

BROOKFIELD LAKIN, LLC,
A Delaware limited liability company

**INVITATION FOR BID,
INSTRUCTIONS TO BIDDERS,
PROJECT SPECIFICATIONS,
SPECIAL PROVISIONS
AND CONTRACT DOCUMENTS
DATED: May 18, 2019**

FOR:

**ALAMAR
Lakin Community Facilities District (CFD)
Avondale Arizona**

**PROJECT #: 174612.04
SOLICITATION #: EN19-083
*CFD PHASE 1 INFRASTRUCTURE IMPROVEMENTS***

BROOKFIELD LAKIN, LLC

INVITATION FOR BIDS

SOLICITATION INFORMATION AND SCHEDULE

SOLICITATION NUMBER: EN 19-083
PROJECT NUMBER: 174612.04
SOLICITATION TITLE: ALAMAR CFD PHASE 1 INFRASTRUCTURE

BID DEADLINE: JUNE 13, 2019 at 5:00 P.M. LOCAL AZ TIME

SUBMITTAL LOCATION: **AVONDALE CITY HALL**
11465 West Civic Center Drive
Avondale, Arizona 85323, Suite 200
c/o City Clerk

PRE-BID MEETING **Mandatory Meeting**
DATE AND TIME: **MAY 28, 2019 at 10:00 A.M. LOCAL AZ TIME**
LOCATION: Avondale City Hall
11465 West Civic Center Drive
Avondale, Arizona 85323
Sonoran Conference Room

ISSUING OFFICE: **Brookfield Lakin, LLC**
14646 Kierland Blvd., Suite 165
Scottsdale, Arizona 85258

BID DOCUMENTS: Bid Documents will be available on the City of Avondale website: www.avondaleaz.gov/procurement released on May 18, 2019

Addenda or supplemental information may be downloaded at the City of Avondale website when applicable:
www.avondaleaz.gov/procurement

QUESTIONS: Kim Duffy via kim.duffy@brookfieldrp.com
Senior Contracts Manager

All questions must to be submitted via email only by **5:00 PM, JUNE 6, 2019**. Answers to questions and other clarifications will be in the final Addenda issued through the City of Avondale Website at on or before **5:00 PM JUNE 10, 2019**.

Competitive sealed Bids for the services specified herein will be received by the Avondale City Clerk at the City Clerk's Office at the above referenced location until the date and time referenced above (the "Bid Deadline"). Bids received by the Bid Deadline shall be publically opened and the Bid Price read. Bids must be in the actual possession of the City Clerk on, or prior to, the Bid Deadline. Late Bids shall not be considered, except as provided in the City of Avondale Procurement Code. Each Bid shall be submitted in a sealed envelope with the Solicitation Number, Solicitation Title and the Bidder's name and address clearly indicated on the front of the envelope.

PROJECT DESCRIPTION

- 1. Broadway Road, West** – The Project consists of approximately 3,287 feet of four lane & raised median, full street surface improvements tying into existing improvements at Avondale & Broadway. Improvements include installation of potable water, storm drain, dry utilities, concrete curb & gutter, sidewalk, paving, striping, signage, street lights, signal conduit sleeves, landscaping, and irrigation
- 2. Alamar Parkway** - The Project consists of approximately 1,420 feet of three lane, full street surface improvements tying into proposed improvements at Broadway. Improvements include installation of potable water, dry utilities, concrete curb & gutter, sidewalk, paving, striping, signage, street lights, landscaping, and irrigation
- 3. Avondale Blvd, South** – The Project consists of approximately 1,371 feet of improvements adding one lane, west half-street surface improvements tying into existing pavement edge of Avondale Blvd. Improvements include installation of storm drain, dry utilities, concrete curb & gutter, sidewalk, paving, striping, signage, street lights, landscaping, and irrigation
- 4. Bid Alternate No. 1 - Adjacent Ways Funding – Littleton Elementary School** - The Project consists of approximately 564 feet of four lane & raised median, north half-street surface improvements tying into existing improvements at Avondale & Broadway. Improvements include installation of storm drain, dry utilities, concrete curb & gutter, sidewalk, paving, striping, signage, street lights, signal conduit sleeves, landscaping, and irrigation
- 5. Bid Alternate No. 2 - Avondale Blvd, North** - The Project consists of approximately 995 feet of improvements adding one lane, west half-street surface improvements tying into existing pavement edge of Avondale Blvd. Improvements include installation of storm drain, dry utilities, concrete curb & gutter, sidewalk, paving, striping, signage, street lights, landscaping, and irrigation
- 6. Bid Alternate No. 3 - Broadway Road, East** - The Project consists of approximately 1,015 feet, street taper surface improvements tying into existing pavement edge of Broadway Road. Improvements include installation of storm drain, guard rail, paving, striping, and signage

NOTICE TO PROSPECTIVE BIDDERS

THE WORK WHICH IS THE SUBJECT OF THIS IFB IS NOT A CITY OF AVONDALE CAPITAL IMPROVEMENT PROJECT. THE SUCCESSFUL BIDDER OR CONTRACTOR WILL EXECUTE CONTRACT DOCUMENTS, AS CONTAINED IN THE IFB, WITH BROOKFIELD LAKIN, LLC, AND NOT WITH THE CITY OF AVONDALE, AND NOT WITH THE LAKIN COMMUNITY FACILITIES DISTRICT. THE WORK INCLUDED IN THIS IFB IS THE SUBJECT OF A DISTRICT DEVELOPMENT, FINANCING PARTICIPATION AND INTERGOVERNMENTAL AGREEMENT AMONG DEVELOPER, BROOKFIELD RESIDENTIAL ARIZONA, THE CITY OF AVONDALE, ARIZONA, AND LAKIN COMMUNITY FACILITIES DISTRICT PURSUANT TO WHICH SUCH WORK MAY BE ACQUIRED FROM OWNER BY SUCH COMMUNITY FACILITIES DISTRICT. THE SUCCESSFUL BIDDER OR CONTRACTOR WILL NOT HAVE RECOURSE, DIRECTLY OR INDIRECTLY, TO SUCH CITY OR COMMUNITY FACILITIES DISTRICT FOR ANY COSTS UNDER ANY CONTRACT OR ANY LIABILITY, CLAIM OR EXPENSE ARISING THEREFROM." (The "Developer" as defined in Instruction 1 to this IFB is the "OWNER" for purposes of the foregoing.)

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BID SUBMITTAL CHECKLIST

It is the Bidder's responsibility to be thoroughly familiar with all requirements and specifications. The following checklist is provided as a courtesy only, and is not binding upon the Owner nor does it modify, in any way, the terms or requirements of this IFB, any applicable statutes, rules, regulations, or the Owner's purchasing policies.

- 1. Bidder has reviewed all instructions, terms and conditions, and specifications to ensure your response fully complies.
- 2. Any addenda have been reviewed and acknowledged on the form included in the IFB. It is the Bidder's responsibility to obtain all addenda relevant to this solicitation via the Issuing Office or other means.
- 3. Insurance requirements have been reviewed and can be fully complied with.
- 4. The Bid Schedule has been fully completed, including prices offered (including any alternatives) have been fully filled in and reviewed for accuracy.
- 5. The Bid Schedule has been signed by an authorized representative of the firm. Unsigned bids will not be considered.
- 6. The List of Subcontractors has been fully completed and executed by Bidder and reviewed for accuracy.
- 7. Any required samples, descriptive literature, or enclosures have been included, if applicable all samples are clearly identified with Bidder's name and solicitation number.
- 8. Statutory Bid Bond has been fully executed by Bidder and appropriate Surety is included.
- 9. The Resolution of Board of Directors for corporate Bidder has been fully executed and included, or other proof of authorization required under this IFB has been included.
- 10. The Non-Collusive Bidding Certification has been executed and included.
- 11. The W-9 Form is complete and included.
- 12. The specified number of copies of Bidder's response has been included if more than one (1) copy is required.
- 13. The bid package and/or envelope have been identified with Bidder's name, Solicitation number and Solicitation Title.

INSTRUCTIONS TO BIDDERS

INSTRUCTION 1: DEFINED AND CONTROLLING TERMS

- 1.01 Definitions: Terms used in these Instructions to Bidders have the meanings indicated in the Contract, the General Conditions, the Project Specifications, Special Provisions, Contract Documents, and Owner Purchasing Procedures, as applicable. Additional terms used in these Instructions to Bidders and any resulting contract[s] have the meanings indicated below:
- A. *Bid, Bidder* – A Bid is the response submitted, and the party submitting a Bid is a Bidder.
 - B. *Design Professional* – The engineer, architect or other design professional designated in the Contract Documents.
 - C. *Developer* – Brookfield Lakin LLC, a Delaware limited liability company.
 - D. *Developer Engineer* – The engineer designated by the Developer.
 - E. *District* – The Lakin Community Facilities District (CFD), an Arizona community facilities district formed by the Municipality.
 - F. *District Engineer* – the engineer designated by the District.
 - G. *Engineers* – Collectively the Developer Engineer and the District Engineer,
 - H. *IFB* – This Invitation for Bids, all supporting documents included herewith, all Bidding Documents, and all properly issued Addenda.
 - I. *Issuing Office* – The office from which the Bidding Documents are to be issued. The Issuing Office is set forth in the Invitation for Bids above.
 - J. *Municipality* – The City of Avondale, Arizona, an Arizona Municipal corporation.
 - K. *Owner* – For purpose of this IFB and any resulting Contract, Developer, District, Municipality, and Trust, as their interested appear as set forth more specifically in Section 1.02 below. For purposes of administering this IFB and any resulting contracts, Developer shall act and have the authority of Owner, subject to requirements for Developer to obtain approval, inspections and/or certifications from the other Owner parties or Engineers. In addition, except where separate notice is required, notice to the Developer shall be notice to all Owners.
 - L. *Project* - The Project set forth in the Project Description above.
 - M. *Project Manager* - The Project Manager set forth in the Invitation for Bids or as otherwise designated in writing by the Owner. If no other Project Manager is designated, the Project Manager shall be the Issuing Office.
 - N. *Site* – the physical location where the Project is located and any ancillary or adjacent areas to be utilized by Contractor and/or Owner in relation to the Project.
 - O. *Trust* – the Trust as set forth in the Declaration of Trust and Affidavit dated August 2, 2018 and recorded on August 6, 2018 in the Official Records of the Maricopa County, Arizona Recorder's Office at Document, No. 20180592936. The Trustee of the Trust is Empire West Title Company, LLC d/b/a Thomas Title & Escrow, an Arizona limited liability company; the First Beneficiaries of the Trust are Lakin Cattle Company, an Arizona corporation, and Cashion Farm Limited Partnership, an Arizona limited partnership; and the Second Beneficiary is Developer.
- 1.02 Project Ownership. The Project involves construction of infrastructure on residential development being developed by Developer, with ownership held in trust through the Trust. As reflected in this IFB, construction of the Projects will be procured pursuant to the Municipalities' public procurement rules for the benefit of the District and the Municipality, and will be dedicated to the Municipality.
- 1.03 Municipality Purchasing Procedures: Construction of the Project shall be procured pursuant to the provisions of Title 34, Chapter 2, Article 1, Arizona Revised Statutes and in accordance with the requirements for construction projects of the Municipality similar to the Project as specified in

Municipality's Code and any procurement guidelines promulgated in connection therewith. Project contracts shall be entered into with the bidder[s] selected in accordance with the requirements for awarding contracts for projects of the Municipality similar to the Project contracts as specified by such code and guidelines. Municipality has adopted Purchasing Procedures which provide for the fair and equitable treatment of all persons involved in public purchasing by the Municipality, maximize the purchasing value of public funds in procurement, and to provide safeguards for maintaining a procurement system of quality and integrity. The provisions of this IFB are intended to be consistent with and incorporate herein by this reference the applicable terms of the Owner Purchasing Procedures. The Municipality's Purchasing Procedures are available on the Municipality's website. Questions concerning the application of such provisions to this IFB shall be addressed in writing to the Project Manager specified on Page 2 of in the form and within the time limits set forth in this IFB.

INSTRUCTION 2: COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents may be obtained electronically from the City of Avondale website www.avondaleaz.gov/procurement in the format stated in the Invitation for Bids above.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids. Neither Owner, Project Manager, nor the Issuing Office assumes any responsibility for errors or misinterpretations resulting from the use of incomplete, modified or unofficial sets of Bidding Documents.
- 2.03 Owner, the Issuing Office and/or Project Manager, 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.

INSTRUCTION 3: QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within 10 days of Owner's request, Bidder may be required to submit: (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 of Arizona
 - B. Bidder's Arizona contractor license number and/or other required professional certifications and good standing thereof.
 - C. Evidence that each natural person submitting a Bid, including the officers, partners, members, and/or principals of the Bidder, to submit documentation of their lawful presence in the United States, pursuant to A.R.S. §§ 1-501 and 1-502.
- 3.02 A Bidder's failure to submit required qualification information within the time(s) indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Instruction 3 to submit information will prejudice the right of Owner to seek additional information, as requested in the Owner's sole discretion, regarding Bidder's qualifications.
- 3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

INSTRUCTION 4: BIDDER'S PRE-BID OBLIGATIONS AND REPRESENTATIONS

- 4.01 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 if access available, 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 Contract Documents, 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 Special Provisions, 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. Become aware of the general nature of the work to be performed by the Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
 - G. Promptly give Project Manager written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Owner is acceptable to Bidder; and
 - H. 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.
- 4.02 Bidder represents and agrees that:
- A. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Instruction, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents; and
 - B. Based on the information and observations referred to in the preceding ¶ 4.01, 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.

INSTRUCTION 5: PRE-BID CONFERENCE

- 5.01 A Pre-Bid conference will be held at the time and location stated in the above Invitation for Bids. Representatives of Owner will be present to discuss the Project. If the Invitation for Bids provides that the Pre-Bid Conference is mandatory, it is mandatory and failure to attend the Pre-Bid Conference may be a basis for disqualifying a Bidder and/or rejecting the Bidder's Bid. If the Pre-Bid Conference is not mandatory, Bidders are encouraged to attend and participate in the conference. Oral statements may not be relied upon and will not be binding or legally effective.

INSTRUCTION 6: INTERPRETATIONS AND ADDENDA

- 6.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to in writing as set forth in the Invitation for Bids above. Any interpretations, clarifications, or other/additional information considered necessary by Project Manager and/or the Owner in response to such questions, or otherwise, will be issued by Addenda and posted on the Owner's website.
- 6.02 Questions received after the Questions Due Date and Time set forth on the Invitation for Bids above may be answered at the sole discretion of the Owner. Inquiries regarding this IFB directed to persons other than the Owner's designated representative may not be answered, and any answers received other than as set forth in this IFB will not be binding upon the Owner for any purpose.

- 6.03 Only answers provided by written Addenda will be binding upon the Owner. Oral and other interpretations or clarifications will be without legal effect. The Owner shall not be responsible for any oral representations or statements relating to the solicitation specifications made by any employee, agent or officer of the Owner.
- 6.04 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.
- 6.05 Receipt of Addenda shall be acknowledged by signing and returning the form included herein with the IFB with the Bid by the specified Bid due date and time. Potential Bidders are responsible for obtaining all addenda relevant to this IFB via the City of Avondale's website (www.avondaleaz.gov/procurement). The Owner shall not be held responsible if a Bidder fails to receive any Addenda issued.

INSTRUCTION 7: BID SECURITY

- 7.01 A Bid must be accompanied by bid security made payable to Owner in an amount of ten percent of Bidder's maximum bid price (determined by adding the base bid and all alternates) and in the form of a certified check, bank money order, or a bid Bond in statutory form (on the form included in the Bidding Documents) issued by a surety meeting the requirements of the General Conditions and applicable law.
- 7.02 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 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. Forfeiture will not preclude the Owner from seeking any or all other remedies provided by law to recover losses sustained as a result of the Bidder's failure to enter into the Contract or to furnish the contract securities or insurance certificates and endorsements.
- 7.03 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 (7) 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.
- 7.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven (7) days after the Bid Opening.

INSTRUCTION 8: SUBSTITUTE, REUSE AND "OR-EQUAL" ITEMS

- 8.01 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, reuse or "or-equal" items. In cases in which the Contract allows the Contractor to request that Project Manager authorize the use of a substitute or "or-equal" item of material or equipment, or reuse of existing materials, unless specifically directed by the Bidding Documents, application for such acceptance must be submitted to the Project Manager in writing at least eight (8) days prior to Submittal Date specified on page 2 or as changed in an Addendum.
- 8.02 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 reuse, "or-equal", or substitution requests are made at Bidder's sole risk.

INSTRUCTION 9: SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 9.01 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 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 Addenda, then the prospective Bidder should refrain from submitting a Bid.

- 9.02 The Bidders shall submit to the Owner with its response to this IFB a complete listing of all Subcontractors the Bidder intends to use in the performance of the work specified in the IFB providing the information required in the Subcontractor List included in the IFB. No Bid will be valid without the complete listing of both subcontractors and major material suppliers as listed in the IFB and the included List of Subcontractors form.

INSTRUCTION 10: PREPARATION OF BID

- 10.01 The Bid Schedule is included with the Bidding Documents.
- A. All blanks on the Bid Schedule shall be typed or 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, unit price and extended price listed therein.
- B. If the Bid Schedule expressly indicates that submitting pricing on a specific alternate item 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."
- 10.02 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.
- 10.03 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The partnership's address for receiving notices shall be shown.
- 10.04 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 firm's address for receiving notices shall be shown.
- 10.05 A Bid by an individual shall show the Bidder's name and address for receiving notices.
- 10.06 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture's address for receiving notices shall be shown.
- 10.07 All names shall be typed or printed in ink below the signatures.
- 10.08 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers and issue dates of which shall be filled in on the Bid Form.
- 10.09 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 10.10 The Bid shall contain evidence of Bidder's authority and qualification to do business in Arizona and the Bidder's Arizona contractor license number and classification, and/or any other required business and/or tax licenses required by the Owner shall also be shown on the Bid Form.
- 10.11 If price is a consideration and in case of error of prices in the Bid, the unit price shall govern. If there is a conflict between values or prices written-out in text and values or prices expressed in numbers, the text values or prices shall control.
- 10.12 No Bid shall be altered, amended, or withdrawn after the specified due date and time.
- 10.13 Periods of time, stated as a number of days, shall be calendar days.
- 10.14 It is the responsibility of all Bidders to examine the entire IFB package and seek clarification of any item or requirement and to check all responses for accuracy before submitting a Bid. Negligence in preparing a Bid confers no right of withdrawal after Bid due date and time.
- 10.15 The Owner shall not reimburse the cost of developing or providing any response to this IFB and development and provision of any offer shall be at the respective Bidder's sole cost. Offers submitted for consideration should be prepared simply and economically, providing adequate information in a straightforward and concise manner.

INSTRUCTION 11: BASIS OF BID

- 11.01 The Basis upon which Bids shall be calculated and submitted (Lump Sum/Fixed Price, Unit Price, and/or Allowances for specific items) are set forth in the IFB, including the Bid Schedule. All Bid items in each Section of the Bid must have a value entered in them.
- 11.02 Lump Sum/Fixed Price:
Bidders shall submit a Bid on a lump sum basis as set forth in the Bid Form.
- 11.03 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" provided in the IFB (usually the Bid Schedule) 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 the General Conditions.
 - C. Discrepancies between the multiplication of quantities, units of work or materials, and/or 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.
- 11.04 Allowances:
If allowances are included on the Bid Schedule the Bid price for each allowance 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 the General Conditions.

INSTRUCTION 12: SUBMITTAL OF BID

- 12.01 Bids must be submitted on the forms provided and in one (1) bound hard copy and one (1) digital copy including the Bid Schedule in Excel format on a jump drive labelled with the Bidder's name and the IFB number. Each copy of the Bid submitted by the Bidder must be a complete copy of the Bid including all of the documents and submittals required in the IFB.
- 12.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or Invitation for Bids and shall be enclosed in a plainly marked package with the Solicitation Number, the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. The sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "**BID ENCLOSED.**" 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, opened, or considered. Unless expressly provided for in the IFB, no electronic Bids will be accepted.
- 12.03 By signature on the Bid Form, the Bidder certifies that:
- A. The submission of the offer did not involve collusion or other anti-competitive practices.
 - B. The Bidder shall not discriminate against any employee or applicant for employment in violation of the Federal Executive Order 11246.
 - C. The Bidder has not given or offered to give, and does not intend to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip favor, or service to a public servant in connection with the submitted offer.
- 12.04 Failure to sign the Bid in all places where required, or the falsity of a statement in a signed Bid, shall void the submitted Bid or any resulting contracts, and the Bidder may be debarred.

INSTRUCTION 13: MODIFICATION AND WITHDRAWAL OF BID

- 13.01 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.
- 13.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 13.01 and submit a new Bid at the required location and manner prior to the date and time for the opening of Bids.
- 13.03 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 justifying withdrawal, that Bidder may withdraw its Bid if the Owner determines that it is in the best interest of the Owner to allow the Bid to be withdrawn, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder may, in the Owner's sole discretion, be disqualified from further bidding on the Work.

INSTRUCTION 14: OPENING OF BIDS

- 14.01 Bids will be opened at the time and place indicated in the Invitation for Bids above and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be posted on the City's website (www.avondaleaz.gov/procurement) after the opening of Bids
- 14.02 All Bids will remain subject to acceptance for the period of time stated in the Bid Form and each Bidder agrees that it will hold open its offer for such period, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period. Unless otherwise specified in the IFB, all Bidders and their Subcontractors shall hold their bids valid for a period of 60 days from the proposal due date stated in the IFB.

INSTRUCTION 15: EVALUATION OF BIDS

- 15.01 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 Owner may reject the Bid as nonresponsive.
- 15.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.
- 15.03 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 issuance of an Intent to Award.
 - B. In the comparison of Bids, 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 plus alternates" 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.
- 15.04 In evaluating whether a Bidder is responsible, Owner will 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.

- 15.05 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.
- 15.06 Any terms of the Bidder's submittal that conflict with the language and requirements of the Owner's solicitation or that take exception to the terms, conditions, specifications and/or other requirements stated within this IFB, may cause the Bidder's submittal to be considered nonresponsive and rejected. Exceptions may be evaluated by the Owner on an individual basis to determine compliance with the purpose and intent of the terms and conditions stated within this solicitation

INSTRUCTION 16: AWARD AND SIGNING OF CONTRACT

- 16.01 Notwithstanding any other provision of this IFB, the Owner expressly reserves the right, when determining whether to award a contract to the lowest responsive and responsible Bidder who has neither been disqualified nor rejected pursuant to the terms and conditions of the IFB, to:
 - A. Waive any immaterial defect or informality; and/or
 - B. Reject any or all Bids, or portions thereof; and/or
 - C. Reissue an Invitation for Bids; and/or
 - D. Exercise any other rights available to the Owner under the terms of the IFB, at law, or in equity.
- 16.02 When Owner issues an Intent of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Contract along with the other Contract Documents as identified in the Contract. Within 5 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Contract (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner.

INSTRUCTION 17: ADDITIONAL PROVISIONS

- 17.01 Contract Applicability: The Bidder shall substantially conform to the terms, conditions, specifications, and other requirements found within the text of this specific IFB. All previous agreements, contracts, or other documents, which have been executed between the Bidder and the Owner, are not applicable to this IFB or any resultant contract.
- 17.02 Gratuities: The Owner may, by written notice to the Bidder, cancel the resultant contract if it is found by the Owner that gratuities, in the form of entertainment, gifts or otherwise, were offered or given by the Bidder or any agent or representative of the Bidder, to any officer or employee of the Owner with a view toward securing an order, securing favorable treatment with respect to the awarding, amending, or the making of any determinations with respect to the performing of such order. In the event the Owner pursuant to this provision cancels the resultant contract, the Owner shall be entitled, in addition to any other rights and remedies, to recover or withhold from Contractor the amount of gratuity. Paying the expense of normal business meals, which are generally made available to all eligible Owner customers, shall not be prohibited by this paragraph.
- 17.03 Public Record: All offers submitted in response to this IFB, whether or not accepted by the Owner, may become a matter of public record available for public inspection, subsequent to the award notification, in accordance with the Municipality's Procurement Policy and Arizona's Public Records laws.
- 17.04 Confidential Information: If a Bidder believes that a Bid, IFB, offer, specification, or protest contains information that should be withheld, a statement advising the Owner of this fact shall accompany the submission and the information shall be identified. The information identified by the Bidder as confidential shall not be disclosed until the Owner makes a written determination on the claim of confidentiality.
- 17.05 Lobbying Prohibition: Any communication regarding this solicitation for the purpose of influencing the process or the award, between any person or affiliates seeking an award from this solicitation and the Owner, including but not limited to employees, and contractors engaged to assist in the solicitation, is prohibited.

- A. This prohibition is imposed from the time of the first public notice of the solicitation until the Owner cancels the solicitation, rejects all responses, awards a Contractor, and otherwise takes action which ends the solicitation process.
- B. This prohibition shall not apply to communication with the official contact(s) specifically identified in the solicitation or Owner-initiated communications for the purposes of conducting the procurement, and in the manner prescribed in the solicitation, including but not limited to pre-bid conferences, clarification of responses, presentations if provided for in the solicitation, requests for Best and Final Proposals, contract negotiations, interviews, protest/appeal resolution, or surveying non-responsive vendors.
- C. Violations of this provision may be a basis for rejecting a response or disbarment of the violator by the Owner. Persons and/or entities violating this prohibition may be subject to a warning letter, rejection of their response, or disbarment by the Owner, in the Owner's discretion, depending on the nature of the violation.

CONTRACT

BROOKFIELD LAKIN, LLC

CONTRACT FOR
Alamar CFD Phase 1 Infrastructure Improvements
Project # 174612.04

THIS CONTRACT is made and entered into on the _____ day of _____, 20____, by and between Brookfield Lakin, LLC, corporation Delaware limited liability company, hereinafter called "**Owner**" and the "**Contractor**" designated below:

Owner and Contractor agree as follows:

ARTICLE 1 – PARTICIPANTS AND PROJECT

OWNER: As set forth in in Instruction 1 of the Invitation for Bids ("IFB"), with Brookfield Lakin, LLC ("Developer") acting on behalf of all Owner entities.
Project Manager: Roger Theis
Telephone: (602) 903-7509
E-mail: roger.theis@brookfieldrp.com

CONTRACTOR: {Name}
{Address}
Arizona ROC No.:
Federal Tax ID No:
Representative:
Telephone:
E-mail:

PROJECT MANAGER/: Brookfield Lakin, LLC

DESIGNER Wood Patel & Associates, Inc.
Representative: Frank Koo
Telephone: (602) 335-8511
E-mail: fkoo@woodpatel.com

PROJECT DESCRIPTION: **Alamar CFD Phase 1 Infrastructure Improvements**

PROJECT LOCATION: **SWC of Avondale Blvd and Broadway Road**

THE WORK WHICH IS THE SUBJECT OF THE BID AND THIS CONTRACT IS THE SUBJECT OF A DISTRICT DEVELOPMENT, FINANCING PARTICIPATION AND INTERGOVERNMENTAL AGREEMENT AMONG DEVELOPER, BROOKFIELD RESIDENTIAL ARIZONA, THE CITY OF AVONDALE, ARIZONA, AND LAKIN COMMUNITY FACILITIES DISTRICT PURSUANT TO WHICH SUCH WORK MAY BE ACQUIRED FROM OWNER BY SUCH COMMUNITY FACILITIES DISTRICT. THE SUCCESSFUL CONTRACTOR WILL NOT HAVE RECOURSE, DIRECTLY OR INDIRECTLY, TO SUCH CITY OR COMMUNITY FACILITIES DISTRICT FOR ANY COSTS UNDER ANY CONTRACT OR ANY LIABILITY, CLAIM OR EXPENSE ARISING THEREFROM." (The "Developer" as defined in Instruction 1 to the IFB is the "OWNER" for purposes of the foregoing.)

ARTICLE 2 – CONTRACT DOCUMENTS

2.1 Contract Documents. The Contract Documents include those identified in Section 2.7 of the General Conditions, including the following:

1. This Contract;
2. Invitation for Bids (and all addenda thereto and documents incorporated therein) (collectively the IFB);
3. Owner's General Conditions (and all documents incorporated therein) (collectively the General Conditions);
4. Required documents submitted as part of Contractor's accepted Bid; and
5. Statutory bonds submitted by Contractor.

The Contract between the parties includes all of the Contract Documents. In the event of a conflict of language between the documents, the provisions shall prevail in the order set forth above. All previous contracts between the Bidder and Owner are not applicable to this Contract or other resultant contracts.

2.2 Definitions. The definitions in Section 2 of the General Conditions and Section 1.01 of the IFB Instructions to Bidders apply to all the Contract Documents, including this Contract. Additional definitions or defined terms applicable to all the Contract Documents for this Project, if any, include the following:

2.3 Special Provisions. If there are any additional provisions that apply to this Project, they are set forth in the Special Provisions included in the IFB.

2.4 Project Plans And Specifications. A detailed list of the plans and specifications for this Project are included in the IFB.

ARTICLE 3 – DESIGN PHASE SERVICES

Contractor is not providing any Design Phase Services to the Owner in relation to this Project unless otherwise noted in the Contract Documents.

ARTICLE 4 – CONSTRUCTION SERVICES

4.1 General.

4.1.1 Contractor agrees at its own cost and expense, to do all work necessary and required to fully, timely and properly complete the construction of the Project in strict accordance with the Contract Documents in a good and workmanlike manner, free and clear of all claims, liens, and charges whatsoever, in the manner and under the conditions specified, within the Project Schedule.

4.1.2 Contractor shall provide all of the labor and materials, and perform the Work in accordance with Section 4 of the General Conditions. Some but not all of the major components of the Construction Services and the corresponding subsections of Section 4 of the General Conditions are set forth below.

4.1.3 At all times relevant to this Contract and performance of the Work, the contractor shall fully comply with all Laws, Regulations, or Legal Requirements applicable to Owner, the Project and the Contract, including, without limitation, those set forth in the General Conditions.

4.1.4 Contractor shall perform the Work under this Contract using only those firms, team members and individuals designated by Contractor consistent with Contractor's accepted Bid, or otherwise, approved by Owner pursuant to the General Conditions. No other entities or individuals may be used without the prior written approval of the Project Manager.

4.1.5 Contractor will comply with all terms and conditions of the General Conditions.

4.1.6 In the event of a conflict between this Contract and the General Conditions or any exhibit hereto or appendix thereto, the terms of this Contract shall control.

4.1.7 Ownership of Work Product. Notwithstanding anything to the contrary in this Contract, all Work Product prepared or otherwise created in connection with the performance of this Contract, including the Work, are to be and remain the property of Owner. For purposes of this provision, "Work Product" shall include all designs, drawings, plans, specifications, ideas, renderings and other information or matter, in whatever form created (e.g., electronic or printed) and in all media now known or hereinafter created. All Work Product shall be considered "Work Made for Hire" as defined in the United States Copyright Act 17 U.S.C. § 101 (Copyright Act). If for any reason any such Work is found not to be a work for hire, Contractor hereby transfers and assigns ownership of the copyright in such Work to Owner. The rights in this Section are exclusive to Owner in perpetuity.

4.2 Contractor's Pre-Contract and Pre-Work Deliverables.

4.2.1 The Contractor will provide the Deliverables in accordance with Section 4.2 of the General Conditions.

4.2.2 Any additional items which Contractor must deliver to Owner prior to commencing the Work on this Project, if any, are stated in the Special Provisions included in the IFB, and also include the following:

4.3 Pre-Construction Conference. Contractor shall attend the Pre-Construction Conference in accordance with Section 4.3 of the General Conditions.

4.4 Performance of the Work (Including Field Measurements, Subcontractors, and Suppliers). Contractor shall perform the Work in accordance with Section 4.4 of the General Conditions.

4.5 Control Of The Project Site. Contractor shall control and maintain the Project Site in accordance with Section 4.5 of the General Conditions.

4.6 Project Safety. Contractor shall implement and enforce Project safety in accordance with Section 4.6 of the General Conditions.

4.7 Materials Quality, Substitutions and Shop Drawings. Contractor shall provide materials testing and submit substitute materials and shop drawings in accordance with Section 4.7 of the General Conditions.

4.8 Project Record Documents. Contractor shall maintain and make available the Project Record Documents in accordance with Section 4.8 of the General Conditions.

4.9 Warranty and Correction of Defective Work. Contractor shall provide warranties and correct defective Work in accordance with Section 4.9 of the General Conditions.

4.10 Municipality and District are express third party beneficiaries to all warranties, guarantees and bonds under this Contract.

4.11 Inspections of the Work, approvals, and certifications by the Engineers will be required as specified by Owner.

ARTICLE 5 – OWNER RESPONSIBILITIES

5.1 Owner shall have the responsibilities, and provide the information specified in, and subject to the conditions set forth in, Section 5 of the General Conditions.

5.2 Additional services to be provided or responsibilities assumed, by Owner, if any, are listed in the Special Provisions and also include the following:

5.3 Additional Information to be provided by Owner, if any, is listed in the Special Provisions and also includes the following:

ARTICLE 6 - CONTRACT TIME

6.1 Contract Time.

6.1.1 The Contract Time shall start with the Notice to Proceed (NTP) and end with Final Acceptance, as set forth in Section 6.4 below. The Notice to Proceed cannot be issued until prior to the approval and acceptance by Owner of the Bid.

6.1.2 The Contract Time shall be as set forth in the Project Schedule. Contractor agrees that it will commence performance of the Work and complete the Project through both Substantial Completion and Final Completion within the Contract Time.

6.1.3 Time is of the essence of this Contract, for the Project, and for each phase and/or designated Milestone thereof.

6.1.4 Failure on the part of Contractor to adhere to the approved Project Schedule will be deemed a material breach and sufficient grounds for termination of this Contract by Owner.

6.2 Project Schedule. The Project Schedule as set forth in the IFB and/or an Exhibit to this Contract shall be updated and maintained throughout Contractor's performance under this Contract in accordance with Section 6.2 of the General Conditions.

6.3 Substantial Completion. Substantial Completion shall be achieved not later than the Substantial Completion Date set forth in the Project Schedule, which is [REDACTED]. Substantial Completion shall be determined in accordance with Section 6.3 of the General Conditions.

6.4 Final Completion and Final Acceptance.

6.4.1 Final Completion will be obtained within the time period set forth in the Project Schedule, which is: [REDACTED].

6.4.2 Final Completion will be determined and Final Acceptance will be issued pursuant to Section 6.4 of the General Conditions.

6.5 Liquidated Damages.

6.5.1 Substantial Completion Liquidated Damages. Contractor acknowledges and agrees that if Contractor fails to obtain Substantial Completion of the Work within the Contract Time, Owner will sustain extensive damages and serious loss as a result of such failure. The exact amount of such damages will be extremely difficult to ascertain. Therefore, Owner and Contractor agree that if Contractor fails to achieve Substantial Completion of the Work within the Contract Time, Owner shall be entitled to retain or recover from Contractor, as liquidated damages and not as a penalty, the following per diem amounts commencing from the Substantial Completion Date required under the Contract until the actual date of Substantial Completion:

6.5.2 Final Completion Liquidated Damages. For the same reasons set forth in Section 6.5.1 above, Owner and Contractor further agree that if Contractor fails to achieve Final Completion of the Work within the Contract Time, Owner shall be entitled to retain or recover from Contractor, as liquidated damages and not as a penalty, the following per diem amounts commencing from the actual date of Substantial Completion or the Final Completion Date as required under the Contract, whichever is later, until the actual date of Final Completion:

such insurance and all required endorsements in forms acceptable to Owner when required and in accordance with Section 4.2 hereof prior to commencing any Work under this Contract.

11.2 Contractor shall provide performance and payment bonds to Owner in accordance with Section 11.2 of the General Conditions, Section 4.2 hereof, and A.R.S. § 34-610(A).

11.3 All of the entities included in the definition of "Owner" under the definition in Instruction 1.01 of the IFB shall be named as additional insureds under the Contractor's /Insurance policies under this Contract.

11.4 Failure to provide proof of insurance and the required endorsements, or the required bonds, in forms acceptable to Owner, will be a material breach and grounds for termination for cause of this Contract.

ARTICLE 12 – INDEMNIFICATION

Contractor shall have and assume the indemnity obligations set forth in Section 12 of the General Conditions. Parties indemnified under this provision shall include all of the entities included in the definition of "Owner" under the definition in Instruction 1.01 of the IFB, and each legislator, director, trustee, partner, member, officer, official, independent contractor or employee thereof.

ARTICLE 13 - DISPUTE RESOLUTION

Any claims or disputes relating to this Contract shall be resolved according to the dispute resolution process set forth in Section 13 of the General Conditions.

ARTICLE 14 – MISCELLANEOUS PROVISIONS

The miscellaneous provisions set forth in Section 14 of the General Conditions shall apply to this Contract.

ARTICLE 15 CONFLICTS OF INTEREST; NO GIFTS TO PUBLIC OFFICIALS.

Contractor shall, upon execution of this Contract and upon execution of each Change Order or modification to this Contract, disclose fully and accurately to Owner whether: (a) Contractor or any owner, member, officer or employee, or any spouse, intended spouse or other relative of any of the foregoing, or any person or entity controlled in whole or in part by any of the foregoing ("Related Persons"), holds any office (whether elected or appointed) or has any other relationship with any governmental entity or agency or any elected or appointed Public Official, or (b) any Public Official or any spouse or other relative of any Public Official, or any entity owned or controlled in whole or in part by any of the foregoing ("Public Persons") owns any interest in Contractor or any other business entity owned or operated in whole or in part by Contractor or any Related Persons, or (c) any Public Persons will receive any part of the Fee or any other consideration relating in any way to the Work to be performed under this Contract and any addenda to this Contract. Contractor shall immediately advise Owner in writing of any supplemental information that renders previously provided information concerning these matters inaccurate or incomplete. Owner's obligations under this Contract are subject to Owner's approval, in its sole discretion, of any conflicts of interest disclosed by Contractor as required herein. Contractor shall avoid any governmental conflicts of interest with regard to performance of the Work. Contractor shall not, on Owner's behalf or in connection with the Work, provide any Gift to or otherwise entertain any Public Official or any other person required. The term "Public Official" means any elected or appointed official, or member, officer, employee or consultant of a federal, state or local governmental or regulatory agency, board, commission, or the judicial branch, or any candidate for such position. The term "Gift" includes any cash or equivalents, honorarium, contribution, item of merchandise, services, discounts on merchandise or services, meals and other entertainment expenses, or any other transfers of any item or service of value. Under no circumstances shall Owner be deemed to have waived the provisions of this Section as to a specific Gift unless the waiver is in writing and signed by two authorized officers of Owner.

IN WITNESS WHEREOF, the parties hereto have executed this Contract through their duly authorized representatives and bind their respective entities as of the effective date.

BROOKFIELD LAKIN, LLC:

CONTRACTOR:

By: _____

By: _____

Its: _____

GENERAL CONDITIONS OF CONTRACT

These terms will be the General Conditions for any Contract entered into as a result of the IFB and are incorporated therein and shall be fully binding upon the Bidder/Contractor

The Owner has adopted General Conditions which encompass provisions that apply, and are incorporated into all construction contracts entered into by the Owner, unless otherwise specifically excluded in the executed Contract. The current edition of the General Conditions can be found on the City of Avondale's Website at: www.avondaleaz.gov/procurement.

Municipality operates under the latest revision of the MAG Specifications as amended by Municipality. Municipality's current effective amendment to the MAG Specifications, if any, may be downloaded from Municipality's Web site. Copies of the MAG Specifications and MAG Standard Details are available at the Maricopa Association of Governments office, 302 N. 1st Avenue, Suite 300, Phoenix, Arizona and may also be downloaded at their Web site: <http://www.mag.maricopa.gov/> under "Publications." The MAG Specifications and Standard Details and Municipality's amendments thereto are incorporated into the Contract

GENERAL CONDITIONS

ADOPTED NOVEMBER 1, 2018

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SECTION 1 — SCOPE OF THESE GENERAL CONDITIONS

These General Conditions encompass provisions that apply, and are incorporated into all construction contracts entered into by the Owner, unless otherwise specifically excluded in the executed Contract. Sections 2 through 14 of these General Conditions apply to all construction contracts, in whatever form, including without limitation, Fixed Price, Construction Manager at Risk (CMAR), and Guaranteed Maximum Price (GMP) Cost-Based.

SECTION 2 — GENERAL DEFINITIONS

Note: The definitions below are in addition to the specific definitions in the solicitation(s) and/or contract(s) which these General Conditions apply. Additional definitions of terms that only have application to contracts involving Guaranteed Maximum Price (GMP) and Cost-Based Contracts, Change Orders are found in Section 15.1 below; and additional definitions of terms that only have application to contracts involving Pre-Construction Services are found in Sections 17.1 below.

2.1. Change Order – A written instrument issued after execution of the Contract Documents signed by Owner and Contractor, stating their agreement upon all of the following: the addition, deletion or revision in the scope of services or deliverables; the amount of the adjustment to the Contract Price, the extent of the adjustment to the Contract Time, or modifications of other contract terms. The Contract Price and the Contract Time may be changed only by Change Order.

2.2. City or Municipality– City of Avondale, a municipal corporation.

2.3. Construction Manager at Risk (CMAR) – The person or business entity with whom Owner has entered into an agreement for construction management to provide pre-construction and/or construction services and/or work in relation to the Project at issue. As used in these General Conditions, the term Contractor includes and applies to CMAR.

2.4. Consultant – A person or firm that provides professional services.

2.5. Contingent Bid Items – This is a minor bid item which is likely, but not certain, to occur during the course of work. If the Engineer determines that this work is required, the Contractor will accomplish the work and payment will be made based on the contingent unit bid price included in the proposal. Since the quantity listed in the proposal is primarily for bid comparison, the amount of work required by the Engineer may vary materially from this.

2.6. Contract – The written agreement executed between Owner and Contractor, including all of the Contract Documents.

2.7. Contract Documents – The documents which together form the Contract between Owner and Contractor, as identified in Article 2 of the Contract, or are otherwise incorporated into the Contract, including the Contract, the exhibits thereto, these General Conditions, any Notice to Proceed, the RFP (if applicable), , the Plans and Specifications, Project Schedule, written and properly executed Change Orders, MAG Specifications and Owner’s amendments thereto, and any other documents so designated in the Contract.

2.8. Contract Price – The agreed-upon price to be paid to Contractor for full, timely, and acceptable completion of the Services or Work under the terms of the Contract.

2.9. Contract Time(s) – The number of calendar days or the dates related to the applicable phase, Substantial Completion, and/or Final Acceptance as stated in Contract Documents. The Contract Time is set forth in the Contract, and is based upon the Project Schedule agreed to by Owner in writing.

2.10. Contractor – The person or business entity with whom Owner has entered into an agreement for construction related work or services in relation to the Project at issue. As used in these General

Conditions, the term Contractor includes and applies to CMAR under contract with Owner to provide pre-construction and/or construction services.

2.11. Contractor Payment Request – The form that is accepted by Owner and used by Contractor in requesting progress payments or final payment and which shall include such supporting documentation as is required by the Contract Documents and/or Owner.

2.12. Construction Documents – The plans, specifications, and drawings prepared and issued by the Design Professional and approved by Owner for construction, meaning the documents are sealed by the Design Professional (as required), acceptable for permitting and incorporated into the Contract by reference. All amendments and modifications to the Construction Documents must be approved in writing by Owner prior to incorporation into the Contract.

2.13. Critical Path – Critical path is the sequence of project network activities which add up to the longest overall duration. Once established in the Project Schedule, the Critical Path for the Project shall not be changed without prior written approval of Owner.

2.14. Critical Path Method (CPM) - A scheduling technique which identifies the logical sequence of the activities occurring in a Construction Project, the anticipated time required to complete each activity in the Project, and the activities that must be completed on schedule to finish the Project within the anticipated time. Typically, activities are arranged in a network that shows both activities and their dependencies. CPM is also used as a management technique which enables contracting parties to predict when activities may occur so that resources can be effectively used and limitations can be identified.

2.15. Day Calendar day(s) unless otherwise specifically stated in the Contract Documents.

2.16. Design Professional – The qualified, licensed person, firm or corporation who furnished design services required under the Contract Documents to include, but not limited to: development of the Construction Documents, review of Contractor Submittal(s), response to Request for Information, approval and certification of progress payment applications, construction administration, Substantial Completion, and Final Acceptance and Completion, if so designated.

2.17. Differing Site Conditions – Concealed or latent physical conditions or subsurface conditions at the Site that, (i) materially differ from the conditions indicated in the Contract Documents, or (ii) are of an unusual nature, differing materially from the conditions ordinarily encountered and generally recognized as inherent in the Work at the general area of the Site. Caliche, rock, hard-digging or sandy/silty soil encountered on a project is not considered a “Differing Site Condition.”

2.18. Final Acceptance – The Owner’s acceptance of the facility or project from the Contractor after all Work is completed, tested, and inspected in accordance with the contract requirements. Final Acceptance results in a Letter of Acceptance (LOA).

2.19. Final Completion – When the Contractor has achieved full and final completion of the Project as defined in the Contract Documents and Owner has delivered to Contractor the written Final Acceptance of the Project. See Section 6.4 below.

2.20. Float – The number of Days by which an activity can be delayed without lengthening the Critical Path and extending the Contract Time. Unless otherwise expressly agreed in writing, all Float belongs to Owner.

2.21. Laws, Regulations, or Legal Requirements - Any and all applicable laws, rules, regulations, ordinances, codes and orders applicable to the Project of any and all governmental bodies, agencies, authorities and courts having jurisdiction and any applicable provisions of a Development Agreement for the Project (if any), including, without limitation, those provisions relating to the design and construction of the Project, dust control, hazardous materials, historical and environmental preservation, demolition, excavation, safety, employment, discrimination, ADA, building codes, zoning, and notice.

2.22. Line Item – The individual elements of Work identified on a bid or other schedule and associated with a price or a unit price and quantity particular to that individual element of the Work. Also refers to individual items of work within the Schedule of Values.

2.23. Liquidated Damages – Designated damages for the Owner to collect as compensation upon a specific breach (example: late delivery).

2.24. MAG Specifications – The latest revision of the latest edition adopted by the Municipality of the Uniform Standard Specifications for Public Works Construction published by MAG.

2.25. MAG Standard Details – The latest revision of the latest edition adopted by the Municipality of Uniform Standard Details as published by MAG.

2.26. Municipality or City – City of Avondale, a municipal corporation.

2.27. Notice to Proceed (NTP) – A written notice given by Owner to Contractor fixing the date on which Contractor will start to perform Contractor’s obligations under the Contract.

2.28. Owner – The person, persons, entity and/or entities designated as the “Owner” in the solicitation(s) and/or Contract(s) to which these general conditions apply.

2.29. Project – The Project specified in the Contract (including a Job Order).

2.30. Project Manager – The Project Manager designated in Article 1 of the Contract, or any successor thereto designated by Owner. The Project Manager has the authority to act on behalf of Owner, as delineated and limited by the Contract Documents and applicable law. Owner shall communicate with Contractor through the Project Manager. The Project Manager has no authority to bind Owner or City Council in contravention of any City code, State or Federal statute or regulation, or these General Conditions.

2.31. Project Schedule – The schedule for the completion of the Project agreed to and/or required by Owner and incorporated into the Contract.

2.32. Project Team – The Project Team consisting of the Design Professional, Contactor, Project Manager, and such others as Owner may designate.

2.33. Proposal – A Proposal submitted to the Owner by a Contractor, CMAR, Design Professional or Design-Builder in response to an Invitation for Bids,(IFB), a Request for Qualifications (RFQ), a Request for Proposals (RFP) or other solicitation or request by the Owner. Proposals may be Fixed Price, Guaranteed Maximum Price (GMP), Unit Price, or other form as required or requested by the Owner.

2.34. Quality Assurance (QA) Testing – Testing performed to verify the accuracy and applicability of the QC testing results and to ascertain that the materials installed meet the specified levels of quality in accordance with the Contract Documents.

2.35. Quality Control (QC) Testing – Testing performed to assure that the materials installed comply with the requirements in the Contract Documents.

2.36. Requests for Information (RFIs) – Formal written request from Contractor to Owner and/or Contractor for the Project seeking clarification or additional information needed for Contractor to properly complete the Work and/or Services under the Contract. Owner may require RFIs to be submitted on a specific form or in a specified format.

2.37. Schedule of Values (SOV) – The specified document prepared by Contractor, and approved and accepted by Owner, which divides the Contract Price into pay items, such that the sum of all pay items equals the Contract Price for the construction phase Work, or for any portion of the Work having a separate specified Contract Price.

2.38. Scope of Work – The scope of work agreed to and/or required by Owner and incorporated into the Contract.

2.39. Shop Drawings – All drawings, diagrams, schedules and other data specifically prepared for the Work by Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

2.40. Site – The physical location of the Project and any ancillary or adjacent areas to be utilized by Contractor and/or Town in relation to the Project, including storage and/or staging areas, and construction easements.

2.41. Special Provisions – Additional conditions which apply to the specific Project and/or Scope of Work which are set forth in Exhibit D of the Contract.

2.42. Specifications – The part(s) of the Contract Documents for the construction phase consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto. Where specified, the Project shall be constructed using the current Uniform Standard Specifications and Details for Public Works Construction as furnished by the Maricopa Association of Governments, as amended by Owner.

2.43. Subconsultant – A person, firm or corporation having a Contract with Consultant/Contractor to furnish services required as its independent professional associate or consultant with respect to the Project.

2.44. Subcontractor – An individual or firm having a direct Contract with Contractor or any other individual or firm having a Contract with the aforesaid contractors at any tier, who undertakes to perform a part of the pre-construction services or construction phase Work at the site for which Contractor is responsible. Subcontractors shall be selected through the Subcontractor selection process described in the Contract Documents, if any.

2.45. Substantial Completion – The date when the Owner determines that the Work (or separable units of Phases as provided in the Contract Documents) is essentially and satisfactorily complete in accordance with the Contract Documents such that the Project is ready for use by the Owner for its intended purpose, opening to the general public, full occupancy or use by Owner (including, without limitation, all separate units, or rooms, facilities, access, income-generating areas, and/or all areas serving the general public, as applicable, shall be ready for full operation without material inconvenience or discomfort), including, to the extent applicable to the Work, the following: all materials, equipment, systems, controls, features, facilities, accessories, and similar elements are installed in the proper manner and in operating condition, inspected, and approved; surfaces have been painted; masonry and concrete cleaned with any sealer or other finish applied; utilities and systems connected and functioning site work complete permanent heating, ventilation, air conditioning, vertical transportation, and other systems properly operating with proper controls; lighting and electrical systems installed, operable and controlled; paving completed, signage installed, and/or other work as applicable, has been performed to a similar state of essential and satisfactory completion.

2.46. Total Float – Number of Days by which the pre-construction services or construction phase Work or any part of the same may be delayed without necessarily extending a pertinent Contract Time or schedule milestone in the Project Schedule.

2.47. Work – The entire completion of construction or the various separately identifiable parts thereof, required to be furnished during the construction phase. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials, resources and equipment into the construction, and performing or furnishing services and documents as required by the Contract Documents for the construction phase.

SECTION 3 — STANDARD SPECIFICATIONS AND DETAILS

3.1 Municipality operates under the latest revision of the MAG Specifications and MAG Standard Details, as may be amended by Municipality. Municipality's current effective amendments, if any, to the MAG Specifications and/or MAG Standard Details may be accessed from Municipality's Web site at www.avondaleaz.gov:

3.2 Copies of the MAG Specifications and MAG Standard Details are available at the Maricopa Association of Governments' office, 302 N. 1st Avenue, Suite 300, Phoenix, Arizona. They may also be downloaded at their Web site: <http://www.mag.maricopa.gov> under "Publications."

3.2 The applicable MAG Specifications and Standard Details and Municipality's amendments thereto are incorporated into the Contract.

SECTION 4 — CONTRACTOR'S RESPONSIBILITIES FOR CONSTRUCTION SERVICES

4.1 General

4.1.1 Contractor shall construct the Work in accordance with the Contract Documents and as outlined in the Contract to the satisfaction of Owner, exercising the degree of professional care, skill, diligence, quality and judgment that a professional Contractor engaged, experienced and specializing in the construction of construction and/or facilities of similar scope, function, size, quality, complexity and detail in areas throughout the United States comparable to the Municipality would exercise at such time, under similar conditions. Contractor shall, at all times, perform the Work in conformance with sound and generally accepted engineering principles and construction management and construction contracting practices.

4.1.2 Contractor shall comply with, and require all Subcontractors to comply with, the Arizona Contractors' license Laws, Regulations, or Legal Requirements, including all requirements with respect to being duly registered and licensed.

4.2 Contractor's Pre-Contract and Pre-Work Deliverables

4.2.1 Before beginning any Work under the Contract, Contractor shall execute the Contract and deliver to Owner the items listed in Sections 4.2.2 and 4.2.3 below, and the Contract must be executed by Owner. Failure to do so will be a material breach of the Contract could result in Owner: (i) declaring Contractor in default and collecting on Contractor's bid bond, or performance bonds as appropriate; (ii) suspending and/or debaring Contractor; and/or (iii) terminating the Contract for Cause and recovering damages from Contractor therefore.

4.2.2 Signed Contract. When Contractor delivers a signed Contract to Owner, Contractor shall also deliver to Owner such bonds and certificates of insurance with endorsements in such amounts (and other evidence of insurance requested by Owner) required under Section 11 of these General Conditions, and as the Contract requires.

4.2.3 Government Approvals and Permits. Contractor shall obtain all necessary permits for the Work and pay all applicable fees, unless otherwise noted on the plans and in the specifications. For bidding purposes, an allowance for all permit fees is included in the bid schedule under the item "allowance for permit fees." The Contractor shall be paid for the actual cost of the permit fees upon submitting a receipt showing the fee Contractor has paid. Excluded from the above allowance are items such as all costs incurred by the Contractor in securing the permit except for the actual permit fee established by the agency, cost for all shut downs or outages, cost for pole bracing, cost of permits for construction water, cost of construction water, cost for any additional insurance requirements, cost for any licenses, and other similar type costs. Contractor is specifically notified of the need to obtain the necessary environmental permits or file the necessary environmental and regulatory permit notices. Copies of all permits and the associated notices must be provided to Owner prior to starting the permitted activity.

4.2.4 Workmen's Compensation Insurance. As evidence of Workmen's Compensation Insurance, Contractor shall provide a letter of certification from the Industrial Commission of Arizona that Contractor is insured by the State Compensation Fund or is an authorized self-insurer, or a certificate of insurance issued by an insurance company authorized by the Insurance Department of Arizona to write Workmen's Compensation and Occupational Disease Insurance in the State of Arizona.

4.3 Pre-Construction Conference

4.3.1 Prior to the commencement of any Work, Owner will schedule a Pre-Construction Conference.

4.3.2 The purpose of this Conference is to establish a working relationship between Owner, Contractor, the utility firms, and various City agencies. The agenda will include critical elements of the work schedule, submittal schedule, cost breakdown of major lump sum items, Payment Requests and processing, coordination with the involved utility firms, and emergency telephone numbers for all representatives involved in the course of construction.

4.3.3 Minimum attendance by Contractor at any mandatory meeting with Owner shall be (1) Contractor's Representative, who is authorized to execute and sign documents on behalf of the firm, (2) Contractor's on-site Superintendent, and (3) Contractor's Safety Officer, or other employee responsible for safety.

4.4 Performance of the Work (including Field Measurements, Subcontractors, and Suppliers)

4.4.1 Unless otherwise provided in the Contract Documents to be the responsibility of Owner or a separate Contractor, Contractor shall provide through itself or Subcontractors the necessary supervision, labor, inspection, testing, start-up, material, equipment, machinery, temporary utilities and other temporary facilities to permit Contractor to complete the Work consistent with the Contract Documents.

4.4.2 Contractor shall perform all construction activities efficiently and with the requisite expertise, skill and competence to satisfy the requirements of the Contract Documents. Contractor shall at all times exercise complete and exclusive control over the means, methods, safety, sequences and techniques of construction.

4.4.3 Contractor's Superintendent shall be present at the Site at all times that material Work under this Contract is taking place. Contractor's Superintendent or designee shall be present at the Site at all times any other Work under this Contract is taking place.

4.4.3.1 All elements of the Work shall be under the direct supervision of a foreman or his designated representative on the Site who shall have the authority to take actions required to properly carry out that particular element of the work.

4.4.3.2 In the event of any noncompliance with this Section 4, Owner may require Contractor to stop or suspend the Work in whole or in part.

4.4.4 Where the Contract Documents require that a particular product be installed and/or applied by an applicator approved by the manufacturer, it is Contractor's responsibility to ensure the Subcontractor employed for such work is approved by the manufacturer.

4.4.5 Before starting the Work, Contractor shall carefully study and compare the various plans, drawings, other Contract Documents, and specifications relative to that portion of the Work as well as the information furnished by Owner, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the site affecting it. The exactness of grades, elevations, dimensions, or locations given on any Drawings, or the work installed by other contractors, is not guaranteed by Owner.

4.4.6 Before ordering materials or doing Work, Contractor and each Subcontractor shall verify measurements at the Site and shall be responsible for the correctness of such measurements. No extra charge or compensation will be allowed because of differences between actual dimensions and the dimensions indicated on the Contract Documents, including the drawings.

4.4.9 If Contractor observes error, discrepancies or omissions in the Contract Documents, it shall promptly notify the Design Professional and Owner and request clarification. If Contractor, with the exercise of reasonable care, should have recognized such error, inconsistency, omission or difference and fails to report it to Owner, and if Contractor proceeds with the Work affected by such observed errors, discrepancies or omissions, without receiving such clarifications, it does so at its own risk and shall be liable to Owner for damages resulting from proceeding without clarification.

4.4.10 In all cases of interconnection of its Work with existing or other work, Contractor shall verify at the Site all dimensions relating to such existing or other work. Any errors due to Contractor's failure to so verify all such grades, elevations, locations or dimensions shall be promptly rectified by Contractor without any increase in the Contract Price. Any design errors or omissions noted by Contractor during this review shall be reported promptly to Owner.

4.4.11 Contractor shall establish and maintain all construction grades, lines, levels, and benchmarks, and shall be responsible for accuracy and protection of same. This Work shall be performed or supervised by a licensed civil engineer or surveyor in the State or Arizona.

4.4.12 Contractor shall be responsible for the proper performance of the work of Subcontractors and any acts and omissions in connection with such performance. Nothing in the Contract Documents is intended or deemed to create any legal or contractual relationship between Owner and any Subcontractor or Sub-Subcontractor, including but not limited to any third-party beneficiary rights.

