeeding layers.

Permanently exposed surfaces shall be kept in a moist condition for seven (7) days or the exposed surface can be covered with a suitable protective curing material. Any damage to the protective covering within seven (7) days shall be repaired at no cost to SSCAFCA.

Regardless of the curing material used, the permanently exposed surfaces shall be kept moist until the protective cover is applied. Such protective cover is to be applied as soon as practicable, with a maximum time limit of twenty-four (24) hours between the finishing of the surface and the application of the protective cover or membrane.

The soil-cement shall be protected from freezing (if applicable) for seven (7) days after construction by covering the exposed surface with loose earth, concrete blankets, straw, or other suitable material approved by the SSCAFCA Field Services Director/Engineer.

513.7.2 CONSTRUCTION JOINTS

At the end of each day's work, or whenever construction operations are interrupted for more than two (2) hours, a 15 degree minimum skew traverse construction joint shall be formed by cutting back into the completed work to form a full-depth vertical face as directed by the SSCAFCA Field Services Director/Engineer. If construction joints are formed at more than one layer, the construction joint for each layer shall be staggered at 8 feet horizontally from the construction joint of the layer below.

513.7.3 MAINTENANCE

The Contractor shall be required, within the limits of his Contract, to maintain the soil-cement in good condition until all work is completed and accepted. Maintenance shall include immediate repairs of any defects that may occur. This work shall be done by the Contractor at his own expense and repeated as often as necessary. Unsatisfactory work not meeting project specifications shall be replaced for the full depth of a layer.

513.7.4 INSPECTION AND TESTING

The SSCAFCA Field Services Director/Engineer, with the assistance and cooperation of the Contractor, shall make such observations and tests as he deems necessary to verify that the Contractor's work is in conformance with the Contract documents. These observations and tests may include, but shall not be limited to: (1) the taking of test samples of the soil-cement and its individual components at all stages of processing and after completion, and (2) the close observation of the operation of all equipment used on

the work. Only those materials, machines, and methods meeting these requirements of the Contract documents shall be used by the Contractor.

Testing, by the Project Manager, for proper compaction shall be done on at least every other lift of compacted soil-cement at any location chosen by the testing personnel. If the lift being tested does not meet the minimum 95 percent density/compaction requirements, the area must be reworked until it meets project specifications or be removed and replaced at the Contractor's expense. The Contractor shall not continue soil cement placement on any soil-cement lift which has not met project specifications until such time as that lift has been reworked, retested, and has met project requirements.

513.8 MEASUREMENT AND PAYMENT

513.8.1 MEASUREMENT

This work shall be measured by the following:

- (1) In cubic yards of completed-in-place soil-cement and used for tests by the SSCAFCA Field Services Director/Engineer or Testing Laboratory and:
- (2) In tons of cement incorporated into the soil-cement used in accordance with the computation below and for tests by the SSCAFCA Field Services Director/Engineer.

Any waste of soil cement materials by the Contractor during the handling, mixing, placing, operations, etc. or any use of materials in excess of quantities and percentages specified, or any use by the Contractor's own testing shall not be paid for.

Soil cement will be measured as the number of cubic yards of soil cement mixes satisfactorily placed within the finish lines of the structures and the excavation pay lines, as applicable, as indicated on the project plans and/or specified herein.

513.8.2 PAYMENT

The work shall be paid for at the Contract Unit Price per cubic yard of soil-cement and at the Contract Unit Price per ton of cement furnished, multiplied by the quantities obtained in accordance with Subsection 513.8.1.

Such payment shall constitute full reimbursement for all work necessary to complete the soil-cement structure, dewatering, watering, mixing, placing, compacting, curing, and all other incidental operations. Such payment shall also constitute reimbursement for assistance with inspection and testing that SSCAFCA may require.