4.4.13 Contractor shall coordinate the activities of all Subcontractors. Contractor shall coordinate performance of the Work with Owner and applicable departments or agencies within City, the Design Professional and other contractors or parties involved in the Project. If Owner performs other work on the Project or at the Site with separate contractors under Owner's control, Contractor agrees to cooperate and coordinate its activities with those of such separate contractors so that the Project can be completed in an orderly and coordinated manner without unreasonable disruption.

4.4.14 Contractor shall insure that all employees performing any Work for which Contractor is responsible have a legal right to live and work in the United States. Upon request by Owner, a copy of the Birth Certificate, Immigration and Naturalization Card, or Special Entry Permit shall be provided to the Owner. In addition, all compensation of any such employee shall meet all applicable requirements of the Fair Labor Standards Act (FLSA) and Federal Minimum Wage Laws.

4.4.15 Contractor will not substitute or change any Subcontractor or Supplier without the prior written approval of Owner. Any substitute or replacement Subcontractor or Supplier shall be required to meet the same qualifications and selection criteria and process as the original Subcontractor or Supplier. If a Subcontract/Supplier selection plan has been approved by Owner, Contractor will follow that plan unless otherwise approved by Owner in writing.

4.4.16 Contractor shall not change or replace any members of its Project team, including Contractor's Representative, Project Manager, or Superintendent, without an explanation for the change being given to Owner, and receiving prior written approval of the change from Owner, which approval will not be unreasonably withheld.

4.4.17 Subcontractors whose scope of work has a value greater than 15% of the total Contract Price are required to furnish performance and payment bonds to Contractor, unless otherwise approved in writing by Owner.

4.4.18 MAG Specification § 108.2(E), requiring a minimum amount of self-performance by Contractor for certain scopes of work, does not apply.

4.4.19 Owner anticipates the use one or more business applications, including a file sharing application called SharePoint (collectively “Business Applications”), each of which has its own applicable Terms of Use”. Contractor agrees to comply with and to be bound by the applicable Terms of Use, to utilize the relevant Business Applications in accordance with such Terms of Use and to cause its employees, representatives, agents and sub-subcontractors and their employees, representatives and agents) utilizing the relevant Business Applications do so in accordance with such Terms of Use.

4.5 Control of the Project Site

4.5.1 Throughout all phases of construction, including suspension of Work, Contractor shall keep the Site reasonably free from debris, trash and construction wastes to permit Contractor to perform its construction services efficiently, safely and without interfering with the use of adjacent land areas. Prior to Final Acceptance of the Work, or a portion of the Work, Contractor shall remove all debris, trash, construction wastes, materials, equipment, machinery and tools arising from the Work or applicable portions thereof to permit Owner to occupy the Project or a portion of the Project for its intended use.

4.5.2 Contractor shall take whatever steps, procedures or means necessary to prevent dust nuisance due to construction operations. The dust control measures shall be maintained at all times to the satisfaction of Owner and in accordance with all applicable Laws, Regulations, or Legal Requirements.

4.5.3 Contractor shall be responsible to Owner for the acts and omissions of Contractor’s employees, Subcontractors and their agents and employees, and any other person performing any of the Work under a Contract with Contractor, or claiming by, through or under Contractor, for all damages, losses, costs and expenses resulting from such acts or omissions.

4.5.4 Contractor shall maintain Americans with Disabilities Act (ADA) and American Nationals Standards Institute (ANSI) accessibility requirements during construction activities, including without limitation compliance with the 2010 regulations governing implementation of the ADA to the extent applicable. ADA and ANSI accessibility requirements shall include, but not be limited to, parking, building access, areas of refuge, and emergency exit paths of travel. Contractor shall be responsible for the coordination of all work to minimize disruption to residents and the public.

4.6 Project Safety

4.6.1 The Project and all Work performed in relation thereto is governed by applicable provisions of the federal laws, including but not limited to, the latest amendments of the following:

- a. Williams-Steiger Occupational Safety & Health Act of 1970, Public Law, 91-596.
- b. Part 1019 and Part 1926 – Occupational Safety and Health Standards, Chapter XVII of Title 20, Code of Federal Regulations.
- c. Part 1518 – Safety and Health Regulations for Construction, Chapter XIII of Title 29, Code of Federal Regulations.

4.6.2 Contractor is responsible for safety of the Site and the Project for employees of Contractor as well as for members of the general public and others who may drive or walk through or be at or near the Site, or be impacted by the Work.

4.6.3 Contractor assumes responsibility for implementing and monitoring all safety precautions and programs related to the performance of the Work.

4.6.4 Contractor shall provide a “competent person” as required by O.S.H.A regulations. The “competent person” shall be identified at the Pre-Construction Conference with Owner advised in writing of any changes.

4.6.5 Contractor and Subcontractors shall comply with all Laws, Regulations, or Legal Requirements relating to safety, as well as any Owner specific safety requirements set forth in the Contract Documents, provided that such Owner-specific requirements do not violate any applicable Laws, Regulations, or Legal Requirements.

4.6.6 As between Owner and Contractor, Contractor is responsible to Owner for any and all the safety issues relating to the Work on the Project. Contractor shall administer and manage the safety program. This will include, but not necessarily be limited to review of the safety programs of each Subcontractor. Contractor shall monitor the establishment and execution of compliance with all applicable regulatory and advisory agency construction safety standards.

4.6.7 Contractor shall maintain and have sole responsibility for safety on the job site.

4.7 Materials Quality, Shop Drawings, Submittals, Substitutions and Reuse.

4.7.1 Quality Control and Quality Assurance Testing. Owner shall contract directly with third-party testing professionals required for the Project, but Contractor will implement and coordinate with Owner's testing plan and quality assurance plans pursuant to MAG Specification and MAG Standard Details MAG Specifications and MAG Standard Details and as further required and/or directed by Municipality.

4.7.2 Shop Drawings and Other Submittals

4.7.2.1 Contractor shall prepare and submit shop drawings and other submittals showing details of all work to insure proper installation of the Work using those materials and equipment specified under the Approved Plans and Specifications.

4.7.2.2 A schedule of shop drawing and other expected submittals shall be submitted with the Project Schedule for Owner approval that avoids bulk submissions to the extent reasonably possible. Unless otherwise noted, shop drawings will not be required for items specified or detailed in the Uniform Standard Specifications and Details or the Technical Specifications. The schedule of shop drawing and other submittals shall include all of the items for which shop drawings and/or submittals are required by the Contract Documents, including the Specifications.

4.7.2.3 Shop drawings and submittals shall be numbered consecutively for each specification section and shall accurately and distinctly present the following:

- (a) All working and erection dimensions.
- (b) Arrangements and sectional views.
- (c) Necessary details, including complete information for making connections between work under this Contract and work under other Contracts.
- (d) Kinds of materials and finishes.
- (e) Parts list and description thereof.

4.7.2.4 Contractor shall schedule, prepare and submit all shop drawings and other submittals in accordance with a time-table that will allow its suppliers and manufacturers sufficient time to fabricate, manufacture, inspect, test and deliver their respective products to the project site in a timely manner so as to not delay the complete performance of the work.

4.7.2.5 The review of shop drawings and/or submittals will be general and shall not relieve Contractor of responsibility for the accuracy of such drawings or submittals, nor for the proper fitting and construction of the Work, nor for the furnishing of materials or Work required by the Contract. No

construction called for by shop drawings or submittals shall be initiated until such have been reviewed and approved by Owner.

4.7.3 Substitutions or Reuse. Any requests or proposals for substitutions and/or reuse of materials shall be submitted and processed as provided in Section 4.7.2 above.

4.7.4 Long Lead Time Items. Contractor shall submit shop drawings and/or other submittals on all long lead items to be furnished and installed as part of the project within ten (10) days after execution of the Contract. In addition, Contractor shall order all long lead items to be furnished and installed as part of this Project within (3) days after receiving approved shop drawings and/or submittals. For all long lead times for which shop drawings are not required, Contractor shall order said long lead items within fifteen (15) days after execution of the Contract. Within two (2) days after ordering long lead items, Contractor shall supply copies of all purchase orders, along with an accurate delivery schedule from the supplier.

4.8 Project Record Documents

4.8.1 During the construction period, Contractor shall maintain at the jobsite a full-size set of prints of the Construction Document Drawings and Shop Drawings for Project Record Document purposes.

4.8.2 Contractor shall mark these drawings to indicate the actual installation where the installation varies from the original Construction Documents. Contractor shall give particular attention to information on elements that will be concealed, which would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:

- (a) Dimensional changes to the Drawings.
- (b) Revisions to details shown on Drawings.
- (c) Locations and depths of underground utilities.
- (d) Revisions to routing of piping and conduits.
- (e) Actual equipment locations.
- (f) Changes made by Change Order or Addendum.
- (g) Details not on original Contract Drawings.

4.8.6 Contractor shall submit Project Record Drawing sets and Shop Drawings to Owner or its representative for review and comment.

4.8.7 Upon receipt of the reviewed Project Record Drawings from Owner, Contractor shall correct any deficiencies and/or omissions to the drawings and submit the final original of the Project Record Drawings to Owner prior to Final Acceptance and as a condition of Final Acceptance.

4.8.8 Project Manager will review the Project Record Drawings monthly prior to the date established for the Payment Request and shall be the sole judge of acceptance of these drawings.

4.9 Warranty and Correction of Defective Work

4.9.1 Contractor warrants to Owner that the construction of the Work shall be of good and workmanlike quality and completed in strict conformance with all applicable Laws, Regulations, or Legal Requirements and the plans and specifications and all other terms and conditions of the Contract Documents, including all materials and equipment furnished as part of the construction, shall be new unless

otherwise specified in the Contract Documents, of good quality, in conformance with the Contract Documents and free of defects in materials and workmanship.

4.9.2 Unless otherwise provided in the Contract, the date of Substantial Completion shall be the beginning of the Warranty period, except for those portions of the Work which may be unusable or not in service, irrespective of early completion by some Subcontractors of their work. Contractor shall furnish extended warranties for facilities placed in service before Substantial Completion and that expire no earlier than one year beyond Substantial Completion, except as otherwise required in the Contract Documents.

4.9.3 Contractor's warranty obligation shall be in accordance with MAG Specifications.

4.9.4 In addition, unless otherwise specified in the Contract Documents, Contractor and Subcontractors shall provide to Owner all of the following written warranties that apply to the Work, in a form acceptable to Owner as set forth on **Appendix A**.

4.9.5 Nothing in the warranties contained in the Contract Documents are intended to limit any manufacturer's warranty which provides Owner with greater warranty rights than set forth in this Section or the Contract Documents. Contractor will provide Owner with all manufacturers' warranties prior to Final Acceptance.

4.9.6 Contractor agrees that it shall be responsible to manage and administer the correction of any Work that is not in conformance with the Contract Documents during the warranty periods set forth in Section 4.9.4 above, or during any longer periods to the extent required by the Contract Documents. A progress payment, or partial or entire use or occupancy of the Project by Owner, shall not constitute acceptance of Work not in accordance with the Contract Documents.

4.9.7 When notified of a warranty issue, Contractor shall respond in writing within 48-hours and shall perform warranty work as soon as material for said repairs are available (as judged solely by Owner), and in any event Contractor shall take immediate steps to commence and complete correction of nonconforming Work no later than the time period set forth in Owner's written notification in accordance with the Contract Documents. This includes the correction, removal or replacement of the nonconforming Work and any damage caused to other parts of the Work affected by the nonconforming Work. If defects develop which are determined by Owner to be an emergency, Owner shall notify Contractor, via the most expeditious means regarding the nature and condition of the defects. In turn, Contractor shall immediately dispatch necessary forces to correct the defect or the emergency condition in accordance with Contract Documents.

4.9.8 The time periods referenced in this Section apply only to Contractor's obligation to correct nonconforming Work and is not intended to constitute a period of limitations for any other rights or remedies that Owner may have regarding Contractor's other obligations under the Contract Documents.

4.9.9 Without limiting the foregoing or anything in these General Conditions or the Contract to the contrary, Contractor shall obtain and provide to Owner all warranties for any portion of the Project offered by the manufacturer, installer or provider thereof. Owner and the user of the facility shall have the right to the full value and benefit of all such warranties. Contractor will ensure all such warranties are fully transferrable to facilitate the full value of this Section 4.9.9.

4.9.10 Contractor's warranty excludes damages or defects caused by abuse, alterations to the Work not executed by or through Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage.

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

4.9.12 Without limiting the foregoing or anything in these General Conditions or the Contract to the contrary, Contractor shall obtain and provide to Owner all warranties for any portion of the Project offered by the manufacturer, installer or provider thereof. Owner and the user of the facility shall have the right to the full value and benefit of all such warranties. Contractor will ensure all such warranties are fully transferrable to facilitate the full value of this Section 4.9.12.

4.10 Project Schedule. Contractor is responsible for preparing, monitoring, providing to Owner, and complying with and constructing the Project in conformance with the Project Schedule as set forth in Section 6 below.

SECTION 5 — OWNER’S RESPONSIBILITIES

5.1 Owner Project Manager and Inspectors.

5.1.1 Project Manager is responsible for providing Owner-supplied information and approvals in a timely manner to assist Contractor to fulfill its obligations under the Contract Documents.

5.1.2 Project Manager will also provide Contractor with prompt notice when it observes any failure on the part of Contractor to fulfill its contractual obligations, including any default or defect in the project or non-conformance with the drawings and specifications.

5.1.3 In addition to the Engineers as defined in the Contract, Owner may utilize Field Inspectors to assist Project Manager during construction in observing performance of Contractor. Owner's use of Inspectors is for the purpose of assisting Project Manager and such Field Inspectors are not acting in a regulatory or any other capacity.

5.1.3.1 The Inspectors and Engineers are authorized to inspect all Work and materials furnished. Such inspections may extend to all or part of the Work and to preparation, fabrication or manufacture of the materials to be used.

5.1.3.2 The Inspectors and Engineers shall have the authority to issue instructions contrary to the Construction Documents if approved and coordinated with the directions of Project Manager.

5.1.3.3 The Inspectors and Engineers shall have the authority to reject work or materials until any questions at issue can be decided by Project Manager.

5.1.3.4 The use of Inspectors by Owner and/or inspections by the Engineers shall not make Owner responsible for or give Owner control over construction means, methods, techniques, sequences or procedures or for safety precautions or programs or responsibility for Contractor's failure to perform the work in accordance with Contract Documents. The Inspectors are not authorized to direct any of Contractor's activities, employees or Subcontractors.

5.2 Contractor Services. Owner may contract separately with one or more Contractors to provide construction administration of the Project. Contractor shall not have the right to limit or restrict or reject any Contract modifications that are mutually acceptable to Owner and Contractor.

5.3 Design Professional Services. Owner may contract separately with one or more Design Professionals to provide construction administration of the Project. Contractor shall not have the right to limit or restrict or reject any Contract modifications that are mutually acceptable to Owner and Design Professional.

SECTION 6 — CONTRACT TIME

6.1 Contract Time

6.1.1 The Contract Time shall start with the Notice to Proceed (“NTP”) and end with Final Acceptance, as set forth in Section 6.4 below.

6.1.2 The Notice to proceed shall be issued in accordance with MAG Specifications § 108.

6.1.3 Beginning on the date of the NTP, Contractor shall begin to fulfill Contractor's obligations under the Contract. Contractor's obligations include providing Owner and other agencies with any submittals required by

the Project Specific Provisions, including but not limited to, an approved Project Schedule, Traffic Control Plans, and a Stormwater Pollution Prevention Plan. Contractor shall submit all such required submittals before any physical construction work commences on the Site. NTP does not authorize construction work until all contract insurance, bonds, and schedules are submitted to and accepted by the Owner.

6.1.4 The Contract Time shall be as set forth in the Project Schedule. Contractor agrees that it will commence performance of the Work and complete the Project through both Substantial Completion and Final Completion within the Contract Time.

6.1.5 Time is of the essence of this Contract, for the Project, for the Work, and for each phase and/or designated Milestone thereof.

6.2 Project Schedule

6.2.1 The Project Schedule shall be updated, revised and maintained by Contractor and timely communicated to Owner, throughout the Contract Time.

6.2.2 The Project Schedule shall be revised as required by conditions and progress of the Work, but such revisions shall not relieve Contractor of its obligations to complete the Work within the Contract Time, as adjusted in accordance with the Contract Documents. No modification to the Contract Documents or the Contract Time shall be effective unless approved in advance by Owner.

6.2.3 An updated Project Schedule shall be submitted by Contractor at least monthly to Owner as part of the Payment Request (or such shorter interval are required by the Owner or the Contract).

6.2.4 Contractor shall provide Owner with a status report as requested by Owner detailing the progress of the Work, including at a minimum: (i) if the Work is proceeding according to schedule, (ii) any discrepancies, conflicts, or ambiguities found to exist in the Contract Documents that require resolution, and (iii) other information detailing items that require resolution so as not to jeopardize the ability to complete the Work in the Contract Time.

6.2.5 Acceptance of a submitted schedule by Owner should in no way be construed as an affirmation or admission that the schedule is reasonable or workable by Contractor. The responsibility for completing the Work on the Project within the Contract Time remains the obligation of Contractor. Owner's review shall not relieve Contractor from compliance with the requirements of the Contract Documents or be construed as relieving Contractor of its complete and exclusive control over the means, methods, sequences and techniques for executing the work.

6.2.6 Critical Path Method (CPM)

6.2.6.1 Unless otherwise specified in the Contract, the Project Schedule shall include a Critical Path Method (CPM) diagram schedule showing the sequence of activities, the interdependence of each activity and identifies the Critical Path.

6.2.6.2 The CPM diagram schedule shall be in calendar Days and indicate duration, earliest and latest start and finish dates for all activities, and total Float Times for all activities except critical activities. The CPM diagram shall be presented in a time scaled graphical format for the Project as a whole.

6.2.7 Float Time

6.2.7.1 The Total Float time within the overall schedule is for the exclusive use of Owner, but Owner may approve Contractor's use of Float as needed to meet contract Milestones and the Project completion date.

6.2.7.2 Contractor shall not be allowed to sequence, hide, or reallocate Float Time through such strategies, as extending activity duration estimates to consume available Float, using

preferential logic, or using extensive crew/resource sequencing, tec. No time extensions will be granted nor delay damages paid until a delay occurs which extends the Work beyond the Contract Time.

6.2.7.3 Rain-Related Delays. Contractor is required, in preparing the Project Schedule to take into account all relevant weather conditions, including normal rainfall and distribution. No additional Compensation shall be given for any rain-related delays or impacts on the Work or the Project Schedule. The burden of documenting normal rainfall, the excessive rainfall and the impact on Critical Path activities is on Contractor.

6.3 Substantial Completion

6.3.1 When Contractor considers that the Work, phase or a portion thereof, which Owner agrees to accept separately, is substantially complete, Contractor, in conjunction with the Inspector, shall prepare and submit to the Project Manager a comprehensive Punch List of items to be completed or corrected prior to Final Acceptance and Final Payment

6.3.2 Upon receipt Contractor's Punch List, Project Manager will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the inspection by the Project Manager discloses any item, whether or not included on Contractor's Punch List, which is not sufficiently completed in accordance with the Contract Documents so that Owner can occupy or utilize the Work, phase or designated portion thereof for its intended use, Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by Project Manager.

6.3.3 Certificate of Substantial Completion. The Project Manager shall not issue a Certificate of Substantial Completion unless and until the Work (or separable units or Phases as provided in the Contract Documents) is essentially and satisfactorily complete in accordance with the Contract Documents, such that the Project is ready for use by Owner for its intended purpose, opening to the general public, full occupancy or use by Owner (including, without limitation, all separate units, or rooms, facilities, access, income-generating areas, and/or all areas serving the general public, as applicable, shall be ready for full operation without material inconvenience or discomfort), including, to the extent applicable to the Work, the following: all materials, equipment, systems, controls, features, facilities, accessories and similar elements are installed in the proper manner and in operating condition, inspected and approved; surfaces have been painted; masonry and concrete cleaned with any sealer or other finish applied; utilities and systems connected and functioning; site work complete; permanent heating, ventilation, air condition, vertical transportation and other systems properly operating with proper controls; lighting and electrical systems installed, operable and controlled; paving completed, signage installed, and/or other work as applicable, has been performed to a similar state of essential and satisfactory completion. In no event shall Substantial Completion be deemed to have occurred unless and until: (i) a temporary certificate of occupancy has been issued by the appropriate Governmental Authorities (as applicable); and (ii) all terms and Work required under this Agreement have been fulfilled by Contractor and same shall have also been approved and accepted by Owner, subject only to the Punch List Items.

6.4 Final Acceptance and Final Completion

6.4.1 Unless otherwise expressly agreed to in writing by Owner or set forth in the Contract, Final Completion must be obtained by no later than 30 calendar days after the date of Substantial Completion. Failure to timely obtain Final Completion will be a material breach of the Contract.

6.4.2 Upon receipt of written notice that the Work is ready for final inspection and acceptance, Owner and Contractor will jointly inspect to verify that the remaining items of Work have been completed. There shall be no partial acceptance. Final Acceptance shall not be issued and Final Completion shall not occur until all items of work, including Punch List Items, have been completed to Owner's satisfaction as reflected in the written Final Acceptance.

6.4.3 Final Payment under Section 8.4 below shall not be due, owing, or paid by Owner until Final Completion is obtained.

SECTION 7 — CONTRACT PRICE

7.1 Fixed Price Contracts. The Contract Price for all Fixed Price Contracts shall be the amount set forth in the Contract.

7.2 Guaranteed Maximum Price Contracts. Section 15.2 controls the Contracts Price for Guaranteed Maximum Price Contracts.

7.3 Unit Price Contracts.

7.3.1 Contract Price for all Unit Price Contracts shall be the amount set forth in the Contract or Change Order multiplied by the verified quantity provided.

7.3.2 Measurements of quantities to determine the total Contract Price shall be in accordance with MAG Specification §§ 109.1 and 109.2.

7.3.3 The Unit Price may only be changed as set forth in Section 9 below.

7.4 CMAR Contracts. Section 17.7 controls the Contract Price for CMAR Contracts.

7.5 Change Orders.

7.5.1 Fixed Price Change Orders: The Change Order Price for all Fixed Price Change Orders shall be the amount agreed to in the Change Order.

7.5.2 Cost Plus Change Orders: The Change Order Price for all Change Orders which are agreed to based upon a Cost Plus basis, will be determined in accordance with Section 15.2 below.

7.5.3 Unit Price Change Orders: The Change Order Price for all Unit Price Change Orders shall be the amount set forth in the Change Order multiplied by the verified quantity provided.

7.5.4 Measurements of quantities to determine the total Change Order Price shall be in accordance with MAG specifications §§ 109.1 and 109.2.

7.5.5 The Unit Price may only be changed as set forth in Section 9 below.

7.5.6 MAG Specification § 109.4.1 is modified as follows:

Before § 109.4.1, the following is added:

Any deduction or increase in the Contract Price must be supported by a signed, written Change Order fully executed by Owner, and supported by such backup as the Project Manager may require. No adjustments in any Unit Prices will be allowed.

Sections 109.4.1(A) and (B) and 109.4.2(A) are deleted in their entirety.

7.6 Municipality Sales Tax and Other Applicable Taxes. Contractor shall be responsible for collecting and remitting sales tax as necessary and this cost shall be included in all Contract Prices.

SECTION 8 — PAYMENT

8.1 Progress Payments

8.1.1 Payment for the Work will be made in accordance with MAG Specifications § 109 as amended below.

8.1.2 In MAG Specifications § 109.7 (A), replace the first paragraph of the subsection with the following:

Owner will make monthly progress payments during the course of the contract. The payments (estimates of work completed) will be prepared by Contractor on form provided by Owner, and approved by Project Manager in accordance with Section 8.1.3 of the General Conditions. The monthly payment cycle will start with the date of the Notice to Proceed. Owner may process payments more frequently if requested by Contractor and agreed to in writing by Owner.

8.1.3 The payment process functions as follows: Prior to the monthly payment cycle date, Contractor shall send a Contractor Payment Request Form to Project Manager. The Project Team shall review the Contractor Payment Request Form and agree upon any necessary adjustments. Contractor shall certify the final Contractor Payment Request Form by signing and returning to the Project Manager. When approved by the Project Manager, the progress payment shall be processed for payment of any approved amounts within fourteen (14) days (except final payments).

8.1.4 Payments shall be made pursuant to A.R.S. § 34-609.

8.1.5 As a condition precedent for progress payments Contractor shall provide full and unconditional lien waivers for prior payments and conditional lien waivers for currently requested payments, in statutory form, executed by Contractor and any person performing labor or supplying material, machinery, fixtures, or tools for the Work have been delivered to Owner.

8.1.5 When construction of the Project is fifty percent (50%) completed, Contractor may request payment of one-half of the retention pursuant to A.R.S. § 34-609(B)(3), subject to all of Owner's rights to withhold or offset payments, and/or other rights of Owner, under the Contract.

8.1.6 Owner reserves the right under A.R.S. § 34-609(B)(3) to reinstate the ten percent (10%) retention if Owner determines that satisfactory progress is not being made.

8.1.7 Allowances. If the Contract which includes any Allowance items (as defined in Section 15.1.1 below) payments for the Allowance items shall be included in progress payments and accounted for as set forth in Section 15.4 below.

8.1.8 Value Engineering. Any changes in the Contract Price through value engineering or otherwise shall be accomplished through a written Change Order under Section 9 below.

8.2 Payment Upon Substantial Completion.

8.2.1 Within fourteen (14) Days after Substantial Completion and Owner's certification of amounts due pursuant to Contractor's payment applications upon Substantial Completion and subject to Contractor's full compliance with Section 8.1 above, Owner will pay to Contractor all undisputed sums due under the Contract, except:

- a. Remaining retention;
- b. An amount equal to the liquidated damages, if any, assessable under the Contract; and
- c. 150% of the cost to complete all punch list items identified pursuant to Section 6.3 above, as estimated by Project Manager.

8.2.2 No further payments shall be made to Contractor unless and until Final Completion.

8.3 Final Payment.

8.3.1 Subject to all of Owner's rights to withhold or offset payment, and other rights under the Contract, Final Payment including remaining retainage shall be paid only after:

- (i) the Work has been fully completed (including completion of all incorrect or incomplete work items) and the written Final Acceptance has been issued by Owner;
- (ii) necessary operating manuals, any excess materials and supplies necessary for matching materials and supplies incorporated into the Work, acceptable sewer video results (if applicable), and complete "as-built" drawings (including the Building Information Model, if required by the Contract Documents) have been delivered to Owner, as specified in this Section 8.4;
- (iii) full and unconditional lien waivers in statutory form executed by Contractor and any person performing labor or supplying material, machinery, fixtures, or tools for the Work have been delivered to Owner;
- (iv) all conditions and requirements imposed by Owner or any financing entity for the corresponding disbursement have been met; and
- (v) Contractor delivers to Owner a Contractor Payment Request Form requesting Final Payment.

8.3.2 Contractor shall also submit a signed copy of Contractor's Affidavit Regarding Settlement of Claims, in form required by Owner, prior to Final Payment.

8.3.3 In addition, if required under the Project Specific Provisions, Contractor shall compile a complete equipment list and maintenance manual to be submitted to Owner as a precondition to Final Payment. The list shall include the following items for all equipment supplied under the Plumbing, Electrical, Air Conditioning, Elevator, and other Special Equipment Specifications.

- a. Name, Model and Manufacturer.
- b. Complete parts lists and drawings.
- c. Local source of supply for replacement parts along with suppliers' telephone numbers.
- d. Local service organizations serving the equipment and their telephone numbers.
- e. All tags, inspection slips, instruction packages, etc., removed from equipment shall be properly identified as to pieces of equipment from which they were taken.

8.3.4 Contractor shall also deliver to Owner not more than five (5) days after Letter of Acceptance, one (1) digital (in the format specified by Owner), and if requested by Owner, one (1) hard copy, of any applicable Maintenance manuals. Each manual shall include all manufacturer's operation and maintenance instructions and "as-built" drawings with the list herein specified. It shall also include all other diagrams and instructions necessary to properly operate and maintain the equipment, the name, address and telephone number of Contractor and all Subcontractors involved.

8.4 Owner's Right to Withhold Payment. Owner may withhold payment to such extent as may be necessary in Owner's opinion to protect Owner from loss for which Contractor is responsible.

8.5 Liens and Bond Claims. Contractor shall make all payments, in the time required, of all labor and materials furnished to Contractor in the course of the Work and shall promptly furnish evidence of such payments as Owner may require. Contractor shall pay when due all claims arising out of performance of the Work covered by this Contract for which a lien may be filed either against the real estate or leasehold interest of Owner, or against payments due from Owner to Contractor, or for which a claim may be made against any payment or performance bond or both. To the fullest extent permitted by law, Contractor agrees that no liens or other claims in the nature of a lien against the real estate, leasehold, or other interest of Owner, against payment due from Owner to Contractor, or against any payment or performance bond, shall be filed or made in connection with the Work by any party who has supplied professional services, labor, materials, machinery, fixtures, tools, or equipment used in or in connection with the performance of this Contract, and Contractor agrees to remove or to cause to be removed any such liens or claims in the nature

of a lien or bond claim within ten (10) days upon receiving notice or obtaining actual knowledge of the existence of such liens or claim. In addition, Contractor agrees to defend, indemnify, and hold harmless Owner from and against any and all such liens and claims. This paragraph does not apply to claims and liens of Contractor due to non-payment for work performed.

8.5 Financial Record Keeping and Owner's Audit Right

8.5.1 Records for all Contracts between Owner and Contractor shall, upon reasonable notice, be open to inspection and subject to audit, scanning, and/or reproduction during normal business working hours. Owner or its designee may conduct such audits or inspections throughout the term of this Contract and for a period of three years after Final Payment or longer if required by law.

8.5.2 Owner, its authorized representative, and/or the appropriate agency, reserve the right to audit Contractor's records in compliance with local, state or federal policies, statutes or at Owner's discretion, within three (3) years of Final Acceptance of the Work.

SECTION 9 — CHANGES TO THE CONTRACT

9.1 Extra Work/Changes in the Work

9.1.1 Owner reserves the right to make such changes in the plans and specifications for the Work, as it may deem appropriate and any such change as set forth in a written Change Order or Extra Work Order shall be deemed a part of this Contract as if originally incorporated herein.

9.1.2 In the event Owner and Contractor cannot agree on the terms of a Change Order, or when circumstances otherwise require, the Project Manager has the authority to direct the Contractor to perform extra work, if the work in question is an item not provided for in the Contract as awarded. The Project Manager shall have the authority to determine, based upon factual evidence presented by the Contractor, whether the work in question is an item not provided for in the Contract as awarded. If the Project Manager directs the Contractor to perform extra work, the Project Manager's instructions shall include a price that the Contractor cannot exceed in charging the Owner for the extra work. Upon receipt of the Project Manager's directions to perform extra work, the Contractor shall promptly proceed with the extra work and document the actual cost thereof. Contractor's right to payment for extra work shall be determined under subsection 9.1.4(d) below. The Contractor is responsible to manage the extra work to ensure that the price limits set by the Project Manager are not exceeded. Contractor shall perform the extra work and submit documentation for the actual cost of the extra work to the Owner. A Change Order will be issued to cover this work.

9.1.3 Contractor shall not be entitled to payment for extra work unless a written Change Order, in form and content prescribed by Owner, has been executed by Owner. On all requests for Change Orders, Contractor shall specify the increased and/or decreased costs and whether it believes any extensions of time will be necessary to complete its Work as modified by the Change Order. If extra work is performed under subsection 9.1.2 above, a corresponding Change Order shall be prepared, approved and processed by Owner before payment can be made to Contractor.

9.1.4 In general, pricing for Change Orders shall include the same mark-up percentages that were in effect when the Contract was awarded. The cost or credit to the Owner resulting from a change in the Work is subject to Appendix 2 (Policy Statement for Calculating Delays and Damages) and shall be determined, based on the type of pricing for the Contract involved, as follows:

- a. by mutual acceptance of a lump sum properly itemized in a form acceptable to Owner;
- b. by unit prices stated in the Contract Documents;
- c. when the Owner determines that a Unit Price Book Job Order associated with a Job Order Contract requires a Change Order, by using the same Total Cost Data and CCI that are in effect when the Change Order is anticipated to be issued; or
- d. by actual cost and a percentage fee covering overhead and profit, as follows:

- (i) Contractor shall perform the extra work and be compensated for actual cost of labor, materials and equipment.
- (ii) Contractor shall have the right to add the fee percentage applicable to the Work under the Contract, or if no such fee has been agreed to by the parties, not more than five percent (5%) to the Subcontractor's prices for authorized extra work performed solely by Subcontractors. Such percentage shall include all of Contractor's charges for overhead, profit, administration and supervision.
- (iii) Contractor shall have the right to add the fee percentage applicable to Work under the Contract for self-performed extra work, or if no such fee has been agreed to by the parties, Contractor's maximum total allowable additions for overhead, profit, administration and supervision shall not exceed ten percent (10%) of actual verifiable labor, materials and equipment for such self-performed extra work.

9.1.5 Any agreement which modifies the terms of the Contract (including Change Orders) shall be approved in writing by the Project Manager. Once properly executed by both parties, these modifications to the Contract shall have the same effect as if they had been included in the original Contract.

9.2 Accuracy of Change Order Pricing Information.

9.2.1 Subject to §§ 9.2.2 through 9.2.4, signature by the contracting parties shall constitute full accord and satisfaction between Owner and Contractor for all costs, damages, and expenses of whatever kind of nature, including delay, impact or acceleration damages, which may be occasioned by a Change Order of other modification of the Contract agreed to in writing.

9.2.2 Accurate Change Order Pricing Information: Contractor agrees that it is responsible for submitting accurate cost and pricing data to Owner to support its Fixed Price, Unit Price, and/or Cost Plus Change Order Proposals or other Contract price adjustments under the Contract. Contractor further agrees to submit Change Order proposals with cost and pricing data which is accurate, complete, current, and in accordance with the terms of the Contract with respect to pricing of change orders. Contractor agrees that any "buy-out savings" on Change Orders shall accrue 100% to Owner. "Buy-out savings" are defined as any savings negotiated by the Contractor with a Subcontractor or a Material Supplier after receiving approval of a Change Order amount that was designated to be paid to a specific Subcontractor or Supplier for the Approved Change Order work.

9.2.3 Right to Verify Change Order Pricing Information: Contractor agrees that Owner, through its designated representative, will have the right to examine, copy, and scan the records of the Contractor, Subcontractor or Sub-Subcontractor's records (during the Contract period and up to three years after final payment is made on the Contract) to verify the accuracy and appropriateness of the pricing data used to price all Change Order proposals and/or claims. Contractor agrees that if Owner determines the cost and pricing data submitted (whether approved or not) was inaccurate, incomplete, not current, or not in compliance with the terms of the Contract regarding pricing of Change Orders, an appropriate Contract Price adjustment will be made. Such post-approval Contract Price adjustments will apply to all levels of contractors and/or Subcontractors and to all types of Change Order proposals, specifically including Fixed Price, Unit Price, and Cost Plus Change Orders.

9.2.4 Requirements for Detailed Change Order Pricing Information: Contractor agrees to provide a detailed breakdown of allowable labor and labor burden cost (i.e., base wage rate of applicable classifications of workers, payroll taxes, and insurance and benefits costs). This information will be used to evaluate the potential cost of labor and labor burden related to Change Order work. It is intended that this information represent an accurate estimate of the Contractor's actual labor and labor burden cost components. Information is not intended to establish fixed billing or Change Order pricing labor rates. However, at the time Change Orders are priced, the submitted cost data for labor rates may be used to price Change Order work. The accuracy of any such agreed upon labor rate cost components used to price Change Orders will be subject to later audit. Approved Change Order amounts may be adjusted later to correct the impact of inaccurate labor cost components if the agreed upon labor cost components are determined to be inaccurate.

9.3 Emergencies. In any emergency affecting the safety of persons and/or property, Contractor shall act, at its discretion, to prevent threatened damage, injury or loss. Any change in the Contract Price and/or Contract Time resulting from emergency work shall be determined as provided in this Section.

9.4 Differing Site Conditions. If Differing Site Conditions are encountered at the Project Site, then notice by the observing party shall be given to the other party promptly before conditions are disturbed (to the extent practicable) and in no event later than fourteen (14) days after first observance of the conditions. Owner will promptly investigate such conditions and, if Owner determines that Differing Site Conditions exist and they materially cause an increase in the cost of, or time required for, performance of any part of the Work, Contractor will be entitled to equitable adjustment in the Contract Price or Construction Schedule (and other time requirements), or both. If it is determined by Owner that the conditions at the Project Site are not Differing Site Conditions and no change is justified, then Owner shall so notify Contractor in writing, stating the reasons. Claims in opposition to such determination must be made within fourteen (14) days after Owner has given notice of its decision. If Owner and Contractor cannot agree on an adjustment in the Contract Price or Project Schedule (and other time requirements), the adjustment shall be submitted to dispute resolution as provided these General Conditions.

9.5 Changes In Laws, Regulations, Or Legal Requirements Or Taxes. In the event of a material change in applicable Laws, Regulations, or Legal Requirements, or taxes subsequent to the date of the Contract by the parties, Contractor may be entitled to a Change Order, in Owner's discretion, to the extent Contractor can document to the satisfaction of Owner that such change significantly increases Contractor's actual cost of performance of the Work.

SECTION 10 — SUSPENSION AND TERMINATION

10.1 Suspension. Owner may suspend the Contract and/or Contractor's performance in accordance with MAG Specifications § 105.1.

10.2 Termination by Owner for Cause

10.2.1 MAG Specifications § 108.11 applies to the Contract.

10.2.2 Owner may also terminate the Contract if Owner determines, in its sole discretion, that Contractor has:

- (a) Refused or failed to supply enough properly skilled workers or proper materials;
- (b) Failed to make payment to Subcontractors for materials or labor in accordance with the respective agreements between Contractor and the Subcontractors;
- (c) Disregards Laws, Regulations, or Legal Requirements or orders of a public authority having jurisdiction;
- (d) Or is endangering public health and/or safety; and/or
- (e) Otherwise breached a provision of the Contract Documents or any other contract between Owner and Contractor.

10.2.3 When any of the above reasons exist, Owner may terminate the Contract, without prejudice to any other rights or remedies of Owner, after giving Contractor and Contractors' surety, if any, seven (7) days' prior written notice of Owner's intent to terminate the Contract and Contractor's failure to cure any such reasons. Upon such termination, Owner may: (1) take possession of the Site and of all materials thereon owned by Contractor; and/or (2) finish the Work by whatever reasonable method Owner may deem expedient. When Owner terminates the Contract for one of the reasons state above, Contractor shall not be entitled to receive further payment until the Work is finished. If the unpaid balance of the

Contract Price, excluding any remaining Contingency existing at the time of such termination exceeds the costs and expenses of finishing the Work and any other damages incurred by Owner, such excess shall be paid to Contractor. If such costs, expenses and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. This obligation for payment shall survive termination of the Contract.

10.3 Termination by Owner for Convenience. Owner may also terminate the Contract at any time for its convenience upon seven (7) days written notice to Contractor specifying the termination date. In the event of termination which is not the fault, in whole or in part, of Contractor, Owner shall pay to Contractor only such compensation, including reimbursable expenses, due for Work properly performed on the Project prior to the termination date. Upon any termination of the Contract, no further payments shall be due from Owner to Contractor.

10.4 A.R.S. § 38-511. The Contract is subject to, and may be terminated by Owner in accordance with, the provisions of A.R.S. § 38-511.

10.5 Termination by Contractor. If Owner fails to make payment of any undisputed amounts within thirty (30) days after such payment is due, then following ten (10) days' prior written notice to Owner during which time the outstanding and undisputed amount remains unpaid, Contractor may terminate the Contract and recover from Owner payment for Work actually executed and for actual, proven loss with respect to materials, equipment, tools, construction equipment and machinery, including any associated Contractor's Fee, General Conditions Costs and actual damages incurred by Contractor solely as a result of such termination and not capable of mitigation. Under no circumstances shall Owner have any liability for any costs, expenses, overhead, or profits in relation to any work not actually performed, or for any future or anticipated profits, recovery, damages, expenses, or losses.

SECTION 11 — INSURANCE AND BONDS

11.1 Insurance Requirements

11.1.1 Contractor shall obtain, maintain, and provide verification of insurance coverage set forth in the Contract.

11.1.2 Owner may, in the Contract Documents, designate additional insured(s) along with Owner (and their respective employees, members, representatives, agents and affiliates) on all required insurance policies, and all coverage applicable to Owner under this Section 11.1 and Exhibit B shall apply to such designated additional insured(s) as well.

11.1.3 Failure to maintain the insurance policies as required by this Agreement or to provide evidence of renewal is a material breach of this Contract.

11.1.4 Subcontractors. Contractor's certificate(s) shall include all Subcontractors as additional insureds under its policies or Contractor shall furnish to Owner separate certificates and endorsements for each Subcontractor. All coverages for Subcontractors shall be subject to the minimum requirements set forth in the Contract Documents, including Exhibit B of the Contract.

11.1.4 Verification of Coverage

11.1.4.1 Contractor shall furnish Owner with the most recent ACORD® Certificate of Liability Insurance form with additional insured endorsements as required under Exhibit B of the Contract.

11.1.4.2 All certificates and endorsements are to be received and approved by Owner before work commences. Each insurance policy required by this Agreement must be in effect at or prior to commencement of work under this Agreement and remain in effect for the durations required in this Section. Failure to maintain the insurance policies as required by this Agreement or to provide evidence of renewal is a material breach of this Contract.

11.2 Bonds and Other Performance Security

11.2.1 When and as set forth in the Contract, Contractor shall provide a performance bond and a payment bond in full compliance with the applicable statutory and Contract requirements. If no time is specified in the Contract, the bonds shall be delivered to the Owner with the signed Contract.

11.2.2 Each such bond shall be executed by a surety company or companies holding a Certificate of Authority to transact surety business in the State of Arizona, issued by the Director of the Arizona Department of Insurance. A copy of the Certificate of Authority shall accompany the bonds. The Certificate shall have been issued or updated within two (2) years prior to the execution of this Agreement. The bonds shall be written or countersigned by an authorized representative of the surety who is either a resident of the state of Arizona or whose principal office is maintained in this state, as by law required.

11.2.3 The bonds shall be made payable and be acceptable to Owner. The bond forms for the performance and payment bonds shall be in the forms required under A.R.S. § 34-221, *et seq.*

11.2.4 All bonds submitted for this project shall be provided by a company which has been rated AM Best rating of A- or better for the prior four quarters by the latest edition of the 'Results Best's Key Rating Guide (Property/Casualty)' published by the A.M. Best Company.

11.2.5 Personal or individual bonds are not acceptable.

SECTION 12 - INDEMNIFICATION

12.1 To the fullest extent permitted by law, Contractor, its successors and assigns shall indemnify and hold harmless the Owner and its agents, representatives, officers, directors, officials and employees from all demands, proceedings, suits, actions, claims, damages, or losses relating to, arising out of, resulting from or alleged to have resulted from the performance of the Work or failure to comply with Contractor's obligations under the Contract Documents or any Laws, Regulations, or Legal. Contractors' duty to indemnify and hold harmless Owner and its agents, representatives, officers, directors, officials and employees shall arise in connection with all demands, proceedings, suits, actions, claims, workers' compensation claims, unemployment claims, damages, losses or expenses (including but not limited to attorney's fees, court costs, and the cost of appellate proceedings) that are attributable to personal or bodily injury, sickness, disease, death or injury to, impairment or destruction of property including loss of use resulting therefrom, only to the extent caused by negligence, recklessness or intentional wrongful conduct of, of Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable.

12.2 The indemnified party shall have the right to approve the legal counsel selected by Contractor or the insurer of the liability, which approval shall not be unreasonably withheld.

12.3 The indemnification, hold harmless provisions and Owner's Liability Insurance set forth herein shall survive any termination of the Contract.

SECTION 13 — DISPUTE RESOLUTION

13.1 Informal Dispute Resolution. The parties to the Contract agree that time is of the essence in relation to performance of the Contract and completion of the Project, therefore any and all disputes in relation to the Contract will initially be referred to the Project Manager, the Design Professional Representative and/or the Contractor Representative as applicable to the dispute, for immediate resolution. If, after good faith efforts to reach a resolution, none is reached, any party to the dispute may submit the dispute to the Dispute Resolution Representative ("DRR") process set forth below, which is intended to be an expedited process.

13.2 Dispute Resolution Representative (“DRR”) Process

13.2.1 The Parties under the Contract agree that all claims and disputes in relation to the Project which are not resolved in the ordinary course of the Project (“Claim” or “Claims”) shall, as a prerequisite to any mediation, or litigation of the Claim, first be submitted for resolution between the designated Dispute Resolution Representatives of the Parties as set forth herein (the “DRR Process”).

13.2.2 The DRR Process shall be initiated through service of a DRR Notice as set forth below:

(a) for claims by the Contractor or the Design Professional, the DRR Process shall be initiated by the party asserting the claim serving written notice on the Town setting forth in detail: (i) the basis for the claim; (ii) the effect of the Claim upon the construction of, and/or Project Schedule for, the Project; (iii) the specific relief requested, the amount thereof, and how such was calculated; (iv) the parties involved in the Claim, and how they are involved; (v) the specific contract provisions in the Contract Documents (including, if applicable, drawings and specifications) which apply; and (vi) efforts made to date to resolve the Claim.

(b) For claims by the Town, the DRR process will be initiated by the Town providing written notice to the other parties of the basis and amount of its claim, the parties involved in the Claim, and how they are involved, the provisions in the Contract Documents that apply, and the relief requested.

(c) The DRR Notice shall be hand-delivered and e-mailed to the other parties’ designated Dispute Resolution Representatives.

13.2.3 The other parties shall respond in writing to the DRR Notice (“DRR Response”) within ten (10) calendar days of receipt of the DRR Notice, setting forth those items set forth in the DRR Notice that they agree with, dispute, and/or have questions concerning. The DRR Response shall be hand-delivered and e-mailed (with read receipt) to the other parties’ Dispute Resolution Representatives.

13.2.4 The designated Dispute Resolution Representatives for the Parties to the claim shall then meet as soon as possible and in any event within twenty (20) calendar days of submission of the DRR Notice (regardless of whether a DRR Response has been submitted by all parties involved in the dispute), at a mutually agreed upon time and place, to attempt to resolve the Claim based upon the DRR Notice and DRR Response.

13.2.5 At any time after the first meeting required above, either party may terminate the DRR Process by written notice to the other party.

13.2.6 The parties may agree, in writing, to extend or modify the time limits or other provisions of the DRR process in relation to a specific pending Claim.

13.2.7 Unless otherwise designated in a written notice to the other parties, the Project Manager and the representatives of the Contractor and of the Design Professional shall act as the parties’ designated Dispute Resolution Representatives.

13.2.8 If a resolution of the Claim is reached, that resolution shall be set forth in writing and shall be signed by the Parties’ designated Dispute Resolution Representative. If the resolution involves a change in any Contract Documents, the Contract Price, the Project Schedule, or any other change requiring a written Change Order or other document, the parties shall execute an appropriate written Change Order or other document pursuant to the terms of the Contract Documents.

13.3 Mediation

13.3.1 Unless extended by written agreement of the parties involved in the dispute, any Claim not resolved through the DRR process set forth above within five (5) calendar days after the meeting

required under Section 13.2.4 above, or after the DRR is terminated pursuant to Section 13.2.5 above, whichever is earlier, shall be submitted to mediation as a condition precedent to litigation by either party.

13.3.2 The mediation shall be commenced by written demand upon the other party for mediation. If the parties cannot agree upon a mediator within ten (10) calendar days of the written demand, either party may make a request to the Civil Presiding Judge of the Maricopa County Superior Court to appoint a mediator. The mediation shall occur within forty (40) calendar days of the written demand for mediation, unless the parties agree, in writing, to a longer period of time.

13.3.3 The qualifications for the mediator shall be that they be: (a) an experienced mediator, arbitrator or litigator of construction disputes; and (b) having engaged a significant portion of their time involving and/or resolving construction disputes for at least the past five (5) years.

13.3.4 Each party shall provide to the other party and the mediator all of the information and documentation required under 13.2.2(a) and (b) above, together with any additional information and documentation which the party believes relevant. In addition, the parties shall exchange, and provide to the mediator such additional memoranda, information and/or documentation, as the mediator may request, and in the form and at such times, as the mediator may direct.

13.3.5 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in Queen Creek, Arizona, unless another location is mutually agreed upon. Agreements reached in mediation shall be specifically enforceable in any court having jurisdiction thereof.

13.4 Arbitration

13.4.1 If the mediation is unsuccessful, the parties shall submit the dispute and/or claim to be resolved through binding arbitration conducted according to the then current Construction Industry Arbitration Rules of the AAA, but not administrated or conducted by the AAA, which arbitration shall be held in Maricopa County, Arizona, utilizing a single arbitrator selected by the parties, unless the parties agree, in writing, to an alternative arbitration procedure.

13.4.2 If: (a) the parties cannot agree on a single arbitrator within two (2) weeks of the demand for arbitration; or (b) the parties at any time prior to the arbitrator being appointed and the arbitrator has accepted the appointment, cannot agree upon any significant aspect of the arbitration, not already addressed herein, either party may submit the Claim directly to the AAA to select the Arbitrator, and thereafter the arbitration shall be administered by the AAA.

13.4.3 The arbitrator shall be an attorney with at least fifteen (15) years of experience in construction related practice, and whose practice, for at least the last five (5) years, consists of at least 50% construction law.

13.4.4 At the request of either party, the arbitration may include as parties, through joinder, consolidation or otherwise, additional persons or entities involved in the Project, involving claims and/or disputes with common issues and/or facts. The arbitrator shall promptly rule upon any request for joinder or consolidation.

13.4.5 In relation to claims in which the amount in controversy is less than \$250,000, no discovery other than exchange of documents, designation of witnesses and detailed disclosure of claims and defenses (including specifically a detailed basis for calculating all claims), and no more than 3 depositions and 1 expert per side, shall be allowed, subject to disclosure of such other information as approved by the arbitrator. Otherwise, discovery shall be allowed and/or limited as decided by the arbitrator.

13.4.6 The prevailing party in any arbitration or court proceeding under this Agreement shall be entitled to an award by the Arbitrator or judge of its attorneys' fees, costs, and expenses (including expert witness fees) incurred. The Arbitrator and/or judge can also award both pre-judgment and post-judgment interest.

13.4.7 A demand for arbitration shall be made within the time limits specified in the Contract Documents as applicable, and in other cases within a reasonable time after the Claim has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations.

13.4.8 The Parties agree to participate as a party, by joinder and/or consolidation, in any arbitration, litigation, or other dispute resolution involving as an issue, claim, or defense, any action, inaction, or service provided under this Contract or in relation to the Project or the Work, or any defect or deficiency in the Work.

13.4.9 The Party filing a notice of demand for arbitration, or a counterclaim, must assert in the demand or counterclaim all Claims then known to that Party on which arbitration is permitted to be demanded.

13.4.10 Any award by the arbitrator shall not include any consequential or punitive damages.

13.4.11 The award entered by the arbitrator shall be a reasoned award.

13.4.12 The award entered by the arbitrator shall be final and judgment may be entered thereon in the Arizona Superior Court.

SECTION 14 — MISCELLANEOUS PROVISIONS

14.1 Assignment. Neither Contractor nor Owner shall, without the written consent of the other assign, transfer or sublet any portion of this Agreement or part of the Work or the obligations required by the Contract Documents, any such assignment will be void, will transfer no rights to the purported assignee, and would be a material breach of the Contract.

14.2 Governing Law and Venue. In the performance of the Contract, Contractor shall abide by and conform to any and all Laws, Regulations, or Legal Requirements of the United States, State of Arizona, Maricopa County, and the City including but not limited to federal and state executive orders providing for equal opportunities, the Federal Occupational Safety and Health Act and any other federal, state, county or local laws applicable to the Contract. This Contract shall be governed by and construed in accordance with the substantive laws of the State of Arizona, without reference to conflict of laws and principles. Exclusive jurisdiction and venue for any action brought to enforce or construe any provision of this Contract shall be proper in the Superior Court of Maricopa County, Arizona and both parties consent to jurisdiction and venue in such court for such purposes.

14.3 Survival. All warranties, representations and indemnifications by Contractor shall survive the completion or termination of this Agreement.

14.4 No Waiver. The failure of either party to enforce any of the provisions of the Contract Documents or to require performance of the other party of any of the provisions hereof shall not be construed to be a waiver of such provisions, nor shall it affect the validity of the Contract Documents or any part thereof, or the right of either party to thereafter enforce each and every provision.

14.5 Project Communications

14.5.1 All communications concerning the performance of the Work or the Project shall be provided to the designated Project Manager and Contractor's Representative set forth in Article 1 of the Contract.

14.5.2 Project communications may be exchanged by e-mail upon the written agreement of the Project Manager and Contractor Representative, but e-mail communications are not binding upon

Owner and cannot change the terms of the Contract or the scope of work, or effectuate any change that requires a written change order. The use of e-mails is for information only, and e-mails will have no legal or binding effect.

14.6 Bids/Proposals. Unless otherwise stated in the solicitation, all Contractors, Design Professionals and Subcontractors shall hold their bids and/or proposals valid for a period of 120 days from the proposal due date stated in the solicitation.

14.7 Contract Documents.

14.7.1 The Contract Documents are intended to permit the parties to complete the Work and all obligations required by the Contract Documents within the Contract Times for the Contract Price. The Contract Documents are intended to be complementary and interpreted in harmony so as to avoid conflict, with words and phrases interpreted in a manner consistent with construction and design industry standards

14.7.2 In the event of any inconsistency, conflict, or ambiguity between or among the Contract Documents, the Contract Documents shall take precedence as follows from highest to lowest: Change Orders, Addenda, Contract/Job Order, Project Specific Provisions, General Conditions, Technical Specifications, Drawings, Municipality's Amendments to MAG Standard Specifications and Municipality's Standard Details, and MAG Uniform Standard Specifications and Details for Public Works Construction

14.7.3 On the drawings, given dimensions shall take precedence over scaled measurements and large scale drawings over small-scale drawings

14.7.4 The headings used in this Agreement or any other Contract Documents, are for ease of reference only and shall not in any way be construed to limit or alter the meaning of any provision

14.7.5 The Contract Documents form the entire agreement between Owner and Contractor. No oral representations or other agreements have been made by the parties except as specifically stated in the Contract Documents.

14.7.6 The Contract Documents may not be changed, altered, or amended in any way except in writing signed by a duly authorized representative of each party in the form of a Change Order.

14.8 Cooperation and Further Documentation. Contractor agrees to provide Owner such other duly executed documents as shall be reasonably requested by Owner to implement the intent of the Contract Documents.

SECTION 15 - PROVISIONS APPLICABLE SOLELY TO GMP AND COST-BASED CONTRACTS, AND CHANGE ORDERS

Note: The provisions in this Section 15 only apply to Contracts or Change Orders involving Guaranteed Maximum Price (GMP) or cost-based pricing.

15.1 Additional Definitions.

The definitions set forth in Sections 1 apply to GMP and Cost-Based Contracts, Change Orders, and Job Orders, together with the additional definitions set forth below.

15.1.1 Allowance - A specific amount for a specific item of Work, if any, that Owner agrees has not been sufficiently designed, detailed, or selected at the time the Contract Price is agreed to for Contractor to provide a definitive price. Allowances shall be treated in accordance with Section 15.4 of these General Conditions.

15.1.2 Baseline Cost Model – A breakdown and estimate of the scope of the Project developed by CMAR pursuant to Section 17.5.1 of these General Conditions.

15.1.3 CMAR or Construction Manager at Risk - The person or firm selected by Owner to provide pre-construction and/or construction services as detailed in a Construction Manager at Risk Contract

with Owner. In these General Conditions, the term “Contractor” includes CMAR under both pre-construction and construction services contracts.

15.1.4 CMAR Fee or Contractor’s Fee – An agreed to percentage in an accepted GMP that represents the Contractor’s fee for performance of the Work.

15.1.5 Contingency – An agreed to amount in the GMP that may only be used in accordance with the terms set forth in Section 15.4 of these General Conditions.

15.1.6 Contract Documents - Where compensation under the Contract is based upon a GMP accepted by Owner, the term “Contract Documents” also include the accepted Proposal.

15.1.7 Contract Price - Where compensation under the Contract is based upon a GMP accepted by Owner, the term “Contract Price” refers to the GMP.

15.1.8 Cost-Based Contract, Change Order, or Job Order – A Contract, Change Order, or Job Order where the Contract Price is based upon the actual cost of performing the Work, subject to the terms of the Contract Documents, including this Section 15. These would include those generally referred to as “Cost of the Work plus a Fee with a GMP”, “Time and Materials”, or “Cost Plus a Fee”.

15.1.9 Cost of the Work - The direct costs necessarily incurred by Contractor in the proper, timely, and complete performance of the Work. The Cost of the Work shall include only those costs set forth in Sections 15.2 and 15.3 of these General Conditions.

15.1.10 Deliverables – The work products prepared by Contractor in performing the scope of work described in the Contract. Some of the major deliverables to be prepared and provided by Contractor during the pre-construction may include but are not limited to: the Baseline Cost Model and Schedule that validate Owner’s plan and budget, Construction Management Plan, Detailed Project Schedule, Schedule of Values, alternative system evaluations, procurement strategies and plans, Detailed Cost Estimates, construction market surveys, cash flow projections, Proposals, Subcontractor procurement plan, Subcontractor agreements, Subcontractor bid packages, Supplier agreements, Constructability Review, Cost Control Log, Traffic control and phasing plans and others as indicated in this Contract or required by the Project Team.

15.1.11 Detailed Project Schedule – The Detailed Project Schedule developed by the CMAR for the review and approval of the Project Manager in accordance with Section 17.3 of these General Conditions, if applicable.

15.1.12 General Conditions Costs – Those costs set forth in Section 15.3.4 of these General Conditions.

15.1.13 GMP Plans and Specifications – The plans and specifications upon which the Guaranteed Maximum Price Proposal is based.

15.1.14 GMP Proposal - The proposal of Contractor based upon a GMP submitted pursuant to Section 17.7 of these General Conditions for the entire Work and/or portions (phases) of the Work.

15.1.15 Guaranteed Maximum Price or GMP – The Guaranteed Maximum Price set forth in the Contract, Change Order, or Job Order if applicable.

15.1.16 Open Book – On any GMP-based Contract, or Change Order, Owner may attend any and all meetings or discussions pertaining to the Project, including bid openings, and shall have access to all books, invoices, accounts, memoranda, correspondence, and written communications or records of any kind pertaining to the Project, including without limitation, those stored in electronic format.

15.1.17 Preconstruction Services – The services to be provided under the Pre-Construction

Services Contract, including Section 3 of the Contract, including without limitation those set forth in Section 17 below of these General Conditions.

15.2 Contract Price.

15.2.1 The Contract Price for all Contracts and Change Orders based upon payment of the Cost of the Work plus a Fee with a GMP, time and materials, or cost-plus a fee shall be the Cost of the Work incurred plus the Fee agreed to in writing by Owner, limited to the amount of the GMP, if agreed to. Unless otherwise expressly provided in the Contract or Change Order, all Cost Based pricing shall be subject to and limited to a GMP.

15.2.2 The Contract Price may only be changed as set forth in Section 9 above.

15.2.3 Only costs specifically designated as reimbursable costs are eligible for payment by Owner or may be charged against the Contract Price. All other costs will not be paid by Owner and shall not be chargeable against the Contract Price.

15.2.4 Cost-Based Contracts of \$250,000 or Less. For Contracts or Change Orders where the Contract Price is \$250,000 or less, reimbursable costs shall be determined pursuant to MAG Specifications § 109.5, and not Section 15.3 below.

15.2.5 Cost-Based Contracts Over \$250,000. For Contracts or Change Orders where the Contract Price is over \$250,000, reimbursable costs shall be limited to the actual cost of the Work and shall be determined pursuant to the following Section 15.3, Cost of the Work, and not by MAG Specifications 109.5.

15.3 Cost of the Work.

15.3.1 Costs to be Reimbursed.

15.3.1.1 Generally. The term Cost of the Work shall mean costs necessarily incurred by the Contractor in the proper performance of the Work. Such costs shall be at rates not higher than the standard paid at the place of the Project except with prior consent of the Owner. The Cost of the Work shall include only the items set forth in this Section 15.3.1.

15.3.1.2 Labor Costs.

15.3.1.2.1 Wages of construction workers directly employed by the Contractor to perform the construction of the Work at the site or, with the Owner's approval, at off-site workshops. Cost to be reimbursed will be the actual wages paid to the individuals performing the work.

15.3.1.2.2 Wages or salaries of the Contractor's supervisory and administrative personnel when stationed at the site with the Owner's approval. No Contractor personnel stationed at the Contractor's home or branch offices shall be charged to the Cost of the Work. Non-field office based Contractor management and support personnel are expected to provide service and advice from time to time throughout the job and their time devoted to Project matters is considered to be covered by the Contractor's Fee.

15.3.1.2.3 Wages and salaries of the Contractor's supervisory or administrative personnel who would normally be stationed at the field office in accordance with Section 1.2.2 but who become engaged, at factories, workshops or on the road, in expediting the production or transportation of materials or equipment required for the Work, but only for that portion of their time required for the Work. Employee bonuses and/or costs associated with Employee Stock Ownership Plans ("ESOP") will not be considered reimbursable labor or labor burden costs and will be considered non-reimbursable costs considered to be covered by the Contractor's Fee.

15.3.1.2.4 Costs paid or incurred by the Contractor for taxes, insurance, contributions, assessments and benefits required by law or collective bargaining agreements and, for personnel not covered by such agreements, customary benefits such as sick leave, medical and health benefits, holidays, vacations and pensions, provided such costs are based on wages and salaries included in the Cost of the Work under Subparagraphs 1.2 1 through 1.2.3.

15.3.1.2.4.1 Cost of the Work shall include the actual net cost to the Contractor for worker's compensation insurance attributable to the wages chargeable to the Cost of the Work per this agreement. The actual net cost of worker's compensation shall take into consideration all cost adjustments due to experience modifiers, premium discounts, policy dividends, retrospective rating plan premium adjustments, assigned risk pool rebates, any applicable weekly maximums, etc. The Contractor may charge an estimated amount for worker's compensation insurance costs, but will make appropriate cost adjustments to actual costs within 45 days of receipt of actual cost adjustments from the insurance carrier.

15.3.1.2.4.2 Overtime wages paid to salaried personnel (if approved in advance in writing by the Owner) will be reimbursed at the actual rate of overtime pay paid to the individual. No time charges for overtime hours worked on the Project will be allowed if the individual is not paid for the overtime worked.

15.3.1.2.4.3 Any overtime premium or shift differential expense to be incurred by Contractor for hourly workers shall require Owner's advance written approval before the incremental cost of the overtime premium or shift differential will be considered a reimbursable cost. If the Contractor is required to work overtime as a result of an inexcusable delay or other coordination problems caused by the Contractor or anyone they are responsible for, the overtime premium and/or shift differential expense portion of the payroll expense and related labor burden costs will be considered as cost not to be reimbursed.

15.3.1.2.4.4 Reimbursable labor burden costs will be limited to payroll taxes, worker's compensation insurance, the employer's portion of union benefit costs for union employees working on the Project, and the actual verifiable fringe benefit costs incurred by Contractor for non-union individuals working on the Project subject to the following maximum percentages for the following reimbursable non-union fringe benefit costs. The following maximums (as a percentage of reimbursable actual wages by individual) shall apply for each of the following types of fringe benefit costs specifically attributable to the each of the non-union personnel working on the Project:

- Medical Insurance, Dental, Life & AD&D Insurance: 12.00%
- Holiday, vacation and other paid time not worked: 10.00%
- Pension Plan Contributions to Vested Employee Account, Simplified Employee Pension Plans, or 401K matching plans (Note: ESOP related costs are covered by the Contractor Fee) 10.00%

For non-union personnel, no other fringe benefit costs (other than the 3 specific categories listed immediately above, shall be considered reimbursable Cost of the Work. Any labor burden costs that are in excess of the amounts considered reimbursable or are otherwise not considered reimbursable under the terms of this agreement are intended to be covered by the Contractor Fee.

15.3.1.3 Subcontract Costs

15.3.1.3.1 Payments made by the Contractor to Subcontractors in accordance with the requirements of the subcontracts.

15.3.1.3.2 For scope of work bid packages typically performed by subcontractors, Contractor may "self-perform" such work on a cost plus fee (Not-To-Exceed 7.5%) basis subject to an agreed upon Guaranteed Maximum Price for the "self-performed work". The Contractor may bid their proposed Guaranteed Maximum Price for the work to be "self-performed" against at least three other interested trade contractors. Any subcontract for "self-performed work" will provide for payment in an amount equal to the Cost of the Work (as defined in this agreement) and will not to exceed the agreed upon subcontract guaranteed maximum price. All terms and provisions of any subcontract for "self-performed work" will be

consistent with the terms and conditions of this agreement with the exception of the agreed upon Fee percentage. All savings under any such subcontract for “self-performed work” shall be applied to reduce the Cost of the Work under this Agreement and the Guaranteed Maximum Price of this Agreement. For purposes of defining “self-performed work” subject to this contract provision, any division of Contractor, or any separate Contractor or subcontractor that is partially owned or wholly owned by the Contractor or any of their employees or employee’s relatives will be considered a related party entity and will be subject to this provision regarding “self-performed work”. No self-performed work will be allowed to be performed on a lump sum basis.

15.3.1.3.3 Contractor (with respect to its suppliers, subcontractors and all lower tier subcontractors) shall provide Owner advance written notice and shall obtain Owner's approval for any proposed subcontract change order, material purchase order, or other financial commitment in an amount in excess of \$5,000 prior to placing such order or entering into such agreement (regardless of whether or not any such commitment will affect the prime contract Guaranteed Maximum Cost). It is agreed that sums applicable to any subcontract change order, purchase order or other financial commitment entered into in violation of the above notice and approval requirement shall not be included in the amounts owing to Contractor, Subcontractors or Suppliers whether as Costs of the Work or as reasonable termination costs in the event of termination.

15.3.1.4 Costs of Materials and Equipment Incorporated in the Completed Construction

15.3.1.4.1 Costs, including transportation and storage, of materials and equipment incorporated or to be incorporated in the completed construction.

15.3.1.4.2 Costs of materials described in the preceding Subparagraph 1.4.1 in excess of those actually installed to allow for reasonable waste and spoilage. Unused excess materials, in any, shall become the Owner’s property at the completion of the Work or, at the Owner’s option, shall be sold by the Contractor. Any amounts realized from such sales shall be credited to the Owner as a deduction from the Cost of the Work.

15.3.1.4.3 Proceeds from the sale of recyclable materials, scrap, waste, etc. shall be credited to job cost.

15.3.1.5 Costs of Other Materials and Equipment, Temporary Facilities and Related Items

15.3.1.5.1 Costs, including transportation and storage, installation, maintenance, dismantling and removal of materials, supplies, temporary facilities, machinery, equipment and hand tools not customarily owned by construction workers, that are provided by the Contractor at the site and fully consumed in the performance of the Work; and cost (less salvage value) of such items if not fully consumed, whether sold to others or retained by the Contractor. Cost for items previously used by the Contractor shall mean fair market value.

15.3.1.5.2 Rental charges for temporary facilities, machinery, equipment, and hand tools not customarily owned by construction workers that are provided by the Contractor at the site, whether rented from the Contractor or others, and costs of transportation, installation, minor repairs and replacements, dismantling and removal thereof. Rates and quantities of equipment rented shall be subject to the Owner’s prior written approval.

15.3.1.5.2.1 The Projected usage for each piece of equipment to be rented for use on the Project and the estimated total rentals shall be considered by the Contractor before the piece of equipment is rented so that an appropriate rent versus buy decision can be made. Purchased equipment shall be considered “job owned”. At the completion of the Project, the Contractor shall transfer title and possession of all remaining job-owned equipment to the Owner, or Contractor may keep any such equipment for an appropriate fair market value credit to job cost, which will be mutually agreed to by Owner and Contractor.

15.3.1.5.2.2 Each piece of equipment to be rented shall have hourly, daily, weekly

and monthly rates and the most economical rate available shall be reimbursed based on the circumstances of actual need and usage of the piece of equipment while it is stationed at the jobsite. When the piece of equipment is no longer needed for the work, no rental charges will be reimbursed if the piece of equipment remains at the jobsite for the convenience of the Contractor.

15.3.1.5.2.3 Equipment Rental Rates.

15.3.1.5.2.3.1 Compensation for equipment used on the Project shall be paid in accordance with the Equipment Plan submitted by Contractor in the accepted GMP Proposal and no payments will be made in excess of the rates set forth in the Equipment Plan, or actual documented costs, whichever is less.

15.3.1.5.2.3.2 All equipment rental rates and costs are subject to the Owner's right to audit when submitted as part of the Equipment Plan and/or at any time during the Project.

15.3.1.5.2.4 The aggregate rentals chargeable for each piece of Contractor owned tools or equipment shall not exceed 50% of the fair market value of such equipment at the time of its commitment to the Work. The original purchase price and date of purchase of the equipment will be documented with a copy of the purchase invoice for the piece of equipment. Such aggregate limitations will apply and no further rentals shall be charged even if a piece of equipment is taken off the job and is later replaced by a similar piece of equipment. For purposes of computing the aggregate rentals applicable to aggregate rental limitations, rental charges for similar pieces of equipment will be combined if the pieces of equipment were not used at the same time.

15.3.1.5.2.5 Fair market value for used material and equipment as referred to in the Contract Documents shall mean the estimated price a reasonable purchaser would pay to purchase the used material or equipment at the time it was initially needed for the job. Note: This is usually lower than the price a reasonable purchaser would pay for similar new construction material or construction equipment.

15.3.1.5.2.6 All losses resulting from lost, damaged or stolen tools and equipment shall be the sole responsibility of the Contractor, and not the Owner, and the cost of such losses shall not be reimbursable under the Contract.

15.3.1.5.2.7 The Contractor shall be required to maintain a detailed equipment inventory of all job-owned equipment (either purchased and charged to job cost or job-owned through aggregate rentals) and such inventory shall be submitted to Owner each month. For each piece of equipment, such inventory should contain at a minimum (1) original purchase price or acquisition cost (2) acquisition date (3) approved FMV at the time the piece of equipment was first used on the job and (4) final disposition.

15.3.1.5.2.8 All costs incurred for minor maintenance and repairs shall be reimbursed at actual cost. Such costs include routine and preventative maintenance, minor repairs and other incidental costs. Repairs and/or replacement of a capital nature are considered to be covered by the rental rates. Major repairs and overhauls are not considered routine and ordinary, consequently such costs are not reimbursable and are intended to be covered by the rental rates.

15.3.1.5.3 Costs of removal of debris From the Site.

15.3.1.5.4 Costs of document reproductions, facsimile transmissions and long-distance telephone calls, postage and parcel delivery charges, telephone service at the site and reasonable petty cash expenses of the site office.

15.3.1.5.5 That portion of the reasonable expenses of the Contractor's personnel incurred while traveling in discharge of duties connected with the Work. No travel expenses will be reimbursed to Contractor's representatives unless Project related travel required them to travel to a destination more than 100 miles from the Project location. Any travel involving airfare will require advance written approval by an authorized Owner's representative.

15.3.1.5.6 Costs of materials and equipment suitably stored off the site at a mutually acceptable location, if approved in advance by the Owner.

15.3.1.5.7 Reproduction costs will be the actual costs of reproduction subject to a maximum of five cents (\$.05) per square foot for prints and a maximum of five cents (\$.05) per 8 1/2 by 11 inch page for offset print or photo copied contract documents, specifications, etc. Telephone costs will be the actual costs paid to the third party telephone company for the field office telephone.

15.3.1.6 Miscellaneous Costs.

15.3.1.6.1 That portion of insurance and bond premiums that can be directly attributed to the Contract:

15.3.1.6.1.1 The Contractor's actual cost for insurance shall be considered to be included within the Maximum limit for General Conditions Costs. All premiums for any insurance and bonds required for the Project shall reflect the net actual costs to Contractor after taking into consideration cost adjustments due to experience modifiers, premium discounts, policy dividends, retrospective rating plan premium adjustments, assigned risk pool rebates, refunds, etc.

15.3.1.6.1.2 The amount to be reimbursed to the contractor for all contractually required liability insurance will be actual costs not to exceed a total of .5% of the net reimbursable Cost of Work (not including liability insurance and not including fee). If the Contractor's cost of contractually required liability insurance is greater than the amount agreed to be reimbursed per this contract provision, the difference shall be considered to be covered by the Contractor's Fee.

15.3.1.6. 2 Sales, use or similar taxes imposed by a governmental authority that are related to the Work.

15.3.1.6.3 Fees and assessments for the building permit and for other permits, licenses and inspections for which the Contractor is required by the Contract Documents to pay.

15.3.1.6.4 Fees of laboratories for tests required by the Contract Documents, except those related to defective or nonconforming Work and which do not fall within the scope of ¶ 1.7.3 below.

15.3.1.6.5 Royalties and license fees paid for the use of a particular design, process or product required by the Contract Documents; the cost of defending suits or claims for infringement of patent rights arising from such requirement of the Contract Documents; and payments made in accordance with legal judgments against Contractor resulting from such suits or claims and payments of settlements made with the Owner's consent. However, such costs of legal defenses, judgments and settlements shall not be included in the calculation of the Contractor's Fee or subject to the Guaranteed Maximum Price.

15.3.1.6.6 Data processing costs related to the Work. However, any such data processing costs will be limited to the cost of personal computer hardware used at the field office in the normal day to day administration, management and control of the Project. The aggregate charges for any such hardware shall not exceed the FMV of the hardware at the time it was brought to the field office. If the total charges for any particular piece of hardware reach an amount equal to the FMV, that particular piece of hardware shall be turned over to the Owner whenever it is no longer needed for the Project. If the Contractor elects to keep the particular piece of hardware, the job costs shall be credited with a mutually agreeable amount which shall represent the FMV of the particular piece of hardware at the time it was no longer needed for the job. Software or other costs associated with the use of computer programs shall not be considered to be a reimbursable cost and will be considered to be covered by the Contractor's Fee.

15.3.1.6.7 Deposits lost for causes other than the Contractor's negligence or failure to fulfill a specific responsibility to the Owner as set forth in the Contract Documents.

15.3.1.6.8 Legal, mediation and arbitration costs, including attorneys' fees, other than those arising from disputes between the Owner and Contractor, reasonably incurred by the Contractor in the

performance of the Work and with the Owner's prior written approval; which approval shall not be unreasonably withheld.

15.3.1.6.9 Expenses incurred in accordance with the Contractor's standard personnel policy for relocation and temporary living allowances of personnel required for the Work, if pre-approved by the Owner in writing. If Owner authorizes the reimbursement of relocation costs, the reimbursable relocation expenses will be limited to a maximum of \$50,000 per person. Any relocation cost incurred by Contractor in excess of the amount reimbursed by Owner will be considered to be covered by the Contractor's Fee.

15.3.1.7 Other Costs and Emergencies.

15.3.1.7.1 Other costs incurred in the performance of the Work if and to the extent approved in advance in writing by the Owner.

15.3.1.7.2 Costs due to emergencies incurred in taking action to prevent threatened damage, injury or loss in case of an emergency affecting the safety of persons and property.

1 5.3.1.7.3 Costs of repairing or correcting damaged or nonconforming Work executed by the Contractor, Subcontractors or suppliers, provided that such damaged or nonconforming Work was not caused by negligence or failure to fulfill a specific responsibility of the Contractor and only to the extent that the cost of repair or correction is not recoverable by the Contractor from insurance, sureties, Subcontractors or suppliers.

15.3.1.8 Related Party Transactions.

15.3.1.8.1 The term "related party" shall mean a parent, subsidiary, affiliate or other entity having common ownership or management with the Contractor; any entity in which any stockholder in, or management employee of, the Contractor owns any interest in excess of ten percent in the aggregate; or any person or entity which has the right to control the business or affairs of the Contractor. The term "related party" includes any member of the immediate family of any person identified above.

15.3.1.8.2 If any of the costs to be reimbursed arise from a transaction between the Contractor and a related party, the Contractor shall notify the Owner in writing of the specific nature of the contemplated transaction, including the identity of the related party and the anticipated cost to be incurred, before any such transaction is consummated or cost incurred. If the Owner, after such notification, authorizes in writing the proposed transaction, then the cost incurred shall be included as a cost to be reimbursed, and the Contractor shall procure the Work, equipment, goods or service from the related party, as a Subcontractor. If the Owner fails to authorize the transaction, the Contractor shall procure the Work, equipment, goods or service from some person or entity other than a related party.

15.3.2 Costs Not to be Reimbursed.

15.3.2.1 The Cost of the Work shall not include:

15.3.2.1.1 Salaries and other compensation of the Contractor's personnel stationed at the Contractor's principal office or offices other than the site office, except as specifically provided in Subparagraphs 15.3.1.2.2 and 15.3.1.2.3.

15.3.2.1.2 Expenses of the Contractor's principal office and offices other than the site office.

15.3.2.1.3 Overhead and general expenses, except as may be expressly included in Section 1.

15.3.2.1.3.1 Costs of Contractor's home office computer services or other outside computer processing services shall be considered overhead and general expense. Accordingly the

Contractor should not plan to perform any such computer related services or alternatives at the field office when such services or functions can be performed at the Contractor's home or branch offices, or other outside service locations.

15.3.2.1.4 The Contractor's capital expenses, including interest on the Contractor's capital employed for the Work.

15.3.2.1.5 Rental costs of machinery and equipment, except as specifically provided in Subparagraph 15.3.1.5.2.

15.3.2.1.6 Except as provided in Subparagraph 1.7.3 of this Agreement, costs due to the negligence or failure to fulfill a specific responsibility of the Contractor, Subcontractors and suppliers or anyone directly or indirectly employed by any of them or for whose acts of them may be liable.

15.3.2.1.7 Any cost not specifically and expressly described in Section 1.

15.3.2.1.8 Costs, other than costs included in Change Orders approved by the Owner, that would cause the GMP to be exceeded.

15.3.3 Discounts, Rebates, Refunds and Savings.

15.3.3.1 Cash discounts obtained on payments made by the Contractor shall accrue to the Owner if (1) before making the payment, the Contractor included them in an Application for Payment and received payment therefore from the Owner, or (2) the Owner has deposited funds with the Contractor with which to make payments; otherwise, cash discounts shall accrue to the Contractor. Trade discounts, rebates, refunds and amounts received from sales or surplus materials and equipment shall accrue to the Owner, and the Contractor shall make provisions so that they can be secured.

15.3.3.1.1 Cost of the Work will be credited with all insurance policy discounts, performance and payment bond rebates or refunds, refunds or return premiums from any subcontractor default insurance, refunds or rebates from any contractor controlled insurance programs applicable to the Project, merchandise rebates of any nature, refunds of any nature, insurance dividends; and a portion of any volume rebates or free material credits earned with purchase of material or other goods and services charged to the job.

15.3.3.1.2 "Cash" discounts which may accrue to the Contractor will be limited to a maximum of 1.5% of invoice cost. Any portion of "Cash" discounts greater than 1.5% shall automatically accrue to Owner if the Contractor is eligible to take advantage of the discounts.

15.3.3.2 Amounts that accrue to the Owner in accordance with the provisions of Paragraph 3.1 shall be credited to the Owner as a deduction from the Cost of the Work.

15.3.4 General Conditions Costs.

15.3.4.1 General Conditions Costs may include, but are not limited to the following types of costs incurred by the Contractor during construction of the Work to the extent they are reimbursable Costs of the Work as delineated above: payroll costs for Work conducted at the site, payroll costs for the superintendent and full-time general foremen, payroll costs for management personnel resident and working on the site, workers not included as direct labor costs engaged in support (e.g. loading/unloading, clean-up, etc.), administrative office personnel, costs of offices and temporary facilities including office materials, office supplies, office equipment, minor expenses, utilities, fuel, sanitary facilities and telephone services at the site, costs of liability insurance premiums not included in labor burdens for direct labor costs, costs of bond premiums, costs of consultants not in the direct employ of the Contractor or Subcontractors, fees for permits and licenses.

15.3.4.2 General Conditions Costs may be paid on a percentage of the Contract Price or on a lump/stipulate sum basis as set forth in the Contract. All costs included in the General Conditions Costs shall not be separately invoiced to or paid by the Owner.

15.3.4.3 The total amount of General Conditions Costs for the Work may be divided by the number of days allowed for performance of the Work, to determine a fixed daily rate for General Conditions Costs that may be used in computing the General Conditions Costs allocated to any period of time, or for any adjustments in the General Conditions Costs agreed to in writing by the Owner.

15.3.4.4 Any and all savings on the GMP, or any separately guaranteed items comprising the GMP, shall belong to the Owner, subject to any express right in the Contract for the Contractor to share in savings. Savings are subject to the Owner's right to audit, and may be audited separately.

15.4 Allowances.

15.4.1 Contractor shall include in the Contract Price all Allowances stated in the Contract Documents and agreed to in writing by Owner. Items covered by these Allowances shall be supplied for such amounts and by such persons as Owner may direct, provided Contractor will not be required to employ persons against whom Contractor makes a reasonable objection. Materials and equipment under an Allowance shall be selected by Owner in accordance with a schedule to be mutually agreed upon by Owner, Design Professional and Contractor or otherwise in reasonably sufficient time to avoid delay in the Work.

15.4.2 Unless otherwise provided in the Contract Documents:

15.4.2.1 These Allowances shall cover the cost to Contractor, less any applicable trade discount, of the Materials and equipment required by the Allowance, delivered at the Site, and all applicable taxes;

15.4.2.2 Contractor's costs for unloading and handling on the Site, labor, installation costs, overhead, profit and other expenses relating to Materials and equipment required by the Allowance shall be included in the Contract Sum and not in the Allowance; and

15.4.2.3 Whenever the cost is more or less than the Allowance, the Contract Sum shall be adjusted accordingly by Change Order, the amount of which will recognize the difference between actual costs for an Allowance item and the amount of the Allowance item and changes, if any, in handling costs on the Site, labor, installation costs, overhead, profit and other expenses.

15.5 Contingency.

15.5.1 The GMP includes a Contingency. The Contingency (but not the GMP) as set forth in the Schedule of Values shall be adjusted, as may be required, to reflect net savings or net losses resulting from the award of Subcontracts. The amount of the adjustment to the Contingency shall be determined by subtracting the face amount of each Subcontract at the time the Subcontract is entered into from the amount allocated in the initial Schedule of Values applicable to the Work to be performed under such Subcontract. Contractor may only permit funds to be expended from the Contingency for Cost of the Work incurred for completion of the Work after notifying Owner in writing of such expenditure and obtaining written approval from Owner of such expenditure.

15.5.2 After award of all major Subcontracts (representing at least 80% of the GMP), the Contingency may be used by Owner for Owner initiated Change Orders, provided that there remains in the Contingency an amount equal to the original percentage of the Cost of the Work as represented by the Contingency set forth in the GMP. At mutually agreed upon milestones, Owner and Contractor shall meet and confer to analyze the Contingency and determine methods of reducing such Contingency for the benefit of Owner for use on the Project to implement scope changes to the Work or otherwise to make the Contingency available for Owner's use. To support such analysis, Contractor shall identify any actual or known potential claims against it or actual or reasonably anticipated events that would constitute permissible uses of the Contingency. After good faith negotiations, and upon the written request of Owner, Contractor shall release to Owner the requested amount of the Contingency. After Contractor releases any portion of the Contingency, any such release shall be evidenced by a Change Order.

15.6 Reduction In Retention.

If the Contract Price is based upon a GMP, in order to receive payment of one-half of the retention as set forth in Section 8.2.2.3 above, Contractor must also submit to the Project Manager a complete accounting of the actual reimbursable Cost of the Work to date, including all such documentation (including, without limitation, invoices, subcontracts, subcontractor change orders, purchase orders, records of payment, etc.) as Owner may require, to establish whether the payments made to Contractor equal, exceed, or are less than the actual reimbursable Cost of the Work to date. Any excess payments by Owner, as determined by the Project Manager, shall be deducted from the one-half retention payment to be made to Contractor, and any additional excess amounts paid to Contractor shall be refunded by Contractor to Owner. The Project Managers determinations as to actual reimbursable Cost of the Work shall be the basis of payment until final Project Closeout and Final Payment under the Contract. There is no retention for Job Order Contracting construction services contracts.

15.7 Final Payment.

If the Contract Price is based upon a GMP, as a further condition precedent to Final Payment by Owner, Contractor must submit to the Project Manager a complete final accounting of the actual reimbursable Cost of the Work, including all such documentation (including, without limitation, invoices, subcontracts, subcontractor change orders, purchase orders, records of payment, etc.) as Owner may require, to establish whether the payments made to Contractor equal, exceed, or are less than the actual reimbursable Cost of the Work to date. Any excess payments by Owner, as determined by the Project Manager, shall be deducted from the one-half retention payment to be made to Contractor, and any additional excess amounts paid to Contractor shall be refunded by Contractor to Owner. Disputes relating to the final Cost of the Work shall be subject to Owner's audit rights under Sections 8.9 above and 15.7 below, and the dispute resolution process under Section 13 above.

15.8 Open Book.

In addition to the foregoing, all Cost-Based Contracts, Job Orders, or Change Orders, shall be Open Book.

15.9 Differing Site Conditions and/or Change In Laws.

A Change Order for increased costs under Section 9.4 or 9.5 above will only be considered or granted by Owner to the extent such actual, documented costs exceed the remaining amount of the Contractor's Contingency.

SECTION 16 - PROVISIONS APPLICABLE SOLELY TO JOB ORDER CONTRACTS (JOC)

This section intentionally omitted.

SECTION 17 – PROVISIONS APPLICABLE SOLELY TO PRE-CONSTRUCTION SERVICES

Note: Unless otherwise specified in the Contract, the provisions in this Section 17 only apply to Contracts involving Pre-Construction services being performed by a CMAR (i.e., the Construction Manager at Risk Pre-Construction Services Contract). That is why in this Section 3, the term "CMAR" is utilized instead of the term "Contractor", which is utilized throughout the remainder of these General Conditions. See the definitions of "Contractor" in Section 1 above and "CMAR" in Section 15.1 above.

17.1 Additional Definitions

The definitions set forth in Sections 1 and 15.1 above shall apply to all Pre-Construction Services Contracts.

17.2 General

17.2.1 CMAR shall perform the Services required by, and in accordance with the Contract Documents and as outlined in the Exhibit A to the Contract to the satisfaction of the Project Manager, exercising the degree of care, skill, diligence and judgment a professional construction manager experienced in the performance of such services for construction and/or facilities of similar scope, function, size, quality, complexity and detail to the Project in urban areas throughout the United States, would exercise at such time, under similar conditions. CMAR shall, at all times, perform the required services consistent with sound and generally accepted engineering principles and construction management and construction contracting practices.

17.2.2 As a participating member of the Project Team, CMAR shall provide to Owner and Design Professional a written evaluation of Owner's Project Program and budget, each in terms of the other, with recommendations as to the appropriateness of each. CMAR shall prepare a Baseline Cost Model that validates Owner's budget. The Baseline Cost Model shall include all assumptions and basis of estimates in enough detail so that the Project Team can compare future detail estimates to the Baseline Cost Model for variances. Owner and Design Professional will provide all the reasonably required data that is available in order to reach agreement between the team members that the Baseline Cost Model is an accurate projection of the costs of the Project.

17.2.3 CMAR shall attend Project Team meetings, which may include, but are not limited to, bi-weekly Project management meetings, Project workshops, special Project meetings, construction document rolling reviews, public meetings and partnering sessions. CMAR attendance at design or other meetings in which CMAR is provided the opportunity but does not actively participate and/or is not properly prepared is not acceptable. Repeated instances of non-participation and/or lack of preparedness shall be grounds for termination of CMAR Contract for default.

17.2.4 CMAR shall provide Pre-Construction Services, described herein, in a timely manner and consistent with the intent of the most current Drawings and Specifications. CMAR shall promptly notify Owner in writing whenever CMAR determines any Drawings or Specifications are inappropriate for the Project and/or cause changes in the scope of Work that deviates more than the allowed contingencies within the Baseline Cost Model or requires an adjustment in the Baseline Cost Model, Detailed Cost Estimate, Detailed Project Schedule, GMP Proposals and/or in the Contract Time for the Work, to the extent such are established.

17.2.5 CMAR when requested by Owner, shall attend, make presentations and participate as may be appropriate in public agency and or community meetings, relevant to the Project. CMAR shall provide drawings, schedule diagrams, budget charts and other materials describing the Project, when their use is required or appropriate in any such public agency meetings.

17.2.6 Ownership of Work Product. All Work Product prepared or otherwise created in connection with the performance of this Contract, including the Work, are to be and remain the property of Owner. For purposes of this provision, "Work Product" shall include all designs, drawings, plans, specifications, ideas, renderings and other information or matter, in whatever form created (e.g., electronic or printed) and in all media now known or hereinafter created. All Work Product shall be considered Work Made for Hire as defined in the United States Copyright Act 17 U.S.C. §101 (Copyright Act). If for any reason any such Work is found not to be a work for hire, Contractor hereby transfers and assigns ownership of the copyright in such Work to Owner. The rights in this Section are exclusive to Owner in perpetuity.

17.2.7 CMAR represents to Owner in completing the Pre-Construction Services and providing the reports and analysis required thereunder, that Work can be properly and timely constructed within the GMP Proposal, if accepted. CMAR does not assume any design responsibilities unless specifically called for in the scope of work, but CMAR shall be responsible for his errors, omissions or inconsistencies included in the Work.

17.3 Detailed Project Schedule

17.3.1 The fundamental purpose of the Detailed Project Schedule is to identify, coordinate and record the tasks and activities to be performed by all of the Project Team members and then for the Project Team to utilize that Deliverable as a basis for managing and monitoring all member's compliance with the schedule requirements of the Project. Each Project Team member is responsible for its compliance with the Detailed Project Schedule requirements. CMAR shall, however, develop and maintain the Detailed Project Schedule on behalf of and to be used by the Project Team based on input from the other Project Team members. The Baseline Project Schedule shall be developed as part of the Baseline Cost Model. The Detailed Project Schedule shall use the Critical Path Method ("CPM") technique, unless required otherwise, in writing by Owner. CMAR shall use scheduling software acceptable to Owner to develop the Detailed Project Schedule. The Detailed Project Schedule shall be presented in graphical and tabular reports as agreed upon by the Project Team. If Project phasing as described below is required, the Detailed Project Schedule shall indicate milestone dates for the phases once determined. As part of construction phase, Owner may require CMAR to prepare a "resource loaded" schedule for all work, including work performed by Subcontractors, detailing each of the project tasks and the required/ anticipated number of personnel per day for each task. CMAR shall also indicate on the schedule its ability to meet said required/anticipated personnel requirements.

17.3.2 CMAR shall include and integrate in the Detailed Project Schedule the services and activities required of Owner, Design Professional and CMAR including all construction phase activities based on the input received from Owner and the Design Professional. The Detailed Project Schedule shall define activities as determined by Owner to the extent required to show: (a) the coordination between preliminary design and various pre-construction documents, (b) any separate long-lead procurements, (c) any permitting issues, (d) any land, right-of-way, or easement acquisition, (e) bid packaging strategy and awards to Subcontractors and Suppliers, (f) major stages of construction, (g) start-up and commissioning, and (h) occupancy of the completed Work by Owner. The Detailed Project Schedule shall include by example and not limitation, proposed activity sequences and durations for design, procurement, construction and testing activities, milestone dates for actions and decisions by the Project Team, preparation and processing of shop drawings and samples, delivery of materials or equipment requiring long-lead time procurement (if any), milestone dates for various construction phases, Total Float for all activities to the extent authorized by Owner, relationships between the activities, Owner's occupancy requirements showing portions of the Project having occupancy priority, and proposed dates for Final Completion.

17.3.3 A Baseline Project Schedule shall be initiated with the project Baseline Cost Model and agreed to by the project team at the same time. CMAR shall update and maintain a Detailed Project Schedule throughout pre-construction such that it shall not require major changes at the start of the construction phase to incorporate CMAR's plan for the performance of the construction phase Work. CMAR shall provide updates and/or revisions to the Detailed Project Schedule for use by the Project Team, whenever required, but no less often than at the Project Team meetings. CMAR shall include with such submittals a narrative describing its analysis of the progress achieved to-date vs. the Baseline Project Schedule, including any concerns regarding delays or potential delays, and any recommendations regarding mitigating actions.

17.3.3 If phased construction is deemed appropriate at the time of developing the Baseline Cost Model or during the development of the Detailed Project Schedule, and Owner and Design Professional approve, CMAR shall review the design and make recommendations regarding the phased issuance of Construction Documents to facilitate phased construction of the Work, with the objective of reducing the Project Schedule and/or Cost of the Work. CMAR shall take into consideration such factors as natural and practical lines of work severability, sequencing effectiveness, access and availability constraints, total time for completion, construction market conditions, labor and materials availability, and any other factors pertinent to saving time and cost.

17.3.4 Long Lead Time Items. As part of developing the Detailed Project Schedule, CMAR shall identify all long lead time materials, fabrications, equipment, or other items which may impact the Project Schedule and may require early action on the part of the Project Team. Dates for selecting and ordering long lead time items will be included and highlighted in the Detailed Project Schedule.

17.3.5 Equipment Plan. Contractor shall develop an Equipment Plan that addresses all rental and owned equipment, regardless of whether such equipment will be provided by CMAR or subcontractor(s), that will be necessary to construct the Project and the cost of which will be included as a Cost of the Work in the GMP Proposal. The Equipment Plan will seek to minimize the cost of the equipment to Owner and maximize the efficient and coordinated use of the equipment for completion of the Project. The Equipment Plan will not only include the costs and allowable lease rates for the equipment, but will also include an equipment schedule that will be incorporated into the Detailed Project Schedule and the Schedule of Values submitted with the GMP Proposal.

17.4 Design Document Reviews

17.4.1 CMAR shall evaluate periodically the availability of labor, materials/equipment, cost-sensitive aspects of the design; and other factors that may create an unacceptable variance to the Baseline Cost Model and/or Baseline Project Schedule.

17.4.2 CMAR shall recommend, in conjunction with the Project Team, those additional surface and subsurface investigations that, in its professional opinion, are required to provide the necessary information for CMAR to construct the Project. These additional investigations, if agreed to be necessary by the Project Manager and the Design Professional, shall be acquired by Owner and copies of the reports will be provided to CMAR.

17.4.3 CMAR shall meet with the Project Team as required to review designs during their development. CMAR shall familiarize itself with the evolving documents through the various pre-construction phases. CMAR shall proactively advise the Project Team and make recommendations on factors related to construction costs, and concerns pertaining to the feasibility and practicality of any proposed means and methods, selected materials, equipment and building systems, and, labor and material availability. CMAR shall furthermore advise the Project Team on proposed site improvements, excavation and foundation considerations, as well as, concerns that exist with respect to coordination of the Drawings and Specifications. CMAR shall use established value analysis principles in recommending cost effective alternatives.

17.4.4 CMAR shall routinely conduct constructability and bidability reviews of the Drawings and Specifications as necessary to satisfy the needs of the Project Team. The reviews shall attempt to identify all discrepancies and inconsistencies in the Construction Documents especially those related to clarity, consistency, completeness and coordination of Work of Subcontractors and Suppliers.

17.4.4.1 CMAR shall evaluate whether: (a) the Drawings and Specifications are configured to enable efficient construction; (b) design elements are standardized; (c) construction efficiency is properly considered in the Drawings and Specifications; (d) module/preassembly design are prepared to facilitate fabrication, transport and installation; (e) sequences of Work required by or inferable from the Drawings and Specifications are practicable; (f) the design has taken into consideration, efficiency issues concerning access and entrance to the site, laydown and storage of materials, staging of site facilities, construction parking, and other similar pertinent issues; and (g) the design maintains continued operation of the existing Owner systems and maintains traffic on adjacent roadways. CMAR shall also review the Drawings and Specifications to ensure that what is depicted therein can be constructed as designed, and shall promptly inform the Project Team of any issues.

17.4.4.2 CMAR shall check cross-references and complementary Drawings and sections within the Specifications, and in general evaluate whether: (a) the Drawings and Specifications are sufficiently clear and detailed to minimize ambiguity and to reduce scope interpretation discrepancies; (b) named materials and equipment are commercially available and are performing well or otherwise, in similar installations; (c) Specifications include alternatives in the event a requirement cannot be met in the field; and (d) in its professional opinion, the Project is likely to be subject to Differing Site Conditions.

17.4.4.3 The results of the reviews shall be provided to Project Team in formal, written reports clearly identifying all reviewed documents and the discovered discrepancies and inconsistencies in the Drawings and Specifications with notations and recommendations made on the

Drawings, Specifications and other documents. CMAR shall meet with Project Team to discuss any findings and review reports.

17.4.4.4 CMAR's reviews shall be from a contractor's perspective, and though it shall serve to eliminate/reduce the number of RFIs) and changes during the construction phase, responsibility for the Drawings and Specifications shall remain with the Design Professional and not CMAR.

17.4.5 It is CMAR's responsibility to assist the Design Professional in ascertaining that, in CMAR's professional opinion, the Construction Documents are in accordance with applicable Laws, Regulations, or Legal Requirements, building codes, sound engineering principle's rules and regulations. If CMAR recognizes that portions of the Construction Documents are at variance with applicable Laws, Regulations, or Legal Requirements, sound engineering principle's rules and regulations, it shall promptly notify the Project Team in writing, describing the apparent variance or deficiency. However, the Design Professional is ultimately responsible for the compliance of the Drawings and Specifications with those Laws, Regulations, or Legal Requirements.

17.4.6 The Project Team shall routinely identify and evaluate using value analysis principles any alternate systems, approaches, design changes that have the potential to reduce Project costs while still delivering a high quality and fully functional Project consistent with the Project Program. If the Project Team agrees, CMAR in cooperation with the Design Professional will perform a cost/benefit analysis of the alternatives and submit such in writing to the Project Team. Owner, through the Project Manager, will direct which alternatives will be incorporated into the Project. The Design Professional will have full design responsibility for the review and incorporation of CMAR suggested alternatives into the Drawings and Specifications. CMAR shall analyze the costs and schedule impacts of the alternatives against the Baseline Cost Model and Schedule and provide a recommendation for the Project Team's consideration and Owner's approval prior to the establishment of the GMP.

17.5 Baseline Cost Model, Detailed Cost Estimates, And Schedule Of Values

17.5.1 At the conclusion of the Master Planning and Programming, if required, CMAR will review all available information regarding the design and scope of the Project, using CMAR's experience in performing similar work, knowledge of similar projects and current and projected construction costs, and based upon that review shall develop a Baseline Cost Model for review by the Project Team and approval by Owner. Once approved by Owner, the Baseline Cost Model shall be continually referenced as detailed estimates are created as the design progresses throughout the pre-construction until a final GMP for the entire Project is established. A final GMP for the entire Project must be established and approved by Owner prior to the start of construction. It is the responsibility of CMAR to ensure Owner has sufficient information to evaluate and approve a final GMP prior to the time necessary to start construction so construction can be completed within the Contract Time. The Project Detailed Cost Estimate shall be the best representation from CMAR of what the complete functional Project's construction costs will be as indicated by the most current available documents and will be constantly checked against the Baseline Cost Model. CMAR shall communicate to the Project Team any assumptions made in preparing the Baseline Cost Model. The Baseline Cost Model shall support CMAR's Detailed Cost Estimates and may be broken down initially as dictated by the available information, as required by Owner. The Baseline Cost Model shall also include contingencies as agreed to by Owner, which may include, but are not limited to: (a) a design contingency that takes into consideration the advancement of the then current design documents, (b) an escalation contingency from the time of the estimate through the scheduled buy out of the Project, (c) a construction contingency in the same percentage as the Contingency to be included in the GMP.

17.5.2 After receipt of the Design Professional's most current documents from certain specified pre-construction milestones, CMAR shall provide a draft Detailed Cost Estimate including a detailed written report detailing any variances to the Baseline Cost Model and Baseline Project Schedule. The Design Professional and CMAR will reconcile any disagreements on the estimate to arrive at an agreed upon Detailed Cost Estimate for the construction costs based on the scope of the Project through that specified pre-construction milestone. The pre-construction milestones applicable to this paragraph are: Master Planning and Programming, Schematic Design, 50% Design Development, 100% Design Development, and 50% Construction Drawings. If no consensus is reached, Owner will make the final

determination. If the Project Team requires additional updates of the Detailed Cost Estimate beyond that specified in this paragraph, CMAR shall provide the requested information in a timely manner.

17.5.3 If at any point the Detailed Cost Estimate submitted to Owner exceeds the previously accepted Baseline Cost Model or previously approved Detailed Cost Estimate agreed to as set forth in Section 17.5.2 above, CMAR shall make appropriate recommendations to Project Team on means/methods, materials, and or other design elements that it believes will reduce the estimated construction costs, such that it is equal to or less than the established Project Team's Baseline Cost Model.

17.5.4 Near completion of the 50% Construction Drawings and included with the associated report, CMAR shall also submit to the Project Team for review and approval a Schedule of Values that complies with the following requirements. The Schedule of Values shall be based on Owner standard bid schedule and highlight significant variances from any previously submitted Schedule of Values. The Schedule of Values shall be directly related to the breakdowns reflected in the Detailed Project Schedule and CMAR's Detailed Cost Estimate. In addition, the Schedule of Values shall: (a) detail unit prices and quantity take-offs, (b) detail all other contingencies and unit price Work shown and specified in the detailed design documents

17.5.5 CMAR is to track, estimate/price and address the Project Team's overall project cost issues that arise outside of the Baseline Cost Model and the latest approved Detailed Cost Estimate such as: Owner generated changes, Project Team proposed changes, alternate system analysis, constructability items and value engineering analysis. The system used to implement this process will be referred to as the Design Evolution Log. This is to be addressed between the Baseline Cost Model and the Master Planning and Programming Detailed Cost Estimate, and then between the Detailed Cost Estimates for each of the pre-construction milestones thereafter, Schematic Design, 50% Design Development, 100% Design Development, and 50% Construction Documents, and the bid packages for all Phases.

17.5.6 Upon request by Owner, CMAR shall submit to Owner a cash flow projection for the Project based on the current updated/revised Detailed Project Schedule and the anticipated level of payments for CMAR during the design and construction phases. In addition, if requested by Owner and based on information provided by Owner, CMAR shall prepare a cash flow projection for the entire Project based on historical records for similar types of projects to assist Owner in the financing process.

17.5.7 Construction Water. CMAR shall estimate the quantity of water to be used and include the cost thereof in each Detailed Cost Estimate and GMP Proposal provided to Owner.

17.6 Subcontractor And Major Supplier Selections

17.6.1 There are two ways to select Subcontractors and major Suppliers prior to submission of a GMP Proposal: (1) qualifications-based selection; or (2) a combination of qualifications and price. Except as noted below, the selection of Subcontractors/Suppliers is the sole responsibility of CMAR. In any case, CMAR is solely responsible for the performance of the selected Subcontractors/Suppliers, and for compliance with the requirements of Title 34 of the Arizona Revised Statutes in the selection of the Subcontractors/Suppliers, to the extent applicable. CMAR shall comply with its subcontractor selection plan submitted with its Statement of Qualifications.

17.6.2 Owner may approve the selection of a Subcontractor(s) or Suppliers(s) based only on their qualifications when CMAR can demonstrate it is in the best interest of the Project. All Work that is performed after such a qualifications-based selection for a price that is negotiated by CMAR will be billed in accordance with the GMP for actual costs and may be subject to audit by Owner.

17.6.2.1 Qualification based selection of a Subcontractor(s)/Supplier(s) should only occur prior to the submittal of the GMP Proposal.

17.6.2.2 If a Subcontractor/Supplier selection plan was submitted and agreed to by Owner, CMAR shall apply the plan in the evaluation of the qualifications of a Subcontractor(s) or Supplier(s) and provide Owner with its review and recommendation.

17.6.2.3 CMAR must receive written Owner approval for each selected Subcontractor(s) and Supplier(s).

17.6.2.4 CMAR shall negotiate costs for services/supplies from each Subcontractor/Supplier selected under this method.

17.6.3 All Work shall be competitively bid unless a Subcontractor or Supplier was selected pursuant to paragraph 17.5.2 above.

17.6.3.1 CMAR shall develop Subcontractor and Supplier interest, submit the names of a minimum of three qualified Subcontractors or Suppliers for each trade in the Project for approval by Owner and solicit bids for the various Work categories. If there are not three qualified Subcontractors/Suppliers available for a specific trade or there are extenuating circumstances warranting such, CMAR may request approval by Owner to submit less than three names. Without prior written notice to Owner, no change in the recommended Subcontractors/Suppliers shall be allowed.

17.6.3.2 If Owner objects to any nominated Subcontractor/Supplier or to any self-performed Work for good reason, CMAR shall nominate a substitute Subcontractor/Supplier that is acceptable to Owner.

17.6.3.3 CMAR shall distribute Drawings and Specifications, and when appropriate, conduct a prebid conference with prospective Subcontractors and Suppliers.

17.6.3.4 If CMAR desires to self-perform certain portions of the Work, it shall request to be one of the approved Subcontractor bidders for those specific bid packages. CMAR's bid will be evaluated in accordance with the process identified below. If events warrant and Owner concurs that it is necessary in order to insure compliance with the Project Schedule and/or the most recent Detailed Cost Estimate, CMAR may be authorized to self-perform Work without bidding or re-bidding the Work. When CMAR self-performs work without bidding, only the actual costs associated with performing the Work in accordance with the approved GMP will be billed and may be subject to audit by Owner.

17.6.3.5 CMAR shall receive, open, record and evaluate the bids; provided, however, that if CMAR or one of its affiliates is bidding to self-perform the Work that is the subject of the bid, then the bids shall be received, opened, recorded and evaluated by Project Manager instead of CMAR. Bids for each category of Work shall be opened and recorded at a pre-determined time. The apparent low bidders shall be interviewed to determine the responsiveness of their proposals. In evaluating the responsiveness of bid proposals CMAR, in addition to bid price, may consider the following factors: past performance on similar projects, qualifications and experience of personnel assigned, quality management plan, approach or understanding of the Work to be performed, and performance schedule to complete the Work. The final evaluation of Subcontractor/Supplier bids shall be done with Project Manager in attendance to observe and witness the process. CMAR shall resolve any Subcontractor/Supplier bid withdrawal, protest or disqualification in connection with the award at no increase in the Cost of the Work.

17.6.4 CMAR shall be required to prepare two different reports on the subcontracting process.

17.6.4.1 Within fifteen days after each major Subcontractor/Supplier bid opening process; CMAR shall prepare a report for Owner's review and approval identifying the recommended Subcontractors/Supplier for each category of Work. The report shall detail: (a) the name of the recommended Subcontractor/Supplier and the amount of the Subcontractor/Supplier bid for each subagreement; (b) the sum of all recommended Subcontractor/Supplier bids received; (c) and trade work and its cost that CMAR intends to self-perform, if any.

17.6.4.2 Upon completion of the Subcontractor/Supplier bidding process, CMAR shall submit a summary report to Owner of the entire Subcontractor/Supplier selection process. The report shall indicate, by bid process, all Subcontractors/Suppliers contacted to determine interest, the Subcontractors/Suppliers solicited, the bids received and costs negotiated, and the recommended

Subcontractors/Suppliers for each category of Work.

17.6.5 The approved Subcontractors/Suppliers shall provide a Schedule of Values with their bid proposals, which shall be used to create the overall Project Schedule of Values.

17.6.6 If after receipt of sub-bids or after award of Subcontractors and Suppliers, Owner objects to any nominated Subcontractor/Supplier or to any self-performed Work without any reasonable basis, CMAR shall nominate a substitute Subcontractor or Supplier, preferably if such option is still available, from those who submitted Subcontractor bids for the Work affected. Once such substitute Subcontractors and Suppliers are consented to by Owner, CMAR's proposed GMP/Price for the Work or portion thereof may be correspondingly adjusted to reflect any higher or lower costs from any such substitution.

17.7 Fixed Price/GMP Proposal

17.7.1 The Owner may require and/or accept either a Fixed Price Proposal or a GMP Proposal, as set forth in the solicitation and/or as agreed to by the Owner.

17.7.1.1 Fixed Price Proposal. When the Proposal submitted by the CMAR is a Fixed Price, that Fixed Price will be the Contract Price.

17.7.1.2 When a GMP Proposal is submitted for a phase of the Work, the GMP will have a Detailed Cost Estimate of the Costs of the Work (as set forth in Sections 15.2 and 15.3 above) in each phase of the Work that is being proposed plus the current estimate for all other Work. Owner will not approve the GMP for the phase of work without a total estimate for the complete Project. Owner may request a GMP Proposal for all or any portion of the Project and at any time during the pre-construction. Any GMP Proposals submitted by CMAR shall be based on and consistent with Baseline Cost Model and the current update/revised Detailed Cost Estimate at the time of the request and include any clarifications or assumptions upon which the GMP Proposal(s) are based.

17.7.2 A GMP Proposal for the entire Project shall be the sum of the Cost of the Work, CMAR Fee, General Conditions Cost and Contingency. CMAR guarantees to complete the Project at or less than the final GMP Proposal amount plus approved Change Orders. CMAR shall be responsible for any costs or expenses that would cause the Cost of the Work actually incurred, including the Construction Fee and General Conditions Costs, to exceed the GMP.

17.7.3 CMAR shall prepare its Proposal in accordance with Owner's request for Proposal requirements based on the most current completed Drawings and Specifications at that time, which unless otherwise directed by Owner in writing, shall be at 100% construction drawings. CMAR shall mark the face of each document of each set upon which its Proposal is based. These documents shall be identified as the Proposal Plans and Specifications. CMAR shall send one set of those documents to the Project Manager, keep one set and return a third set to the Design Professional.

17.7.4 An updated/revised Detailed Project Schedule, Equipment Plan, and Schedule of Values shall be included in any Proposal(s), all of which shall reflect the Proposal Plans and Specifications the Detailed Project Schedule shall be shown in relationship to the total Project Schedule and identify any variance to the Baseline Project Schedule. Any such Detailed Project Schedule updates/revisions shall continue to comply with the requirements of Sections 17.3.1 through 17.3.5.

17.7.5 Proposal(s) Review and Approval.

17.7.5.1 CMAR shall meet with the Project Team to review the Proposal(s) and the written statement of its basis. In the event the Project Team discovers inconsistencies or inaccuracies in the information presented, CMAR shall make adjustments as necessary to the GMP Proposal.

17.7.5.2 If during the review and negotiation of Proposals design changes are required, Owner may authorize and cause the Design Professional to revise the Proposal Plans and Specifications to the extent necessary to reflect the agreed-upon assumptions and clarifications contained in

the final approved GMP Proposal. Such revised Proposal Plans and Specifications will be furnished to CMAR. CMAR shall promptly notify the Project Team in writing if any such revised Proposal Plans and Specifications are inconsistent with the agreed-upon assumptions and clarifications.

17.7.6 All portions of or items comprising the Proposal are subject to audit by Owner, as deemed appropriate by Owner, including, without limitation, any based upon unit prices or Work to be self-performed by CMAR, or its affiliates.

17.7.7 GMP Proposals shall be Open Book.

17.8 Payment Procedure For Pre-Construction Services

17.8.1 Requests for monthly payments by CMAR for Pre-Construction Services shall be submitted monthly and shall be accompanied by a progress report, detailed invoices and receipts, if applicable. Any requests for payment shall include, as a minimum, a narrative description of the tasks accomplished during the billing period, a listing of any Deliverables submitted, and copies of any Subconsultants' requests for payment, plus similar narrative and listings of Deliverables associated with their Work. Payment for services negotiated as a lump sum shall be made in accordance with the percentage of work completed during the preceding month.

17.8.2 In no event will Owner pay more than seventy-five percent (75%) of the Contract Price until final acceptance of the all Pre-Construction Services, and award of the final approved Construction Services Contract for the entire Project by Owner Council. If CMAR does not prepare a GMP Proposal that is acceptable to Owner, or the GMP Proposal exceeds the Owner's Construction Budget, then CMAR understands and acknowledges that it will forfeit any right to receive the 25% of the Contract Price being retained by Owner.

17.8.3 CMAR agrees that no charges or claims for costs or damages of any type shall be made by it for any delays or hindrances beyond the reasonable control of Owner during the progress of any portion of the Pre-Construction Services specified in this Contract. Such delays or hindrances, if any, shall be solely compensated for by an extension of time for such reasonable period as may be mutually agreed between the parties. It is understood and agreed, however, that permitting CMAR to proceed to complete any such Services, in whole or in part after the date to which the time of completion may have been extended, shall in no way act as a waiver on the part of Owner of any of their respective legal rights herein.

17.8.4 No compensation to CMAR shall be allowed contrary to Article I, Chapter I, Title 34 of the Arizona Revised Statutes.

17.8.5 If any service(s) executed by CMAR is abandoned or suspended in whole or in part, for a period of more than 180 days through no fault of CMAR, CMAR is to be paid for the services performed prior to the abandonment or suspension.

17.9 Additional Pre-Construction Services

17.9.1 Additional services which are outside the scope of the services required under the Contract Documents applicable to a particular project shall not be performed by CMAR without prior written authorization from Owner. Additional services, when authorized by an executed written Change Order under Section 9 of these General Conditions, shall be compensated by a fee mutually agreed upon in such written Change Order between Owner and CMAR.

17.9.2 No claim for additional services, extra work done or materials furnished by CMAR shall be allowed by Owner except as provided herein, nor shall CMAR provide any additional services, do any work, or furnish any material(s) not covered by the contract governing a particular project unless such work or material is first authorized in writing by the Project Manager. Work or material(s) furnished by CMAR without such prior written authorization shall be at CMAR's sole jeopardy, cost, and expense, and CMAR hereby agrees that without prior written authorization no claim for compensation for such services, work or materials furnished shall be made, and Owner shall not be responsible for such costs.

17.9.3 No Work (as defined by Section 1 of these General Conditions) may be performed under any contract, without prior written approval by the Owner. As an example, all procurement of long lead time items that must be procured to support the construction schedule or site investigative Work necessary to complete Pre-Construction Services, if done by the CMAR, will be performed only after a Proposal for the Work has been approved and accepted in writing by Owner and all such Work shall be done only under an executed Contract for Construction Services, or pursuant to a prior written direction from Owner to engage in such procurement.

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INSURANCE REQUIREMENTS

1. **Contractor's Obligation:** Contractor shall secure and maintain, at his or her own expense, until completion of the contract, general liability and property insurance as shall protect Contractor and the Owner from claims for bodily injury, personal injury, and property damage which may arise because of the nature of the work or from operations under this contract. The Contractor's insurance coverage shall be primary insurance with respect to all other available sources.
2. **General Liability Coverage:** Contractor shall have general liability coverage on a per project basis, per occurrence, and in comprehensive form. General liability coverage shall include Products/Completed Operations, Explosion, Underground and Collapse Hazard, Premises, Operations, Contractual, Independent Contractors, Broad Form Property Damage and Personal Injury.
3. **Coverage Amounts:** Contractor shall provide general liability and excess general liability coverage in the following amounts, at a minimum:

Employer's Liability	\$500,000-\$1,000,000
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Contractors General Liability

a. General Aggregate	\$3,000,000
b. Products – Completed Operations Aggregate	\$3,000,000
c. Personal and Advertising Injury	\$3,000,000
d. Each Occurrence (Bodily Injury and Property Damage)	\$2,000,000
e. Excess or Umbrella Liability	
1.) General Aggregate per job	\$3,000,000
per policy year	\$5,000,000
2.) Each Occurrence per job	\$3,000,000
per policy year	\$5,000,000

Automobile Liability

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	\$1,000,000

Contractual Liability

a. Bodily Injury:	
Each Accident	\$2,000,000
Annual Aggregate	\$3,000,000
b. Property Damage:	
Each Accident	\$2,000,000
Annual Aggregate	\$3,000,000
Each Accident	\$2,000,000
Annual Aggregate	\$3,000,000

Workman's Compensation

a. Bodily Injury by Accident each accident	\$1,000,000
b. Bodily Injury by Disease each employee	\$1,000,000
c. Bodily Injury by Disease policy limit	\$1,000,000

4. **Additional Provisions:**

- A. **Additional Insured:** Contractor shall name all general liability policies required hereunder, except workers compensation, automobile and professional liability required shall name; Brookfield Lakin LLC, Lakin Community Facilities District, the City of Avondale and their respective direct and indirect owners, the respective successors and assigns of each of the foregoing, and the respective directors, officers, managers, trustees, trust beneficiaries, agents, employees, and volunteers of each of the foregoing as additional insured utilizing both Insurance Services Office endorsement forms CG2010 and CG2037 or forms acceptable to Owner with the Additional Insured having access to all limits available.
- B. **Cancellation Notice of Material Change of Coverage:** Contractors' required insurance shall be endorsed to provide that the policy(ies) will not be canceled, reduced, discontinued, or otherwise materially altered during the period of performance without thirty (30) days prior written notice to the Owner.
- C. **Certificate(s) of Insurance:** Prior to commencing work under each contract or subcontract, Certificates of Insurance shall be submitted and approved by the Owner. Contractor is responsible for obtaining Certificates of Insurance establishing that Contractor and all subcontractors have complied with insurance requirements previously stated. Copies of Certificate(s) of Insurance shall be forwarded to the Owner for review and filing. Failure of Owner to demand such certificate or other evidence of full compliance with these insurance requirements or failure of Owner to identify a deficiency from evidence that is provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance. Owner shall have the right, but not the obligation, to prohibit Contractor or any of its subcontractors from entering the Project site until such certificates or other evidence that insurance has been placed in complete compliance with these requirements is received and approved by Owner.
- D. **Rating of Insurance Company(ies):** Any and all insurance company(ies) supplying coverage to Contractor must have no less than an "A" rating in accordance with the A.M. Best rating guide.
- E. **Deductible:** Contractor shall be responsible to satisfy any deductible or self-insured retention with respect to any of the coverages required by the Contract Documents.
- F. **Rental Equipment:** In the event that rental of equipment is undertaken to complete and/or perform the Work, Contractor agrees that it shall be solely responsible for such rental equipment. Such responsibility shall include, but not be limited to, theft, fire, vandalism and use by unauthorized persons.
- G. **Personal Property:** In the event that materials or any other type of personal property (Personal Property) is acquired for the Project or delivered to the Project site, Contractor agrees that it shall be solely responsible for such property until it becomes a fixture on the Project, or otherwise is installed and incorporated as a final part of the Project. Such responsibility shall include, but not be limited to, theft, fire, vandalism and use by unauthorized persons. Contractor shall maintain "all risk" insurance, on a replacement cost basis, covering loss or damage to personal property (for which it has title and/or risk of loss) which is to become a final part of the Project, during any time such personal property is in transit and while stored or worked upon away from the Project site.
- H. **Waiver of Subrogation:** Owner and Contractor waive all rights against each other, Project Manager (if not an employee of Owner) and Design Professional, and separate contractors for damages caused by fire or other perils covered by Builder's Risk or any other property insurance, except such rights as they may have to the proceeds of such insurance.
- I. **Right to Require Higher Limits:** Owner reserves the right, in its sole discretion, to require higher limits of liability coverage if, in Owner's opinion, operations by or on behalf of Contractor create higher than normal hazards and, to require Contractor to name additional parties in interest to be Additional Insureds.
- J. **Waiver of Requirements:** The Owner reserves the right to waive or reduce insurance requirements should it be in the best interest of the Owner.