Items governed by this section shall include:

ITEM

Soil Cement

Portland Cement for Soil Cement

UNIT

Cubic Yard

Ton

513.9 STOCKPILE OF AGGREGATE

Soil/aggregate stockpile shall be constructed on level, firm ground free of brush, trees, stumps, roots, rubbish, debris, and other objectionable or deleterious materials and shall be located as to provide a distance of not less than twenty (20) feet from the outside bottom edge of the conical stockpile built up

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under the processing plant conveyor or any other existing stockpile. The stockpile shall be constructed in layers; each layer not exceeding three (3) feet in thickness. Ramps formed for stockpile construction shall be of the same material as that being stockpiled, and will be considered a part of the stockpile. Before steepening a ramp, any contaminated surface material shall be removed.

Stockpiled material should be thoroughly mixed throughout its depth, width, and length before utilization. The material should be homogeneous and uniform in color, gradation and moisture throughout.

Stockpiled material shall conform to the requirements of Subsection 513.3 – PROPORTIONING.

Stockpile sampling will be done by the SSSAFCA Field Services Director/Engineer after the required amount of soil aggregate for soil-cement placement, has been excavated and stockpiled. After the stockpile has been sampled and approved, no material will be added to it without concurrence by the SSSAFCA Field Services Director/Engineer.

Stockpile(s) shall be completed at least eight (8) days prior to start of soil-cement production.

513.10 TESTING

513.10.1 SAMPLING

Samples of soil-cement for quality control moisture content and laboratory compaction tests shall be taken directly from the area being constructed as scheduled or periodic intervals during construction. The samples shall be representative of the material being placed and compacted.

513.10.2 LABORATORY COMPACTION TESTS

The optimum moisture content-maximum density relationship shall be determined in accordance with ASTM D558. Gradation tests shall be performed on each laboratory compaction test sample in accordance with ASTM D422.

513.10.3 Not used

513.10.4 COMPRESSIVE STRENGTH TEST

Compressive strength specimens shall be molded from field samples material and tested in a manner described in Section 513.3.

513.10.5 MOISTURE CONTENT

The frequency of moisture contents tests as determined by nuclear methods shall not be less than five (5) tests per 1,000 cubic yards of compacted soil cement.

513.10.6 DENSITY TESTS

513.10.6.1 NUCLEAR METHODS

The frequency of nuclear density tests (ASTM D6938) shall not be less than five (5) tests for each 1,000 cubic yards of compacted soil cement. Tests shall be by the single probe, direct transmission method only. A minimum of two (2) one-point compaction tests shall be run on every 10 nuclear tests to confirm the estimated maximum dry density. The materials for the one-point compaction test shall be obtained from the location of the nuclear gauge test. Frequency of laboratory compaction tests shall not be less than 1 test for each 1,000 cubic yards of compacted soil-cement fill.

Geotechnical Engineering Report

SSCAFCA Lomas Negras Arroyo – Phase 2 ■ Sandoval County, New Mexico

April 25, 2018 ■ Terracon Project No. 66175192



513.10.6.2 TITRATION TESTING – (Deleted)

513.10.6.3 COMPRESSIVE STRENGTH TESTING

Frequency shall be one (1) test for every one-point compaction test, or a minimum of one per day. The sample shall be obtained from the location of the nuclear gauge test.

513.10.6.4 FAILING QUALITY CONTROL TESTS

Failing quality control tests will not be considered in above frequency of quality control sampling and testing.

513.11 BONDING GROUT

Prior to placing soil-cement against concrete or existing soil cement, a bonding grout should be vigorously mechanically broomed into the exposed concrete channel lining to displace all air films and cover all surfaces, including the vertical faces, to a uniform thickness of 1/8 to 1/4 inch.

The grout should consist of one (1) part Portland cement, and about 1/2 part water to give a thick paint-like consistency. In hot, dry weather the surface of the old concrete can be dampened by light fogging but the grout should not be applied to an extremely wet surface or when hollows and rough areas contain free water. Excess water can be removed with compressed air. In no case should the grout be allowed to dry to a whitish appearance before the soil-cement is placed. Bonding grout will be used on any soil cement that has set more than 12 hours or that has dried out on the surface, as determined by the SCAFCA Field Services Director/Engineer.

END OF SECTION