PROJECT SPECIAL PROVISIONS LIST

The Plans, Details, Specifications and any other Special Provisions applicable to the Project (Special Provisions) are listed below.

List of Project Special Provisions:

Plans: See Addendum 1 attached hereto

Project Special Provisions: See Addendum 1 attached hereto.

Addendum 1
Project Special Provisions - Table of Contents

1. Standard Specifications and Details
2. Scope of Work
3. Plans, Specifications and Supplemental Information for Bid
4. Discrepancy
5. Mandatory Pre-Bid Conference/Prequalifying to Bid
6. Contractor's Interpretation of Estimated Quantities
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25. Cooperation between Contractors
26. Coordination, Verification, and Protection of Existing Utilities
27. Dust Control Plan and Permit/SWPPP
28. Construction Survey, Staking and Inspection
29. Coordination of Inspections and Construction Materials Testing
30. Materials and Equipment Stored Onsite

31. Relocation and/or Adjustment of Existing Facilities, Services, and Access
32. Dry Utility Installation
33. Lights, Fixtures and Paint Colors
34. Landscaping and Planting
35. Restoration of Existing Landscape and Irrigation
36. Record Drawings
37. Progress Payments/Monthly Invoices
38. Punch List
39. Warranties
40. Project Closeout Requirements
41. Corrections of Defects & One Year Walk-Through
42. Execution of Contract
43. Notice to Proceed
44. Substantial Completion
45. Final Completion

ADDENDUM 1

ALAMAR PROJECT SPECIAL PROVISIONS

1. Standard Specifications and Details

Contractor shall perform the Work required in conformance with the 2019 Revision to the 2015 Edition of MAG Uniform Standard Specifications and Details for Public Works Construction, 2019 Revision to the 2015 Edition of MAG Uniform Standard Details for Public Works Construction, Avondale Supplemental to MAG Uniform Standard Specifications and Details for Public Works Construction, and Avondale Standard Details, each of which is incorporated herein by reference. In the event of a conflict between the MAG specifications and the MAG supplement, the MAG Supplement shall prevail. The Contractor shall also perform the Work in accordance with the Plans referenced in Section 3, *Plans, Specifications and Supplemental Information for Bid*.

2. Scope of Work

This contract shall be for all the cost to furnish all material, labor, tools, expendable equipment, and all utility and transportation services necessary to furnish and set in place, in a workmanlike manner, all of the work required in the plans and specifications. Bidder shall bid only materials that will comply with applicable regulatory agency standards (per Plans).

A. Scope of Work also includes all necessary construction staking, record drawings, dust control and Stormwater Pollution Prevention Plan (SWPPP) including, but not limited to the following Work in each Project Segment ("Project"):

- 1) **Broadway Road, West** – The Project consists of approximately 3,287 feet of four lane & raised median, full street surface improvements tying into existing improvements at Avondale & Broadway. Improvements include installation of potable water, storm drain, dry utilities, concrete curb & gutter, sidewalk, paving, striping, signage, street lights, signal conduit sleeves, landscaping, and irrigation.
- 2) **Alamar Parkway** - The Project consists of approximately 1,420 feet of three lane, full street surface improvements tying into proposed improvements at Broadway. Improvements include installation of potable water, dry utilities, concrete curb & gutter, sidewalk, paving, striping, signage, street lights, landscaping, and irrigation.
- 3) **Avondale Boulevard** – The Project consists of approximately 1,371 feet of improvements adding one lane, west half-street surface improvements tying into existing pavement edge of Avondale Blvd. Improvements include installation of storm drain, dry utilities, concrete curb & gutter, sidewalk, paving, striping, signage, street lights, landscaping, and irrigation.
- 4) **Bid Alternate No. 1 - Adjacent Ways Funding – Littleton Elementary School** - The Project consists of approximately 564 feet of four lane & raised median, north half-street surface improvements tying into existing improvements at Avondale & Broadway. Improvements include installation of storm drain, dry utilities, concrete curb & gutter, sidewalk, paving, striping, signage, street lights, signal conduit sleeves, landscaping, and irrigation.

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- 5) **Bid Alternate No. 2 - Avondale Blvd, North** - The Project consists of approximately 995 feet of improvements adding one lane, west half-street surface improvements tying into existing pavement edge of Avondale Blvd. Improvements include installation of storm drain, dry utilities, concrete curb & gutter, sidewalk, paving, striping, signage, street lights, landscaping, and irrigation.
- 6) **Bid Alternate No. 3 - Broadway Road, East** - The Project consists of approximately 1,015 feet, street taper surface improvements tying into existing pavement edge of Broadway Road. Improvements include installation of storm drain, guard rail, paving, striping, and signage.
- 7) **Work Performed by Others**

Site Grading

Rough grading in the Broadway Road West, Alamar Parkway and Adjacent Ways Funding projects have been rough graded by others to +/-0.10 feet of the final subgrade elevations in the Plans. Owner will provide the grading as-builts and compaction reports to the Successful Bidder ("Contractor"). It is the Contractor's responsibility to verify the projects are graded to within +/-0.10 feet of plan subgrade. Any discrepancy not brought to the Owner's attention prior to commencing work shall become the sole responsibility of the Contractor. All work associated with verifying the subgrade elevations provided by the Owner and constructing the subgrade in the roads to the approved plan elevations, shall be in the costs of "Subgrade Preparation" in the Bid Schedule.

Rough Grading, relocations and demolition in the Avondale Boulevard, Avondale Boulevard North, and Broadway Road East projects will be the responsibility of the Contractor. The locations are identified on the Exhibit 1B "Grading, Relocation and Demolition" exhibit.

Contractor shall be responsible to complete finish grading per the Plans and shall be responsible for any borrow or waste haul operations using the Stock Pile Area #1 and Area #2 locations shown on Exhibit 1A "Site Context Map".

3. Plans, Specifications and Supplemental Information for Bid

Revise the third sentence, in the third paragraph, of Subsection 102.4 of the M.A.G. Specifications, to read as follows:

"Bidders shall make their own investigations, both subsurface and above the surface, and form their own estimates of the site conditions."

Add the following text to the end of Subsection 102.4 of the M.A.G. Specifications, to read as follows:

The plans and specifications listed below, along with these Special Provisions, shall be used for bidding purposes:

A. Plans and Specifications

- 1) Alamar Phase 1 Infrastructure Alamar Pkwy Street Lights, Sheets 1 to 4.
- 2) Alamar Phase 1 Infrastructure Avondale Blvd Street Lights, Sheets 1 to 4.

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- 3) Alamar Phase 1 Infrastructure Broadway Road Street Lights, Sheets 1 to 4.
- 4) Alamar Phase 1 Infrastructure Landscape & Irrigation, Sheets 1 to 24.
- 5) Alamar Phase 1 Infrastructure Paving, Storm Drain and Striping, Sheets 1 to 30.
- 6) Alamar Phase 1 Infrastructure Water, Sheets 1 to 16.
- 7) Alamar Phase 1 Offsite Avondale Blvd North & Broadway East Paving & Striping, Sheets 1 to 12.
- 8) Alamar Phase 1 Offsite Avondale Blvd North Street Light Improvements, Sheets 1 to 4.
- 9) Alamar Phase 1 Offsite Broadway Road East McDOT Signing, Sheets 1 to 3.
- 10) Alamar Avondale Blvd & Broadway Road Traffic Signal Pull Box Plan, Sheets 1 to 2.

B. Supplemental Bid Information

- 1) Exhibit 1A - Site Context Map
- 2) Exhibit 1B - Grading, Relocation and Demo
- 3) Exhibit 2 – Preliminary SRP Plans and Conceptual Dry Utility Trench and Conduit Plan
- 4) Exhibit 3 – Typical Gas Main Trench Detail
- 5) Exhibit 4 - Dust Control Plan and Permit Number E190417, Expires 2/20/2020
- 6) Exhibit 5 – Notice of Intent (NOI) Certificate ID#: AZCN74220
- 7) Exhibit 6 - SWPPP, Erosion Control Plan Alamar Phase 1, prepared by Wood Patel and sealed January 3, 2019, Sheets 1 to 8.
- 8) Exhibit 7 - Geotechnical Evaluation Alamar Phase 1, prepared by GeoTek Residential, LLC and sealed on March 8, 2019, Pages 1 to 210.
- 9) Exhibit 8 – Dual Obligee Rider

4. Discrepancy

In the case of discrepancy or conflict, the order in which the documents shall govern is as follows from highest to lowest: Change Orders issued to the Contract Documents, Addenda issued to the Contract Documents, Project Specifications (Project Special Provisions), Plans, Avondale's Amendments to the Standard Specifications and Details, Standard Specifications (MAG), and Standard Details (MAG). In the case of discrepancy or conflict between the Project Special Provisions and Technical Specifications in the Project manual, the more stringent requirement will govern.

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5. Mandatory Pre-Bid Conference/Prequalifying to Bid

In order for all prospective bidders to have an extensive knowledge of the Project, all prospective bidders shall attend a mandatory Pre-Bid Conference as stated in the IFB.

The Pre-Bid Conference will include a discussion of the plans, specifications, etc. Only bidders who have attended and properly registered at the above scheduled Pre-Bid Conference will be considered prequalified to bid on this Project. A bid received from a bidder who has not attended and properly registered at the above scheduled Pre-Bid Conference will not be considered for award. Companies intending to act as a subcontractor on the Project may attend the mandatory Pre-Bid Conference, but are not required to do so.

Attendance at the pre-bid conference will not meet the requirements of proper registration unless the individual attending has registered at the pre-bid conference in accordance with the following:

1. The individual has signed his name on the official roster no later than thirty (30) minutes after the beginning of the conference.
2. The individual has written in the name and address of the company he or she represents.
3. Only one company has been shown as being represented by the individual attending.
4. The individual attending is an officer or permanent employee of the company they are representing.

Attendance at any prior Pre-Bid Conference will not meet the requirement of this provision.

6. Contractor's Interpretation of Estimated Quantities

Contractor shall include the costs of any and all assumptions in the unit prices of the various bid items in the bid schedule.

7. Bid Alternates

The Contractor shall submit a bid for the Base Bid and all Bid Alternates included in the Bid Schedule. Owner reserves the right to award the bid to the lowest responsible bidder based on the Base Bid and / or any combination of Bid Alternates. If Owner does award the bid, it will be to only one bidder under this bid effort.

8. Permit Fees

All Construction Permits will be the Responsibility of the Contractor. The Contractor shall coordinate with the Owner in securing Permit Funds (in Check Form) in order to obtain the respective construction permits necessary to complete the Scope of Work. The check will be for the actual cost of the Building Permit fees. All Right of Way (ROW) permits shall be paid by the Contractor and submitted as a separate invoice for reimbursable expenses, paid off invoice and not added to the contract amount. Contractor will be required to submit all copies of permits and paid receipts to the Owner.

The Contractor will not receive separate payment for items such as costs incurred by the Contractor in securing the permit. Other costs for all shut downs or outages, cost for pole

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bracing, cost for permits, costs for pumping construction water, cost for any additional insurance requirements, cost for any licenses, and other similar costs shall be included in the unit prices for each item of work in the Bid Schedule.

9. Substitutions

Pre-Bid

During the bid process, material, product, or equipment requests for substitutions proposed by the bidders to those specified herein and in the approved plan set shall be pursuant to A.R.S. Title 34-104 and can only be considered during the bidding phase until eight (8) days prior to the receipt of bids when submitted to the Designer and Owner with sufficient data to confirm material, product, or equipment equality. Proposed substitutions submitted after this time will be considered only as a potential change order.

The use of an alternate or substitute item or source may be permitted, subject to the following:

- a. Only substitutions submitted by the Contractor will be accepted for review. The substitution shall be submitted in writing to the Engineer and the Owner accordingly.
- b. The submittal shall include the name, address, and telephone number of manufacturer and supplier as appropriate. Trade name, model or catalog designation.
- c. The submittal shall state any required changes in the contract documents to adapt the design to the proposed substitution. This will include all changes required of other contractors/subcontractors affected by the resulting changes.
- d. The submittal shall contain an itemized estimate of all costs and credits that will result directly or indirectly from the acceptance of such substitution, including costs of design, license fees, royalties, testing, Engineer's evaluation, claims of other contractors/subcontractors, etc.
- e. Submittal shall include any adjustment in the contract time schedule created by the substitution.
- f. Product data including performance and test data, reference standards, and technical description of material, product, or equipment. Include color samples and samples of available finishes as appropriate.
- g. On request of the Engineer, the Contractor shall submit samples or any additional information the engineer and or architect may deem necessary to evaluate the acceptability of the substitution.

10. Unit Prices

The Contractor shall submit unit bid prices that are reasonable and reflect a direct relationship to the proportionate value of the total bid amount. Failure to submit a reasonable unit price may be justification for rejection of a Bid Schedule.

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Bids shall be extended using Engineer's quantities. Unless otherwise stated, quantities shown on any drawings are estimates and each Bidder shall be responsible for calculating their own quantities. In the case of an error in the extension of prices in the bid, the unit price shall govern.

Bidder shall be responsible to clarify any discrepancies by the deadline in the IFB.

11. Tax

Contractor shall be responsible for collecting and remitting tax as necessary as the Prime Contractor. The tax rate to be utilized for this Work shall be 5.72%. Contractor shall incorporate the tax amount into the Unit prices of the various bid items.

12. Scope of Payment

The scope of payment shall be in accordance with M.A.G. Section 109.2. Payment for the items in the proposal will be made at the unit price bid in the proposal. No additional payment will be made for work or materials related to any item in the proposal unless specifically called for.

Payment shall not be made for items of work shown on the plans that are not included as separate bid items in the proposal, whether they are indicated in the plans to be a Non-Pay Item (N.P.I.) or not. These items of work shall be incidental to related bid items and the cost for these items of work shall be included in the applicable unit price bid. No additional payment shall be made to the Contractor for these items of work.

Compensation will be made for alteration of work in accordance with M.A.G. Specifications.

13. Insurance and Bond Requirements

Please reference Insurance and Bond Requirements included in the IFB Bidding Documents.

Prior to the execution of the Contract, the Contractor shall provide a separate policy of insurance, at its sole cost and expense, naming the City of Avondale, a Municipal Corporation and all its agents, representatives, officers, directors, officials and employees as the insured and the Lakin Community Facilities District and all its agents, representatives, officers directors, officials and employees s the insured. The limit of the policy shall be \$2,000,000 for each occurrence. The Policy shall be primary and not contributory to any insurance maintained by Brookfield Lakin LLC; the City of Avondale and the Lakin Community Facilities District and shall remain in effect through the date of final acceptance.

Bids must be submitted on the Bid Schedule provided and be accompanied by the Bid Bond for not less than ten percent (10%) of the total bid, payable to BROOKFIELD LAKIN LLC, or a certified or cashier's check. PERSONAL OR INDIVIDUAL SURETY BONDS ARE NOT ACCEPTABLE.

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Payment and Performance Bonds will be required for this Work. The successful bidder, simultaneously with the execution of the Contract, shall be required to furnish a Payment Bond in the amount equal to one hundred percent (100%) of the Contract Price, and a Performance Bond in an amount equal to one hundred percent (100%) of the Contract Price. Successful Bidder shall name Brookfield Lakin LLC as obligee on both the Payment and Performance Bonds and name the City of Avondale as an additional obligee on the Performance Bond using a Dual Obligee Rider form. An approved Dual Obligee Rider form is included as Appendix 1 in Special Provisions List, Addendum 1 and part of the IFB.

14. Construction Hours

Work hours – No work shall begin on the site Monday through Friday until 6:00 a.m. The working hours from Monday through Friday shall be 6:00 a.m. – 6:00 p.m. Should work be scheduled outside of these hours, then Contractor shall provide notice to **Owner's Representative** and the City of Avondale 48 - hours in advance in order to obtain approval and necessary after-hours work permit as may be required by the City of Avondale.

The Contractor shall assume work on Saturday if necessary to meet the project schedule completion deadlines. The Contractor shall be responsible for his/her overhead and overtime costs associated with any weekend or after hour's work that may be required to meet any project milestone completion dates. The Contractor shall also be responsible for any additional City inspection costs associated with after hour inspections required to meet project deadlines.

15. Notification Requirements

The Contractor shall notify the adjacent property owners, businesses, tenants, schools, and the City of Avondale Departments which may be affected by this project (such as sanitation, police, fire department, etc.), and other parties which may be affected by this project in writing and shall distribute the notice at least 48-hours prior to, but no earlier than one (1) week prior to, doing any work on or in front of any driveway, performing work on or removing any CMU walls, fences or landscape screens, or enacting any street restrictions that will affect access to their property. Contractor shall be responsible to submit notification letters to the City of Avondale for approval as may be required prior to distribution to the public.

The notification shall be for the purpose of allowing the referenced parties to relocate vehicle, reschedule routes, etc., as required, prior to construction and should specify the length of time the wall will be down or the driveway and/or street will be out of service. Alternate access shall be provided as directed by the City of Avondale inspector at no additional cost. If there are any delays in the construction, property owners shall be re-notified.

The notice shall include a description of the work proposed, the timing and duration of the work impacting the property, the Contractor's name, and the name and phone number of the Contractor's contact person. The notice shall also include the name and contact number of the City of Avondale as may be required by the City.

The requirements of this Section shall be at no additional cost to Owner.

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16. Citizen Complaint Resolution

Contractor shall respond to customer/citizen calls or complaints resulting directly or indirectly from this project within two hours of receipt and shall resolve any issues within 48 hours. The Contractor shall keep Owner, Project Manager, Owner's Representative, City Inspector aware of all such calls and complaints within 24 hours of receipt and their resolution. The requirements of this section shall be at no additional cost to Owner.

17. Traffic Control and Barricades

A written proposal prepared by an individual who is IMSA or ATSSA certified, outlining the intended plans for traffic control and for maintain continuous access to residences and businesses along the construction site.

18. Temporary Pavement Markers

Unless otherwise directed by the City Inspector, temporary pavement markers shall be installed immediately after paving to allow traffic barricades to be removed and traffic to use as many lanes as possible. Unless otherwise determined by the City Inspector, temporary pavement markers shall be installed for all longitudinal lines including but not necessarily limited to two-way left turn lines, lane lines and gore lines at exclusive turn lanes.

The Contractor shall maintain the temporary pavement markings until permanent striping is installed and complete in-place. After the permanent striping is completed, Contractor shall remove any temporary markers that remain in-place that are not in-line with the permanent striping. The requirements of this section shall be non-pay items.

19. Off-Duty Police Officer and Patrol Car

A contingent bid item is included in the General Items for each project for Contractor to provide unit price costs for Off-Duty Police Officer and Patrol Car as required by the Traffic Control Plan.

20. Time and Material Rates

The Successful Bidder shall provide an hourly rate sheet for all proposed equipment makes and models as well as personnel that will be utilized on the project. The rate shall include all operation and maintenance cost in the hourly rate. This information may be used in the event of a time and material change order for items not anticipated in the Bid Schedule.

21. Construction Water

Owner will provide construction water at no cost to Contractor from an onsite water pond(s). Onsite construction water pond location(s) are identified in **Exhibit 1A**. The Contractor shall take into consideration the amount of construction water needed to complete the Work and include the cost to pump and withdraw water from the construction ponds as part of the unit prices. Contractor shall keep daily logs to track and report daily water use to Owner. Construction water shall be a non-pay item ("NPI").

ADDENDUM 1

22. Construction Debris

The Contractor shall be responsible to haul debris offsite and ensure the site is secure and kept free of trash, debris, oil and all other contaminants. Upon completion of the Work, the Contractor shall ensure the site is cleaned, with all trash, debris, oil and all other contaminants properly disposed of. Final retention will not be released until the staging areas are cleaned to Owner's Representative's satisfaction, and the Work is deemed to be 100% complete.

23. Concrete Washouts

Concrete washout locations are to be determined with Owner's Representative. The Contractor shall be responsible for the set-up, maintenance and removal of the washout. Any wash out identified to be from this Work that is not in a preapproved location, will be cleaned by the Contractor at no additional cost to Owner. Final retention will not be released until all concrete washout areas associated with this Work are cleaned to the satisfaction of Owner's Representative.

24. Potholing

Potholing will not be included as a separate line item for this Project. Any possible potholing that is performed on the Project during the construction phase shall be considered a Non-Pay Item (NPI) and included in the unit prices of the various pay items as provided by the Successful Bidder.

25. Cooperation between Contractors

Add the following paragraph to the end of subsection 105.7 of the M.A.G. Specifications:

Work under this contract will necessitate interaction with other contractors in the same area. Timing of installation of certain facilities on this project will be critical; the Contractor shall be responsible for all required coordination and cooperation with other contractors on site. Any damage to others' work will be repaired and back charged against this Work at cost plus 25%. The repair will be completed by the original contractor.

26. Coordination, Verification, and Protection of Existing Utilities

Add the following sentence to the beginning of the second paragraph of subsection 105.6 of the M.A.G. Specifications:

Contractor shall be solely responsible for coordination of Blue Stake and verification of all utility locations and potential interference with any utilities prior to commencement of any excavation or trenching work.

Add the following sentences at the end of subsection 105.6 of the M.A.G. Specifications:

Contractor shall be responsible for the protection of any existing storm drain structures. They shall be kept intact, open and free flowing at all times. Contractor shall be responsible for protection of all existing utilities in the Work area.

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27. Dust Control Plan and Permit/SWPPP

Contractor shall abide by the current **Dust Control Plan and Permit Number E190417** with an expiration date of February 20, 2020 and issued to RCCM, LLC and SWPPP/Arizona Pollutant Discharge Elimination System (AZPDES) Stormwater Construction **General Permit ID#: AZCN74220 (CGP)** issued to Brookfield Lakin LLC.

Contractor shall be responsible for dust control related to the project construction and shall take whatever means necessary to control any abnormal conditions.

Contractor shall provide adequate means for cleaning trucks and/or other equipment of mud prior to entering public streets, and take whatever measures are necessary to insure that all roads are maintained in a clean, mud and dust free condition at all times.

Contractor shall be responsible for maintaining dust control at all times during the work, including off hours and weekends. The work site must be kept debris free. Tracking dirt onto streets is not allowed and if it occurs must be cleaned immediately. Gravel track-out pads or other approved BMPs shall be used where applicable.

Temporary drainage control measures may be required during and after construction until final pavement in accordance with the approved plans and in accordance with any established or required Best Management Practices (BMPs) as part of the **Arizona Pollutant Discharge Elimination System (AZPDES)**.

Contractor shall submit to the City a copy of the Dust Control Plan and Permit (**Exhibit 4**), Erosion Control Plan/SWPPP (**Exhibit 5**), and permit prior to start of work.

Contractor shall be held responsible for payment of any fines due to dust violations and shall make all necessary repairs of any damaged areas due to Contractor's construction activities. Contractor shall have at all times while working onsite a current MCAQD certified "Comprehensive Dust Control Coordinator" and all water trucks/water pull operator shall have a current MCADQ "Basic Dust Control Training" certification. Certification cards should be readily available upon request. Each Contractor is responsible for their own daily dust logs, dust control, and for any fines levied for non-compliance.

28. Construction Survey, Staking, and Inspection

At a minimum, Contractor shall be responsible for providing Pre-Construction Surveys, Construction Surveys, and Post-Construction Surveys (including Record Drawings). The Successful Bidder shall furnish the services of a surveyor professionally licensed or registered to perform land surveying in the State of Arizona. The Successful Bidder shall advise the District Engineer in writing the name and license number of the person who will perform the survey Work. All surveying in connection with this Contract shall be the responsibility of Contractor-provided surveying service (RLS). Owner will provide the Successful Bidder AutoCAD base files for the Scope of Work.

This work will be paid for at the contract unit price per lump sum Bid Item stated as Construction Surveying and Staking for each Project.

The Contractor shall coordinate any and all necessary inspections with the City of Avondale, Maricopa County agencies, and/or any other approving agency. Contractor

ADDENDUM 1

shall provide construction administration and day-to-day construction inspection for compliance with the contract documents. The City of Avondale will perform inspection for compliance with the conditions of the City building permit(s) and right-of-way permit(s) that govern this work. The City requires a 48-hour notice for inspections.

29. Coordination of Inspections and Construction Materials Testing

All construction materials to be used or incorporated in the project are subject to inspection, Quality Control & Quality Assurance testing, and approval or rejection by the City. Quality Control (QC) testing is defined as the testing performed to assure that the materials installed comply with the requirements in the contract documents. Quality Assurance (QA) testing is defined as the testing performed to verify the QC results and to ascertain that the materials installed meet the specified levels of quality in accordance with the contract documents. Any material rejected by the City shall be removed immediately and replaced in an acceptable manner at no additional cost.

The Contractor shall be responsible to coordinate construction materials testing with Owner's geotechnical material testing consultant ("Owner's Testing Consultant") in order to complete the Work in accordance with the plans and specifications. Owner will contract with and be responsible to pay Owner's Testing Consultant for construction materials testing for this Scope of Work. Owner will provide to the Bidders soils investigation report(s) as Exhibit 7. Copies of all material testing results and final reports are to be delivered to Owner's Representative. The Contractor shall coordinate with Owner's Testing Consultant to insure all materials are inspected upon receipt on site, and are properly tested prior to placement.

Additionally, any materials that are placed that are later determined to be out of specification shall be removed and replaced at the Contractor's cost. Contractor shall be responsible for additional costs incurred from re-testing due to failing test results. No extension of time will be allowed due to rejection.

All core holes shall be patched by the Contractor at no additional cost to Owner.

At the option of the City, materials may be approved at the source of supply before delivery is started per MAG Specification Section 106.1.

30. Materials and Equipment Stored Onsite

Materials and equipment may be stored onsite with approval from Owner's Representative. Owner will not assume any responsibility for materials or equipment staged on the property. Contact Owner's Representative for location and approval of construction trailers.

31. Relocation and/or Adjustment of Existing Facilities, Services, and Access

If relocation or adjustment of existing facilities is noted on the plans, this is intended to include the relocation or adjustment of items appurtenant to the noted piece of work, just as if they were specifically called out. If these appurtenant items are lost or broken during

ADDENDUM 1

construction, they shall be replaced by the Contractor with items of equal or better quality, at no additional cost to Owner.

If an underground facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which the Contractor could not reasonably have been expected to be aware of, Contractor shall promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency), give written notice thereof to Owner. Owner will promptly review the underground facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the underground facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, the Contractor shall be responsible for the safety and protection of such underground facility.

32. Dry Utility Installation

Dry utility installation bid items have been included in the Bid Schedule contained herein. Preliminary SRP Plans and/or conceptual plan for the Work has been provided to Bidder as **Exhibit 2** of the Supplemental Bid Information.

The requested pricing for this Work shall be based on the typical joint trench detail as shown in **Exhibit 2**. Cox and Century Link conduit facilities shall be installed in the joint trench by others. Southwest Gas facilities shall require a separate trench to accommodate a 4-inch or 6-inch gas mainline per gas trench detail shown in **Exhibit 3** contained herein. Successful Bidder shall be responsible to coordinate all conduit and mainline installation and backfill with the respective utility companies. All electrical equipment shall conform to SRP requirements and specifications. Please reference SRP specified Contractor Supplied Material at <http://www.srpnet.com/electric/business/specs/pdfx/ess/11-Contractor-SuppliedMaterial.pdf>.

Contractor shall be responsible to include the material and installation of Copper Ground wire #2 as part of the Dry Utility Installation and seek reimbursement directly from SRP upon completion of work. Final compensation will be based on the actual quantities installed at the unit prices submitted in the Bid Schedule. The Bidder agrees to hold unit prices submitted in the Bid Schedule valid regardless of the final quantities installed.

Contractor is advised that work on this project is expected to require coordination with Utility Companies who own and operate overhead lines and poles. The coordination may include, but not be limited to the following activities: installing or connection to SES or power source to operate equipment as part of this scope.

Contractor is responsible to contact the applicable Utility Company representative and discuss his proposed construction methods; in order to determine what actions the Utility Company must take and the costs related to those actions. The Contractor shall include these costs in the applicable bid items for this project.

The primary and the back-up representatives for review and cost determination are as follows:

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Company	Personnel	Office Number	Mobile Number	Fax Number
CenturyLink	Ronijean Grant-Sloan	480-768-4294	480-748-1352	n/a
Salt River Project	Bob Maldonado (12kv)	602-236-8066	602-809-1142	602-236-0875
Salt River Project	Jeff Wruble (69kv)	602-236-0465		

Customer is advised the above list does not include local cable television companies. Contractor shall determine if cable television lines are involved in the Project limits and shall contact them for similar information.

33. Lights, Fixtures and Paint Colors

This work shall consist of identifying all paint colors and finishes noted on the construction plans for the scope of work to include, but not limited to, CMU block, view fence, traffic signal poles, street light poles and arms, granite, rip rap, boulders, and etc.

Contractor shall furnish and install all materials, equipment and labor necessary to complete the paint and finishing work as shown on the plans. Measurement and payment for all paint and finishes shall be included in the unit price for each item as installed and complete.

Contractor shall provide for Owner's review and approval a minimum of 1'-0" square painted or finished samples for each item noted on the construction drawings prior to fabrication or installation.

34. Landscaping and Planting

Add the following paragraph to Section 430.5.4 of the M.A.G. Specifications:

Contractor shall stake all trees within the Sight Visibility Triangle (SVT) for review and approval by Designer prior to installation in the SVT. Contractor shall verify quantities prior to bid.

Plant Submittals:

Contractor shall provide plant locations and images of all plant species in one submittal.

Plant Procurement:

All plant material shall be in compliance with the Arizona Nursery Association (ANA) specifications, latest edition. Contractor shall procure all plant material 45 days prior to start of construction. Contractor shall not substitute any plant material.

Warranty:

Submit Landscape warranty to developer's representative. Warrant that trees, saguaros, and yuccas will be alive and in good health for a period of one-year after acceptance except for defects resulting from neglect by developer or abuse by others.

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Owner must follow contractor's maintenance schedule and provide current maintenance log to Owner's Representative.

Remove and replace dead, unhealthy, or girdled trees and yuccas that lose original form and size during warranty period with material equal to that specified. Replace any material which does not meet requirements within thirty days of notification. All replacement material shall be subject to an additional one-year maintenance period.

Warrant that shrubs and other plantings will be alive and in satisfactory condition for a period of 90 days from date of acceptance or will be replaced at no additional cost to the developer.

All plant material shall be maintained in a healthy, sturdy condition during the warranty period by the contractor. Turf shall be mowed and trimmed weekly after root establishment.

All replacement plants, including shrubs, cacti, groundcovers, vines, and perennials shall be subject to an additional 90-day maintenance period.

35. Restoration of Existing Landscape and Landscape Irrigation

The Contractor will be required to remove and restore existing landscape and landscape irrigation that is disturbed by this project. Said landscape and landscape irrigation shall be replaced in-kind and repaired to the satisfaction of the private property owner (if applicable) and the City Inspector. All repairs and restoration shall be performed by a registered Landscape Contractor who is properly licensed with the State of Arizona. Existing conditions defined herein shall include, but not be limited to, plants, pavestones, decorative boulders, rock, gravel, masonry walls, driveways, concrete borders, planters, electrical lines, lighting, underground sprinkler systems and other landscape materials.

Where the new street right-of-way line (ROW) has been re-aligned through existing private property, the Contractor shall modify and restore the private landscape irrigation system from the back of new sidewalk to the limits of the disturbed landscaped areas.

The Contractor shall provide and install all piping, plumbing, mounting hardware, fittings, connections, conduit, electrical equipment, junction boxes, valve boxes, covers, plates, sprinkler heads, emitters, and all other equipment, materials and labor as required to complete the work in a workmanlike manner and suitable for the purpose for which it was intended. All irrigation systems (i.e., sprinkler heads, bubblers, emitters, controls, etc.) serving an area affected by this project shall be restored as required to facilitate the continued operation for their intended use.

All equipment and materials damaged during construction shall be removed and disposed of and new equipment and materials installed in its place. New equipment and materials shall be of the same type and manufacturer as the items to be replaced and shall provide equal performance. New sprinkler heads shall have the same precipitation output as the existing lawn heads to remain. All piping, pipe fittings, couplings, sprinklers, emitters, conduit, sleeving, low voltage control conductors, service line conductors, drip line, fixtures, etc. used in the repair and restoration of existing sprinkler and emitter systems shall be new, in perfect condition, and shall comply with M.A.G. Specification Section 757.

ADDENDUM 1

All sprinkler heads in existing lawn areas in the path of the new construction shall be removed and relocated as required to provide complete coverage of the lawn area without overspray on sidewalks and walls. If the trees and plants being removed are served with drip irrigation or bubblers, said irrigation system shall be modified to eliminate the irrigation serving the removed tree and/or plant locations such that the remaining system remain in good working order to serve all other trees and/or plant materials.

All existing backflow prevention units, controllers, and irrigation control valves in the path of new construction shall be relocated into existing landscaped areas within Temporary Construction Easements away from proposed utilities and underground electrical lines. Completely remove the entire assembly and all accessories and connections leaving the entire space free from exposed parts. Provide and install all piping, plumbing apparatus, mounting hardware, fittings, connections, conduit, electrical apparatus, junction boxes, valve boxes, covers, plates, etc. as required to complete the work in a workmanlike manner and suitable for the purpose for which it was intended. All equipment damaged during relocation shall be removed and disposed of and new equipment installed in its place. New equipment shall be of the same type and manufacturer as the equipment to be replaced and provide equal performance and the new construction shall be in accordance with the City's standard details for landscape irrigation system backflow prevention devices.

Where decorative surface gravel or rock exists, the Contractor shall remove existing gravel or rock away from the area to be disturbed and away from the area where excavated material will be placed. Any existing plastic under gravel or rock shall be pulled back or removed. The trenches shall be backfilled and compacted to 90% (minimum) of maximum density. After backfilling, the plastic shall be pulled back into place or replaced with 3-mil (minimum thickness) black plastic and the rock or gravel put back into place on top of the plastic. The Contractor shall augment the rock or gravel with matched material, as necessary to cover/hide the plastic and underlying soil.

Protection and restoration of property and landscaping shall comply with M.A.G. Specification Sections 107.9, 107.10 and 107.11. Unless otherwise noted on the plans, all replacement plants, trees and shrubs shall be of the same species and equivalent size as the plant, tree or shrub being replaced, as determined by the City Inspector. Notwithstanding said requirement, the minimum tree size shall be 24-inch box and the minimum shrub size shall be 5-gallon. All trees shall be in compliance with the Arizona Nursery Association (ANA) specifications, latest edition.

Restoration work shall include rough and fine grading, placement of decomposed granite, planting and staking of plant materials, restoration of turf areas, etc. Unless otherwise stated on the approved plans, turf areas shall be re-established and restored by re-seeding.

The Contractor shall be required to provide a temporary water source to the vegetation (including hand watering, if necessary) until the landscape irrigation system is restored to full function at no additional cost to the City.

Unless otherwise determined by the City Inspector, the Contractor shall complete all repairs and/or restoration work on damaged or disturbed landscape irrigation systems and damaged electrical lines and lighting within 24-hours of such damage or disruption.

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For each parcel, unless otherwise determined by the City Inspector, the Contractor shall complete repairs and restoration work on landscaping within one week after completion of project work on that parcel. In addition, the total duration of project work (including disturbances to the landscape and landscape irrigation) on any one parcel shall not exceed 60 days, unless otherwise approved by the City Inspector.

The provisions of this section shall be at no additional cost to Owner.

36. Record Drawings

Contractor shall provide Record Drawings which shall clearly show all differences between the Contract work as drawn and as installed for all work, as well as work added to the Contract which is not shown on the Contract Drawings.

Contractor shall maintain a set of Civil and Landscape Record Drawings at the job site. These shall be kept legible and current and shall be available for inspection at all times by the Engineer of Record or Architect. Show all changes in the Contract work, or work added, on these Record Drawings in a contrasting color, including work changed by Addendum, Architectural Supplementary Information ("ASI") or Field Directive.

In showing changes in the work, or added work, use the same legends as were used on the Contract Drawings. Indicate exact locations by dimensions and exact elevations given in job datum, by depth. Give dimensions from a permanent point. Give elevations to sewer and storm drainage lines to the invert elevation.

Electrical Record Drawings shall indicate exact routing of all conduit, power and control wiring, etc., location and function of all controls and whether manual or automatic and normal amperage readings for all motors taken at the equipment under normal load conditions.

Record Drawings shall contain the names, addresses and phone number of the Subcontractors and shall be signed by the Contractor.

The Engineer of Record or Architect and District shall review the Record Drawings on a weekly basis, and they shall be the sole judges of the acceptability of these drawings. Updated record drawings showing as-built construction shall accompany each monthly progress payment submittal. Upon Completion of the Project, submit final Record Drawings to the Engineer of Record or Architect and District for review. Upon receipt of notice of review of the Record Drawings, deliver them together with one set of prints, to the Engineer of Record or Architect.

37. Progress Payments/Monthly Invoices

Payments shall be made pursuant to A.R.S. 34-221. Owner may retain up to ten percent (10%) of the amount set forth in each progress payment application ("Progress Payment Application(s)"). When construction of each Project is fifty percent (50%) completed, Contractor may request payment of one-half of the retention pursuant to A.R.S. 34-221(C),

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subject to all of Owner's right to withhold or offset payments, and/or other rights of Owner, under the Contract.

Owner reserves the right under A.R.S. 34-221 (C) to reinstate the ten percent (10%) retention if Owner determines that satisfactory progress is not being made.

Monthly Billing

Contractor shall submit by the 25th of the month, a **DRAFT** of the Estimated Progress Payment Application to Owner's Representative for review prior to submitting the Estimated Progress Payment to DMB accounting at **SMA** (arizonaaccountspayable@brookfieldrp.com).

Contractor shall submit on the last day of the month, an Estimated Progress Payment Application to be reviewed by Owner and Owner's Representative for all Work completed the previous month for which payment will be requested.

An Estimated Progress Payment Application of the work submitted shall be deemed approved and certified for payment after seven (7) days from the date payment application is received by Owner unless before that time the Owner issues written findings setting forth those items in detail in the estimate of the work that are not approved for payment under the contract.

The progress payment shall be paid on or before fourteen (14) days after the estimate of the work is certified and approved.

The Contractor shall present monthly payment applications to Owner via E-mail to arizonaaccountspayable@brookfieldrp.com with a copy to Kim Duffy (kim.duffy@brookfieldrp.com) no later than the last day of the month. Payment applications received by the last day of the month will be paid within 21 days from when Estimated Progress Application has been received by Owner.

Separate invoices shall be presented for the following:

- i) ROW Permit Fee Reimbursement (with a copy of the permit attached)
- ii) Temporary Traffic Control Fees (with copies of associated billing attached)
- v) Approved Change Orders

****Lien Releases for construction work shall accompany the monthly invoice submittal by the last day of the month. A conditional waiver on progress for the current invoice amount and an unconditional waiver on progress for the prior month's payment***

38. Punch List

The Contractor shall be responsible for completion of a punch list in a manner to ensure final acceptance by Project Manager, and necessary agency inspectors. Contractor shall

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be responsible for completing any and all punch list items and obtaining final acceptance for the Work from the City of Avondale. Final retention may be billed once all punch lists are completed. Copies of final punch list approvals must accompany the final retention invoice. Owner may release retention based on receipt of City Final by Project, mutually exclusive of one another.

Landscape Maintenance

Contractor shall be responsible for 90-day maintenance of landscape installation with maintenance period to begin upon Substantial Completion, as determined by Project Manager or Owner's Representative. Maintenance period is a Non-Pay Item (NPI) and shall be part of the unit prices for landscape and irrigation installation.

Demobilization

Authorized demobilization may be approved with notification to Project Manager or Owner's Representative to coordinate no other Contractors will be affected from such operations. Demobilization will not be permitted if there are open action items and/or if the work has not been approved by the required agencies.

39. Warranties

The Contractor warrants that the materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contracts. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective.

Owner is entitled to request evidence as to the kind and quality of materials and equipment furnished for the project.

The Contractor's warranty excludes remedy for damage or defect caused by abuse modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage.

40. Project Closeout Requirements

Upon completion of the Work, the Contractor is required to meet with Project Manager or Owner's Representative to confirm completions, submittal, and acceptance of all project requirements. Including but not limited to securing City Final Letter(s) of Acceptance on the Scope of Work, final payments, release of retention and waivers, the completion and gathering of all documentation and transferring the work from construction to operation and maintenance status.

41. Correction of Defects & One Year Walk-Through

Upon receipt of written notice from the Owner, or any agent of the Owner designated as responsible for management of the Warranty Period, of the discovery of a defect, the Contractor shall promptly remedy the defect(s), and provide written notice to the Owner and designated agent indicating action taken. In case of emergency where delay would cause serious risk of loss or damage to the Owner, or if the Contractor fails to remedy within 30 days, or within another period agreed to in writing, the Owner may correct the

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defect and be reimbursed the cost of remedying the defect from the Contractor or its Surety.

One Year Walk-Through

If, within one year after date of Final Completion of the Work or designated portion thereof; any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. This period of one year shall be extended with respect to portions of the Work first performed after Final Completion by the period of time between Final Completion and the actual performance of the Work.

This obligation shall survive acceptance of the Work under the Contract and termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

The Contractor will return to the jobsite to repair or replace any work which is found to be defective or deficient before the expiration of a one-year period.

Nothing contained in this paragraph shall be constructed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the time period of one year as described above relates only if the specific obligation of the Contract to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

42. Execution of Contract

Within seven (7) calendar days of receipt of Contract(s) for execution from Owner, the Bidder shall execute the Contract(s) and provide the required certificate of insurance, and return these executed documents to Owner for review and processing. Failure by Bidder to properly execute the Contract(s) and provide the required certification as specified shall be considered a breach of Contract by Bidder. Owner shall then be free to terminate the Contract(s) or, at option, release Successful Bidder and be free to award the Contract(s) to another Bidder.

43. Notice to Proceed

Within 14 Days of the issuance of the Notice of Award, Owner may issue a written Notice to Proceed. The Notice to Proceed shall stipulate the actual Contract Start date, the Contract Time and the dates of Substantial Completion and Final Completion. The issuance of the Notice to Proceed may be included as part of the Addendum to the Contract. The time required for the Contractor to obtain permits and licenses shall be included in the Contract Time and shall not be justification for a delay claim by the Contractor. The time required for the Contractor to prepare, transmit and obtain approval of applicable submittals shall be included in the Contract Time and shall not be justification

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for a delay claim by the Contractor. No work shall commence without coordination with the Owner's representatives and the City Inspector.

44. Substantial Completion

When the Contractor considers that the work is Substantially Complete, Contractor shall notify Project Manager or Owner's Representative to schedule a walk of the Work completed. Project Manager or Owner's Representative shall submit a comprehensive Punch List to the Contractor. Contractor may edit and supplement the Punch List. The Contractor shall proceed promptly to compete and correct the Punch List items. Failure to include an item on the Punch List does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. The City shall determine when the Project and Contractor's Work is substantially complete. "Substantial Completion" means construction has been completed in accordance with the Contract Documents to the extent that the City can use or occupy the entire Project, or the designated portion of the Project, for the use intended without any outstanding, concurrent construction at the site, except as may be required to complete or correct Punch List items. A prerequisite for Substantial Completion over and above the extent of construction completion required, is receipt by the City of acceptable documentation that Contractor has successfully tested and demonstrated all systems for their intended use. The date of Substantial Completion shall be confirmed by a Certificate of Substantial Completion signed by the City and Contractor. The Certificate of Substantial Completion signed by the City and Contractor shall state the respective responsibilities of the City and the Contractor for security, maintenance, utilities, damage to the Work and insurance.

45. Final Completion

The Owner shall determine when the Project and the Contractor's Work is finally completed. "Final Completion" means completion of the Project by the Contract in accordance with the Contract Documents, certified to the City by the Contractor. Final Completion shall be achieved only upon the Owner's written acceptance of the following items:

- A. the construction;
- B. all testing;
- C. demonstration by Contractor that the Work functions as required by the Contract Documents and meets all Contract requirements;
- D. resolution of all outstanding system deficiencies and Punch List items, if any;
- E. delivery of all as-built documentation, drawings, completed record documents (with revisions made after Substantial Completion); annotated submittals and design document deliverables;
- F. submittal, acceptance, and delivery of the one hundred percent (100%) complete O&M manuals;
- G. deliver of warranties, inspections certificates, bonds and all other required documents,
- H. all prerequisites for final payment; and
- I. submittal of Contractors' request for final payment and acceptance enclosing all required documentation. Upon Final Completion the City shall issue a Certificate of Final Completion to the Contractor.

BID SCHEDULE

**ALAMAR CFD PHASE 1 INFRASTRUCTURE IMPROVEMENTS
SOLICITATION #: EN 19-083
PROJECT #: 174612.04**

THIS BID IS SUBMITTED BY:

_____, a(n) _____ (Corporation, Limited Liability Company, Partnership, Joint Venture, Sole Proprietorship, Individual), holder of an Arizona Registrar of Contractor's license: ROC# _____, classification _____

NAME	TITLE	DATE
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(Failure to fill in the information above, regarding the Bidder being a holder of Arizona State Contractor's License is grounds for rejection of the bid.)

The undersigned Bidder, having examined and determined the scope of the Contract Documents, hereby proposes to perform the work described herein for the following unit prices or lump sum amounts:

ACKNOWLEDGEMENT OF ADDENDA

_____ acknowledges that it has received the following
addenda: (Bidder name)

_____ (Addendum #) _____ (Date)

_____ (Addendum #) _____ (Date)

_____ (Addendum #) _____ (Date)

_____ (Addendum #) _____ (Date)

_____ (Addendum #) _____ (Date)

_____ (Addendum #) _____ (Date)

_____ (Addendum #) _____ (Date)

_____ (Addendum #) _____ (Date)

_____ (Addendum #) _____ (Date)

Date: _____

(Signature)

(Title)

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
BASE BID					
Broadway Road West - Water					
1	16" DIP Water Line and Fittings	LF	3,397	_____	_____
2	8" DIP Water Line and Fittings	LF	445	_____	_____
3	4" DIP Water Line and Fittings	LF	67	_____	_____
4	Fire Hydrant Complete (MAG 360-2)	EA	7	_____	_____
5	4" Valve, Box and Cover (COA A1391)	EA	1	_____	_____
6	8" Valve, Box and Cover (COA A1391)	EA	6	_____	_____
7	16" Valve, Box and Cover (COA A1391)	EA	6	_____	_____
8	2" Water Service (COA A1300 & A1302)	EA	3	_____	_____
9	Connect to Existing 16"x16" Cross	EA	1	_____	_____
10	Curb Stop and Flushing Pipe (MAG 390, Type 'A')	EA	6	_____	_____
				Subtotal	_____
Broadway Road West - Storm Drain					
11	Catch Basin (COA A1533)	EA	3	_____	_____
12	15", Class III RGRCP	LF	38	_____	_____
13	24", Class III RGRCP	LF	195	_____	_____
14	U' Type Headwall (MAG 501-1)	EA	2	_____	_____
15	Handrail (MAG 145)	LF	24	_____	_____
16	Flared End Pipe Section	EA	1	_____	_____
17	Outfall Access Barrier (COP 1563)	EA	2	_____	_____
18	Loose Rip Rap	CY	21	_____	_____
				Subtotal	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
Broadway Road West - Concrete					
19	Concrete Paver	SF	751	_____	_____
20	6" Vertical Curb & Gutter (MAG 220-1, Type 'A')	LF	11,380	_____	_____
21	6" Vertical Curb & Depress Curb (MAG 220-1, Type 'A')	LF	5,272	_____	_____
22	6" Mountable Curb (MAG 220-2, Type 'E')	LF	279	_____	_____
23	Curb Transition (MAG 220-2)	LF	30	_____	_____
24	Valley Gutter with Apron (MAG 240)	SF	3,086	_____	_____
25	Concrete Sidewalk (MAG 230)	SF	47,275	_____	_____
26	Midblock Ramp (COA A1235-5)	EA	4	_____	_____
27	Sidewalk Ramp (COA A1235-2)	EA	12	_____	_____
28	Driveway Entrance (COA A1251-2)	EA	1	_____	_____
29	Pedestrian Refuge (COA A1225)	LS	1	Lump Sum	_____
				Subtotal	_____
Broadway Road West - Paving					
30	3" AC on 8" ABC Pavement	SY	262	_____	_____
31	5" AC on 14" ABC Pavement	SY	21,745	_____	_____
32	Pavement Thickened Edge (MAG 201, Type 'A')	LF	173	_____	_____
33	Subgrade Preparation	SY	22,007	_____	_____
34	2' Sawcut and Remove Existing Asphalt	SY	36	_____	_____
35	Adjust Valve Frame and Cover (COA A1391)	EA	21	_____	_____
36	Hydrant Marker (COA A1609)	EA	5	_____	_____
37	Survey Marker (MAG 120, Type 'A')	EA	7	_____	_____
38	Barricade (MAG 130, Type 'B')	LF	193	_____	_____
				Subtotal	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
Broadway Road West - Signage and Striping					
39	Permanent Regulatory / Traffic Control Signage and Posts (COA A1600)	LS	1	Lump Sum	_____
40	Pavement Striping	LS	1	Lump Sum	_____
				Subtotal	_____
Broadway Road West - Street Lights					
41	Communication Trench (COA A1720-2) and 2 - 3" Schedule 80 PVC Conduit with Pull Tape for Secondary Communications Network (COA	LF	3,289	_____	_____
42	Single Arm Street Light Pole, Luminaire & Foundation, Complete & Installed	EA	5	_____	_____
43	Double Arm Street Light Pole, (2) Luminaires & Foundation, Complete & Installed	EA	16	_____	_____
44	Street Light Pull Box & 1" Conduit to Pole	EA	21	_____	_____
45	#7 Traffic Signal Pull Box - Future Traffic Signal	LF	6	_____	_____
46	2 - 3" PVC Traffic Signal Conduits - Future Traffic Signal	LF	650	_____	_____
				Subtotal	_____
Broadway Road West - Landscape					
Trees					
47	24" Box Tree	EA	422	_____	_____
Shrubs					
48	5 Gal Cacti/Accent/Succulent	EA	274	_____	_____
49	5 Gal Shrub	EA	414	_____	_____
50	1 Gal Shrub	EA	932	_____	_____
51	Annuals	SF	180	_____	_____
52	Midirion Sod	SF	12,670	_____	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
Broadway Road West - Irrigation					
53	Drip Irrigation, (Valve, wire, filter, pipe, emitters, flush caps)	SF	86,300		
54	Irrigation Controller (Complete with Enclosure, Air Card and Lighting Arrestor)	EA	2		
55	POC Assemblies (Backflow Preventer, Flow Sensor, Master Valve)	EA	2		
56	3/4" Copper Service Line to from water meter to backflow	LF	100		
57	Turf Irrigation (Valve, wire, pipe, sprinklers)	SF	11,575		
Broadway Road West - Inerts					
58	Fine grading	SF	187,200		
59	Root Barrier (6'-0" min. of Root Barrier installed on each side of tree within 5' of hardscape or wall)	LS	1	Lump Sum	
60	Desert Pavement 3" minus (Express Caramel)	SF	175,815		
61	Decomposed Granite - 3" screen	SF	11,380		
62	6"X4" Extruded header curb	LF	525		
				Subtotal	
Broadway Road West - General Items					
63	Mobilization	LS	1	Lump Sum	
64	AZPDES Permit Compliance/Dust Control	LS	1	Lump Sum	
65	Construction Survey and Staking	LS	1	Lump Sum	
66	Traffic Control Plan	LS	1	Lump Sum	
67	Off-Duty Avondale Police Officer (contingent item)	HR	40		
68	Avondale Police Dept Official Patrol Car (contingent item)	HR	40		
				Subtotal	
Alamar Parkway - Water					
69	12" DIP Water Line and Fittings	LF	1,484		

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
70	8" DIP Water Line and Fittings	LF	222	_____	_____
71	Fire Hydrant Complete (MAG 360-2)	EA	3	_____	_____
72	8" Valve, Box and Cover (COA A1391)	EA	4	_____	_____
73	12" Valve, Box and Cover (COA A1391)	EA	4	_____	_____
74	2" Water Service (COA A1300 & A1302)	EA	1	_____	_____
75	Curb Stop and Flushing Pipe (MAG 390, Type 'A')	EA	5	_____	_____
				Subtotal	_____
Alamar Parkway - Storm Drain					
76	Catch Basin (COA A1533)	EA	2	_____	_____
77	15", Class III RGRCP	LF	73	_____	_____
78	24", Class III RGRCP	LF	195	_____	_____
79	Flared End Pipe Section	EA	2	_____	_____
80	Loose Rip Rap	CY	14	_____	_____
				Subtotal	_____
Alamar Parkway - Concrete					
81	6" Vertical Curb & Gutter (MAG 220-1, Type 'A')	LF	2,825	_____	_____
82	Valley Gutter with Apron (MAG 240)	SF	1,051	_____	_____
83	Concrete Sidewalk (MAG 230)	SF	5,817	_____	_____
84	Sidewalk Ramp (COA A1235-2)	EA	8	_____	_____
				Subtotal	_____
Alamar Parkway - Paving					
85	3" AC on 8" ABC Pavement	SY	187	_____	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
86	3.5" AC on 10" ABC Pavement	SY	7,420	_____	_____
87	Pavement Thickened Edge (MAG 201, Type 'A')	LF	126	_____	_____
88	Subgrade Preparation	SY	7,606	_____	_____
89	Adjust Valve Frame and Cover (COA A1391)	EA	11	_____	_____
90	Hydrant Marker (COA A1609)	EA	3	_____	_____
91	Survey Marker (MAG 120, Type 'B')	EA	4	_____	_____
92	Barricade (MAG 130, Type 'B')	LF	78	_____	_____
				Subtotal	_____
Alamar Parkway - Signage and Striping					
93	Permanent Regulatory / Traffic Control Signage and Posts (COA A1600)	LS	1	Lump Sum	_____
94	Pavement Striping	LS	1	Lump Sum	_____
				Subtotal	_____
Alamar Parkway - Street Lights					
95	Single Arm Street Light Pole & Luminaire, Complete & Installed	EA	15	_____	_____
96	Street Light Pull Box & 1" Conduit to Pole	EA	15	_____	_____
				Subtotal	_____
Alamar Parkway - Landscape					
Trees					
97	24" Box Tree	EA	163	_____	_____
Shrubs					
98	5 Gal Cacti/Accent/Succulent	EA	135	_____	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
99	5 Gal Shrub	EA	59		
100	1 Gal Shrub	EA	1,579		
Alamar Parkway - Irrigation					
101	Drip Irrigation, (Valve, wire, filter, pipe, emitters, flush caps)	SF	33,000		
102	Irrigation Controller (Complete with Enclosure, Air Card and Lighting Arrestor)	EA	1		
103	POC Assemblies (Backflow Preventer, Flow Sensor, Master Valve)	EA	1		
104	3/4" Copper Service Line to from water meter to backflow	LF	100		
Alamar Parkway - Inerts					
105	Fine grading	SF	62,615		
106	Root Barrier (6'-0" min. of Root Barrier installed on each side of tree within 5' of hardscape or wall)	LS	1	Lump Sum	
107	Desert Pavement 3" minus (Express Caramel)	SF	179,515		
				Subtotal	
Phase 1 Powerline Easement - Landscape					
Trees					
108	24" Box Tree	EA	41		
109	15 Gal.	EA	46		
Shrubs					
110	5 Gal Shrub	EA	102		
111	1 Gal Shrub	EA	1,198		
Powerline Easement (Avondale Blvd.) - Irrigation					
112	Drip Irrigation, (Valve, wire, filter, pipe, emitters, flush caps)	SF	60,000		
Powerline Easement - Inerts					
113	Fine grading	SF	253,930		
114	Desert Pavement 3" minus (Express Caramel)	SF	219,170		

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
115	Decomposed Granite - 3" screen	SF	34,760	_____	_____
116	8' wide concrete Trail	SF	4,000	_____	_____
				Subtotal	_____
Alamar Parkway and Powerline Easement - General Items					
117	Mobilization	LS	1	Lump Sum	_____
118	AZPDES Permit Compliance/Dust Control	LS	1	Lump Sum	_____
119	Construction Survey and Staking	LS	1	Lump Sum	_____
120	Off-Duty Avondale Police Officer (contingent item)	HR	40	_____	_____
121	Avondale Police Dept Official Patrol Car (contingent item)	HR	40	_____	_____
				Subtotal	_____
Avondale Boulevard - Water					
122	8" DIP Water Line and Fittings	LF	120	_____	_____
123	Fire Hydrant Complete (MAG 360-2)	EA	1	_____	_____
124	16"X8" TSV,B&C (COA A1391, Type 'A')	EA	1	_____	_____
125	Curb Stop and Flushing Pipe (MAG 390, Type 'A')	EA	1	_____	_____
				Subtotal	_____
Avondale Boulevard - Storm Drain					
126	Catch Basin (COA A1533)	EA	1	_____	_____
127	15", Class III RGRCP	LF	35	_____	_____
128	Flared End Pipe Section	EA	1	_____	_____
129	Loose Rip Rap	CY	7	_____	_____
130	Handrail (MAG 145)	LF	24	_____	_____
				Subtotal	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
Avondale Boulevard - Concrete					
131	6" Vertical Curb & Gutter (MAG 220-1, Type 'A')	LF	1,141	_____	_____
132	6" Mountable Curb (MAG 220-2, Type 'E')	LF	20	_____	_____
133	Curb Transition (MAG 220-2)	LF	10	_____	_____
134	Curb Termination (MAG 222)	EA	1	_____	_____
135	Concrete Sidewalk (MAG 230)	SF	6,987	_____	_____
				Subtotal	_____
Avondale Boulevard - Paving					
136	5" AC on 14" ABC Pavement	SY	1,841	_____	_____
137	Pavement Thickened Edge (MAG 201, Type 'A')	LF	15	_____	_____
138	Subgrade Preparation	SY	1,841	_____	_____
139	Grading, Relocation and Demolition	LS	1	Lump Sum	_____
140	Adjust Valve Frame and Cover (COA A1391)	EA	2	_____	_____
141	Hydrant Marker (COA A1609)	EA	1	_____	_____
142	Survey Marker (MAG 120, Type 'A')	EA	1	_____	_____
143	Pavement Sawcut, Remove and Replacement	SY	30	_____	_____
				Subtotal	_____
Avondale Boulevard - Signage and Striping					
144	Permanent Regulatory / Traffic Control Signage and Posts (COA A1600)	LS	1	Lump Sum	_____
145	Pavement Striping	LS	1	Lump Sum	_____
				Subtotal	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
Avondale Boulevard - Street Lights and Traffic Signals					
146	Communication Trench (COA A1720-2), 2-2" and 2-4" Schedule 80 PVC Conduit with Pull Tape for Primary Communications Network	LF	1,239	_____	_____
147	Single Arm Street Light Pole, Luminaire & Foundation, Complete & Installed	EA	6	_____	_____
148	Street Light Pull Box & 1" Conduit to Pole	EA	6	_____	_____
149	#7 Traffic Signal Pull Box - Future Traffic Signal	EA	8	_____	_____
150	2 - 3" PVC Traffic Signal Conduits - Future Traffic Signal	LF	866	_____	_____
				Subtotal	_____
Avondale Boulevard - General Items					
151	Mobilization	LS	1	Lump Sum	_____
152	AZPDES Permit Compliance/Dust Control	LS	1	Lump Sum	_____
153	Construction Survey and Staking	LS	1	Lump Sum	_____
154	Traffic Control Plan	LS	1	Lump Sum	_____
155	Off-Duty Avondale Police Officer (contingent item)	HR	40	_____	_____
156	Avondale Police Dept Official Patrol Car (contingent item)	HR	40	_____	_____
				Subtotal	_____
Phase 1 - Dry Utilities					
157	Broadway Rd., Avondale Rd., Alamar Pkwy.				
158	Feeder Trench and Backfill (E/T/Catv)	LF	5,890	_____	_____
159	Feeder (Road Crossing - Avondale Blvd)	LF	830	_____	_____
160	Distribution / Service Trench and Backfill (E/G/T/Catv)	LF	830	_____	_____
161	Street Light Only Trench and Backfill (E/G/T/Catv)	LF	3,135	_____	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
162	Gas Only Trench and Backfill	LF	3,585	_____	_____
163	Gas Only Trench and Backfill (benched w/SRP Feeder)	LF	1,390	_____	_____
164	1-6"PE Gas Sleeve	LF	100	_____	_____
165	1-6"PE Gas Sleeve (optional)	LF	700	_____	_____
166	2.5" Conduit	LF	4,460	_____	_____
167	2.5" Conduit 90 degree Elbows	EA	36	_____	_____
168	2.5" Conduit (Street Light)	LF	9,475	_____	_____
169	2.5" Conduit 90 degree Elbows (Street Light)	EA	165	_____	_____
170	(6) - 3" Conduits (1-1/2 sack slurry with spacers @ 6' intervals)	LF	11,530	_____	_____
171	(9) - 3" Conduits (1-1/2 sack slurry with spacers @ 6' intervals)	LF	670	_____	_____
172	(12) - 3" Conduits (1-1/2 sack slurry with spacers @ 6' intervals)	LF	300	_____	_____
173	3" Conduit 90 degree Elbows	EA	90	_____	_____
174	Transformer Pad with Slurry	EA	2	_____	_____
175	Pull Box, Switch, Fuse and Capacitor Pads with Slurry	EA	12	_____	_____
176	SRP Feeder OH/UG pole transition	EA	1	_____	_____
177	Dry Utility Sleeve (1-2.5" SRP Sleeve)	LF	200	_____	_____
178	Dry Utility Sleeve (6-3" SRP Sleeve_1-1/2 sack slurry with spacers @ 6' i	LF	60	_____	_____
179	Dry Utility Sleeve (6-3"+3-2.5" SRP, 2-4" Telco, 2-2" Cox Sleeve)	LF	300	_____	_____
				Subtotal	_____

BID ALTERNATE NO. 1: ADJACENT WAYS FUNDING - LITTLETON ELEMENTARY SCHOOL FRONTAGE

Broadway Road School Frontage - Water

180	8" DIP Water Line and Fittings	LF	76	_____	_____
181	Fire Hydrant Complete (MAG 360-2)	EA	1	_____	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
182	Curb Stop and Flushing Pipe (MAG 390, Type 'A')	EA	1	_____	_____
				Subtotal	_____
Broadway Road School Frontage - Concrete					
183	Concrete Paver	SF	185	_____	_____
184	6" Vertical Curb & Gutter (MAG 220-1, Type 'A')	LF	565	_____	_____
185	6" Vertical Curb & Depress Curb (MAG 220-1, Type 'A')	LF	440	_____	_____
186	Concrete Sidewalk (MAG 230)	SF	5,300	_____	_____
187	Midblock Ramp (MAG 238-1)	EA	2	_____	_____
188	Construct Half Sidewalk Ramp	EA	1	_____	_____
				Subtotal	_____
Broadway Road School Frontage - Dry Utilities					
189	Gas Only Trench and Backfill	LF	600	_____	_____
190	1-6" PE Gas Sleeve	LF	60	_____	_____
				Subtotal	_____
Broadway Road School Frontage - Paving					
191	5" AC on 14" ABC Pavement	SY	2,145	_____	_____
192	Pavement Thickened Edge (MAG 201, Type 'A')	LF	35	_____	_____
193	Subgrade Preparation	SY	2,145	_____	_____
194	Hydrant Marker (COA A1609)	EA	1	_____	_____
195	Barricade (MAG 130,Type 'B')	LF	35	_____	_____
				Subtotal	_____
Broadway Road School Frontage - Signage and Striping					
196	Permanent Regulatory and Posts (COA A1600)	LS	1	Lump Sum	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

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BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
197	Pavement Striping	LS	1	Lump Sum	_____
				Subtotal	_____
Broadway Road School Frontage - Street Lights					
198	Single Arm Street Light Pole, Luminaire & Foundation, Complete & Installed	EA	2	_____	_____
199	Street Light Pull Box & 1" Conduit to Pole	EA	2	_____	_____
				Subtotal	_____
Broadway Road School Frontage - Landscape					
Trees					
200	24" Box Tree	EA	24	_____	_____
Shrubs					
201	5 Gal Cacti/Accent/Succulent	EA	7	_____	_____
202	5 Gal Shrub	EA	16	_____	_____
203	1 Gal Shrub	EA	148	_____	_____
				Subtotal	_____
Broadway Road School Frontage - Irrigation					
204	1/2-inch class 315 pvc lateral pipe	LF	2,500	_____	_____
205	1 1/4-inch class 200 pvc mainline pipe	LF	20	_____	_____
206	1-inch remote control drip valve assembly	EA	3	_____	_____
207	1-inch quick coupling valve assembly	EA	1	_____	_____
208	2-inch sch80 pvc sleeves	LF	185	_____	_____
209	Drip flush cap assembly	EA	12	_____	_____
				Subtotal	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
Broadway Road School Frontage - Inerts					
210	Fine grading	SF	3,700	_____	_____
211	Root Barrier (6'-0" min. of Root Barrier installed on each side of tree within 5' of hardscape or wall)	LS	1	Lump Sum	_____
212	Desert Pavement 3" minus (Express Caramel)	SF	3,700	_____	_____
				Subtotal	_____

BID ALTERNATE NO. 2: AVONDALE BOULEVARD NORTH (Not CFD Eligible)

Avondale Boulevard N - Water

213	8" DIP Water Line and Fittings	LF	90	_____	_____
214	Fire Hydrant Complete (MAG 360-2)	EA	1	_____	_____
215	16"X8" TSV,B&C (COA A1391, Type 'A')	EA	1	_____	_____
216	Curb Stop and Flushing Pipe (MAG 390, Type 'A')	EA	1	_____	_____
				Subtotal	_____

Avondale Boulevard N - Storm Drain

217	Concrete Scupper and Spillway (MAG 206-1 & 206-2)	EA	1	_____	_____
218	Loose Rip Rap	CY	18	_____	_____
				Subtotal	_____

Avondale Boulevard N - Concrete

219	6" Vertical Curb & Gutter (MAG 220-1, Type 'A')	LF	957	_____	_____
220	6" Mountable Curb (MAG 220-2, Type 'E')	LF	20	_____	_____
221	Curb Transition (MAG 220-2)	LF	10	_____	_____
222	Curb Termination (MAG 222)	EA	1	_____	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
223	Concrete Sidewalk (MAG 230)	SF	4,477		
				Subtotal	
Avondale Boulevard N - Paving					
224	5" AC on 14" ABC Pavement	SY	1,718		
225	Pavement Thickened Edge (MAG 201, Type 'A')	LF	13		
226	Subgrade Preparation	SY	1,718		
227	Grading, Relocation and Demolition	LS	1	Lump Sum	
228	Adjust Valve Frame and Cover (COA A1391)	EA	1		
229	Hydrant Marker (COA A1609)	EA	1		
230	Pavement Sawcut, Remove and Replacement	SY	32		
				Subtotal	
Avondale Boulevard N - Signage and Striping					
231	Permanent Regulatory / Traffic Control Signage and Posts (COA A1600)	LS	1	Lump Sum	
232	Pavement Striping	LS	1	Lump Sum	
				Subtotal	
Avondale Boulevard N - Street Lights					
233	Communication Trench (COA A1720-2), 2-2" and 2-4" Schedule 80 PVC Conduit with Pull Tape for Primary Communications Network	LF	1,139		
234	Single Arm Street Light Pole, Luminaire & Foundation, Complete & Installed	EA	6		
235	Street Light Pull Box & 1" Conduit to Pole	EA	6		
				Subtotal	

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
Avondale Boulevard N - Landscape					
Trees					
236	24" Box Tree	EA	41	_____	_____
Shrubs					
237	1 Gal Shrub	EA	290	_____	_____
Avondale Boulevard N - Irrigation					
238	Drip Irrigation, (Valve, wire, filter, pipe, emitters, flush caps)	SF	15,000	_____	_____
239	Turf Irrigation (Valve, wire, pipe, sprinklers)	SF	4,900	_____	_____
Avondale Boulevard N - Inerts					
240	Fine grading	SF	5,800	_____	_____
241	Root Barrier (6'-0" min. of Root Barrier installed on each side of tree within 5' of hardscape or wall)	LS	1	<u>Lump Sum</u>	_____
242	Desert Pavement 3" minus (Express Caramel)	SF	5,800	_____	_____
				Subtotal	_____
Avondale Blvd. N - General Items					
243	Mobilization	LS	1	<u>Lump Sum</u>	_____
244	AZPDES Permit Compliance/Dust Control	LS	1	<u>Lump Sum</u>	_____
245	Construction Survey and Staking	LS	1	<u>Lump Sum</u>	_____
246	Traffic Control Plan	LS	1	<u>Lump Sum</u>	_____
247	Off-Duty Avondale Police Officer (contingent item)	HR	40	_____	_____
248	Avondale Police Dept Official Patrol Car (contingent item)	HR	40	_____	_____
				Subtotal	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
<u>BID ALTERNATE NO. 3: BROADWAY EAST (Not CFD Eligible)</u>					
Broadway Road East - Storm Drain					
249	12", Class V RGRCP	LF	13	_____	_____
250	L' Type Headwall	EA	1	_____	_____
251	Remove existing Headwall	EA	1	_____	_____
252	Existing Pipe Connection	EA	1	_____	_____
				Subtotal	_____
Broadway Road East - Paving					
253	5" AC on 14" ABC Pavement	SY	1,718	_____	_____
254	Pavement Thickened Edge (MAG 201, Type 'A')	LF	13	_____	_____
255	Subgrade Preparation	SY	1,718	_____	_____
256	Grading, Relocation and Demolition	LS	1	Lump Sum	_____
257	Pavement Sawcut, Remove and Replacement	SY	32	_____	_____
258	Standard MASH Guardrail 31"	LF	66	_____	_____
259	MASH Compliant TL3 End Terminal	EA	1	_____	_____
				Subtotal	_____
Broadway Road East - Signage and Striping					
260	Permanent Regulatory / Traffic Control Signage and Post (MAG 131 Type B)	LS	1	Lump Sum	_____
261	Pavement Striping	LS	1	Lump Sum	_____
				Subtotal	_____
Broadway Road East - General Items					
262	Mobilization	LS	1	Lump Sum	_____
263	AZPDES Permit Compliance/Dust Control	LS	1	Lump Sum	_____
264	Construction Survey and Staking	LS	1	Lump Sum	_____

LAKIN COMMUNITY FACILITIES DISTRICT (CFD)
 AVONDALE, ARIZONA

ALAMAR PHASE 1 CFD INFRASTRUCTURE IMPROVEMENTS

SOLICITATION NUMBER: EN 19-083

PROJECT NUMBER: 174612.04

BID SCHEDULE

<u>ITEM #</u>	<u>ITEM DESCRIPTION</u>	<u>UNIT</u>	<u>QTY</u>	<u>UNIT PRICE</u>	<u>TOTAL PRICE</u>
265	Traffic Control (McDot)	LS	1	Lump Sum	_____
266	Off-Duty Avondale Police Officer (contingent item)	HR	40		_____
267	Avondale Police Dept Official Patrol Car (contingent item)	HR	40		_____
				Subtotal	_____

BID SUMMARY

Base Bid - Broadway Road (Items 1 - 68)	_____
Base Bid - Alamar Parkway (Items 69 - 121)	_____
Base Bid - Avondale Blvd (Items 122 - 156)	_____
Base Bid - Phase 1 Dry Utilities (Items 157 - 179)	_____
Bid Alternate 1 - Broadway Road Elementary School Frontage (Items 180 - 212)	_____
Bid Alternate 2 - Avondale Blvd North (Not CFD Eligible) - (Items 213 - 248)	_____
Bid Alternate 3 - Broadway East (Not CFD Eligible) - (Items 249 - 267)	_____
TOTAL BID SUMMARY	_____

BID SUBMITTED

- A. **BASE BID PLUS BID ALTERNATE NO. 1 TOTAL - (Items 1 - 212)** _____
- B. **BASE BID PLUS BID ALTERNATE NOS. 1, 2 AND 3 TOTAL - (Items 1 - 267)** _____

LIST OF SUBCONTRACTORS

The following information gives the name, business address, portion of Work (description of Work to be done), and estimated value for each Subcontractor that will be used in the Work if the Bidder is awarded the Contract. No Subcontractor doing Work in excess of Ten Thousand Dollars (\$10,000.00) and who is not listed shall be used without the written approval of the Owner which shall not be unreasonably withheld. (Additional supporting data may be attached to this page. Each page shall be sequentially numbered and headed "Proposed Subcontractors" and shall be signed.) Substitutions of Subcontractors may be made by the Bidder so long as all Subcontractors used meet all requirements for Subcontractors and all subcontract agreements meet all requirements for sub-agreements and lower tier agreements as set forth in the Contract Documents.

Name and Address	Description of Work	Estimated Value

Statutory Bid Bond

**STATUTORY BID BOND
PURSUANT TO TITLE 34, CHAPTER 2, ARTICLE 1 OF THE ARIZONA REVISED STATUTES
(Penalty of this bond must be 10% of the bid amount)**

KNOW ALL MEN BY THESE PRESENTS:

That _____ (hereafter "Principal"),
as Principal, and _____, a corporation organized and existing under the
laws of the State of _____, with its principal offices in the City of _____,
(hereafter "Surety"), as Surety, are held and firmly bound unto the
_____ (hereafter "Obligee"), in
the amount of _____ (Dollars)
(\$ _____), for the payment whereof, the said Principal and Surety bind themselves,
and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these
presents.

WHEREAS, the Principal has submitted a bid for _____

NOW, THEREFORE, if the Obligee shall accept the proposal of the Principal and the Principal shall enter into a contract with the Obligee in accordance with the terms of the proposal and give bonds and certificates of insurance as specified in the standard specifications with good and sufficient surety for the faithful performance of the contract and for prompt payment of labor and materials furnished in the prosecution of the contract, or in the event of the failure of the Principal to enter into the contract and give the bonds and certificates of insurance if the Principal pays to the Obligee the difference not to exceed the penalty of the bond between the amount specified in the proposal and such larger amount for which the Obligee may in good faith contract with another party to perform the work covered by the proposal then this obligation is void. Otherwise, it remains in full force and effect provided, however, that this bond is executed pursuant to the provisions of Section 34-201, Arizona Revised Statutes, and all liabilities on this bond shall be determined in accordance with the provisions of the section to the extent as if it were copied at length herein.

Witness our hands this _____ day of _____, 20____.

PRINCIPAL

SEAL

BY: _____

SURETY

BY: _____

AGENCY OF RECORD

RESOLUTION OF BOARD OF DIRECTORS

**CERTIFIED COPY OF RESOLUTION OF
BOARD OF DIRECTORS OF**

(Name of Corporation)

RESOLVED that _____, _____ of
(Person Authorized to Sign) (Title)

_____ ("Corporation") is authorized to sign and submit the bid or proposal of this corporation for the following project:

**BROOKFIELD LAKIN, LLC: ALAMAR CFD PHASE 1 INFRASTRUCTURE IMPROVEMENTS
SOLICITATION NO.: EN 19-083**

The foregoing is a true and correct copy of the resolution adopted by the Corporation at the meeting of its Board of Directors held on the _____ day of _____, 20_____.

By _____

Title _____

(SEAL)

(THIS FORM MUST BE COMPLETED IF BIDDER IS A CORPORATION)

NON-COLLUSIVE BIDDING CERTIFICATION

STATE OF _____)
) SS.
COUNTY OF _____)

I, _____ of the City/Town of _____, in the County of _____ and the State of _____, of full age, being duly sworn according to the law of my oath depose and say that:

I am _____ a _____ of the firm of _____, the Bidder making the Bid for the Brookfield Lakin, LLC Project _____, Project # _____, Solicitation # _____ and that I executed the said Bid with full authority to do so; that said Bidder has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the above named Project; and that all statements contained in said Bid and in this affidavit are true and correct, and made with full knowledge that Owner relies upon the truth of the statements contained in said Bid and in the statements contained in this affidavit in awarding the Contract for the said Project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such Contract upon an agreement of understanding, for a commission, percentage, brokerage or contingent fee, except bonafide employees or bonafide established commercial or selling agencies maintained by:

(Signature of Bidder)

(Printed or Typed Name of Bidder)

(Seal of Corporation)

Sworn to before me this _____ day of _____, 20__, in the County of _____, State of _____.

(Notary Public)

W-9 FORM

Form W-9 (Rev. November 2005) Department of the Treasury Internal Revenue Service	Request for Taxpayer Identification Number and Certification		Give form to the requester. Do not send to the IRS.
	Name (as shown on your income tax return)		
	Business name, if different from above		
	Check appropriate box: <input type="checkbox"/> Individual/ Sole proprietor <input type="checkbox"/> Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Other ▶		<input type="checkbox"/> Exempt from backup withholding
	Address (number, street, and apt. or suite no.)		Requester's name and address (optional)
	City, state, and ZIP code		
List account number(s) here (optional)			

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on Line 1 to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I Instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3. Note: If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number								
OR								
Employer identification number								

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
- I am a U.S. person (including a U.S. resident alien).

Certification Instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. (See the Instructions on page 4.)

Sign
Here

Signature of
U.S. person ▶

Date ▶

Purpose of Form

A person who is required to file an information return with the IRS, must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

U.S. person. Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

- Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
- Certify that you are not subject to backup withholding, or
- Claim exemption from backup withholding if you are a U.S. exempt payee.

In 3 above, if applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

For federal tax purposes, you are considered a person if you are:

- An individual who is a citizen or resident of the United States,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States, or
- Any estate (other than a foreign estate) or trust. See Regulations sections 301.7701-6(a) and 7(a) for additional information.

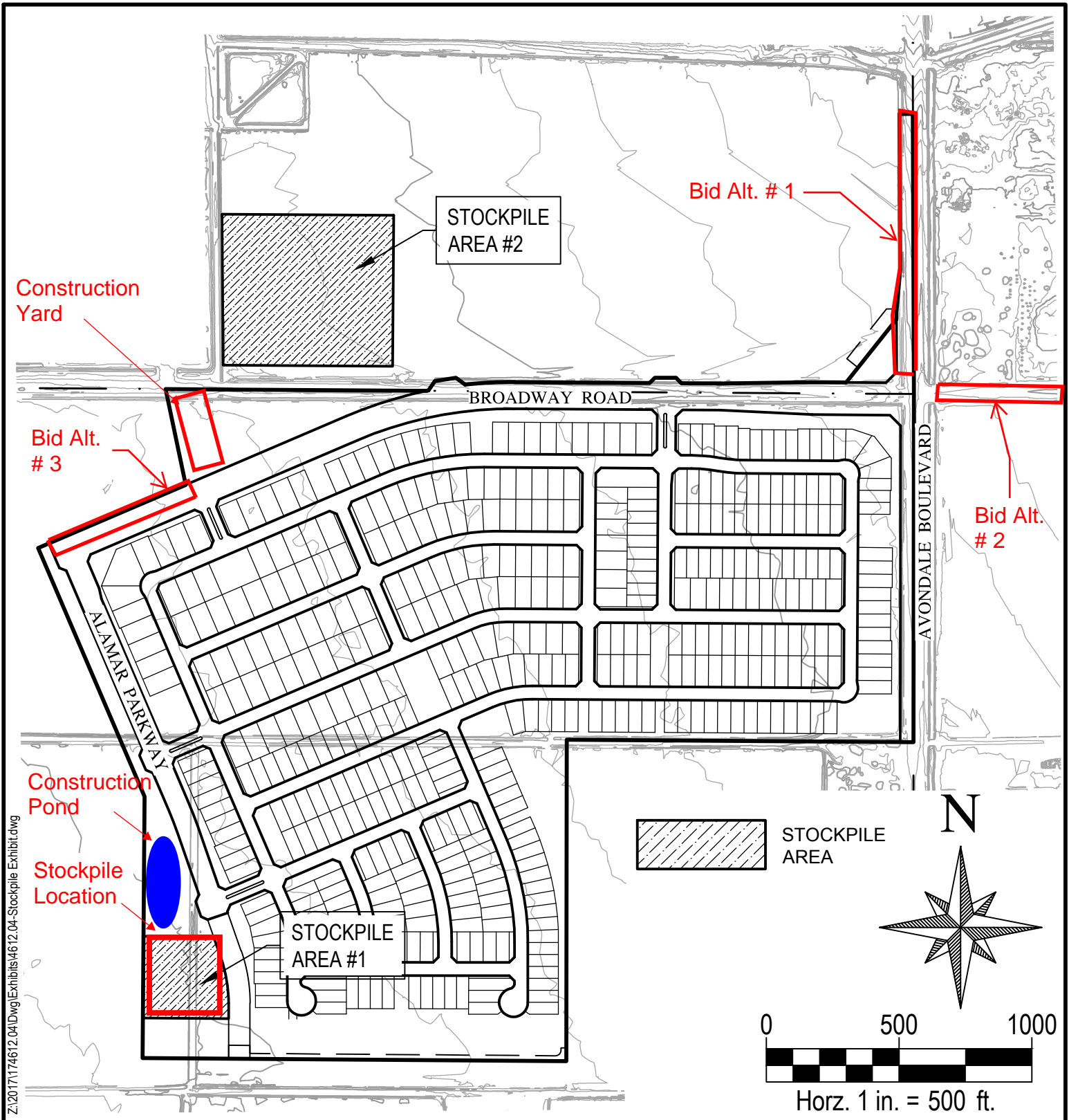
Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,

Cat. No. 10231X

Form **W-9** (Rev. 11-2005)



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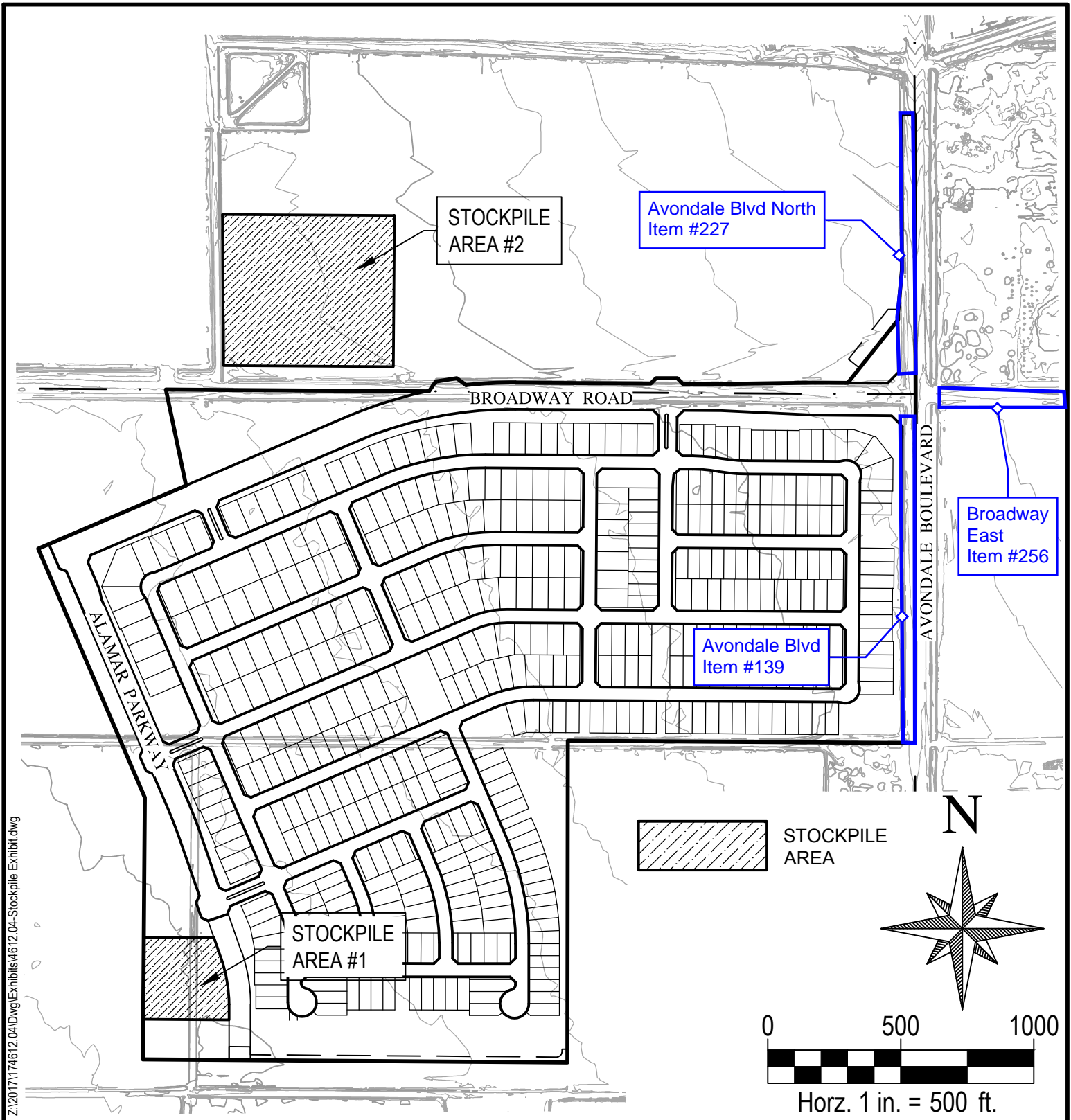
NOT
FOR
CONSTRUCTION
OR RECORDING

WOOD/PATEL
MISSION: CLIENT SERVICE®
(602) 335-8500
WWW.WOODPATEL.COM

ALAMAR - PHASE 1

**Exhibit 1A
Site Context Map**

DATE: 01/02/2018	SCALE: 1" = 500'	SHEET 1 OF 1
JOB NO.: 174612.04	DESIGN: FK	
	DRAWN: BT	



Z:\2017\174612.04\Drawings\Exhibits\4612.04-Stockpile Exhibit.dwg

**NOT
FOR
CONSTRUCTION
OR RECORDING**

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WWW.WOODPATEL.COM

ALAMAR - PHASE 1

EXHIBIT 1B - GRADING, RELOCATION & DEMOLITION EXHIBIT

DATE:
01/02/2018

SCALE:
1" = 500'

SHEET
1 OF 1

JOB NO.:
174612.04

DESIGN: FK
DRAWN: BT

EXHIBIT 2 SRP/CONCEPTUAL DRY UTILITY PLAN

COVER SHEET

GENERAL NOTES:

CONDUIT NOTES UNLESS OTHERWISE NOTED:

- ALL CONDUIT TO BE DB120, RATED FOR 90 C CABLE, ASTM F512, ELBOWS TO BE DB40
- ALL SERVICE CONDUIT TO BE 2.5"
- ALL STREET LIGHT OR DUSK TO DAWN LIGHT CONDUIT IS TO BE 2.5"
- ALL SECONDARY CONDUIT TO BE 3"
- ALL PRIMARY CONDUIT TO BE 2.5"
- ALL FEEDER CONDUIT TO BE 3-3"

CONDUCTOR NOTES UNLESS OTHERWISE NOTED:

- ALL SERVICE CONDUCTOR TO BE US10M OR US10X
- ALL STREET LIGHT OR DUSK TO DAWN LIGHT CONDUCTOR IS TO BE UTX10LK OR UTX10DK
- ALL SECONDARY CONDUCTOR TO BE UTX350K
- ALL PRIMARY CONDUCTOR TO BE 1-UA2K
- ALL FEEDER CONDUCTOR TO BE 3-UA750K

NOTE
NO FOREIGN UTILITIES UNDER SRP EQUIPMENT!

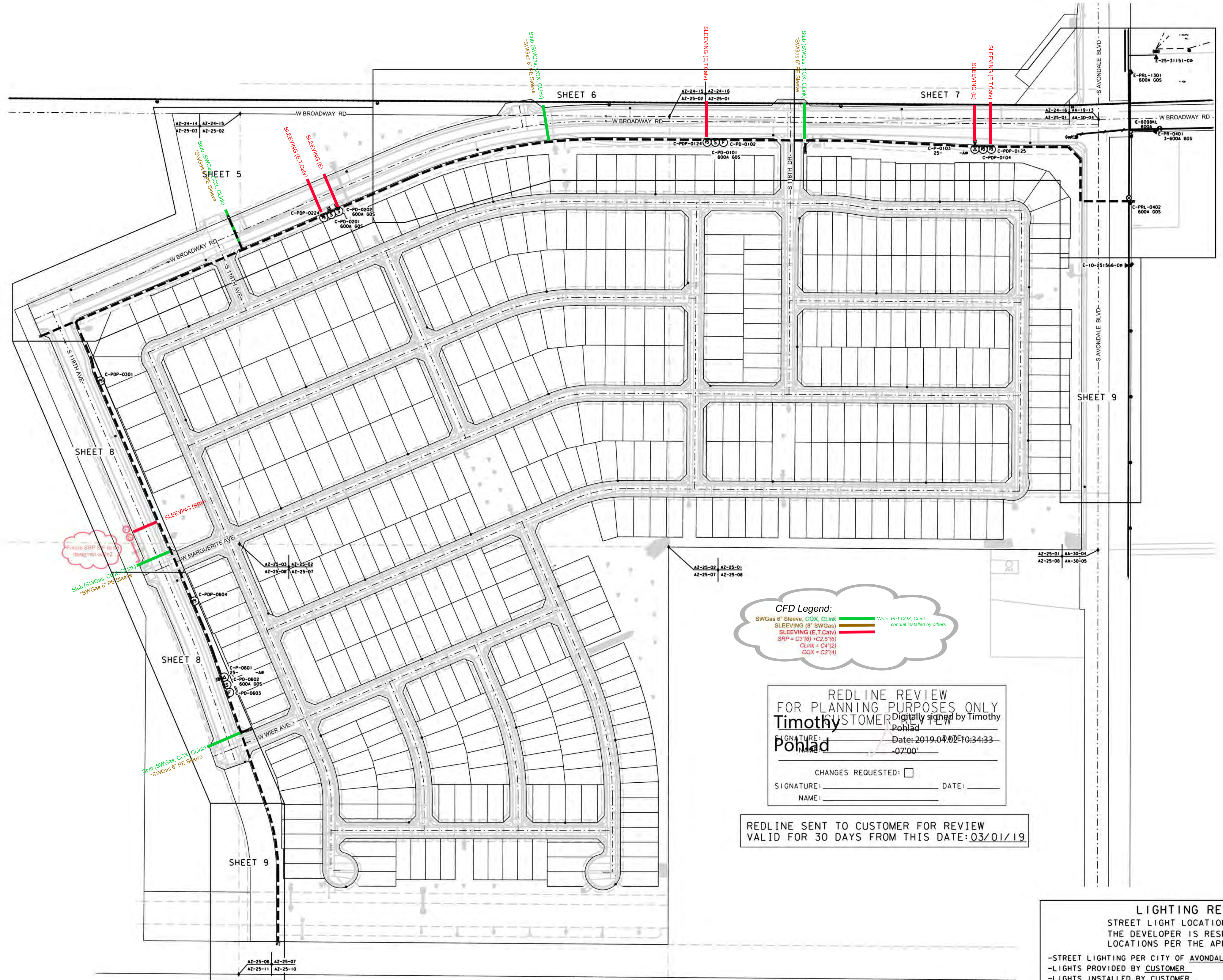
PROJECT NOTES

SRP ELECTRIC SERVICE SPECIFICATIONS ARE AVAILABLE ON-LINE AT:
[HTTP://WWW.SRPNET.COM/ELECTRIC/BUSINESS/SPECS](http://www.srpnet.com/ELECTRIC/BUSINESS/SPECS)

- CUSTOMER TO PROVIDE ALL CONDUIT, CONDUIT INSTALLATION, TRENCHING AND REQUIRED BACKFILL, 3 PHASE XFMR PADS, J-BOXES, PULL BOXES, SONO TUBES & GROUND RODS.
- CUSTOMER TO PURCHASE FROM SRP AND INSTALL AT ALL VEHICULAR ELECTRIC GATES THE SRP RESTRICTED ACCESS GATE SWITCH (RAS) WHEN THEY BECOME OPERATIONAL.
- CUSTOMER IS SOLELY RESPONSIBLE FOR ALL CONDUIT INSTALLED ON THIS JOB UNTIL SRP'S WIRE IS INSTALLED. SRP TAKES OWNERSHIP OF ALL CONDUIT AFTER WIRE IS INSTALLED.
- CUSTOMER SHALL PROVIDE AND INSTALL 2500 LB TENSILE STRENGTH 5/8" PRE-LUBRICATED MULE TAPE FOR ALL SERVICE CONDUITS.
- CUSTOMER TO INSURE ALL FILL BELOW AND AROUND ELECTRIC UTILITY FOUNDATIONS AND PADS IS COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY (AT OR NEAR OPTIMUM MOISTURE CONTENT) IN ACCORDANCE WITH ASTM D698. 1/2 SACK LEAN MIX SLURRY BACKFILL MAY BE PLACED IN LIEU OF COMPACTED BACKFILL.

IF SIDE LOT TRENCHING IS REQUIRED, THE TRENCH MUST BE A MINIMUM OF 5FT. IN DEPTH. COMPACTION MUST BE A MINIMUM OF 95% OF MAXIMUM DRY DENSITY.

- CUSTOMER TO PROVIDE SRP WITH A CLEAR OPERATIONAL AREA THAT EXTENDS 12FT. IMMEDIATELY IN FRONT OF ALL ELECTRIC EQUIPMENT OPENINGS. !! NO OBSTRUCTIONS !!
- CUSTOMER IS SOLELY RESPONSIBLE FOR PROVIDING ALL REQUIRED GRADE STAKES AND PROPERTY PINS.
- ALL METERING TO COMPLY WITH EUSERC, NEC, SRP SPECIFICATIONS AND MUNICIPAL CODES.
- CUSTOMER TO PROVIDE AND INSTALL PVC CONDUIT FROM SERVICE ENTRANCE SECTION TO TRANSFORMER OR J-BOX.
- CUSTOMER TO CONTACT SRP IRRIGATION, PHONE (602) 236-3333 TO COORDINATE ANY TRENCHING THAT WILL CROSS AN SRP IRRIGATION.
- SUBDIVISION DESIGNED FOR:
 - 200 AMP RES. SES'S ONLY
 - 400 AMP SES'S ONLY
 - MIXED OR OTHER, NOTED ON MAINLINE.
- PROVIDE SRP WITH OFFICIAL ADDRESS OF SES PANELS AND ALSO PROVIDE SHOP DRAWINGS FOR ALL PANELS GREATER THAN 225 AMP THAT ARE NOT ON PRE-APPROVED LIST. ELECTRONIC COPIES ARE PREFERRED AND CAN BE SENT TO: SHOPDRAW@SRPNET.COM (PDF FILES ARE PREFERRED).



GRAPHIC SYMBOLS
(SHADED SYMBOL INDICATES EXISTING FACILITY)

E-ELECTRIC C-COMMUNICATION W-WATER G-GAS SD-STORM S-SEWER DRAIN

--- "E" WITHOUT CIRCLE INDICATES EXISTING TRENCH
 --- "E" WITH CIRCLE INDICATES PROPOSED TRENCH

TYPICAL SRP ABBREVIATIONS

- C = CONSTRUCT
- R = REMOVE
- T = TRANSFER
- A = ABANDON
- F/SW = FRONT OF SIDEWALK
- B/SW = BACK OF SIDEWALK
- F/C = FRONT OF CURB
- B/C = BACK OF CURB
- E/P = EDGE OF PAVEMENT
- L/G = LIP OF GUTTER
- R/W = RIGHT OF WAY

--- UNDERGROUND STREETLIGHT CONDUCTOR
 --- UNDERGROUND SERVICE CONDUCTOR
 --- UNDERGROUND SECONDARY CONDUCTOR
 --- PROPOSED UNDERGROUND TRENCH/BORE
 --- EXISTING UNDERGROUND TRENCH/BORE
 --- INDICATES ABANDONMENT

◇ SERVICE ENTRANCE SECTION (S.E.S.)
 ○ PROPOSED MANHOLE
 □ PROPOSED PULL BOX
 ○ PROPOSED SPLICE POINT
 ○ PROPOSED STREET LIGHT
 ○ PROPOSED PRIVATE LIGHT (STAKED BY CUSTOMER)
 ○ PROPOSED POLE AND RISER
 // DOUBLE SLASH LINES INDICATE REMOVAL
 EM ELECTRONIC MARKER
 --- MATCH POINTS FOR MULTIPLE SHEETS OF DRAWING
 --- CONDUIT
 ○ PROPOSED FLUSH-MOUNTED J-BOX
 ○ PROPOSED ABOVE-GROUND J-BOX
 ○ PROPOSED WOOD POLE
 □ WORK POINT BOX

CFD Legend:

- SWGas (Sleeve, COX, CLink) Note: Pkt COX, CLink conduit installed by others
- SLEEVING (E,T,Cable)
- SRP = C2(18) + C2(5) (18)
- CLink = C4(12)
- COX = C2(4)

REDLINE REVIEW FOR PLANNING PURPOSES ONLY

Digitally signed by Timothy Pohlad
 Signature: Timothy Pohlad
 Date: 2019.04.07 10:34:33 -0700

CHANGES REQUESTED:

SIGNATURE: _____ DATE: _____
 NAME: _____

REDLINE SENT TO CUSTOMER FOR REVIEW
 VALID FOR 30 DAYS FROM THIS DATE: 03/01/19

NOTICE
THIS JOB ORDER WORKS WITH OTHER JOBS.

O. H. # _____
 U. G. # 13119769
 U. G. # 13119770
 U. G. # 13119771
 U. G. # 13119772
 U. G. # 13119773
 U. G. # 13119775

CONTACTS:

DESIGN CONSULTANT:
ALEX BABCOCK
OFFICE: (602) 236-8695
MOBILE: (602) 980-3287

PROJECT LEADER:
SHANNON EMMONS
MOBILE: (602) 818-9266

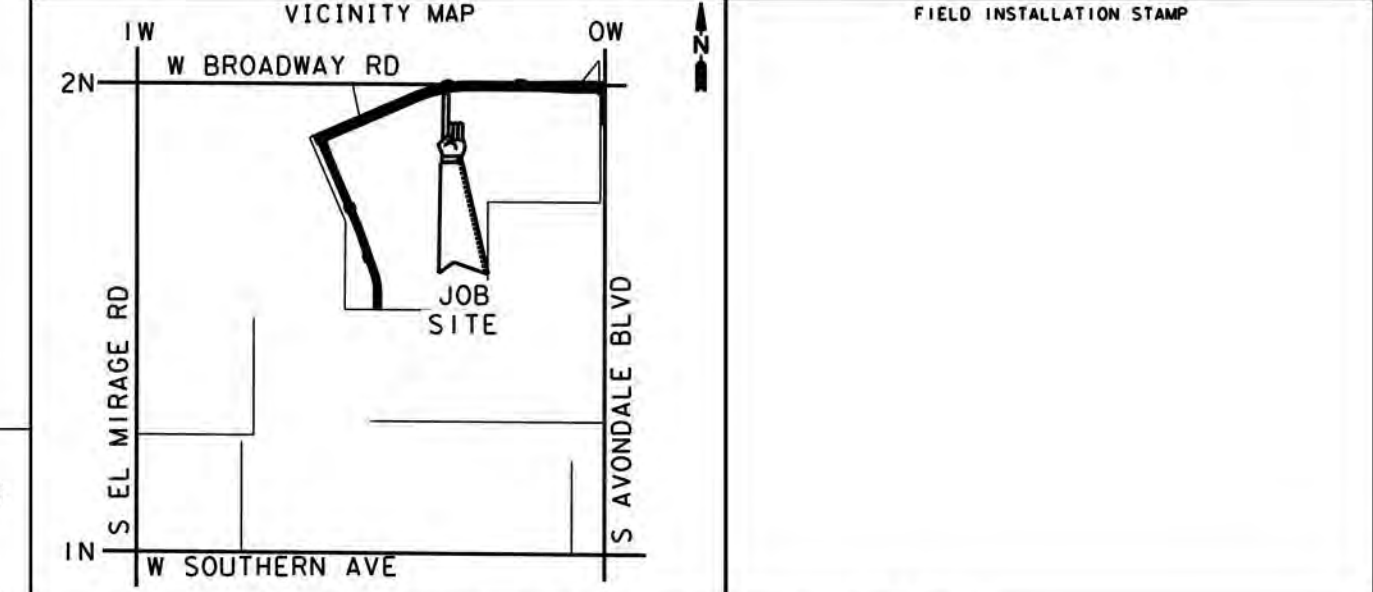
INSPECTIONS:
OFFICE: (602) 236-0676

CONSTRUCTION CONSULTANT:
BRENDA BURCHETT
MOBILE: (602) 818-8624

LIGHTING RESPONSIBILITIES:

STREET LIGHT LOCATIONS ARE SHOWN FOR REFERENCE ONLY. THE DEVELOPER IS RESPONSIBLE FOR STAKING STREET LIGHT LOCATIONS PER THE APPROVED STREET LIGHT PLANS.

- STREET LIGHTING PER CITY OF AVONDALE
- LIGHTS PROVIDED BY CUSTOMER
- LIGHTS INSTALLED BY CUSTOMER
- LIGHTS CONNECTED BY SRP
- LIGHT NUMBERS DONE BY SRP



SURVEY AND PERMIT INFORMATION

SRP SURVEY TO STAKE FOR LOCATION AND TIE FOR EASEMENTS. CUSTOMER CONTROL POINTS REQUIRED: YES NO

CUSTOMER'S SURVEY TO STAKE FOR LOCATION/CONSTRUCTION AND TIE FOR EASEMENTS. CUSTOMER'S SURVEYOR MUST ATTEND PRE-CON MEETING.

SRP SURVEY TO STAKE FOR LOCATION, NO EASEMENT REQUIRED.

3RD PARTY EASEMENT REQUIRED.

NO SURVEY REQUIRED.

PERMIT REQUIRED: CITY OF AVONDALE COUNTY _____ OTHER _____ PERMIT NO. _____

NO PERMIT REQ.

REV	REVISED BY	DATE	JOB CREATED	REVISION DESCRIPTION
	AJJONES	01/18/19		JOB CREATED

NATURAL GAS YES NO

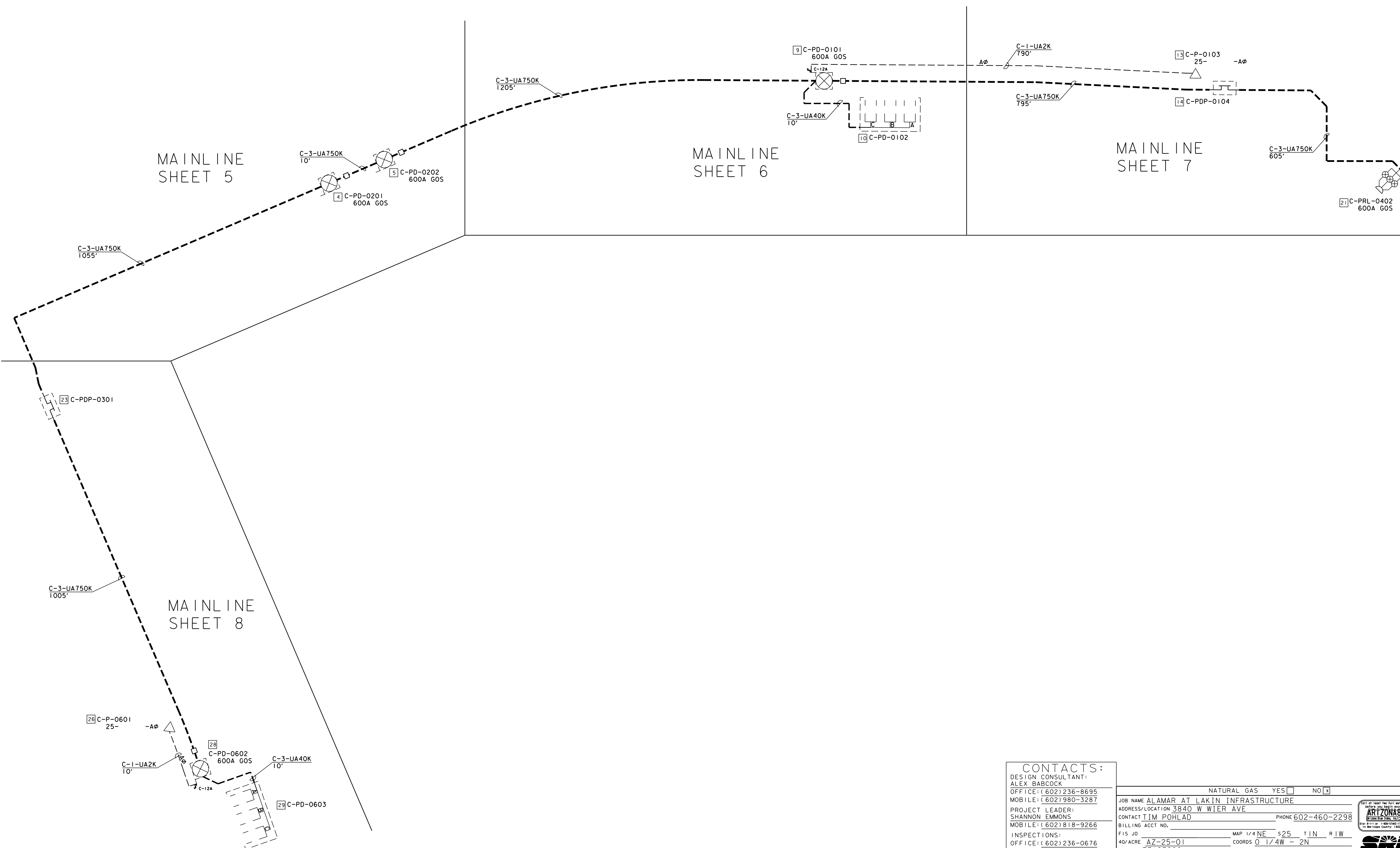
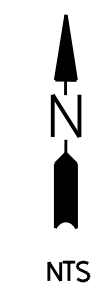
JOB NAME ALAMAR AT LAKIN INFRASTRUCTURE
 ADDRESS/LOCATION 3840 W WIER AVE
 CONTACT TIM POHLAD PHONE 602-460-2298

BILLING ACCT NO. _____ MAP 1/4 NE S25 T1N R1W
 40/ACRE AZ-25-01 COORDS 0 1/4 W - 2N
 AMP NO T3103298 AMP VERSION _____
 COST CENTER 22640
 ROUTING CODE DDY+11

FOR CUSTOMER APPROVAL
 NOT FOR CONSTRUCTION



SCHEMATIC



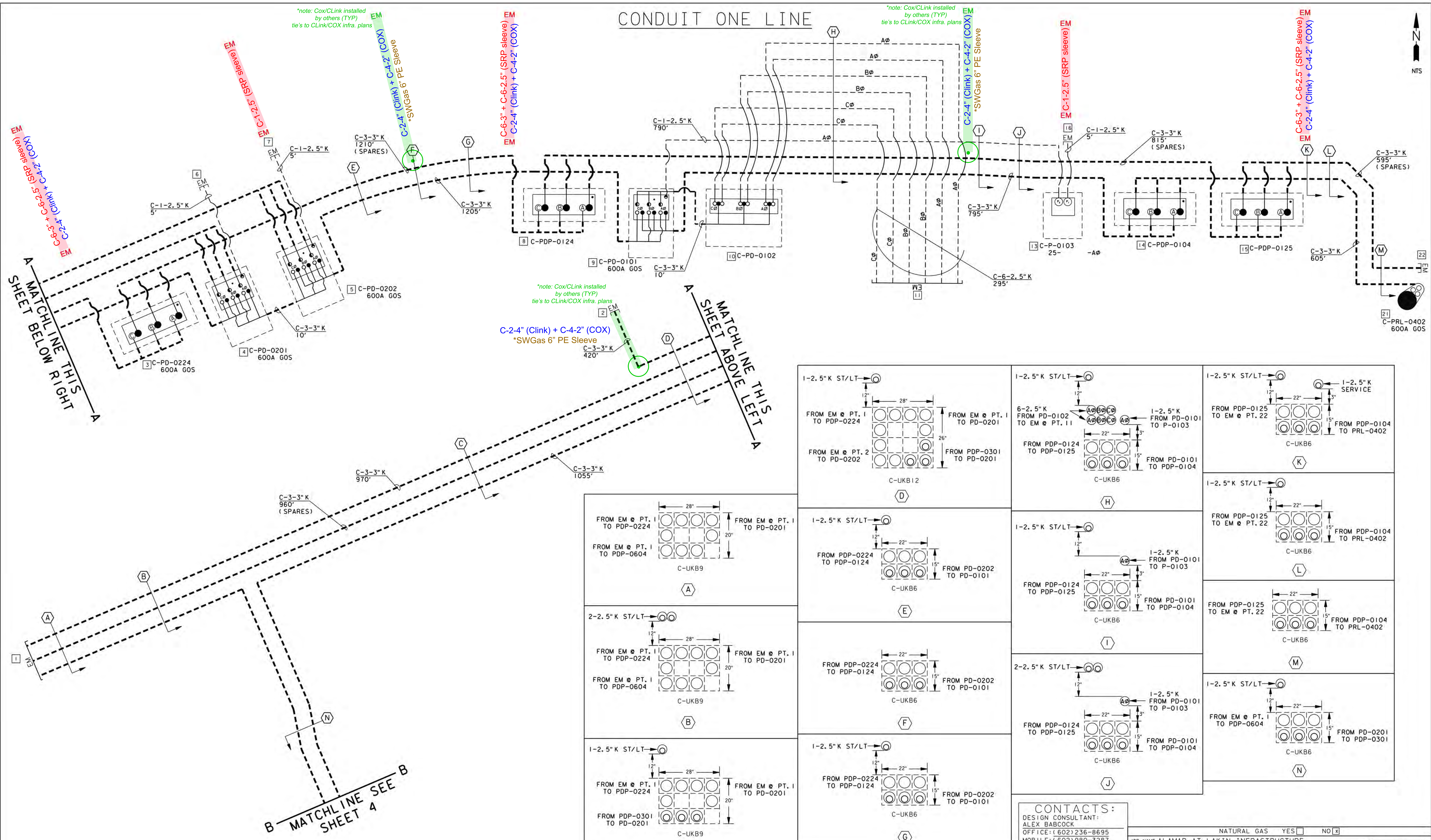
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 OFFICE: (602) 236-8695
 MOBILE: (602) 980-3287
 PROJECT LEADER:
 SHANNON EMMONS
 MOBILE: (602) 818-9266
 INSPECTIONS:
 OFFICE: (602) 236-0676
 CONSTRUCTION CONSULTANT:
 BRENDA BURCHETT
 MOBILE: (602) 818-8624

NATURAL GAS YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
JOB NAME ALAMAR AT LAKIN INFRASTRUCTURE	
ADDRESS/LOCATION 3840 W WIER AVE	
CONTACT TIM POHLAD	PHONE 602-460-2298
BILLING ACCT NO. _____	
FIS JO _____	MAP 1/4 NE S25 T1N R1W
40/ACRE AZ-25-01	COORDS 0 1/4W - 2N
AMP NO T3103298	AMP VERSION _____
COST CENTER 22640	
ROUTING CODE DDY+11	



FOR CUSTOMER APPROVAL
NOT FOR CONSTRUCTION

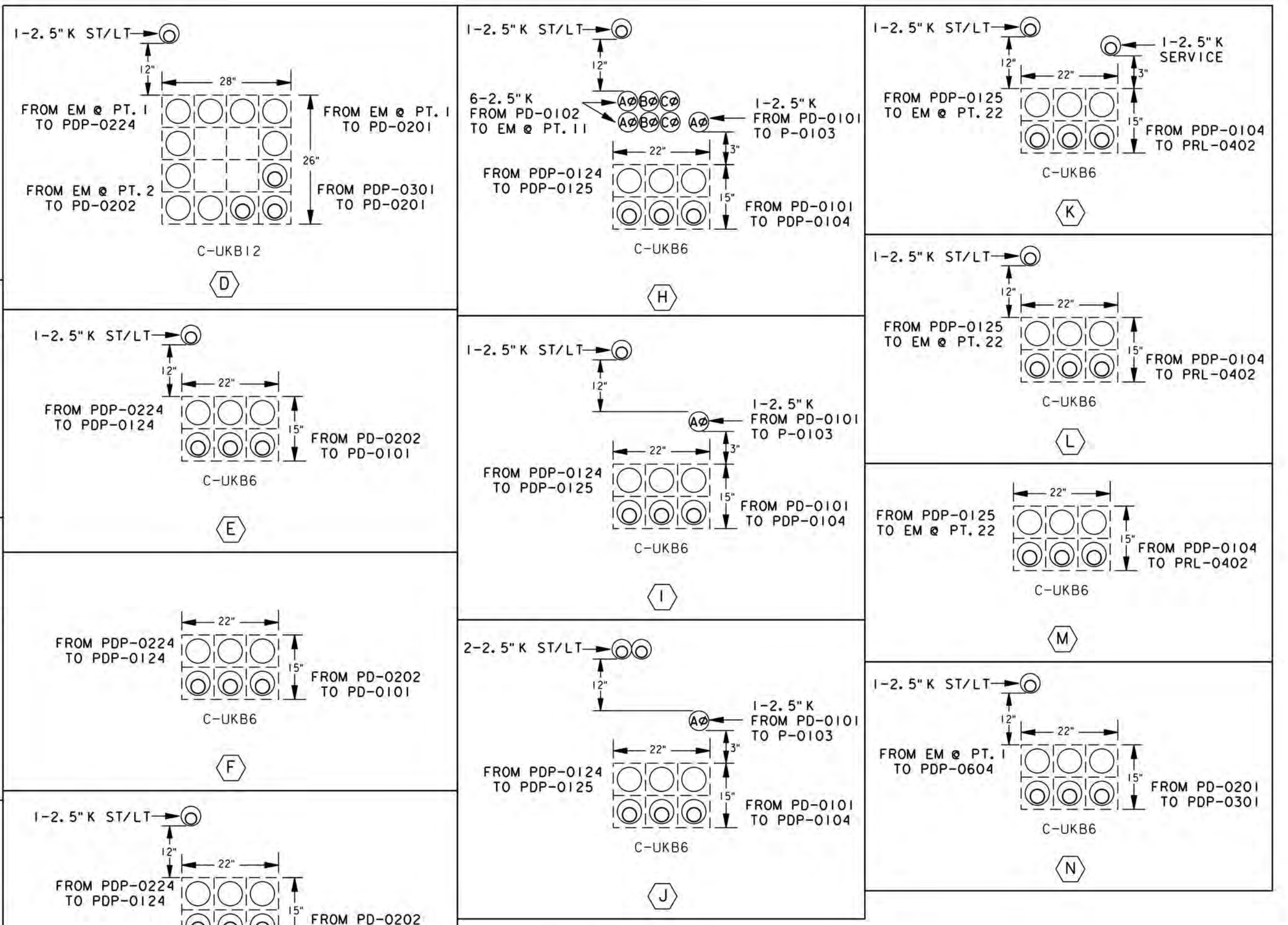
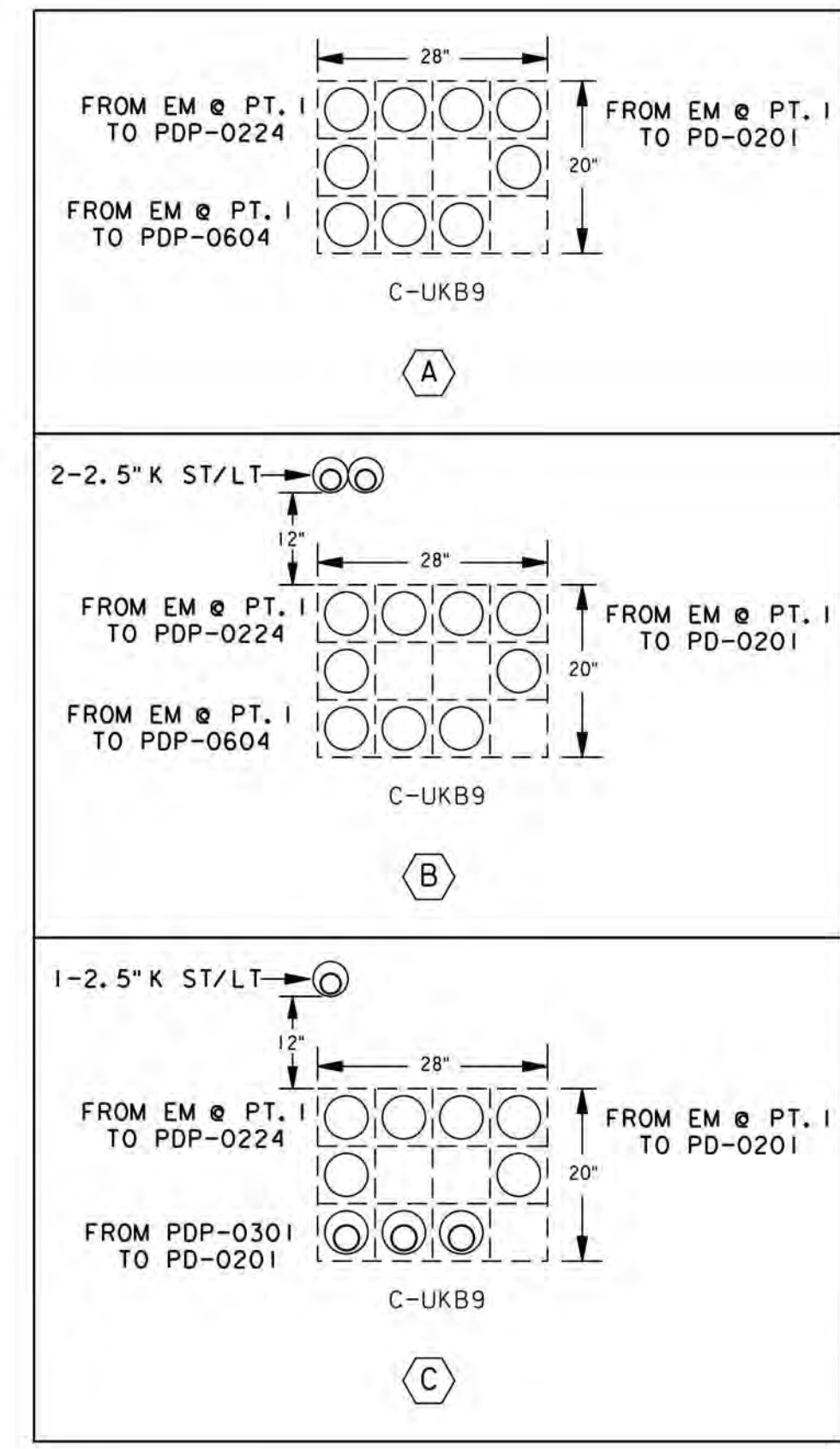
CONDUIT ONE LINE



A MATCHLINE THIS SHEET BELOW RIGHT

A MATCHLINE THIS SHEET ABOVE LEFT

B MATCHLINE SEE SHEET 4



CONTACTS:
 DESIGN CONSULTANT:
 ALEX BABCOCK
 OFFICE: (602) 236-8695
 MOBILE: (602) 980-3287
 PROJECT LEADER:
 SHANNON EMMONS
 MOBILE: (602) 818-9266
 INSPECTIONS:
 OFFICE: (602) 236-0676
 CONSTRUCTION CONSULTANT:
 BRENDA BURCHETT
 MOBILE: (602) 818-8624

NATURAL GAS YES NO

JOB NAME ALAMAR AT LAKIN INFRASTRUCTURE
 ADDRESS/LOCATION 3840 W WIER AVE
 CONTACT TIM POHLAD PHONE 602-460-2298
 BILLING ACCT NO. _____
 FIS JO _____ MAP 1/4 NE S25 T1N R1W
 40/ACRE AZ-25-01 COORDS 0 1/4W - 2N
 COST CENTER 22640 AMP VERSION _____
 ROUTING CODE DDY+11

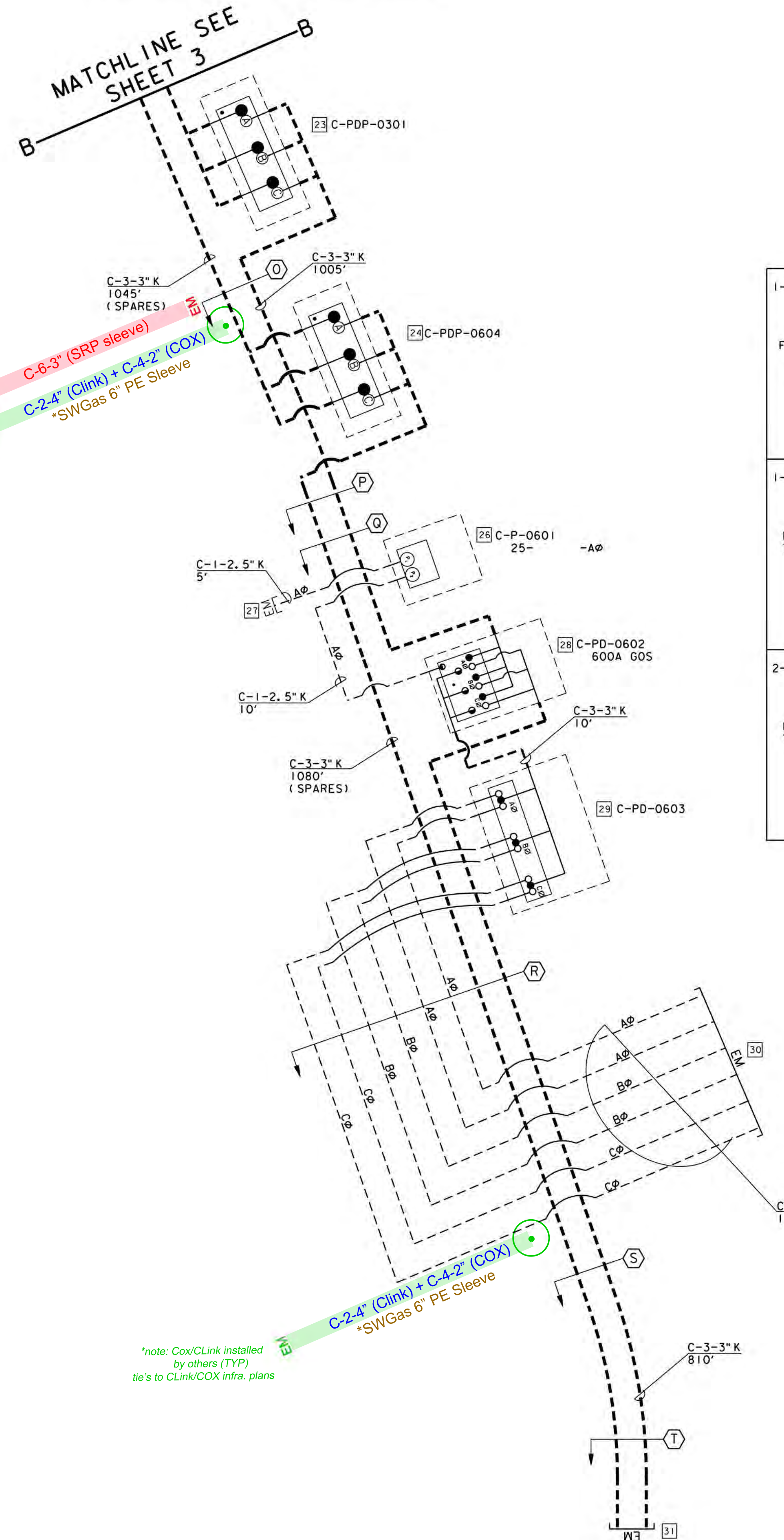
FOR CUSTOMER APPROVAL
 NOT FOR CONSTRUCTION

ARTIZONABT
 1000 N. CENTRAL AVENUE, SUITE 1000
 PHOENIX, AZ 85004
 (602) 236-1100

SRP

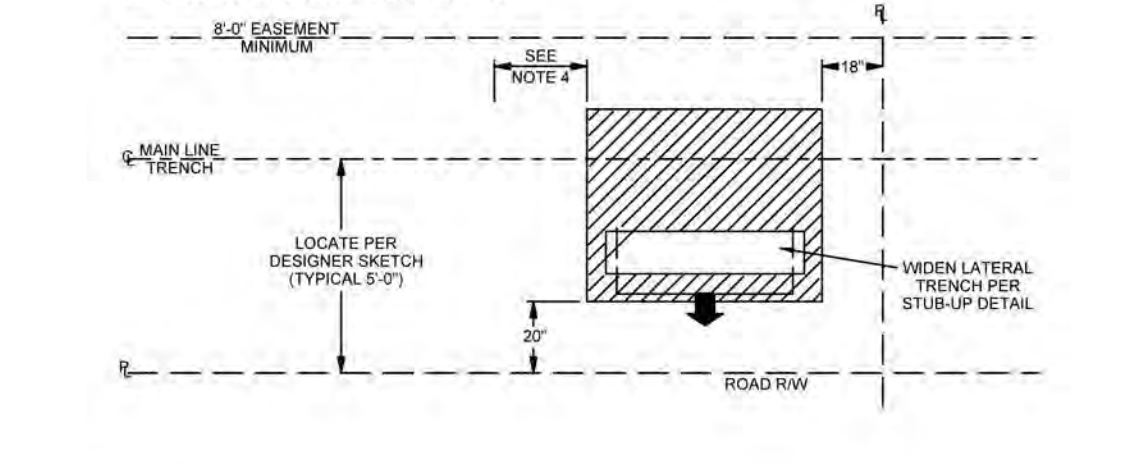
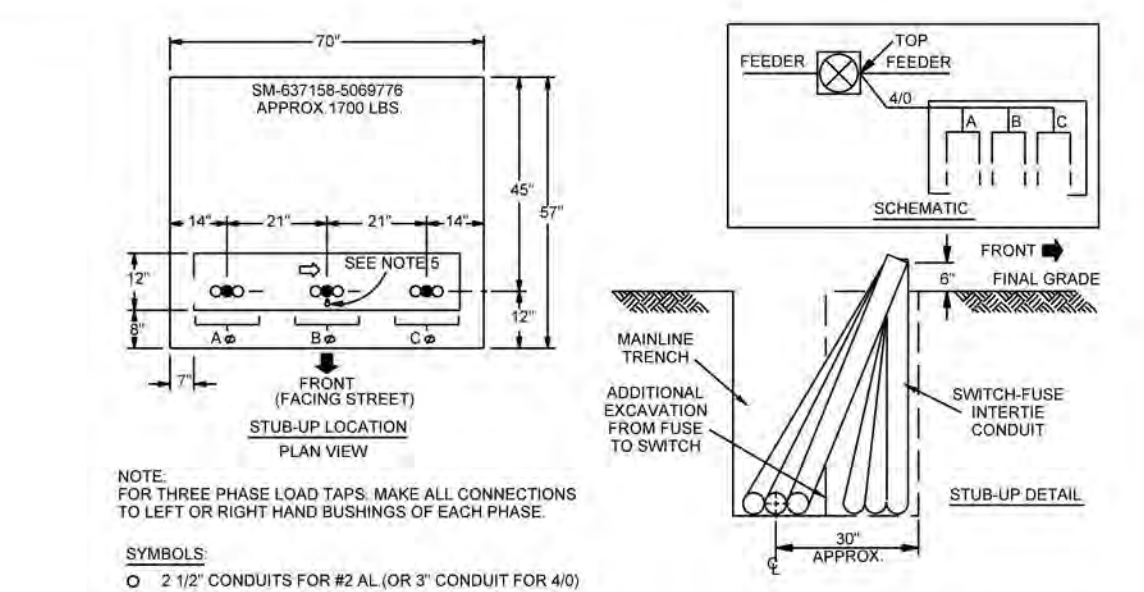
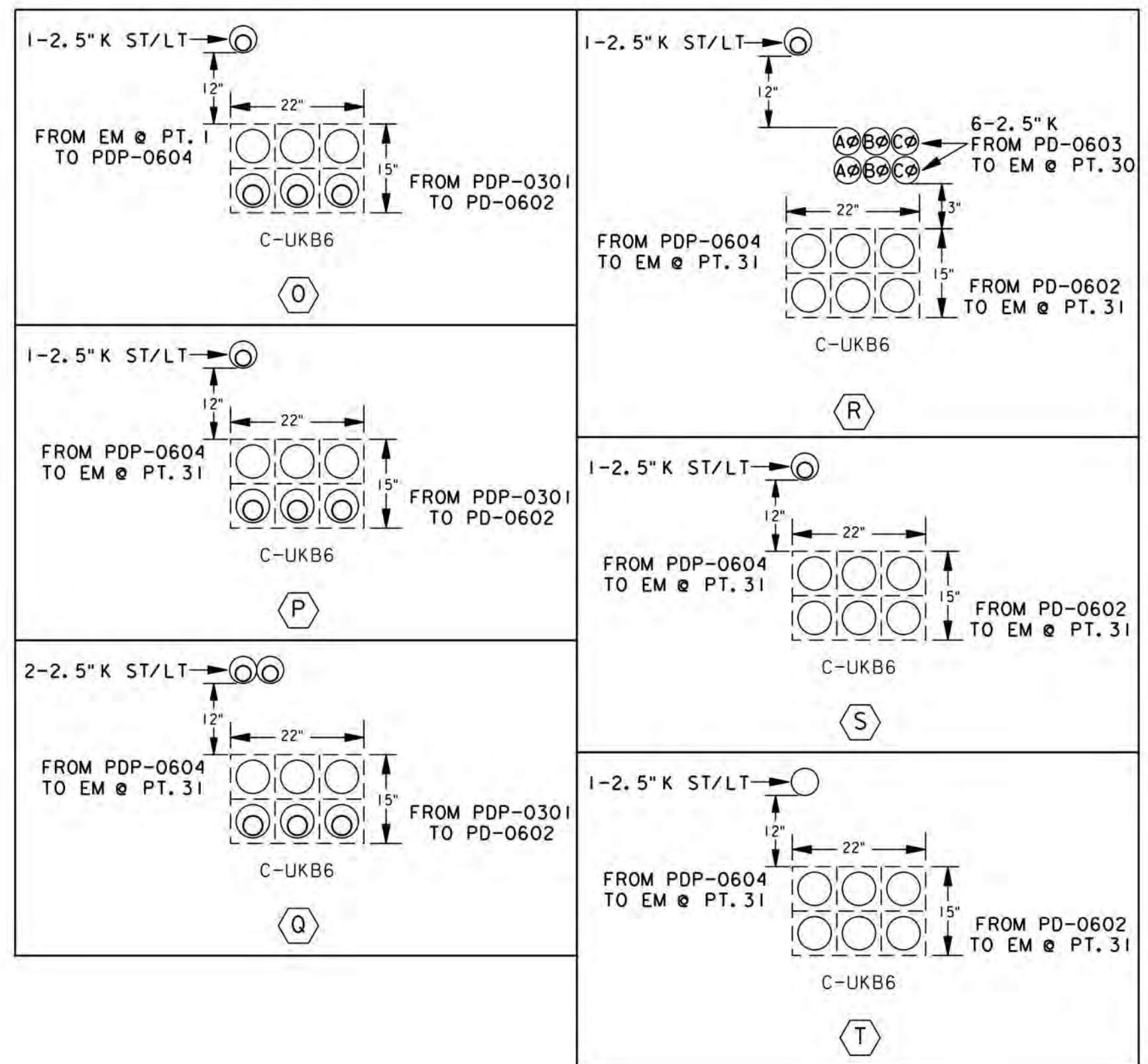
SHEET NUMBER 3 of 11

CONDUIT ONE LINE



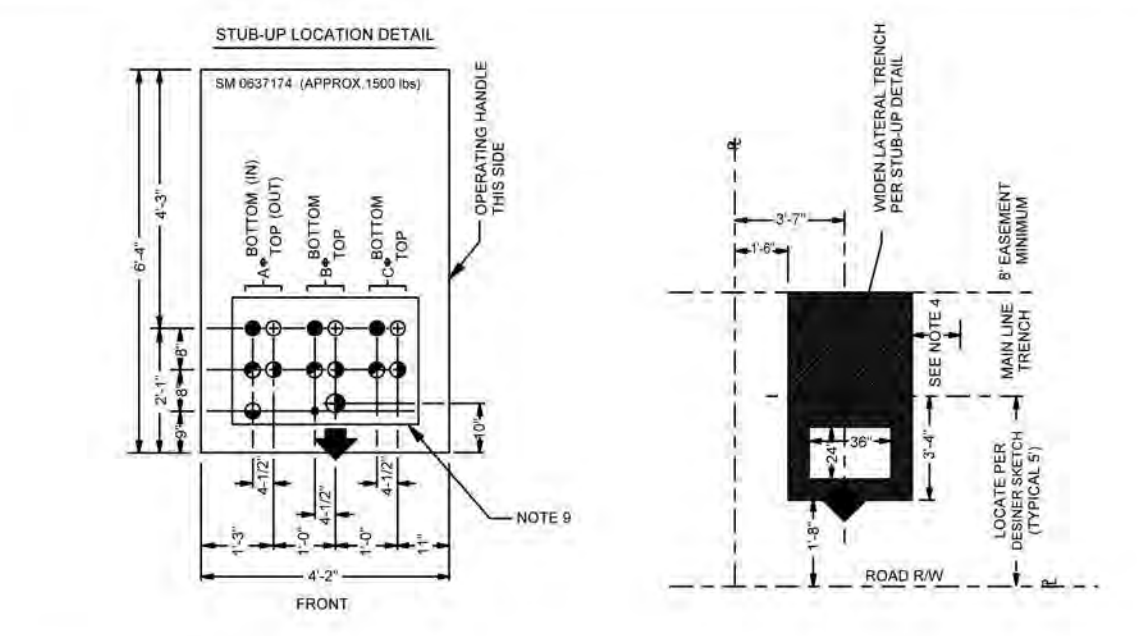
*note: Cox/CLink installed by others (TYP) tie's to CLink/COX infra. plans

*note: Cox/CLink installed by others (TYP) tie's to CLink/COX infra. plans



- NOTES:
1. ALL PAD ELEVATIONS SHALL BE ESTABLISHED BY SURVEY (BLUE TOP) AND TOP OF PAD SHALL BE 4" ABOVE FINAL GRADE IN IMMEDIATE AREA.
 2. PAD MUST BE LEVEL BEFORE SETTING ENCLOSURE.
 3. AREA UNDER PAD MUST BE COMPACTED PER TRENCH SPECIFICATIONS.
 4. MAINTAIN A MINIMUM 18" SEPARATION BETWEEN THE SIDES OF THE ENCLOSURE PAD AND THE PAD OF ANY ADJACENT EQUIPMENT OR FENCE. ALLOW ENOUGH SPACE FOR CONDUIT ELBOWS.
 5. STUB 20 BARE COPPER NEUTRAL FROM SWITCH TO ENCLOSURE GROUNDING PADS OR INSTALL GROUND ROD SO IT DOES NOT INTERFERE WITH CABLE. CONNECT GROUND ROD TO CABINET GROUND WITH #4 COPPER WIRE.
 6. IF OBSTACLES ARE ANTICIPATED IN FRONT OF THE FUSE ENCLOSURE (DESIGNATED PARKING), FRONT OF FUSING ENCLOSURE SHALL BE ROTATED 90 DEG. IN TO EASEMENT. ADDITIONAL LABELING SHALL BE PLACED ON THE SIDE OF THE ENCLOSURE FACING ROAD RIGHT OF WAY.

Underground Distribution Construction Standards	REV. UPDATED STOCK CODES	ISSUE DATE: 01/15/87
SRP PROPRIETARY MATERIAL	SWITCHING AND FUSING DEAD-FRONT FUSING ENCLOSURE	REV. DATE: 08/08/13 APPROVAL: B. PRIEST
	3-11-1	813E119 DGN



- IDENTIFICATION OF SYMBOLS
- | SYMBOL | POSITION | CABLE TERMINATION |
|--------|------------|---|
| 1 | TOP | 3" CONDUIT FOR EITHER: 500MCM FEEDER OR 750MCM FEEDER |
| 2 | TOP-TAP | 3" CONDUIT FOR EITHER: 500MCM FEEDER, 750MCM FEEDER OR 40 AL |
| 3 | TOP-TAP | 4" CONDUIT FOR 3-40 AL (NOTE 6) |
| 4 | TOP-TAP | 3-1/2" CONDUIT FOR FUSED SINGLE PHASE TRANSFORMER (NOTE 10) TAP INTERNALLY FUSED (AIRSIDE TOP ONLY) |
| 5 | BOTTOM-TAP | 3" CONDUIT FOR 40 AL CAPACITOR TAP (NEUTRAL) - BELOW REQUIRES PARKING STAND EXTENSION 250000 |
| 6 | BOTTOM | 3" CONDUIT FOR EITHER: 500MCM FEEDER OR 750MCM FEEDER |
| 7 | | GROUND ROD |

- NOTES:
1. ALL PAD ELEVATIONS SHALL BE ESTABLISHED BY SURVEY (BLUE TOP) AND TOP OF PAD SHALL BE 4" ABOVE FINAL GRADE IN IMMEDIATE AREA.
 2. PAD MUST BE LEVEL BEFORE SETTING ENCLOSURE.
 3. AREA UNDER PAD MUST BE COMPACTED PER TRENCH SPECIFICATIONS.
 4. MAINTAIN A MINIMUM OF 3 FT SEPARATION BETWEEN SWITCH PAD AND THE PAD OF ADJACENT EQUIPMENT.
 5. IF 3 FT OF CLEAR SPACE ON THE RIGHT SIDE (NOTE 4) IS OBTAINED, A SWITCH WITH THE OPERATING HANDLE ON THE LEFT IS AVAILABLE (STOCK CODE 82824). OTHERWISE, THIS SWITCH DOES NOT HAVE THE SINGLE PHASE FUSED TAP CAPACITY.
 6. MAINTAIN A MINIMUM OF 12 FT CLEARANCE IN FRONT OF SWITCH DOORS.
 7. IF OBSTACLES ARE ANTICIPATED IN FRONT OF THE SWITCH (E.G. DESIGNATED PARKING), THE SWITCH SHALL BE ROTATED 90° SO THE OPERATING HANDLE FACES ROAD RIGHT-OF-WAY. ADDITIONAL LABELING SHALL BE PLACED ON THE SIDE OF THE ENCLOSURE FACING ROAD RIGHT OF WAY.
 8. STUB UP ONE 4" CONDUIT AS SHOWN ABOVE WHEN TAPPING INTO AN EXISTING 3-40 AL IN ONE 4" CONDUIT. THIS AVOIDS THE NEED FOR A PULL BOX AT THE SWITCH TO REPAIR THE 40 AL OUT INTO 3" CONDUIT.
 9. SEE PADE 3-13 AND 3-14 WHEN THIS SWITCH WILL BE TIED INTO DIRECT BURIED CABLE OR OVERHEAD SYSTEM THAT WILL BE CONVERTED TO ALL CONDUIT SYSTEM IN THE FUTURE.
 10. 500VA MAXIMUM ONE 500VA OR TWO 250VA TRANSFORMERS IF TWO 250VA TRANSFORMERS ARE CONNECTED. TRAFFIC SIGNALS (AUTO OR MAN) MAY ONLY BE SERVED FROM FIRST TRANSFORMER OUT.

Underground Distribution Construction Standards	REV. UPDATED STOCK CODES	ISSUE DATE: 01/15/87
SRP PROPRIETARY MATERIAL	SWITCHING AND FUSING DEAD FRONT SWITCHING ENCLOSURE	REV. DATE: 07/25/13 APPROVAL: B. PRIEST
	3-13-2	813E124 DGN

DETAILS PERTAINING TO SRP ELECTRICAL SERVICE SPECIFICATIONS CAN BE FOUND AT:
[HTTP://WWW.SRPNET.COM/ELECTRIC/BUSINESS/SPECS/](http://www.srpnet.com/electric/business/specs/)

CONTACTS:
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 MOBILE: (602) 980-3287
 PROJECT LEADER:
 SHANNON EMMONS
 MOBILE: (602) 818-9266
 INSPECTIONS:
 OFFICE: (602) 236-0676
 CONSTRUCTION CONSULTANT:
 BRENDA BURCHETT
 MOBILE: (602) 818-8624

NATURAL GAS YES NO

JOB NAME ALAMAR AT LAKIN INFRASTRUCTURE
 ADDRESS/LOCATION 3840 W WIER AVE
 CONTACT TIM POHLAD PHONE 602-460-2298
 BILLING ACCT NO. _____
 FIS JO _____ MAP 1/4 NE S25 T1N R1W
 40/ACRE AZ-25-01 COORDS 01/4W - 2N
 AMP WO T3103298 AMP VERSION _____
 COST CENTER 22640
 ROUTING CODE DDY+11

FOR CUSTOMER APPROVAL
 NOT FOR CONSTRUCTION

ARIZONA
 STATE BOARD OF ELECTRICAL ENGINEERS
 REG. NO. 100-11462-11 1100-11462-11
 EXPIRES 12/31/13

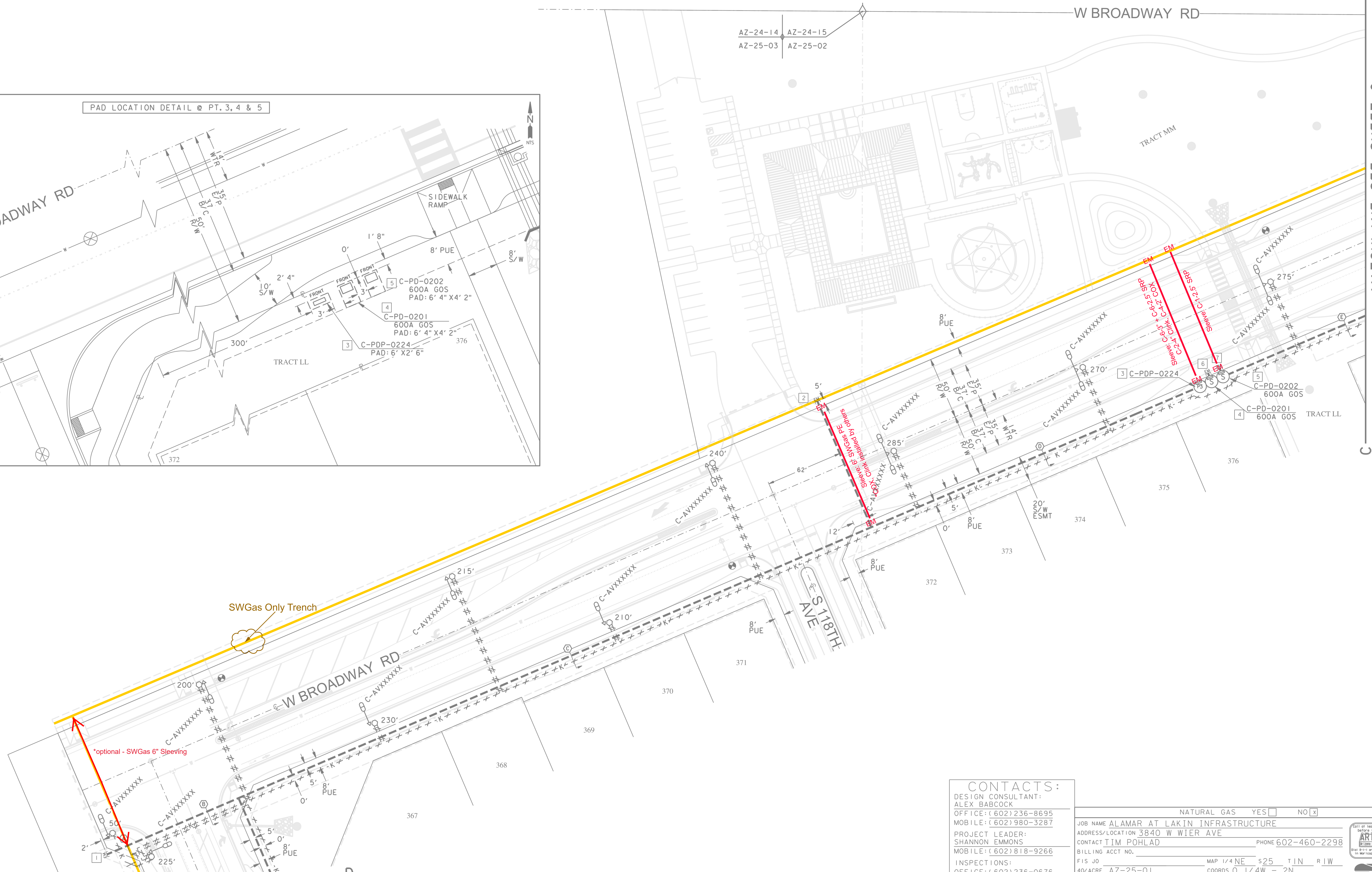
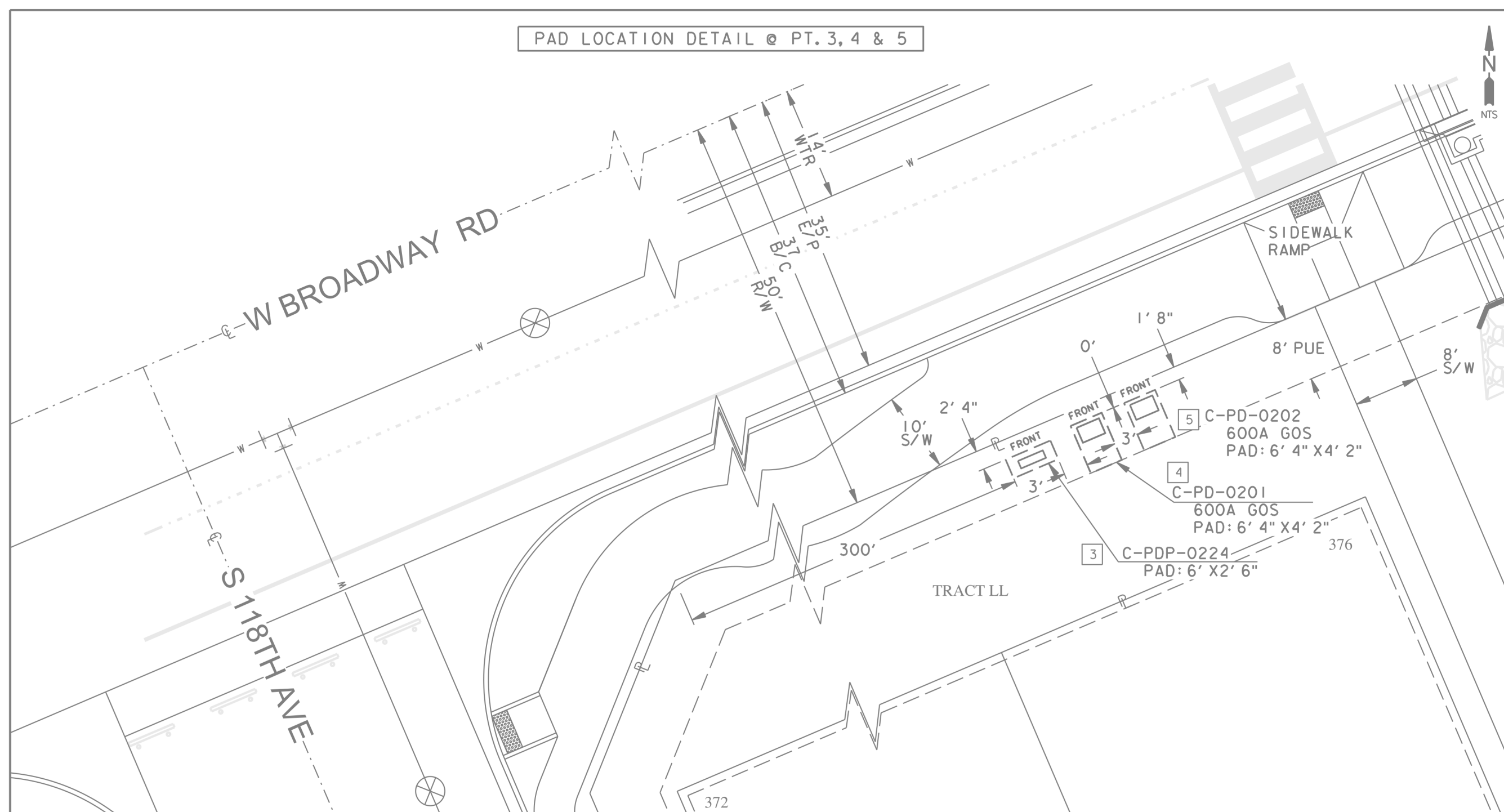
SRP

SHEET NUMBER 4 of 11

MAINLINE

SCALE: 1" = 40'

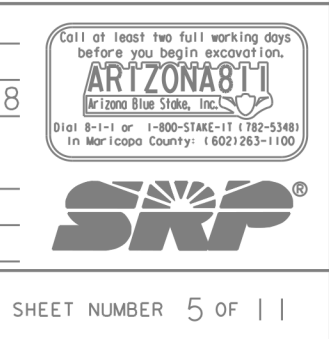
MATCHLINE SEE SHEET 6



MATCHLINE SEE SHEET 8

CONTACTS:
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NATURAL GAS YES NO
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 AMP NO T3103298 AMP VERSION _____
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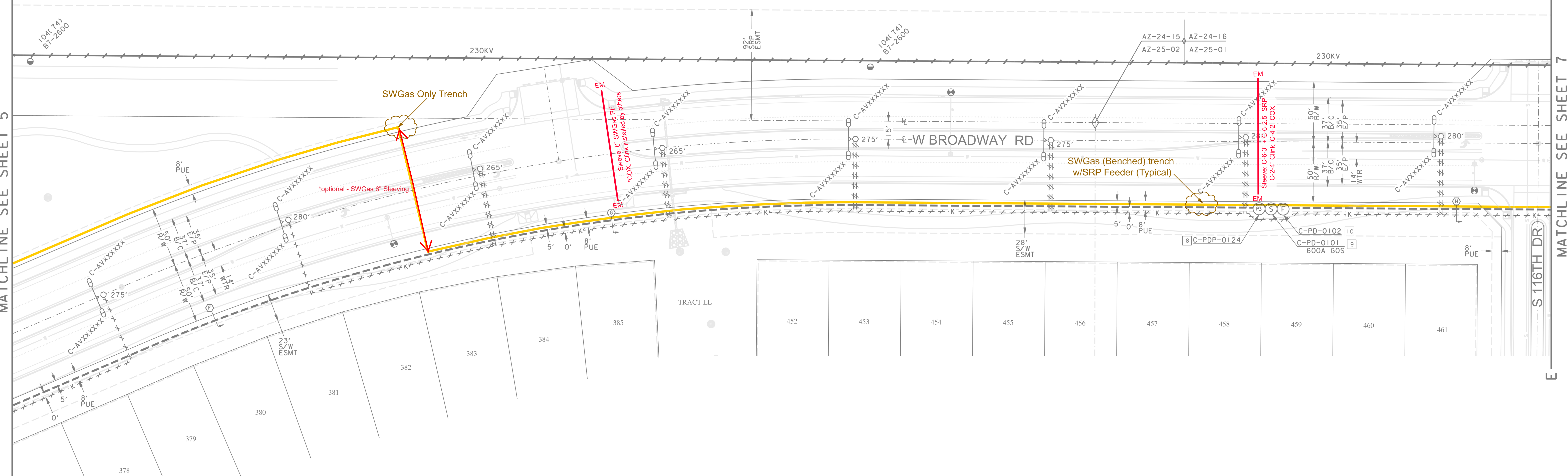
FOR CUSTOMER APPROVAL
 NOT FOR CONSTRUCTION

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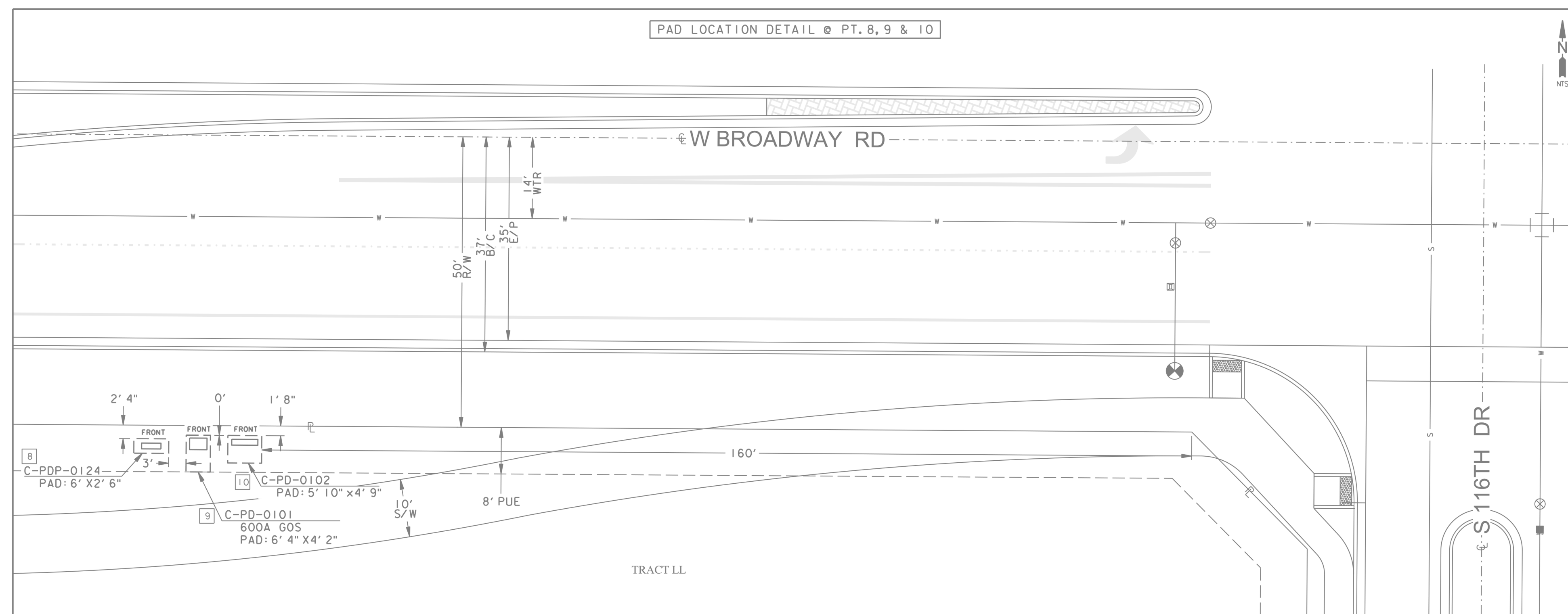
SCALE: 1" = 40'

MATCHLINE SEE SHEET 5

MATCHLINE SEE SHEET 7

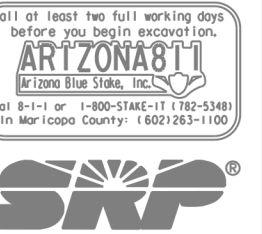


PAD LOCATION DETAIL @ PT. 8, 9 & 10



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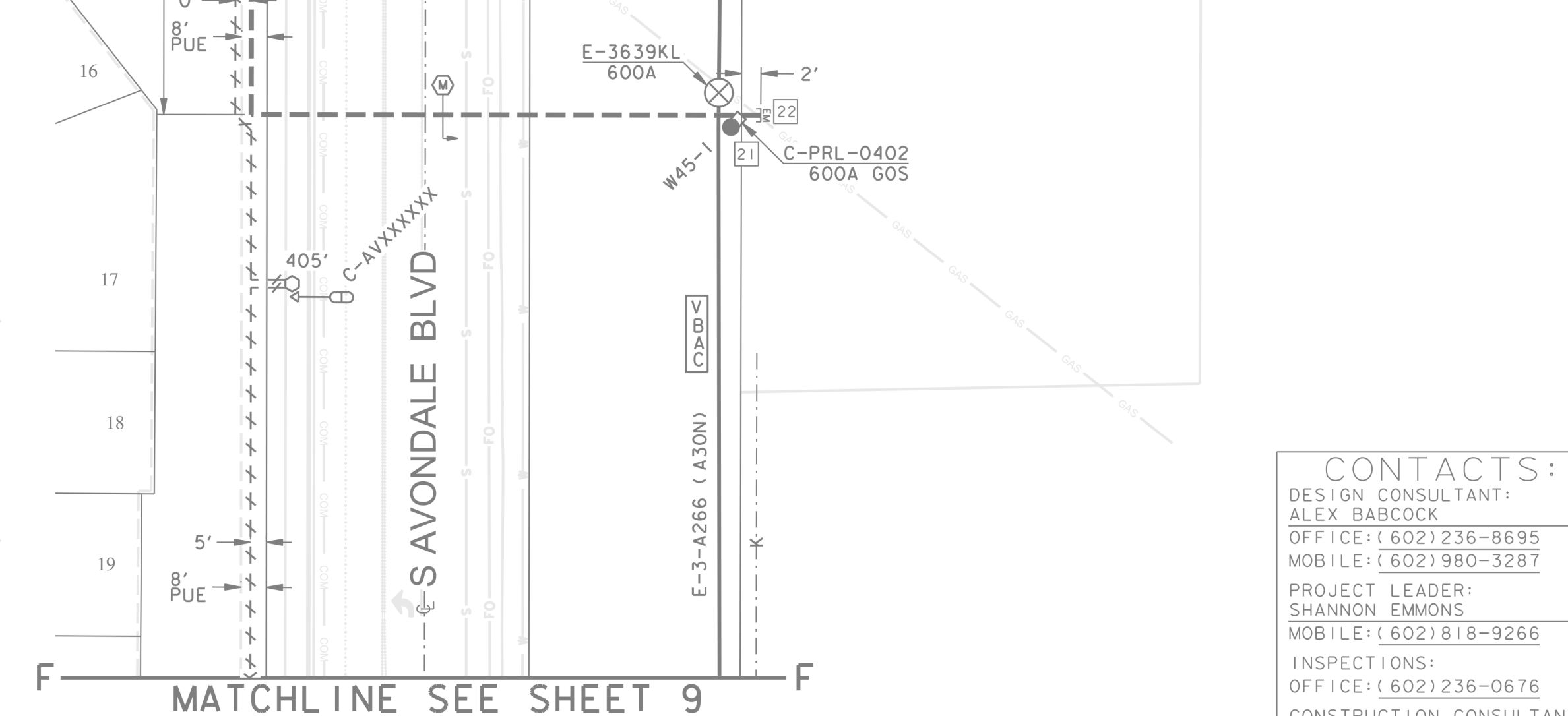
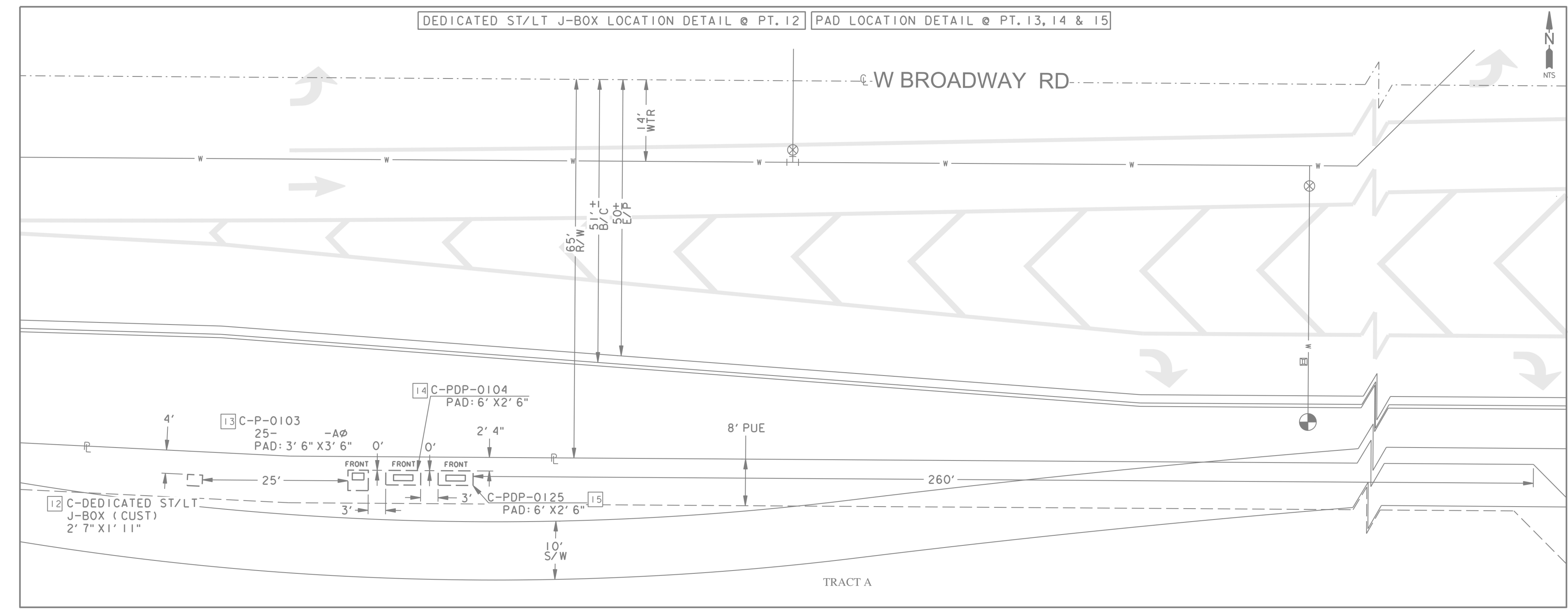
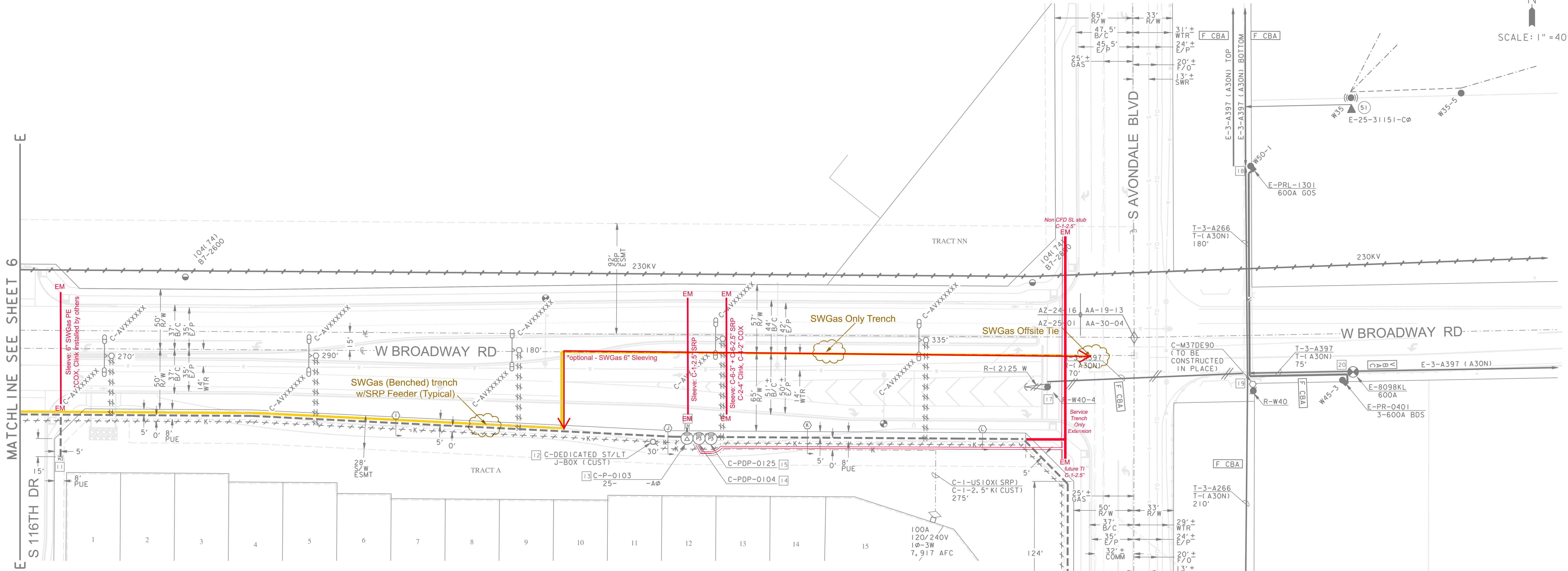
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ADDRESS/LOCATION 3840 W WIER AVE	
CONTACT TIM POHLAD	PHONE 602-460-2298
BILLING ACCT NO.	
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40/ACRE AZ-25-01	COORDS 0 1/4 W - 2N
AMP NO T3103298	AMP VERSION
COST CENTER 22640	
ROUTING CODE DDY+11	



FOR CUSTOMER APPROVAL
 NOT FOR CONSTRUCTION

MAINLINE

SCALE: 1" = 40'



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NATURAL GAS YES NO

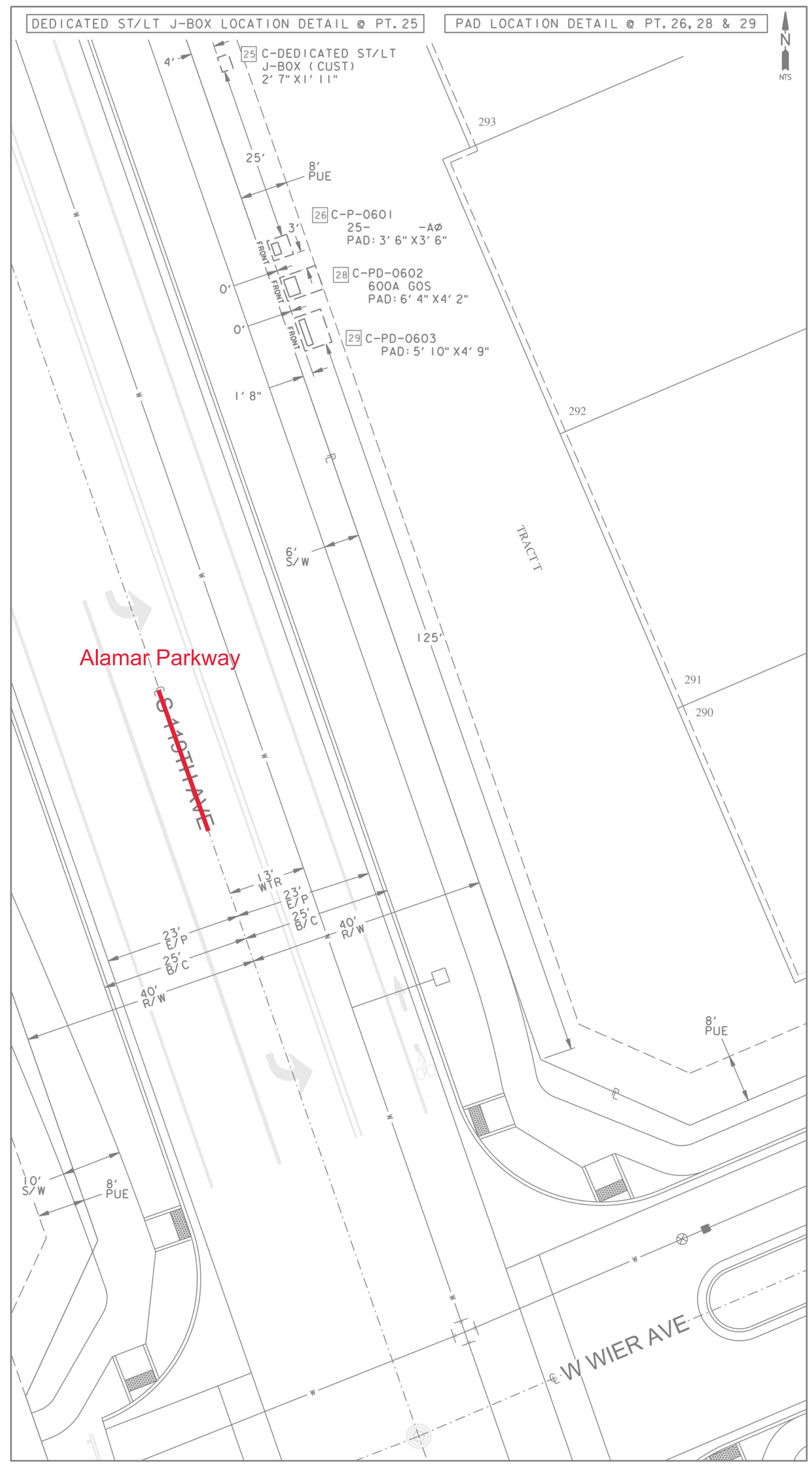
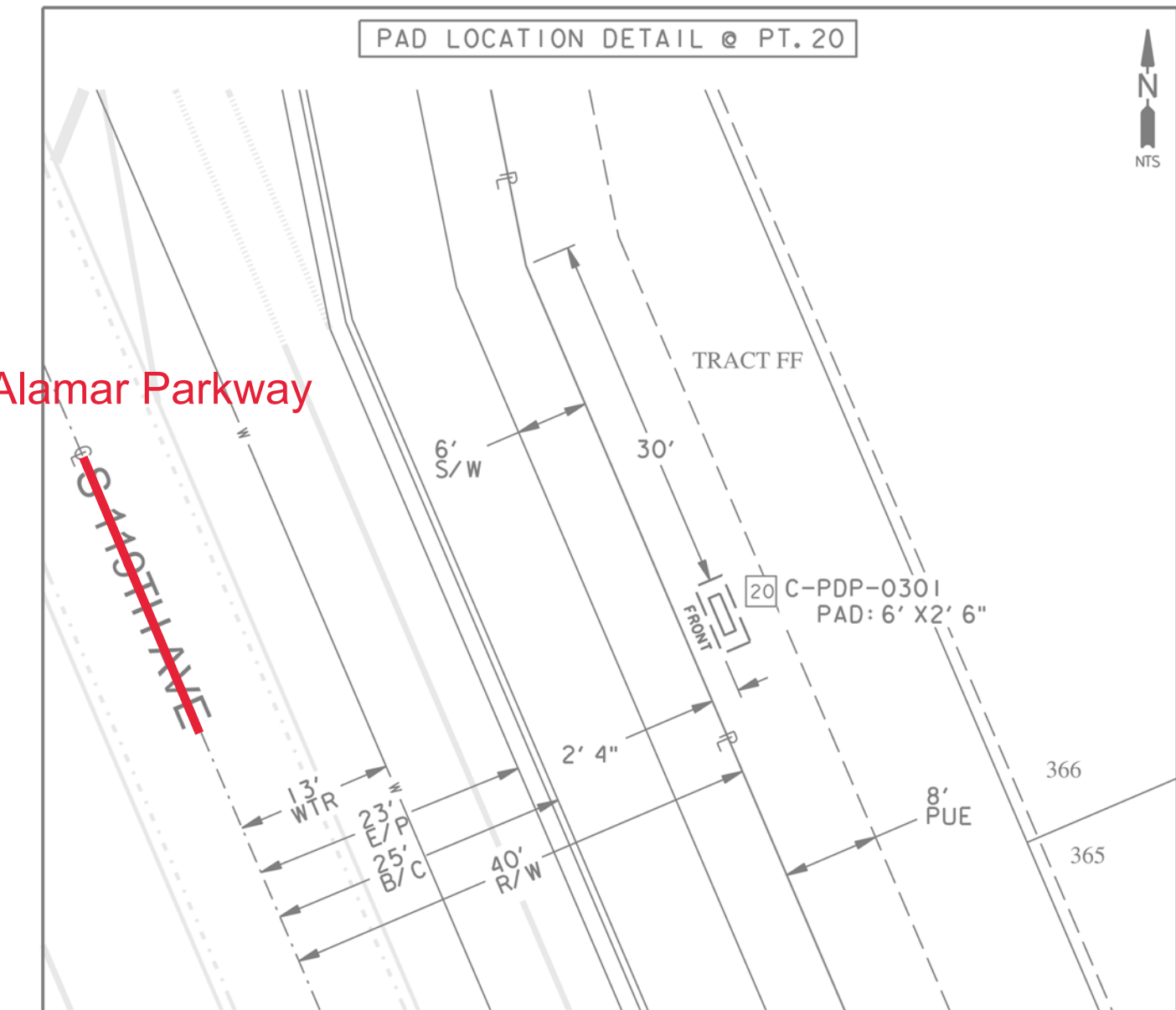
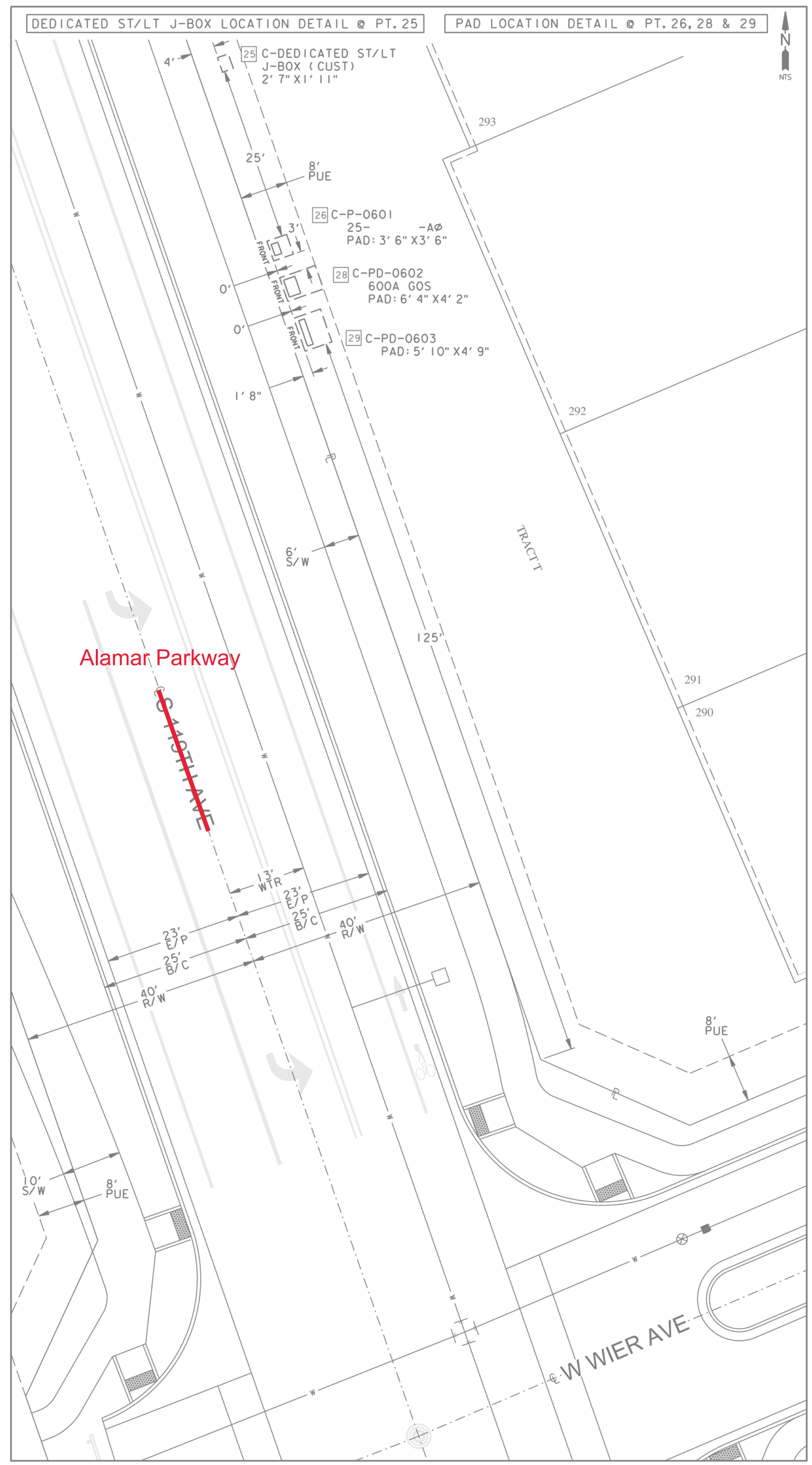
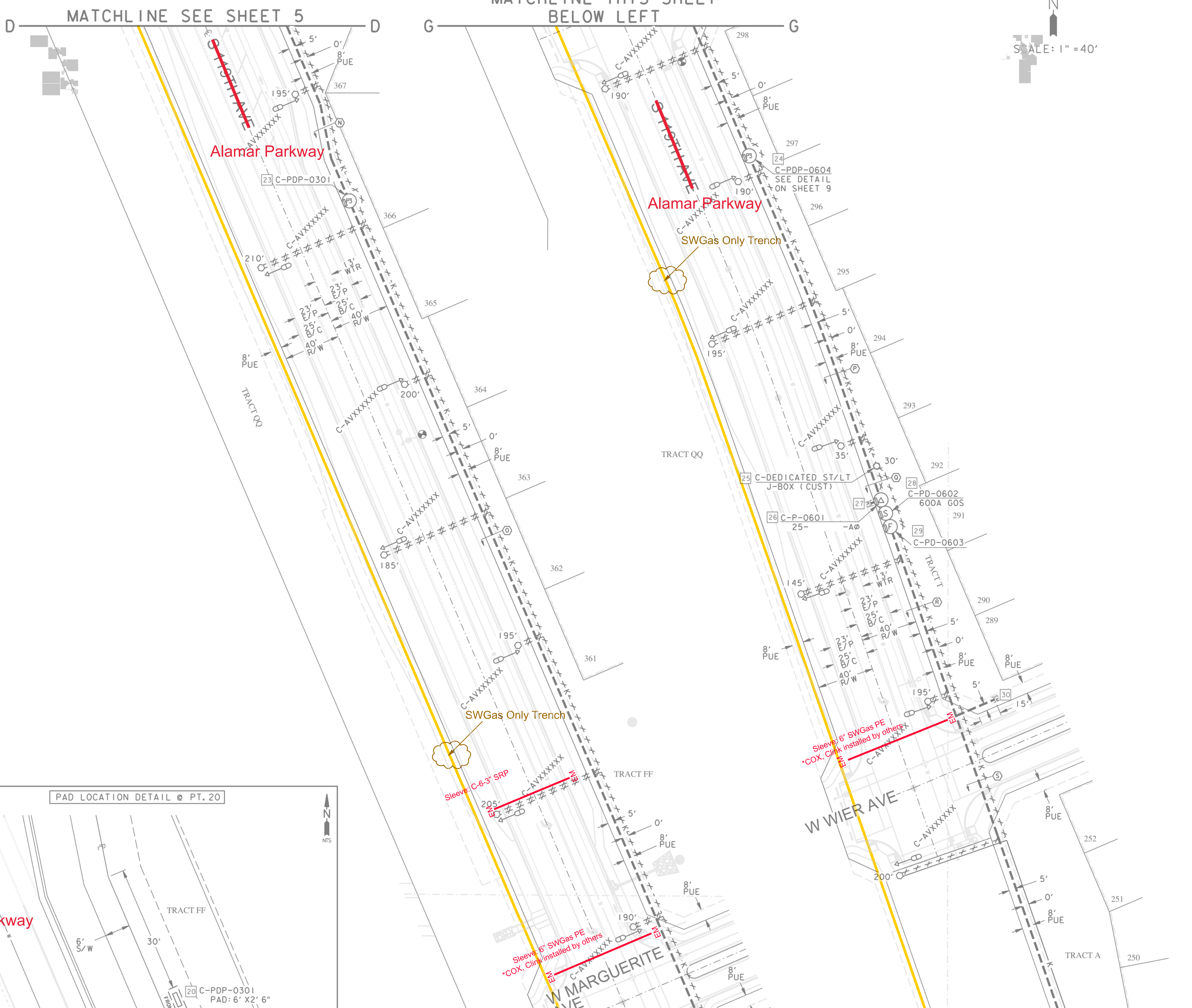
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 ADDRESS/LOCATION 3840 W WIER AVE
 CONTACT TIM POHLAD PHONE 602-460-2298
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 40/ACRE AZ-25-01 COORDS 0 1/4 W - 2N
 AMP NO T3103298 AMP VERSION _____
 COST CENTER 22640
 ROUTING CODE DDY+11

FOR CUSTOMER APPROVAL
 NOT FOR CONSTRUCTION

SHEET NUMBER 7 of 11

MAINLINE

MATCHLINE THIS SHEET BELOW LEFT



CONTACTS:
 DESIGN CONSULTANT:
 ALEX BABCOCK
 OFFICE: (602) 236-8695
 MOBILE: (602) 980-3287
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NATURAL GAS YES NO

JOB NAME ALAMAR AT LAKIN INFRASTRUCTURE
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 CONTACT TIM POHLAD PHONE 602-460-2298
 BILLING ACCT NO. _____
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 COST CENTER 22640
 ROUTING CODE DDY+11

FOR CUSTOMER APPROVAL
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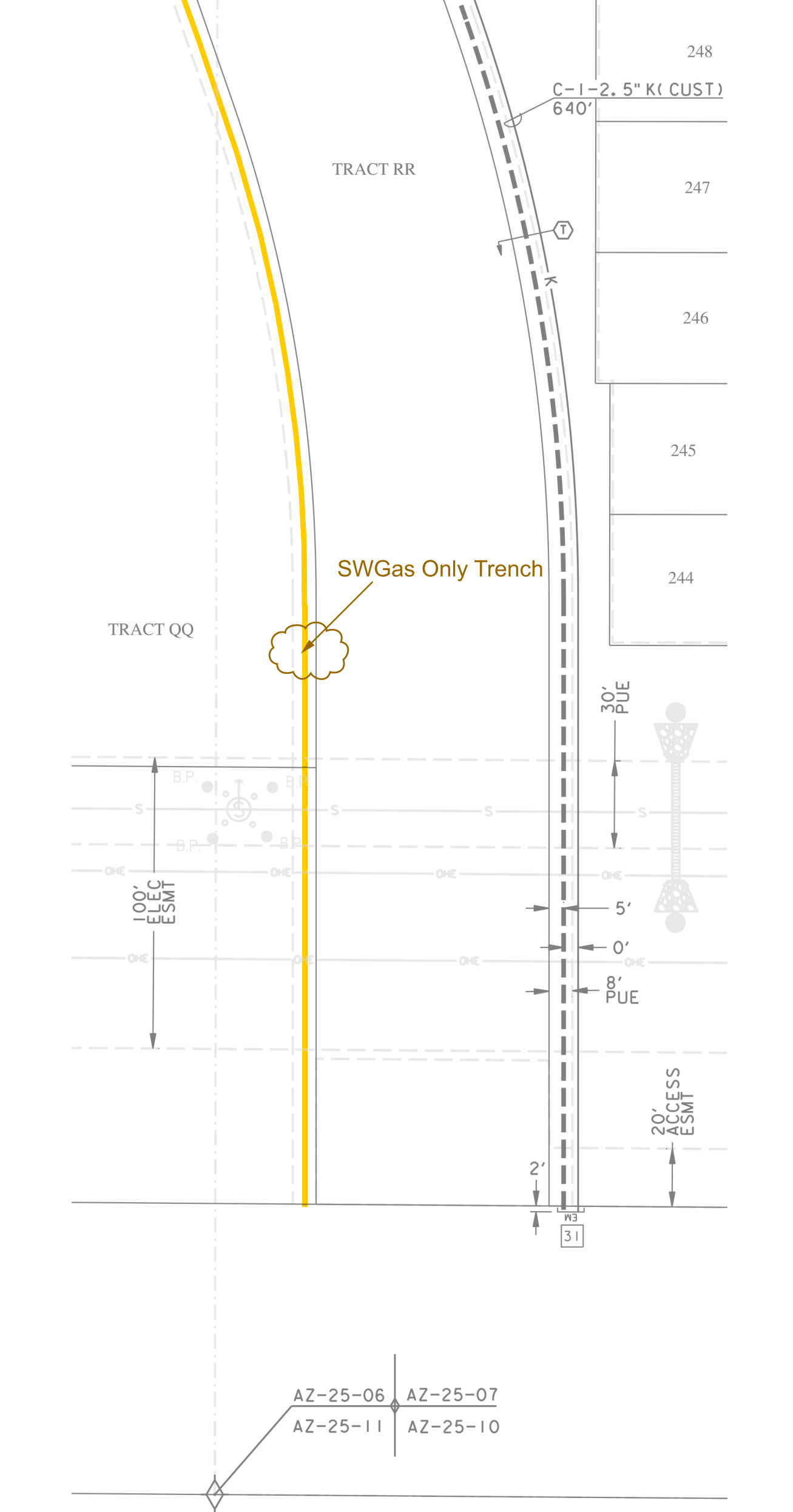
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 No. 100-1486-01
 Exp. 12/31/2024

SRP

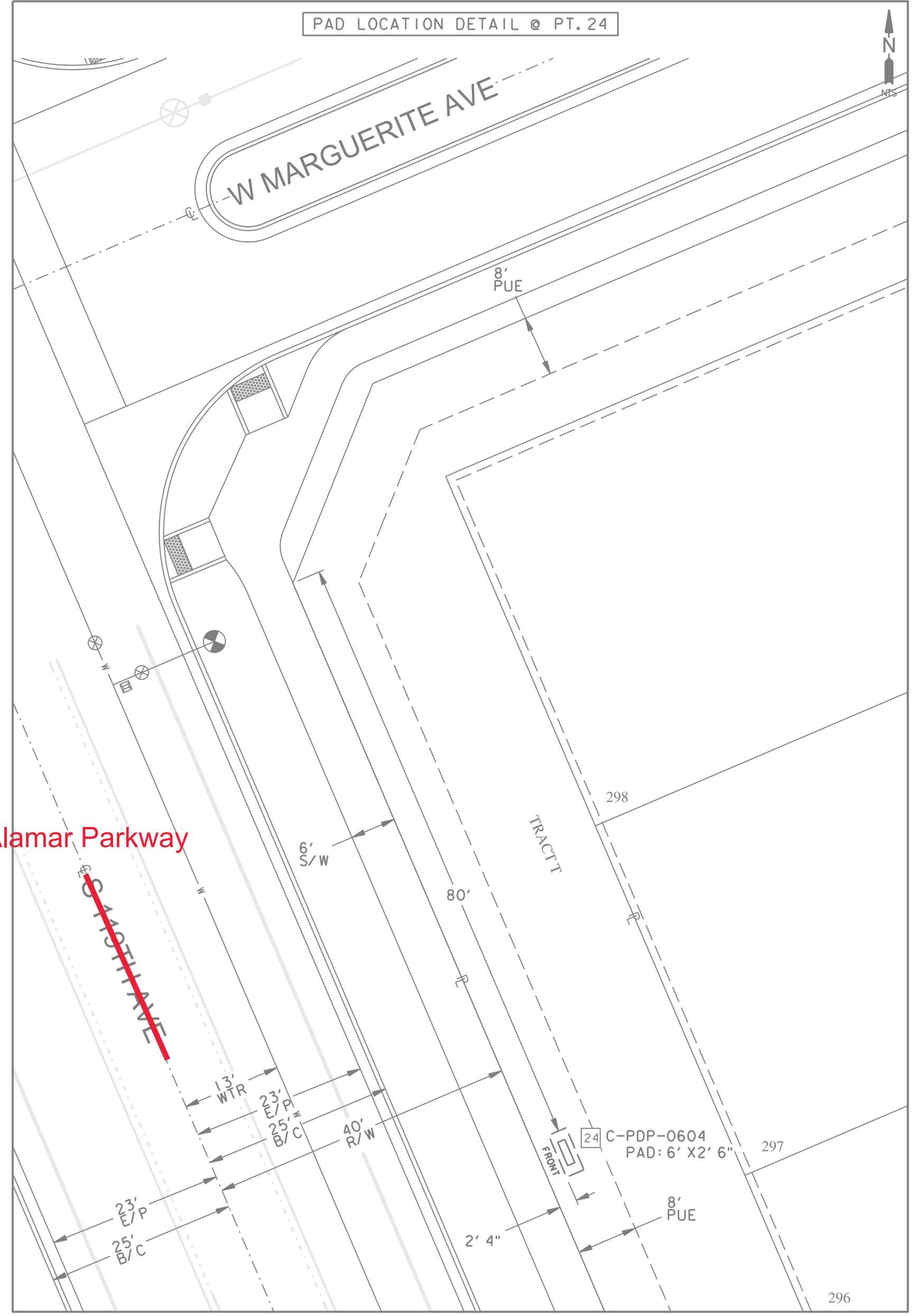
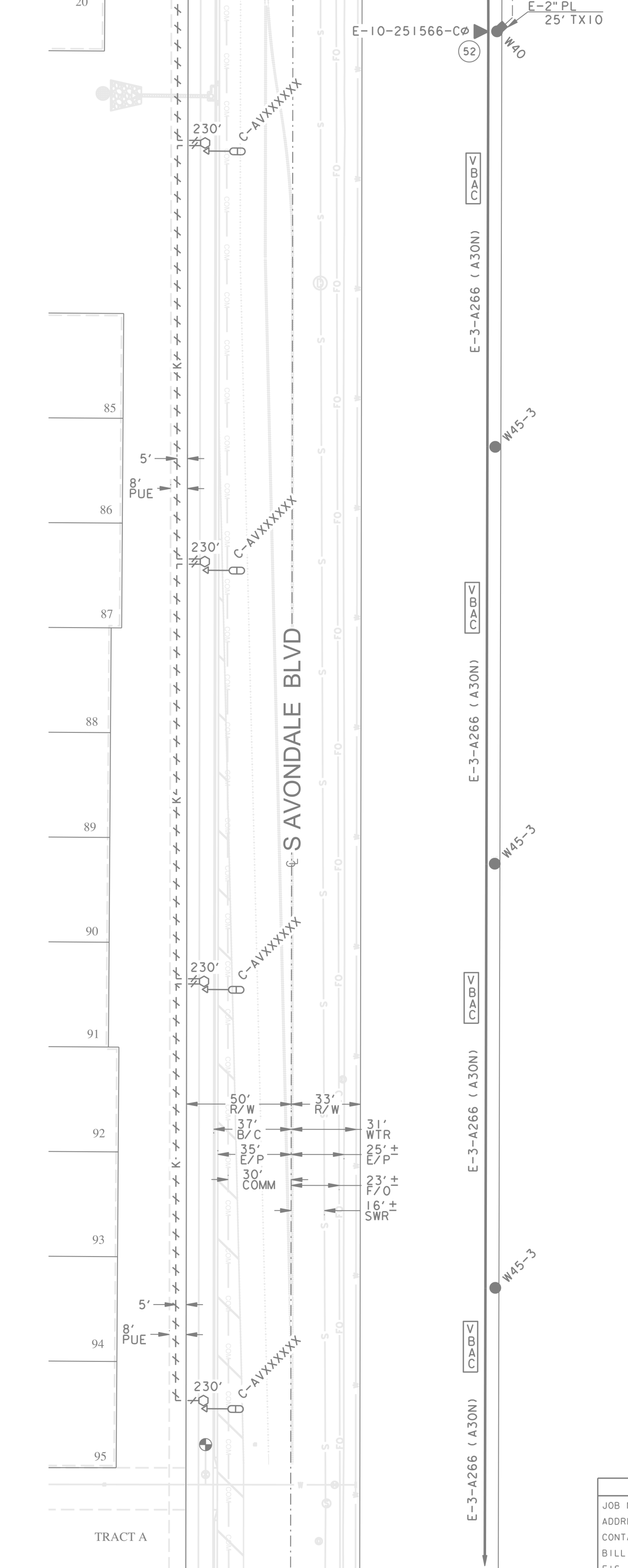
SHEET NUMBER 8 OF 11

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MATCHLINE SEE SHEET 8



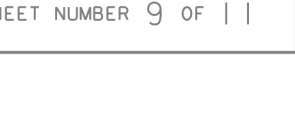
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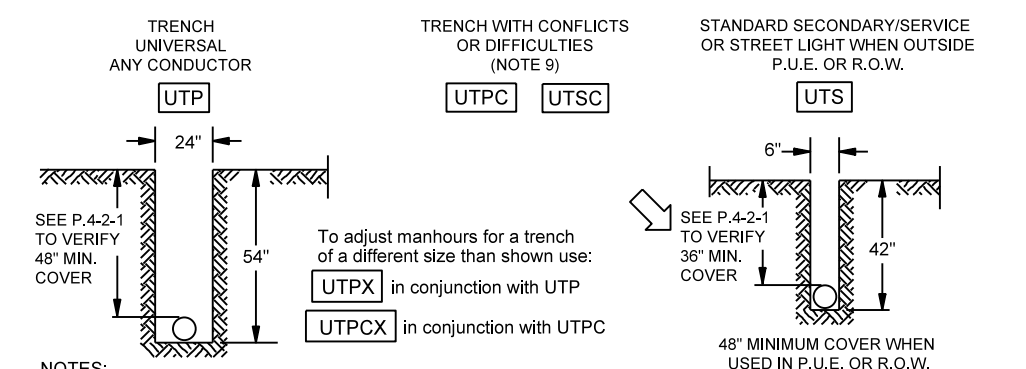


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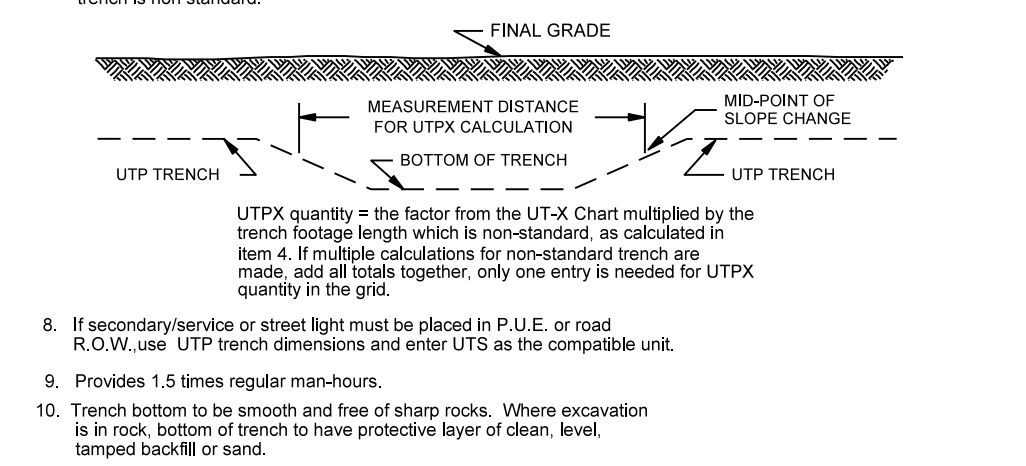
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CONTACT TIM POHLAD	PHONE 602-460-2298
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40/ACRE AZ-25-01	COORDS 0 1/4 W - 2N
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NOT FOR CONSTRUCTION

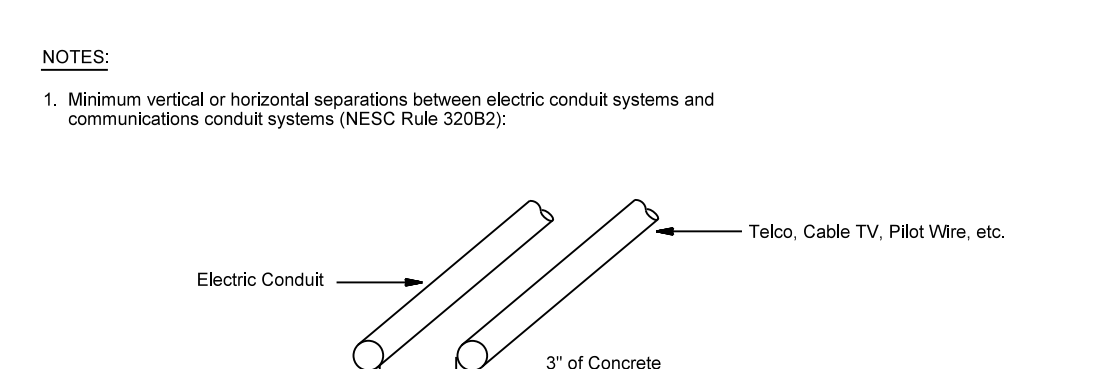




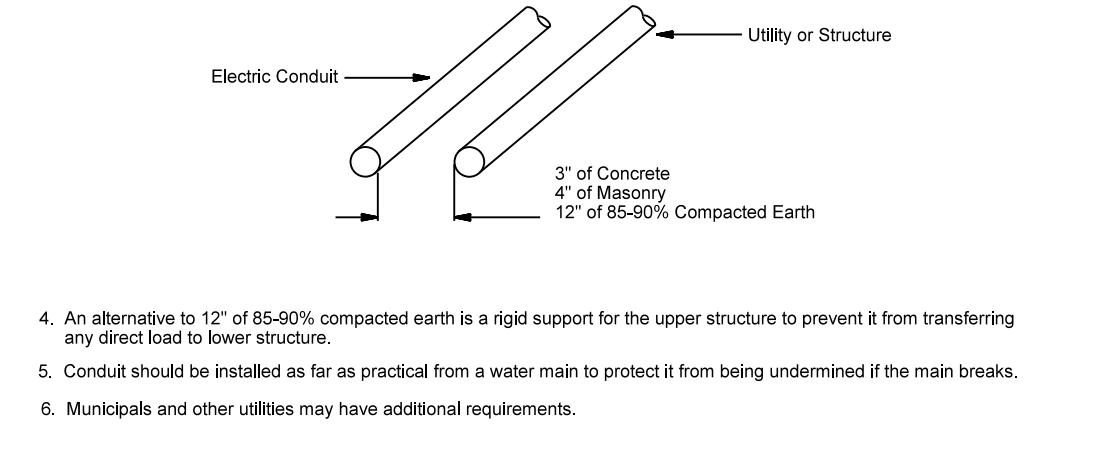
- NOTES:**
- Trench depths and conduit cover are to be measured from final grade stakes. All trench depths or conduit cover requirements specified on a job drawing shall be followed.
 - These trench codes provide man-hours for excavation only and do not provide for trench backfill.
 - The total trench footage length will be shown in the grid as standard trench, either UTP for primary or UTS for secondary, street light, or service. When trench is provided by customer, this is the only coding required on the job grid.
 - Non standard trench locations will be identified on the job order sketch with required width and depth dimensions given.
 - When trenching is provided by SRP, non standard trenches shall have 2 compatible unit codes in the grid. UTP plus the UTPX, to adjust the time for digging.
 - When specified depth cannot be obtained because of solid rock, a minimum earth cover of 24" is acceptable, provided a minimum 2" encasement of concrete surrounds the conduit.
 - Use example shown to figure length of UTPX trench, unless the entire trench is non standard.



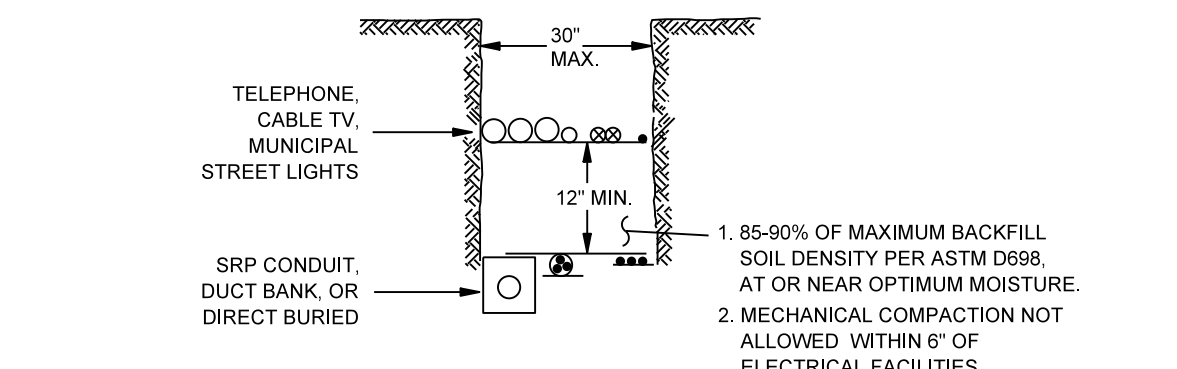
Underground Distribution Construction Standards	REV. CORRECTED TRENCH DEPTH TYPO.	Page 1 of 2
SRP	TRENCHING EXCAVATION CODES	ISSUE DATE: 01/05/87
PROPRIETARY MATERIAL	5-1-1	REV. DATE: 03/06/13 APPROVAL: B.PRIEST 8513E15.DGN



- NOTES:**
- Minimum vertical or horizontal separations between electric conduit systems and communications conduit systems (NESC Rule 320B2):
 - Minimum clearance between an electric conduit system and other existing underground structures or utilities (note 4):
 - Horizontal clearance for parallel structures (NESC Rule 320B):



Electric Service Specifications	REV. REFORMAT	Page 1 of 1
SRP	CLEARANCES UNDERGROUND CONDUIT	ISSUE DATE: 04/15/88
PROPRIETARY MATERIAL	5-3	REV. DATE: 10/25/12 APPROVAL: WEL 8509E146.DGN



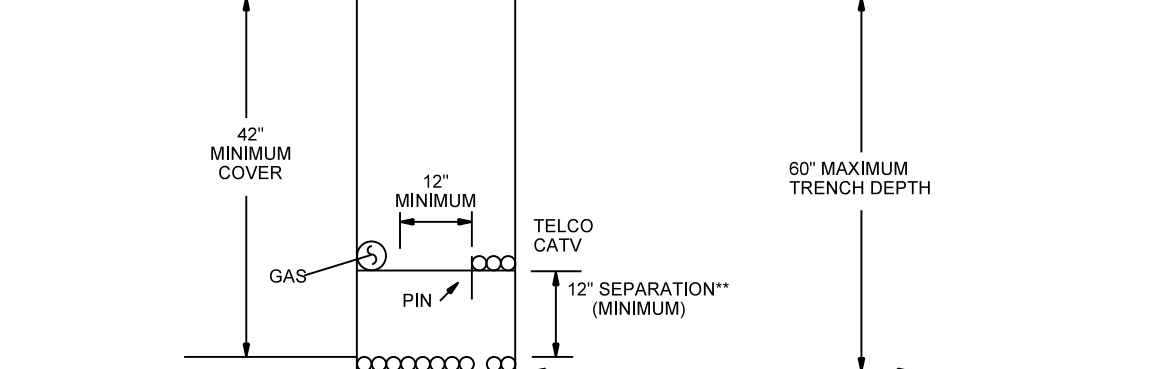
- NOTES:**
- Water and sewer are not allowed in a joint trench with SRP electrical facilities.
 - SRP electric and communications facilities shall be at the bottom of the trench.
 - Twelve inches of earth must separate electric facilities from any overlying facilities. Such earth shall be compacted to at least 85% of maximum density, per ASTM D998 (at or near optimum moisture content). Soils in the remainder of the trench must be placed and compacted as noted in the Trenching Section of the Underground Distribution Line Construction Standards.
 - Joint trench width shall not exceed 30 inches.
 - Joint trench with natural gas is acceptable as follows:

CONDUCTOR TYPE	ACCEPTABLE LOCATIONS FOR JOINT TRENCH WITH GAS
Service, Secondary and #2 Primary	All Locations in Residential Subdivisions (See pages 2-8-1 & 2-8-1)
Service, Secondary, #2 and 4/0 Primary	Commercial Private Property Only (Not in PUE)
Feeder	None - see note A.

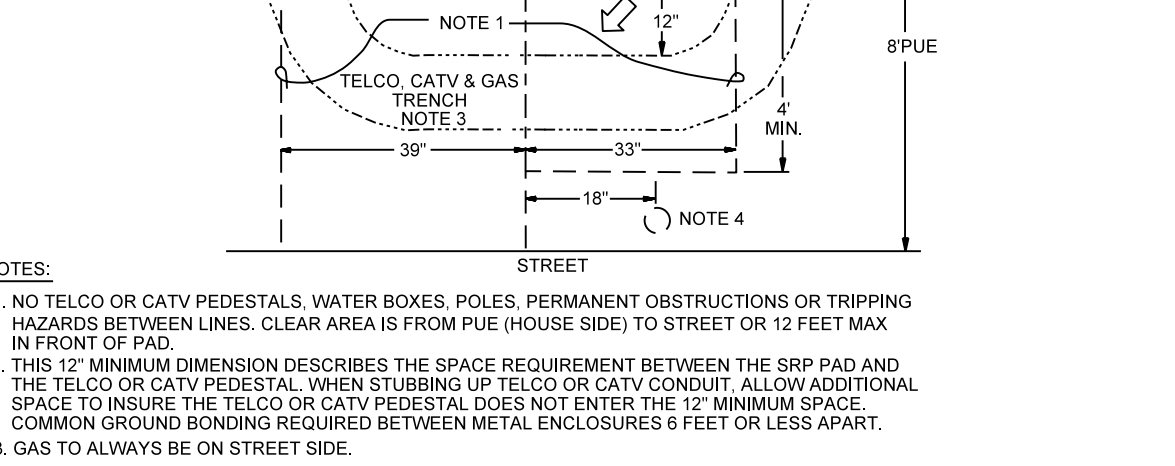
A. Joint use trench with feeder is not allowed because it presents an obstacle to future feeder access. The following acceptable alternatives will be allowed:

- A separate feeder and gas trench with a minimum of 2 feet of undisturbed earth between the two trenches.
- A shelf-type trench with 6 feet radial separation between the feeder and gas.

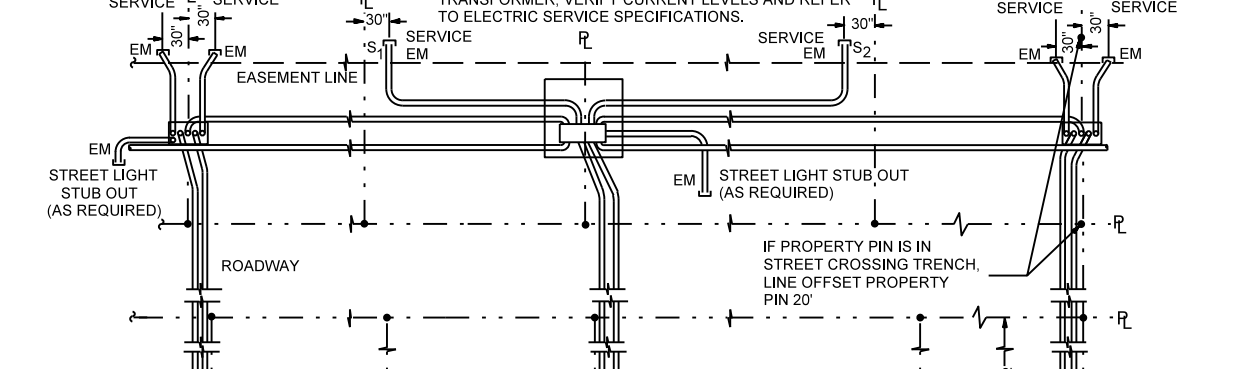
Electrical Clearance Standards	REV. REFORMAT	Page 1 of 1
SRP	UNDERGROUND CLEARANCES JOINT USE TRENCH	ISSUE DATE: 09/30/91
PROPRIETARY MATERIAL	2-1-1	REV. DATE: 11/26/12 APPROVAL: W.LARAME 8507E.DGN



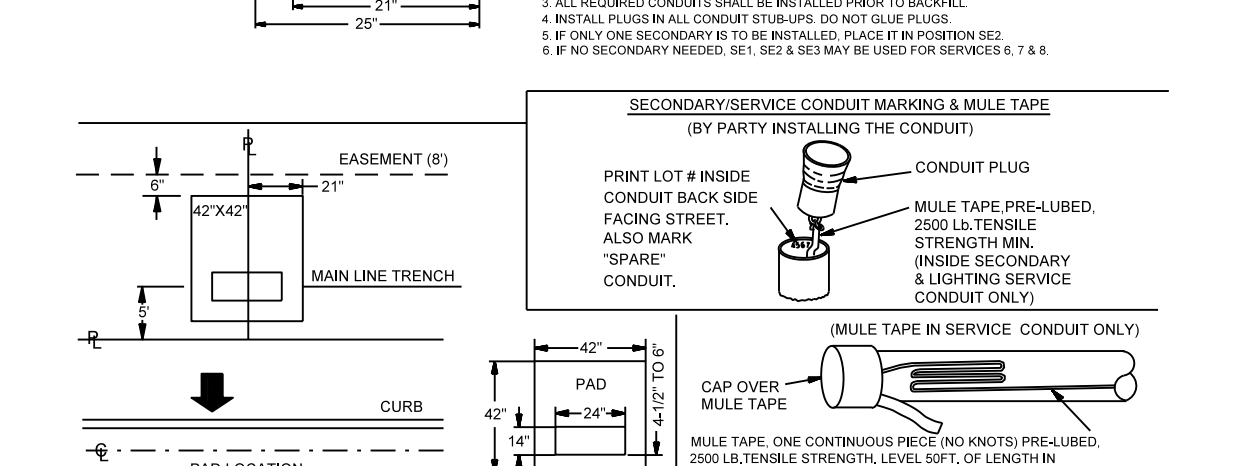
- NOTES:**
- No TELCO OR CATV PEDESTALS, WATER BOXES, POLES, PERMANENT OBSTRUCTIONS OR TRIPPING HAZARDS BETWEEN LINES. CLEAR AREA IS FROM PUE (HOUSE SIDE) TO STREET OR 12 FEET MAX IN FRONT OF PAD.
 - THIS 12" MINIMUM DIMENSION DESCRIBES THE SPACE REQUIREMENT BETWEEN THE SRP PAD AND THE TELCO OR CATV PEDESTAL. WHEN STUBBING TELCO OR CATV CONDUIT, ALLOW ADDITIONAL SPACE TO INSURE THE TELCO OR CATV PEDESTAL DOES NOT ENTER THE 12" MINIMUM SPACE. COMMON GROUND BONDING REQUIRED BETWEEN METAL ENCLOSURES 6 FEET OR LESS APART.
 - GAS TO ALWAYS BE ON STREET SIDE.
 - IF A LIGHT POLE OR OTHER UTILITY IS REQUIRED IN THIS AREA, IT IS PREFERRED THAT IT BE INSTALLED A MINIMUM OF 18" FROM THE PROPERTY LINE.



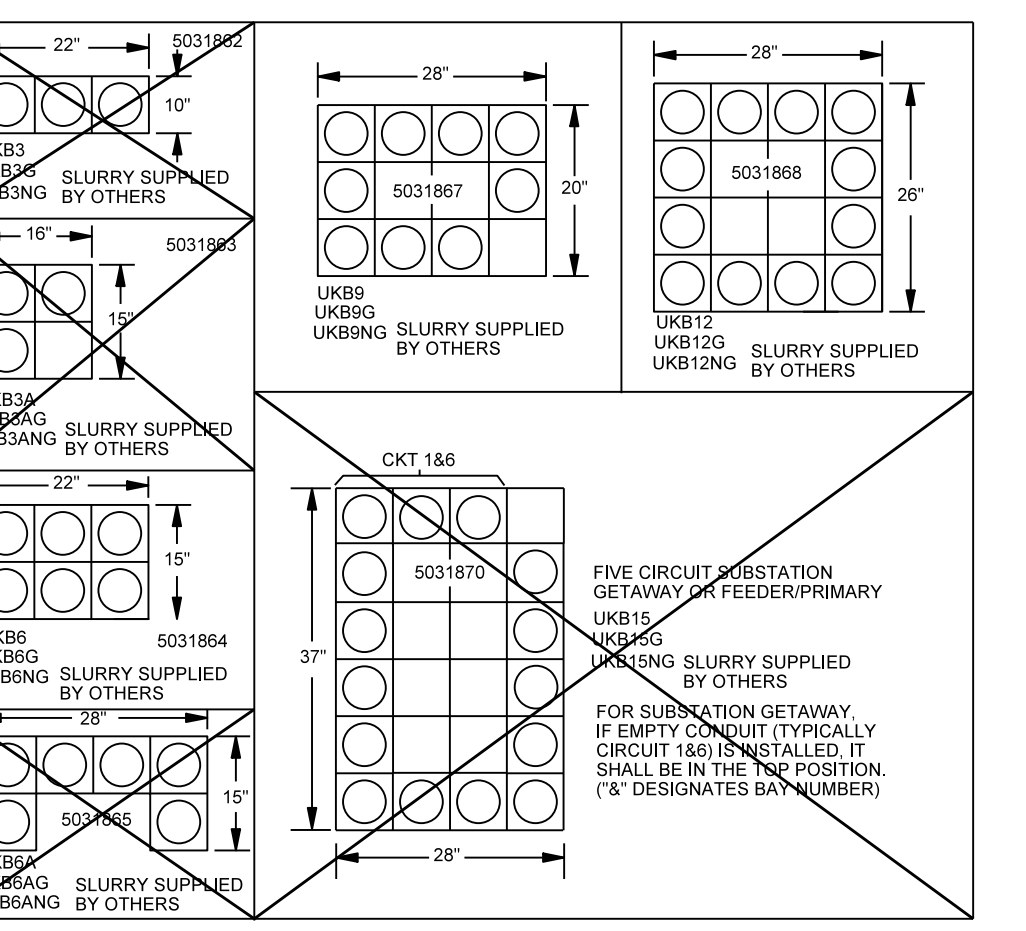
Electrical Clearance Standards	REV. REFORMAT	Page 1 of 1
SRP	UNDERGROUND CLEARANCES MAIN LINE TRENCH RESIDENTIAL SUBDIVISIONS	ISSUE DATE: 07/26/01
PROPRIETARY MATERIAL	2-3-1	REV. DATE: 07/26/13 APPROVAL: W.LARAME 8507E9.DGN



- NOTES:**
- CONNECT GROUND ROD TO TRANSFORMER GROUND LUG WITH #4 CU WIRE.
 - USE OF GROUND ROD AND ALL CONDUITS ARE TO BE 6 INCHES ABOVE FINAL GRADE FOR ALL CONDUITS.
 - ALL REQUIRED CONDUITS SHALL BE INSTALLED PRIOR TO BACKFILL.
 - INSTALL FLEXIBLE JUNCTION FITTINGS. DO NOT USE RIGID.
 - IF ONLY ONE SECONDARY IS TO BE INSTALLED, PLACE IT IN POSITION #2.
 - IF NO SECONDARY NEEDED, SET #2 & #3 MAY BE USED FOR PUE PER 2.1 & 2.2.

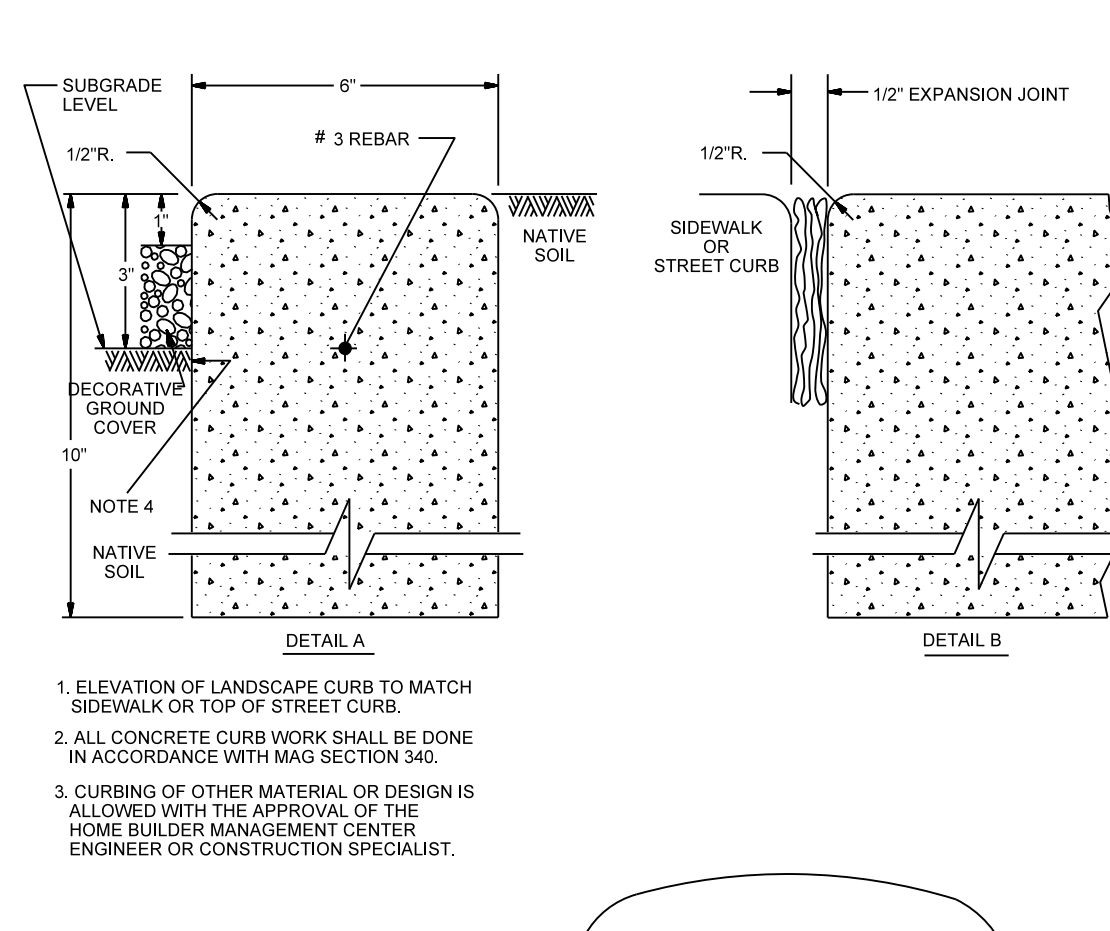


Underground Distribution Construction Standards	REV. REFORMAT	Page 1 of 6
SRP	TRANSFORMERS SINGLE PHASE RESIDENTIAL TRANSFORMER PAD CONDUIT STUB-UP DETAIL WITH ABOVE GROUND JUNCTION BOXES (BACK OF PUE)	ISSUE DATE: 04/30/93
PROPRIETARY MATERIAL	9-11-1	REV. DATE: 09/28/12 APPROVAL: B.PRIEST 8513E10.DGN



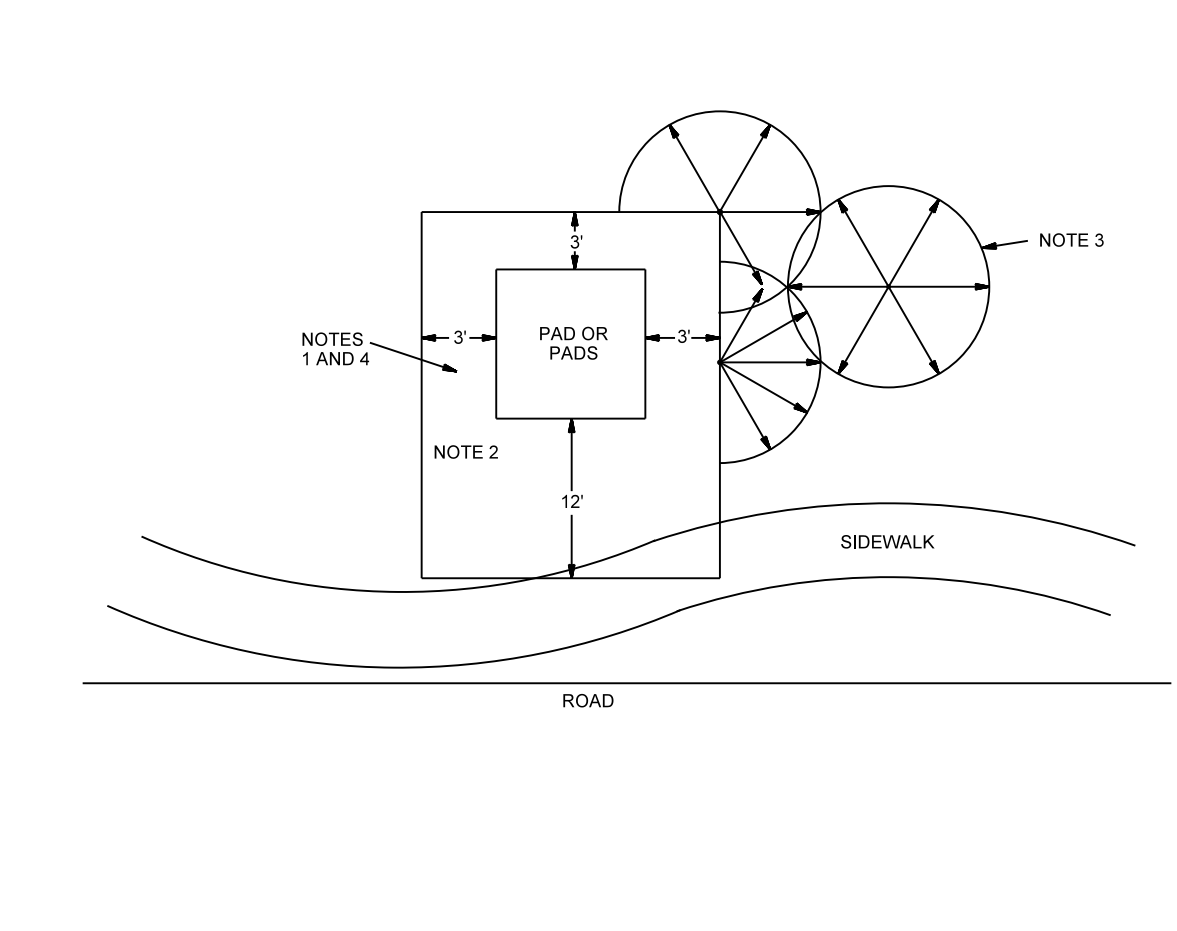
- NOTES:**
- A #2 COPPER NEUTRAL WILL BE REQUIRED WITH DUCT BANKS FROM A SUBSTATION OUT TO THE TERMINATION OR SPLICE POINT AS SPECIFIED BY DESIGNER. SEE PAGE 4-13-2 FOR #2 COPPER INSTALLATION INSTRUCTION.
 - ALL UKB CONDUIT BANKS CONSIST OF 3" CONDUITS WITH A MINIMUM OF 2 IN CONTROLLED LOW STRENGTH MATERIAL (1- 1/2 SACKS CEMENT/TYO.) ENCASING AND WILL HAVE SPACERS LOCATED AT 6 FT INTERVALS.
 - ADD "F" TO CONDUIT BANK CODE WHEN ENCASING WITH FULL STRENGTH CONCRETE.
 - ADD SUFFIX "FE" TO GET ENCASING WITH FULL STRENGTH RED CONCRETE. (EL PASO GAS CROSSING)
 - CONDUIT CONFIGURATIONS OTHER THAN THOSE SHOWN MUST BE SPECIFIED BY DESIGNER ON SKETCH. INNER SPACES OF [UKB12], [UKB15], [UKB18], [UKB21], [UKB24], [UKB27], [UKB30], [UKB33], [UKB36], [UKB39], [UKB42], [UKB45], [UKB48], [UKB51], [UKB54], [UKB57], [UKB60], [UKB63], [UKB66], [UKB69], [UKB72], [UKB75], [UKB78], [UKB81], [UKB84], [UKB87], [UKB90], [UKB93], [UKB96], [UKB99], [UKB102], [UKB105], [UKB108], [UKB111], [UKB114], [UKB117], [UKB120], [UKB123], [UKB126], [UKB129], [UKB132], [UKB135], [UKB138], [UKB141], [UKB144], [UKB147], [UKB150], [UKB153], [UKB156], [UKB159], [UKB162], [UKB165], [UKB168], [UKB171], [UKB174], [UKB177], [UKB180], [UKB183], [UKB186], [UKB189], [UKB192], [UKB195], [UKB198], [UKB201], [UKB204], [UKB207], [UKB210], [UKB213], [UKB216], [UKB219], [UKB222], [UKB225], [UKB228], [UKB231], [UKB234], [UKB237], [UKB240], [UKB243], [UKB246], [UKB249], [UKB252], [UKB255], [UKB258], [UKB261], [UKB264], [UKB267], [UKB270], [UKB273], [UKB276], [UKB279], [UKB282], [UKB285], [UKB288], [UKB291], [UKB294], [UKB297], [UKB300], [UKB303], [UKB306], [UKB309], [UKB312], [UKB315], [UKB318], [UKB321], [UKB324], [UKB327], [UKB330], [UKB333], [UKB336], [UKB339], [UKB342], [UKB345], [UKB348], [UKB351], [UKB354], [UKB357], [UKB360], [UKB363], [UKB366], [UKB369], [UKB372], [UKB375], [UKB378], [UKB381], [UKB384], [UKB387], [UKB390], [UKB393], [UKB396], [UKB399], [UKB402], [UKB405], [UKB408], [UKB411], [UKB414], [UKB417], [UKB420], [UKB423], [UKB426], [UKB429], [UKB432], [UKB435], [UKB438], [UKB441], [UKB444], [UKB447], [UKB450], [UKB453], [UKB456], [UKB459], [UKB462], [UKB465], [UKB468], [UKB471], [UKB474], [UKB477], [UKB480], [UKB483], [UKB486], [UKB489], [UKB492], [UKB495], [UKB498], [UKB501], [UKB504], [UKB507], [UKB510], [UKB513], [UKB516], [UKB519], [UKB522], [UKB525], [UKB528], [UKB531], [UKB534], [UKB537], [UKB540], [UKB543], [UKB546], [UKB549], [UKB552], [UKB555], [UKB558], [UKB561], [UKB564], [UKB567], [UKB570], [UKB573], [UKB576], [UKB579], [UKB582], [UKB585], [UKB588], [UKB591], [UKB594], [UKB597], [UKB600], [UKB603], [UKB606], [UKB609], [UKB612], [UKB615], [UKB618], [UKB621], [UKB624], [UKB627], [UKB630], [UKB633], [UKB636], [UKB639], [UKB642], [UKB645], [UKB648], [UKB651], [UKB654], [UKB657], [UKB660], [UKB663], [UKB666], [UKB669], [UKB672], [UKB675], [UKB678], [UKB681], [UKB684], [UKB687], [UKB690], [UKB693], [UKB696], [UKB699], [UKB702], [UKB705], [UKB708], [UKB711], [UKB714], [UKB717], [UKB720], [UKB723], [UKB726], [UKB729], [UKB732], [UKB735], [UKB738], [UKB741], [UKB744], [UKB747], [UKB750], [UKB753], [UKB756], [UKB759], [UKB762], [UKB765], [UKB768], [UKB771], [UKB774], [UKB777], [UKB780], [UKB783], [UKB786], [UKB789], [UKB792], [UKB795], [UKB798], [UKB801], [UKB804], [UKB807], [UKB810], [UKB813], [UKB816], [UKB819], [UKB822], [UKB825], [UKB828], [UKB831], [UKB834], [UKB837], [UKB840], [UKB843], [UKB846], [UKB849], [UKB852], [UKB855], [UKB858], [UKB861], [UKB864], [UKB867], [UKB870], [UKB873], [UKB876], [UKB879], [UKB882], [UKB885], [UKB888], [UKB891], [UKB894], [UKB897], [UKB900], [UKB903], [UKB906], [UKB909], [UKB912], [UKB915], [UKB918], [UKB921], [UKB924], [UKB927], [UKB930], [UKB933], [UKB936], [UKB939], [UKB942], [UKB945], [UKB948], [UKB951], [UKB954], [UKB957], [UKB960], [UKB963], [UKB966], [UKB969], [UKB972], [UKB975], [UKB978], [UKB981], [UKB984], [UKB987], [UKB990], [UKB993], [UKB996], [UKB999].
 - THESE CONDUIT BANKS WITH THE EXCEPTION OF SUBSTATION GET-AWAYS, MAY BE ROTATED 90 OR 180 DEGREES AS SPECIFIED BY DESIGNER.
 - WHEN TRENCHING UNDER EXISTING CONDUIT BANKS REFER TO UKB25 FOR SUPPORTING SPECIFICATIONS (PG. 4-15-1).
 - THE ABOVE DIMENSIONS ARE NOMINAL OVERALL FOR DETERMINING TRENCH DIMENSIONS.
 - INDIVIDUAL CONDUITS ARE NOT TO BE ENCIRCLED WITH STEEL SUCH AS WIRE OR REBAR AS EXCESSIVE HEATING WILL RESULT. ENCIRCLEMENT AROUND ENTIRE DUCT BANK IS PERMISSIBLE.
 - REFER TO CLEARANCE SECTION FOR MINIMUM COVER OF A DUCT BANK INSTALLED IN ROAD RIGHT OF WAYS.
 - ON SUBSTATION GET-AWAYS DESIGNATE TOP ROW OF CONDUIT TO BE IN TOP WINDOW OF MANHOLE.

Underground Distribution Construction Standards	REV. UPDATED STOCK CODES	Page 1 of 2
SRP	CONDUIT FEEDER OR PRIMARY 3" CONDUIT BANK SPECIFICATION CODES	ISSUE DATE: 01/15/87
PROPRIETARY MATERIAL	4-13-1	REV. DATE: 11/20/14 APPROVAL: B.PRIEST 8513E15.DGN



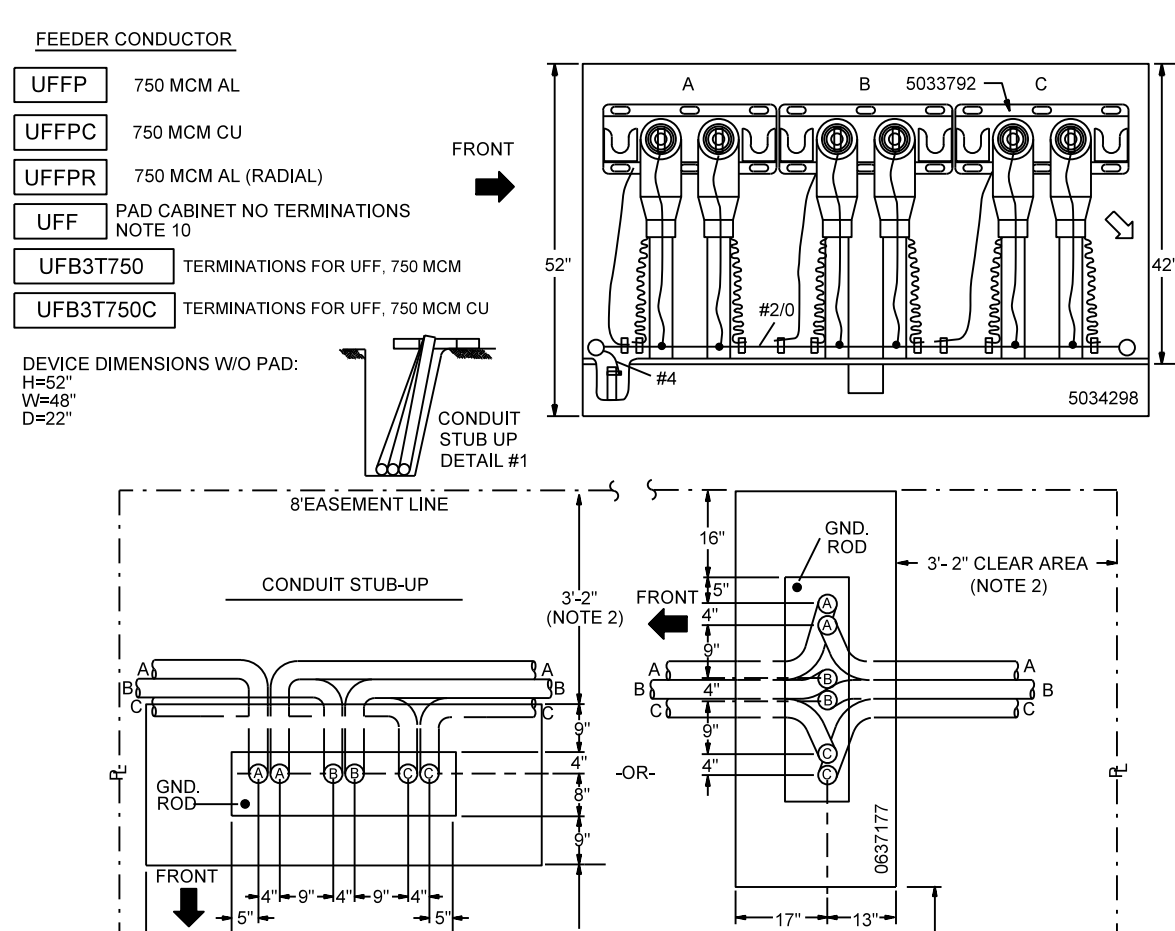
- NOTES:**
- ELEVATION OF LANDSCAPE CURB TO MATCH SIDEWALK OR TOP OF STREET CURB.
 - ALL CONCRETE CURB WORK SHALL BE DONE IN ACCORDANCE WITH MASS SECTION 310.
 - CURBING OF OTHER MATERIAL OR DESIGN IS ALLOWED WITH THE APPROVAL OF THE HOME BUILDER MANAGEMENT CENTER ENGINEER OR CONSTRUCTION SPECIALIST.

Underground Distribution Construction Standards	REV. CHANGED PAGE NUMBER	Page 1 of 1
SRP	LANDSCAPING DRY-LANDSCAPE BORDER DETAILS	ISSUE DATE: 02/15/02
PROPRIETARY MATERIAL	10-1-1	REV. DATE: 08/07/12 APPROVAL: B.PRIEST 8513E32.DGN



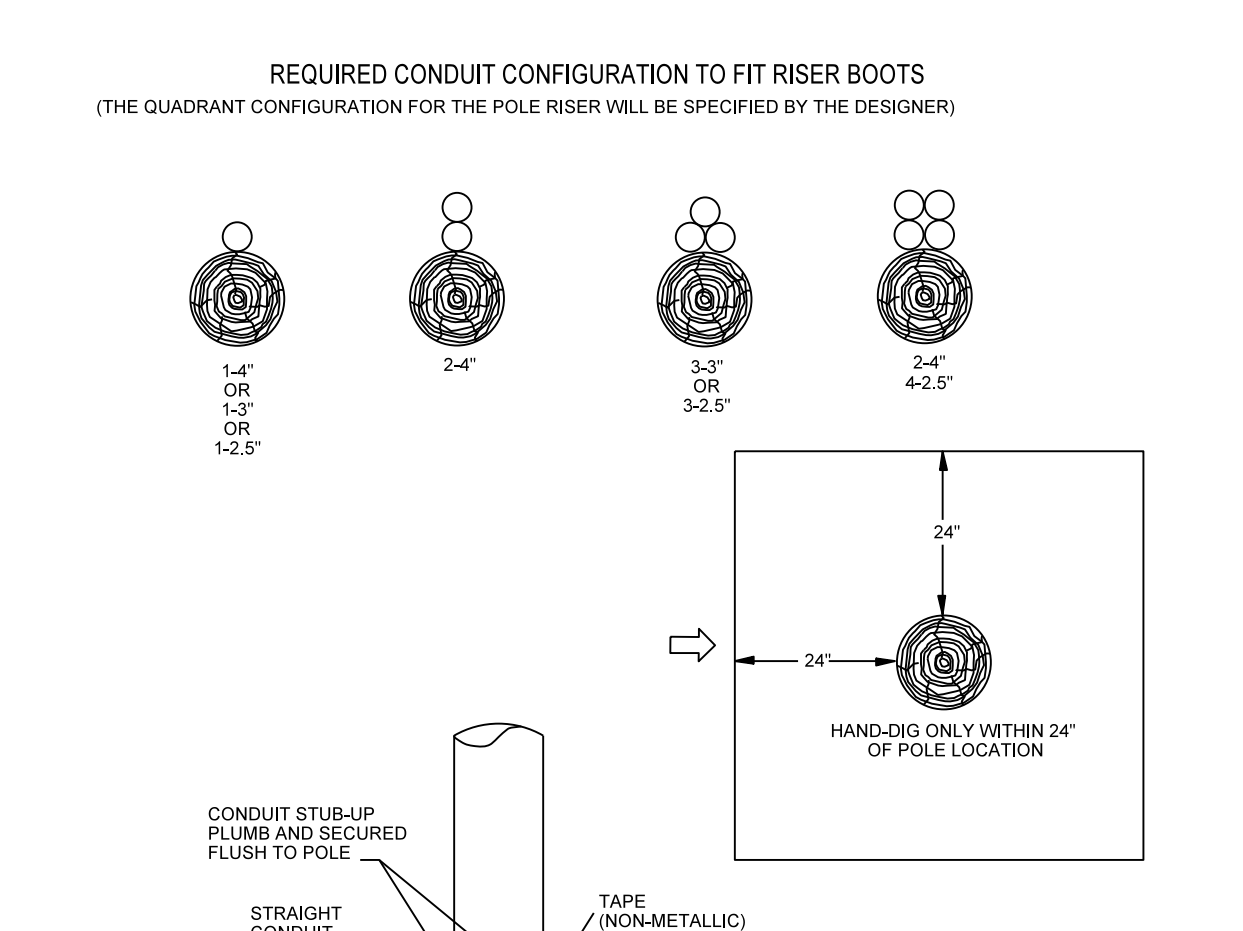
- NOTES:**
- EASEMENT GRANTOR SHALL MAINTAIN A CLEAR AREA THAT EXTENDS 3 FEET FROM AND AROUND ALL EDGES OF ALL TRANSFORMER PADS AND OTHER EQUIPMENT PADS AND A CLEAR OPERATIONAL AREA THAT EXTENDS 12 FEET IMMEDIATELY IN FRONT OF ALL TRANSFORMER AND OTHER EQUIPMENT OPENINGS. NO OBSTRUCTION, TREES, SHRUBS, FIXTURES OR PERMANENT STRUCTURES SHALL BE PLACED WITHIN SAID AREAS.
 - AREA TO BE DRY LANDSCAPED.
 - SPRINKLER HEADS SHALL BE DIRECTED AWAY FROM PAD MOUNTED EQUIPMENT. AS SHOWN ABOVE. SPRINKLER HEADS SHALL NOT SPRAY ON PAD MOUNTED EQUIPMENT OR DRY LANDSCAPED AREA AROUND EQUIPMENT.
 - DRY LANDSCAPE SURFACE MAY BE CRUSHED GRANITE OR GRAVEL WITH A MAXIMUM PARTICLE SIZE NO GREATER THAN 1". NATIVE SOIL, CONCRETE OR ASPHALT PAVEMENT.
 - SEE PG. 10-1-1 FOR LANDSCAPE BORDER IF REQUIRED.

Underground Distribution Construction Standards	REV. CHANGED PAGE NUMBER, DELETED NOTE 6.	Page 1 of 1
SRP	LANDSCAPING DRY-LANDSCAPE CONTROLLED AREA DETAIL	ISSUE DATE: 02/20/02
PROPRIETARY MATERIAL	10-2-1	REV. DATE: 08/28/12 APPROVAL: B.PRIEST 8513E32.DGN



- NOTES:**
- INSTALL GROUND CONNECTORS INTO ENCLOSURE GROUNDING NUTS. TRAIN #20 CU ALONG FRONT BASE OF ENCLOSURE AND CONNECT TO GROUND CONNECTORS. GROUND JUNCTION BASE TO #20 USING #6 CU.
 - CLEAR SPACE PROVIDED FOR POSSIBLE FUTURE SWITCH REPLACEMENT.
 - INSTALL GROUND ROD SO IT DOES NOT INTERFERE WITH CONDUITS. CONNECT #4 CU LEAD FROM GROUND ROD TO GROUND CONNECTOR.
 - TRAIN CONCENTRIC NEUTRAL WIRES DOWN ALONG CABLES AND CONNECT TO #20 CU BUS USING COMPRESSION CONNECTORS. CONNECT GROUND LEADS FROM INSULATED BUSHING CAPS TO #20 CU USING SPLIT BOLTS.
 - WHEN ADDING FEEDER TERMINATIONS TO RADIAL INSTALLATION USE THREE UFB7500.
 - FOR USE ON 500 MCM FEEDER. CHANGE T-BODY CONNECTOR AND CABLE ADAPTER.
 - CONDUIT STUB-UP TEMPLATE IS SRP STOCK # 5031743.
 - IF PULLING ENCLOSURE IS CHANGED OUT WITH A SWITCH, THE LEFT-MOST TERMINATION OF EACH PHASE WILL BE RE-TERMINATED ON THE BOTTOM BUSHINGS OF THE SWITCH.
 - TOP OF PAD SHALL BE 4" MINIMUM ABOVE SURROUNDING FINISH GRADE AND AT SUFFICIENT ELEVATION TO PREVENT FLOODING.
 - #20 COPPER GROUNDS BROUGHT UP INTO CABINET MUST BE LOOPED TO MAINTAIN SYSTEM GROUND CONTINUITY.

Underground Distribution Construction Standards	REV. UPDATED STOCK CODES	Page 1 of 1
SRP	SWITCHING AND FUSING 750 MCM FEEDER PULLING ENCLOSURE	ISSUE DATE: 04/30/93
PROPRIETARY MATERIAL	3-2-1	REV. DATE: 07/28/13 APPROVAL: B.PRIEST 8513E18.DGN



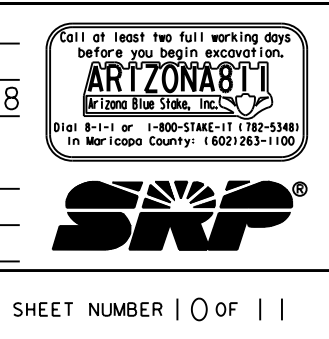
- NOTES:**
- CONDUIT STUB-UP PLUMBS AND SECURED FLUSH TO POLE.
 - STRAIGHT CONDUIT.
 - TAPE (NON-METALLIC).
 - FINAL GRADE.
 - COUPLING.
 - 24" HAND-DIG ONLY.
 - 24" HAND-DIG ONLY.
 - DO NOT DISTURB COMPACTION SOIL IN THIS AREA.
 - PRIMARY CONDUIT/ SECONDARY CONDUIT 36" RADIUS 90 DEGREE ELBOW (BELOW GRADE).

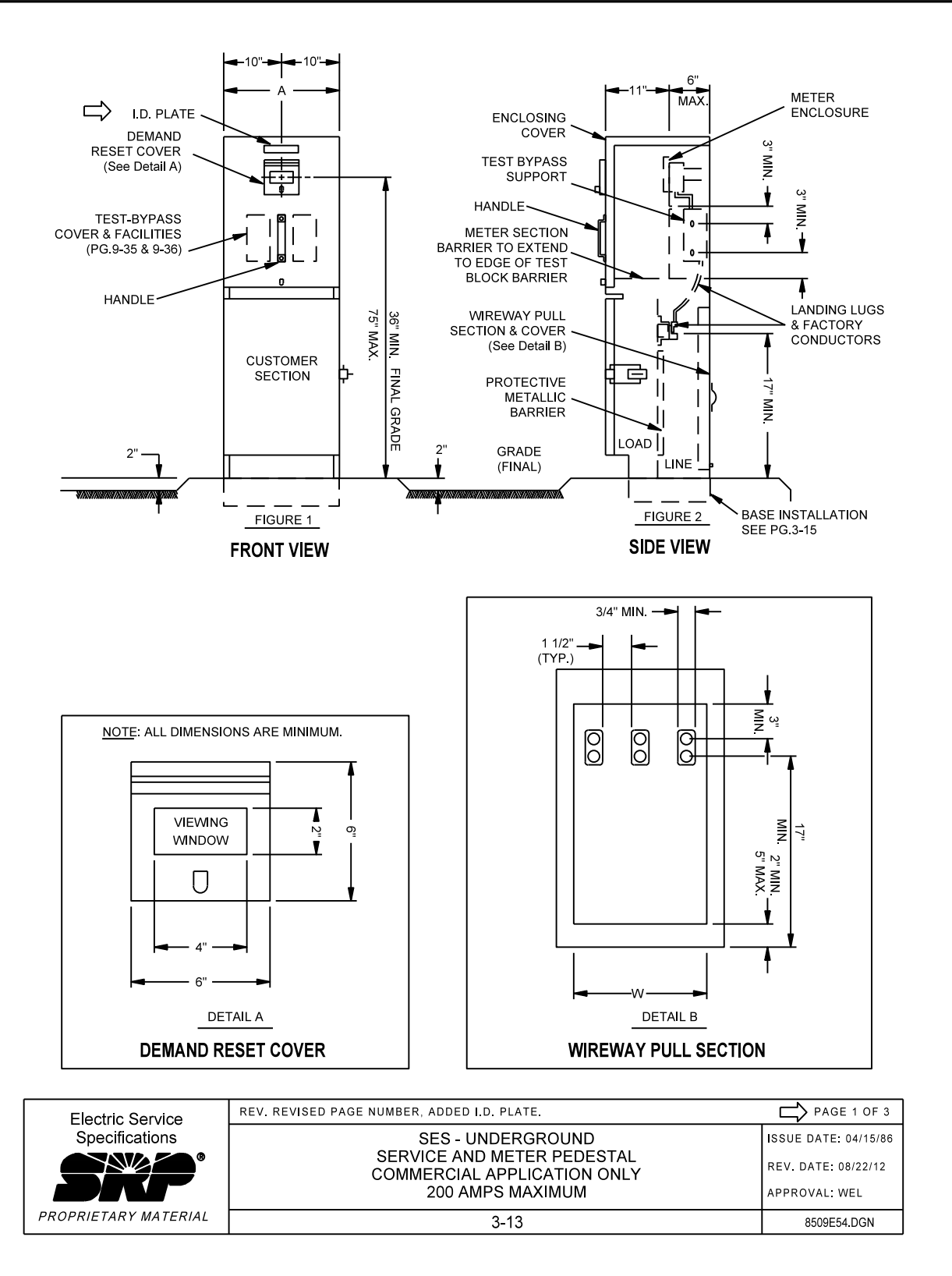
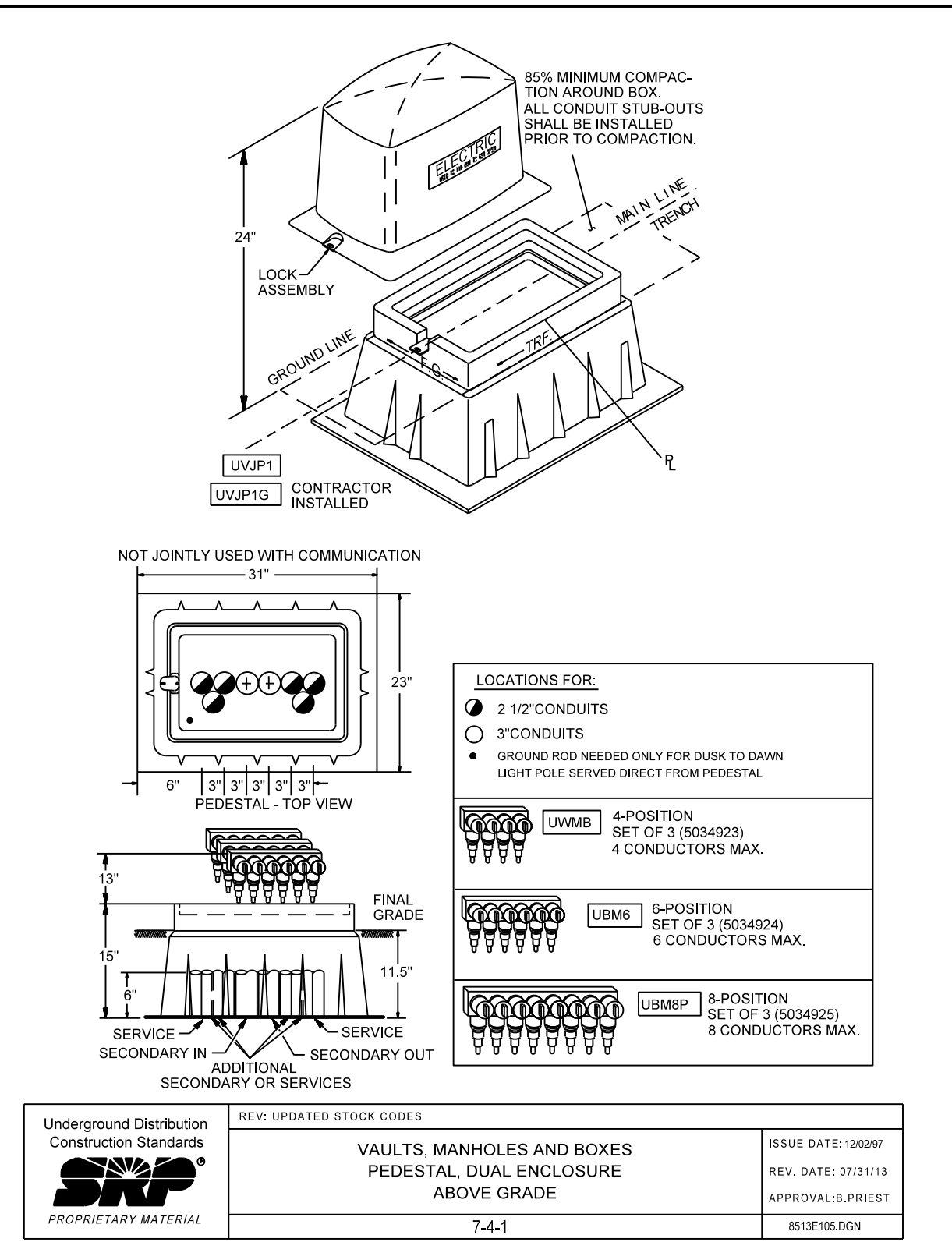
Electric Service Specifications	REV. "HAND-DIG ONLY" DETAIL ADDED.	Page 1 of 1
SRP	TRENCHING AND CONDUIT POLE RISER ELBOW AND LOCATION	ISSUE DATE: 09/01/09
PROPRIETARY MATERIAL	6-4	REV. DATE: 10/14/15 APPROVAL: N.SABBAH 8509E10.DGN

DETAILS PERTAINING TO SRP ELECTRICAL SERVICE SPECIFICATIONS CAN BE FOUND AT:
[HTTP://WWW.SRPNET.COM/ELECTRIC/BUSINESS/SPECS/](http://www.srpnet.com/electric/business/specs/)

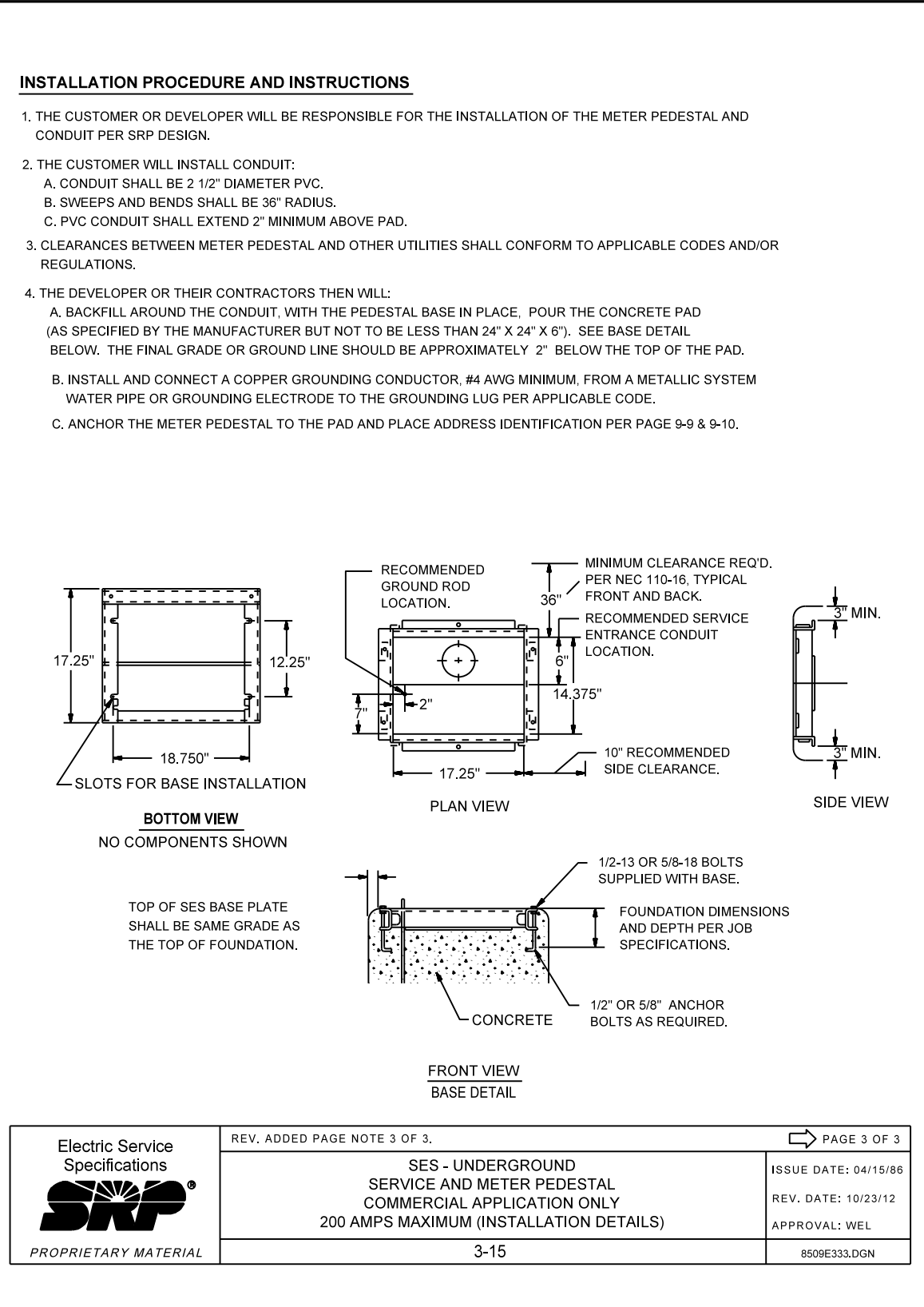
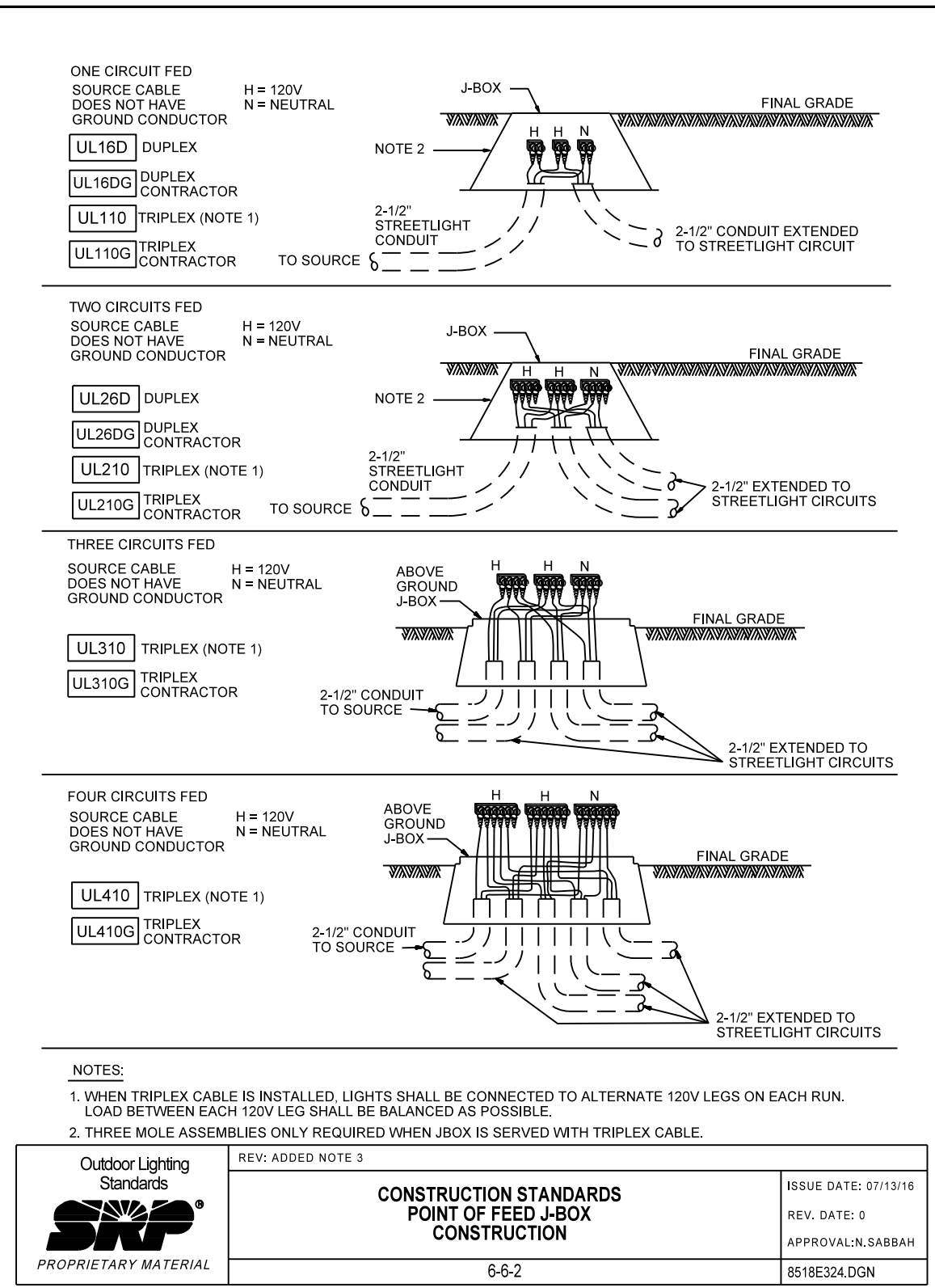
CONTACTS:
DESIGN CONSULTANT:
ALEX BABCOCK
OFFICE: (602) 236-8695
MOBILE: (602) 980-3287
PROJECT LEADER:
SHANNON EMMONS
MOBILE: (602) 818-9266
INSPECTIONS:
OFFICE: (602) 236-0676
CONSTRUCTION CONSULTANT:
BRENDA BURCHETT
MOBILE: (602) 818-8624

CONTACTS:
NATURAL GAS YES NO
JOB NAME ALAMAR AT LAKIN INFRASTRUCTURE
ADDRESS/LOCATION 3840 W WIER AVE
CONTACT TIM POHLAD PHONE 602-460-2998
BILLING ACCT NO. _____
F I S J O _____ MAP 1/4 NE S25 T1N R1W
40/ACRE AZ-25-01 COORDS 0 1/4 W - 2 N
AMP NO T3103298 AMP VERSION _____
COST CENTER 22640
ROUTING CODE DDY+11
FOR CUSTOMER APPROVAL
NOT FOR CONSTRUCTION

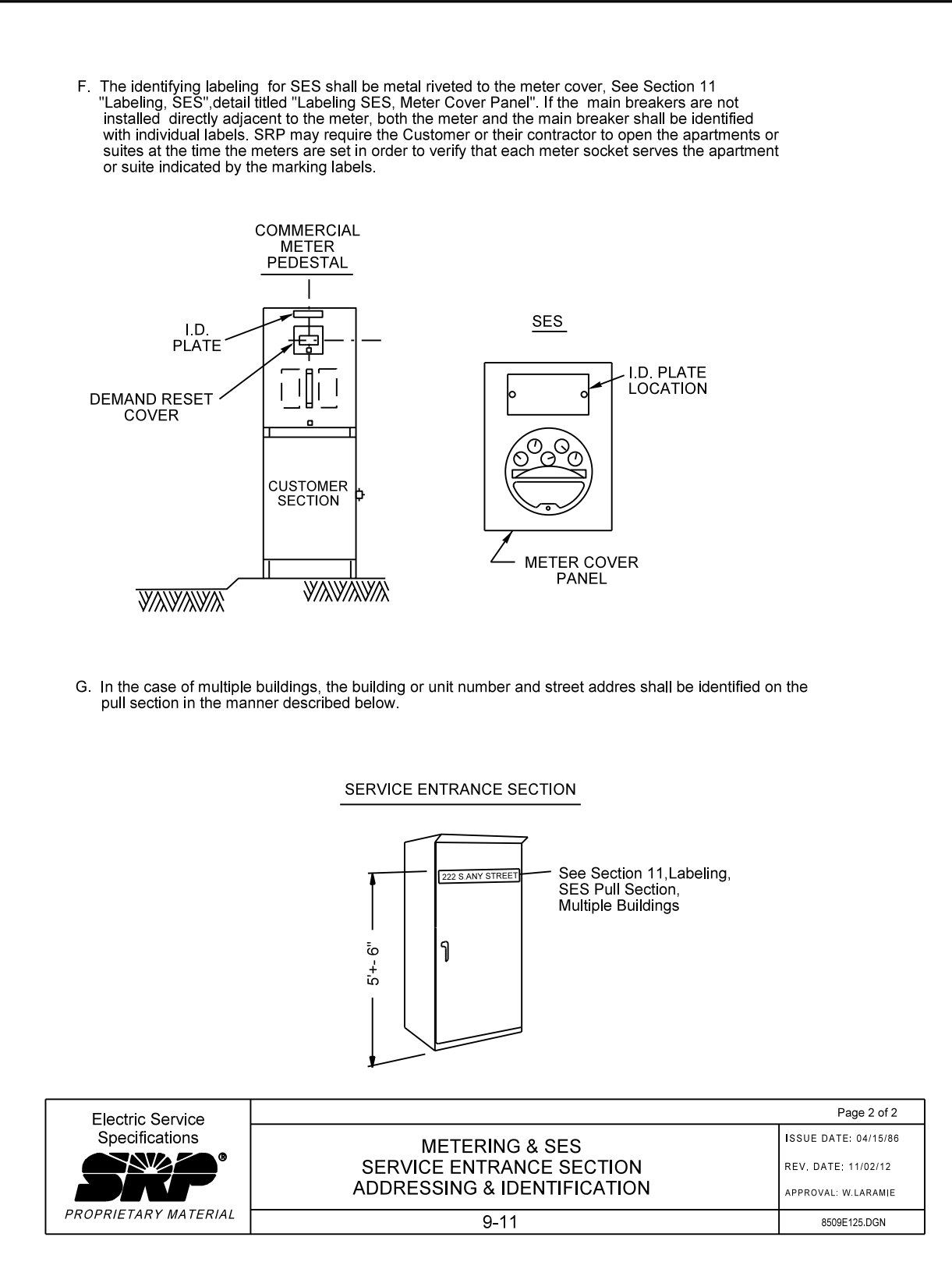
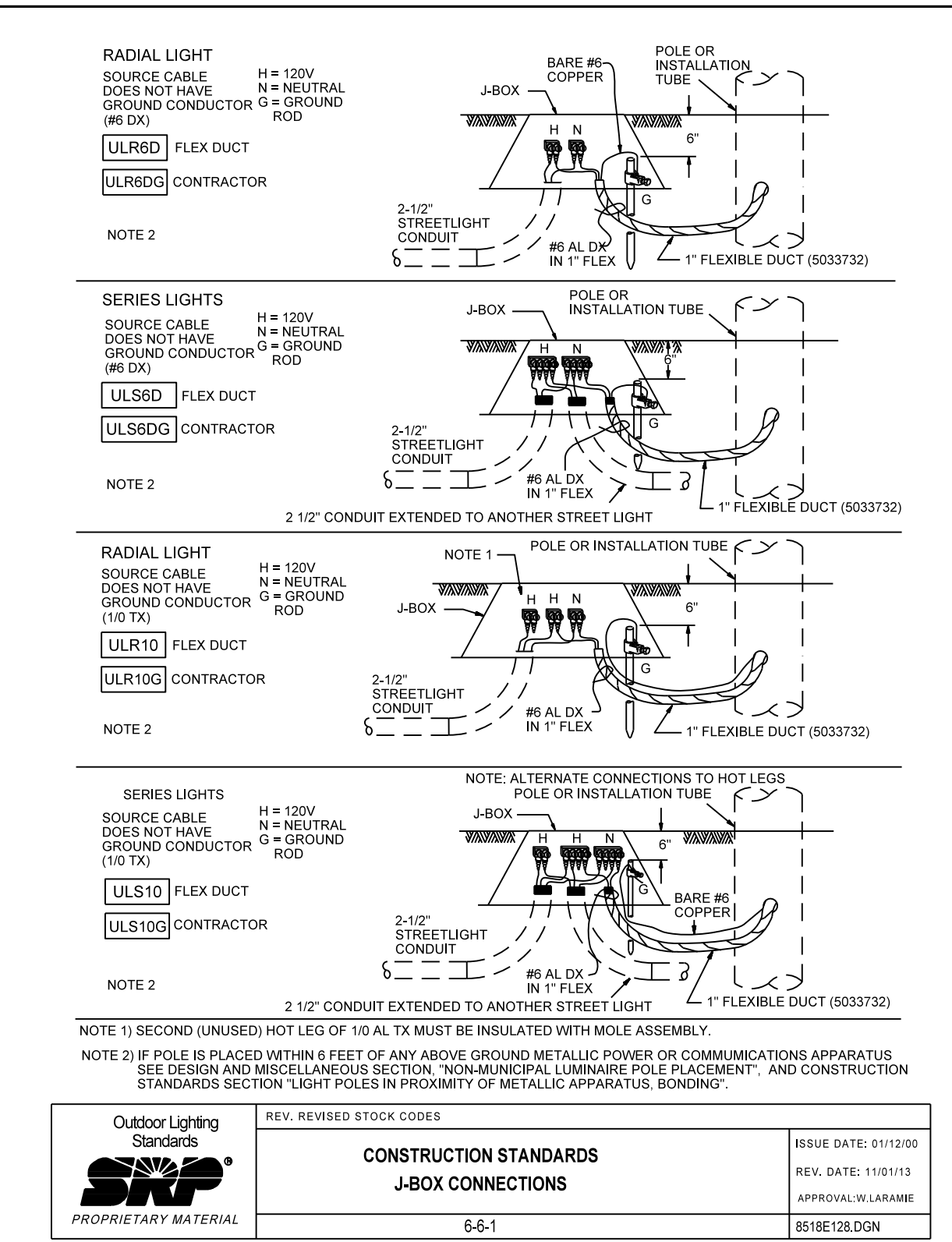




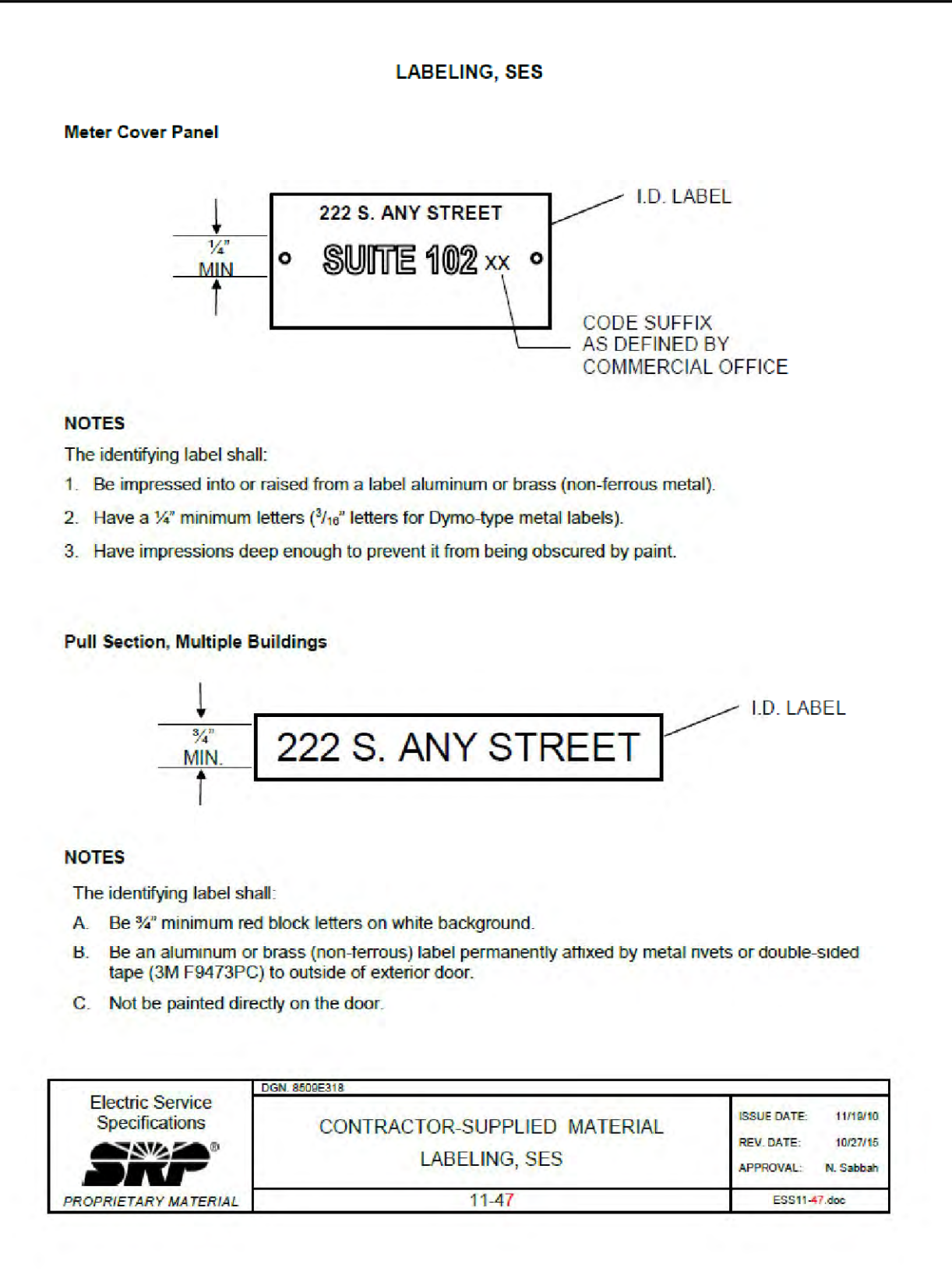
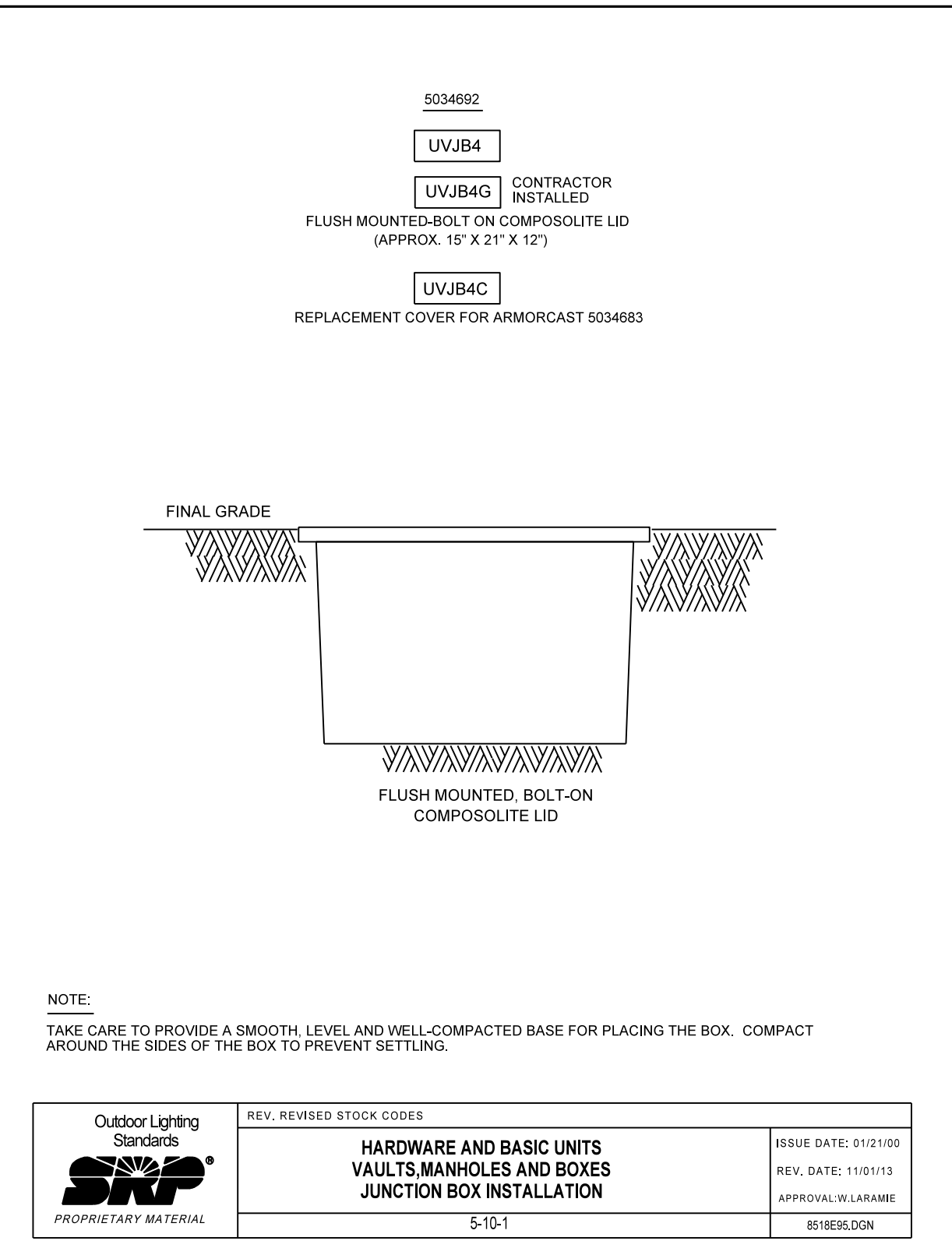
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[HTTP://WWW.SRPNET.COM/ELECTRIC/BUSINESS/SPECS/](http://www.srpnet.com/electric/business/specs/)



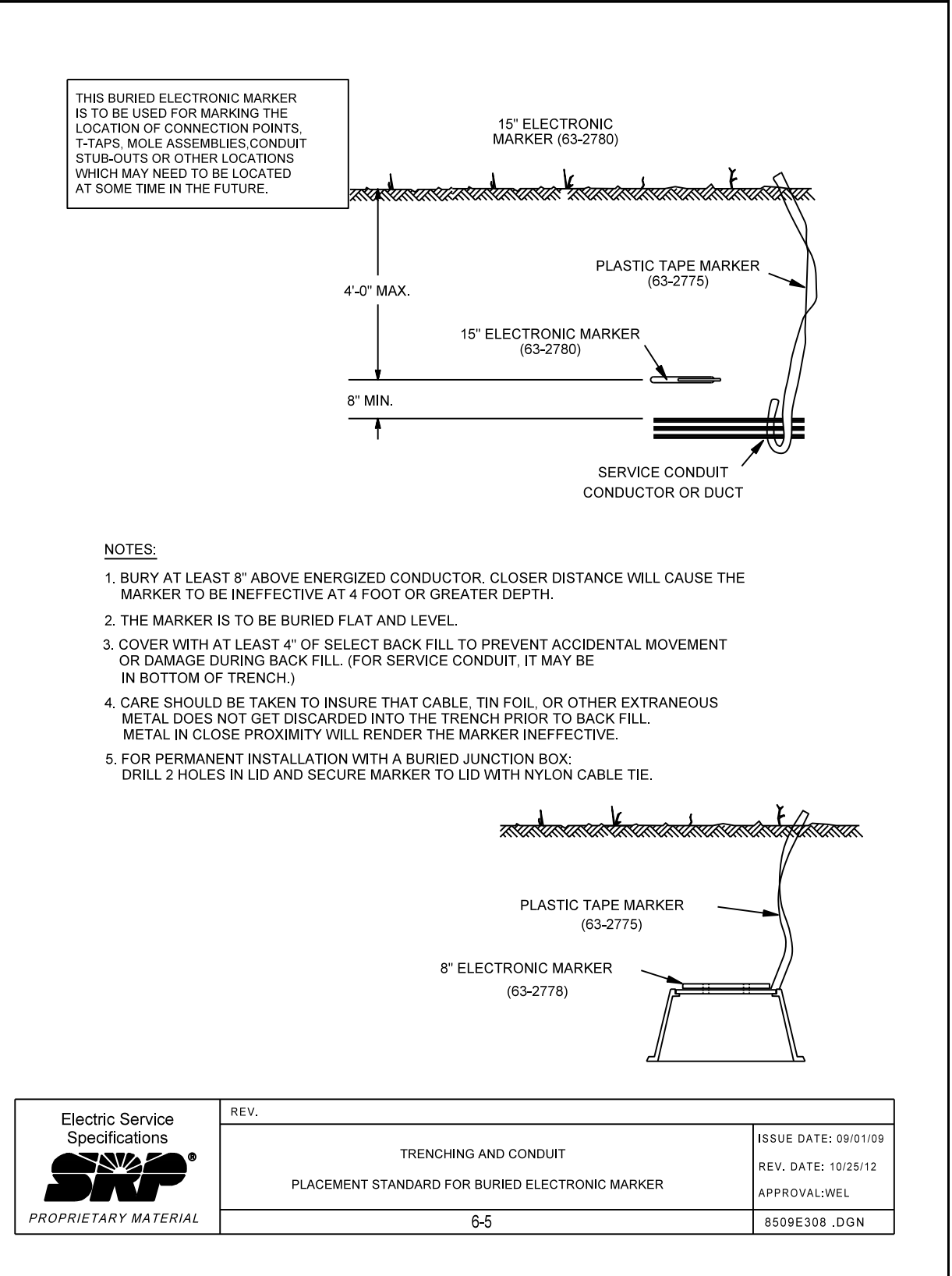
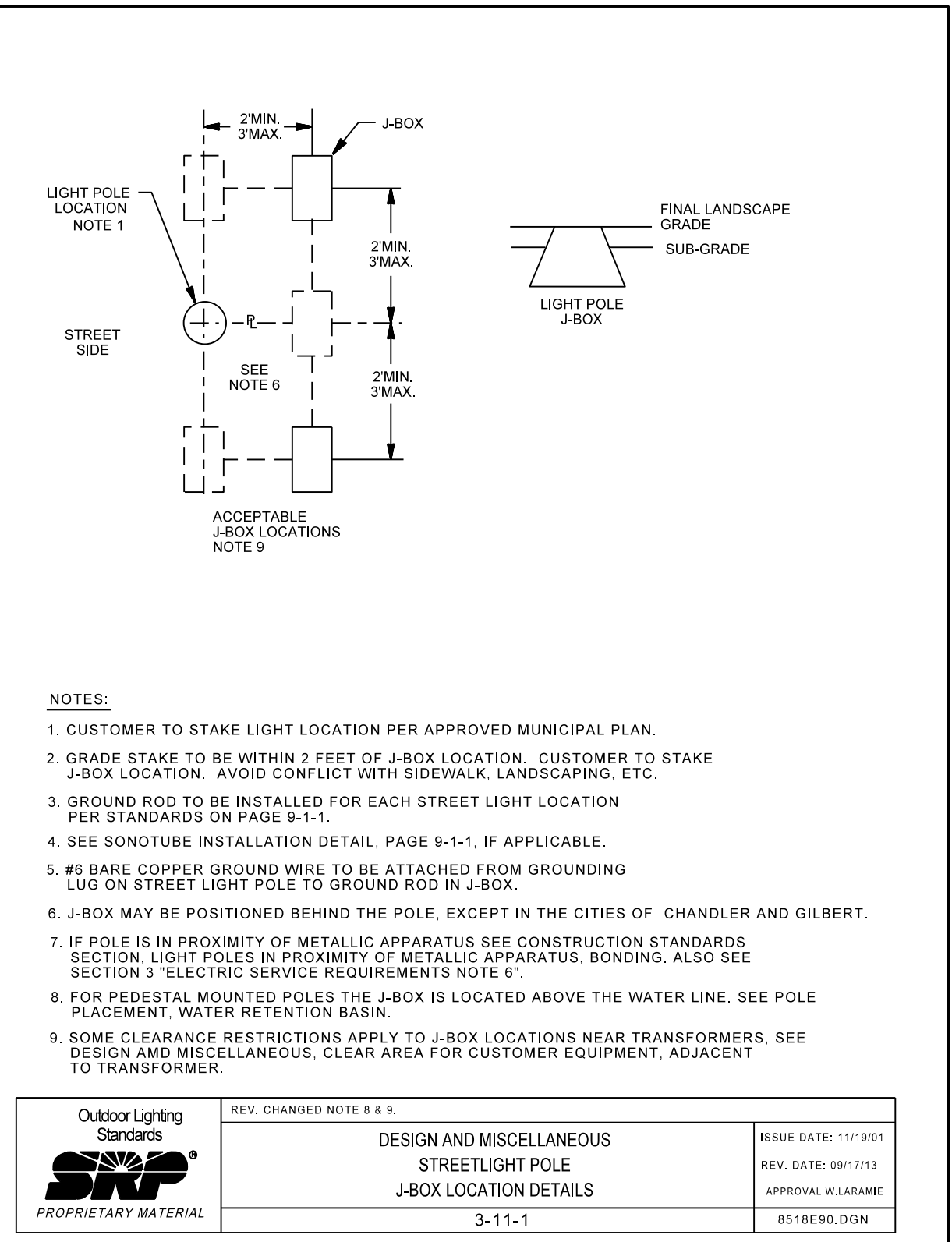
DETAILS PERTAINING TO SRP ELECTRICAL SERVICE SPECIFICATIONS CAN BE FOUND AT:
[HTTP://WWW.SRPNET.COM/ELECTRIC/BUSINESS/SPECS/](http://www.srpnet.com/electric/business/specs/)



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CONSTRUCTION CONSULTANT:
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MOBILE: (602) 818-8624



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NATURAL GAS YES NO

JOB NAME: ALAMAR AT LAKIN INFRASTRUCTURE
ADDRESS/LOCATION: 3840 W WIER AVE
CONTACT: TIM POHLAD PHONE: 602-460-2298
BILLING ACCT NO.:
FIS JO:
40+ ACRE: AZ-25-01 MAP 1/4 NE S25 T1N R1W
AMP NO: T3103298 AMP VERSION:
COST CENTER: 22640
ROUTING CODE: DDY+11

FOR CUSTOMER APPROVAL NOT FOR CONSTRUCTION

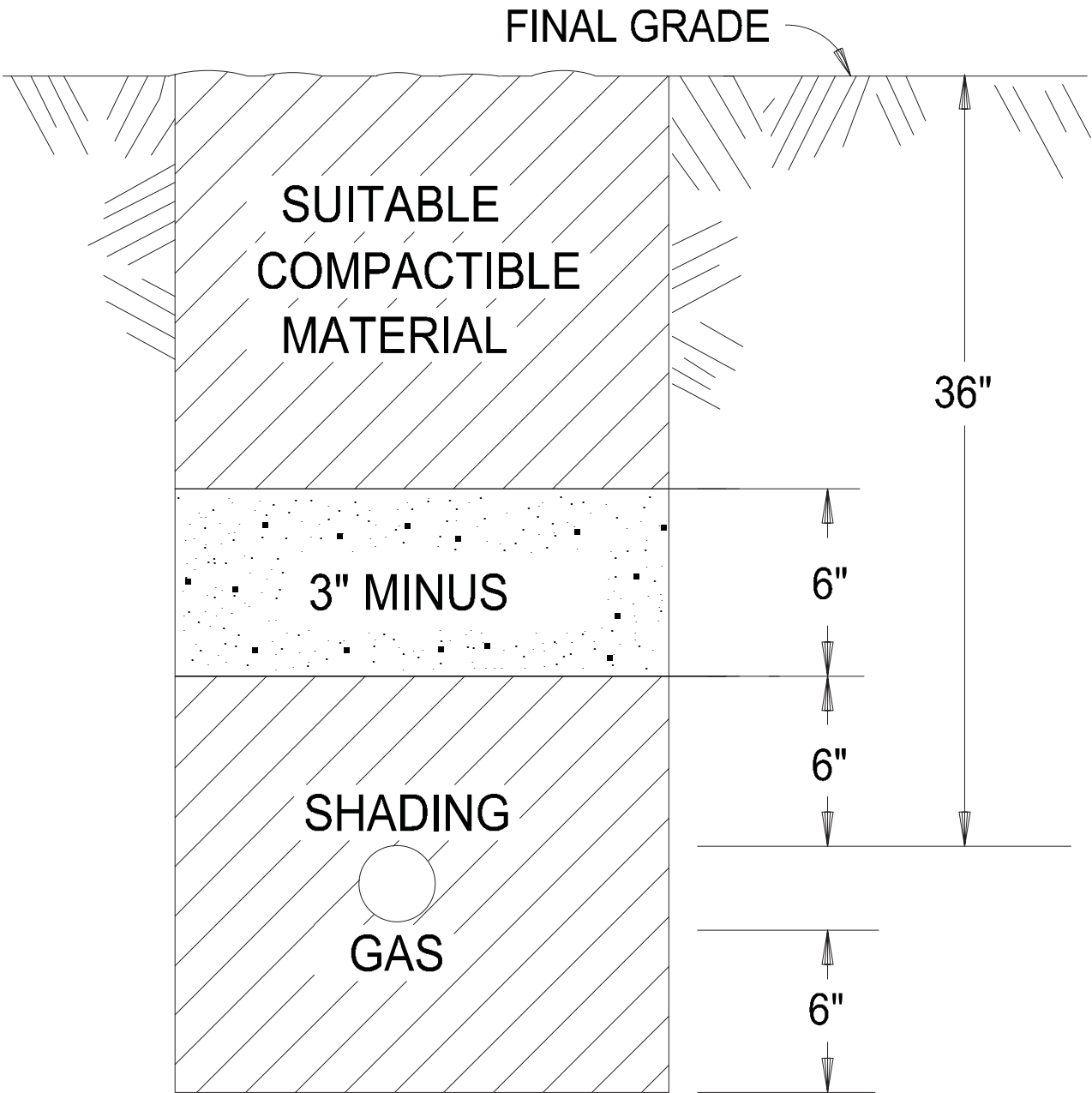
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811-4-4-4
1-800-544-4141
1-800-144-4141

SRP

SHEET NUMBER | 11 OF 11

EXHIBIT 3
Gas Main Installation - Trench Detail

MAIN INSTALLATION



ENSURE ALL TRENCHES FOR MAINS AND SERVICES ARE PROPERLY BACKFILLED BEFORE GASSING UP FACILITIES.

**MARICOPA COUNTY
AIR QUALITY
DEPARTMENT**



**Dust Compliance Division
1001 N Central Ave, Suite 400
Phoenix, AZ 85004
602-506-6010**

Dust Control Permit

**ATTENTION: RCCM, LLC
7520 E ADOBE DR
SCOTTSDALE, AZ 85255**

**PERMIT NUMBER: E190417
ISSUE DATE: 02/19/19
EXPIRATION DATE: 02/20/20**

PROJECT INFORMATION:

Project Acreage: 176

Project Type: RESIDENTIAL

Project Start Date: 02/18/19

Reno Demo Start Date: 00/00/00

Neshap Notif. Submit Date: 00/00/00

Neshap Determiner Date: 00/00/00

Neshap Determiner Name:

Asbestos:

SITE INFORMATION:

Site Address 1: SWC OF AVONDALE BLVD & BROADWAY
RD
AVONDALE, AZ 85353-

Cross Streets: AVONDALE BLVD
BROADWAY RD

Site Loc: B01012400

Parcel #: 50067004C

CONDITIONS:

- 1) A copy of the approved dust control plan and permit must be available on site.
- 2) The approved dust control plan, including the federally approved best available control measures (BACMs) must be implemented.
- 3) A dust control plan that has been determined ineffective by the Department shall be revised within 3 working days of notification.
- 4) Any activity not identified in the dust control plan is not covered by this permit.
- 5) Any haul truck carrying bulk material shall be required to cover the load with a tarp or other suitable enclosure.
- 6) All Dust Control permits shall be renewed annually, if the project has not been completed. Applications for permit renewal shall be submitted no later than 14 days prior to the expiration date of the original permit.
- 7) An Asbestos/NESHAP notification is required for demolition of structures.
- 8) No activity shall discharge into the ambient air emissions in excess of 20% opacity.

**ANY PERSON WHO VIOLATES ANY OF THESE CONDITIONS MAY BE SUBJECT TO CIVIL OR CRIMINAL PENALTIES
PURSUANT TO ARIZONA REVISED STATUTES (A.R.S.) 49-502 OR 49-514.**

Maricopa County

Air Quality Department

Return completed form to:
Maricopa County Air Quality Department
3800 N Central Ave, Suite 1400, Phoenix, AZ 85012
Phone (602) 506-6010 Fax (602) 372-0587
AQPermits@maricopa.gov

PERMIT ACREAGE INCREASE REQUEST

Documents may be submitted in person at:
3800 N. Central Ave. Suite 1400, Phoenix, AZ 85012 or 501 N. 44th Street, Suite 200, Phoenix, AZ 85008.

Important: Please note that email will be our primary means for routine communication with you, unless you do not have an email account. Please be sure that your email address is entered correctly.

Date: 15-May-19 Permit Holder: RCCM, LLC
Permit Number: E190417 Project Name: _____
Phone Number: +1 (602) 885-1783 Email: James@rccmlc.com
Project Address: SWC of Avondale Blvd & Broadway Rd City: Avondale State: AZ Zip: 85323
Acreage Increase: Change From 168 Acres. Change To 176 Acres.

Maricopa County Rule 280, Sections 310 and 314 Fee Schedule:	Total Surface Area Disturbed	Fee
1. Site increases that result in the same fee tier require no additional charge.	0.1 to less than 1 acre	\$530.00
2. Site increases that result in a change of fee tiers will require the applicant to pay the difference between the two tiers.	1 acre to less than 10 acres	\$1,060.00
3. In addition to all other applicable fees, a late fee of \$100.00 will be assessed to sources who have been issued a Notice of Violation for engaging in dust-generating operations without the proper Dust Control Permit.	10 acres to less than 50 acres	\$3,855.00
	50 acres to less than 100 acres	\$6,425.00
	100 acres to less than 500 acres	\$9,635.00
	500 acres or greater	\$15,415.00

Special Instructions:

1. A new site map is required for ALL site increases and should be submitted with this form.
2. Site increases keep the original issue date and expire one year from original issue date.
3. Increases to five acres or greater require a project sign and modifications to the originally submitted dust control plan.
4. Increases to two acres or greater will require a track out control device and modifications to the originally submitted dust control plan.
5. Sites with one or more acres of disturbed surface area are required, under Maricopa County Rule 310, Section 309, to have an on-site representative of the permit holder successfully complete the Basic Dust Control Training class.
6. Sites with five or more acres of disturbed surface area are required, under Maricopa County Rule 310, Section 310.6, to have a Dust Control Coordinator onsite who successfully completed the Comprehensive Dust Control Training class.
7. Maricopa County Rule 310, Section 309 also requires that all water truck and water-pull drivers on any 310 permitted site shall have successfully completed the Basic Dust Control Training class.

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

Arizona Revised Statute §13-2704 makes it a criminal offense to knowingly make a false material statement to a public servant in connection with an application for any benefit, privilege, or license.

I certify that the information provided in this application and accompanying documents is true, correct, and complete to the best of my knowledge.

Signature: _____ Title: Construction Manager

Typed or Printed Name of Signer: James Thompson Date: 15-May-19

Payment options:
Submit this form by email and a member of our staff will call you for a credit card payment.
Print out this form and mail it to the address at the top of this form. Make checks payable to MCAQD.

If No Fees are associated with this acreage increase, submit this form by email.

OFFICE USE ONLY

Approved By: _____ Date: _____

APPROVED
By Mark Thompson at 4:33 pm, May 15, 2019



Maricopa County

Air Quality Department

Return completed form to:
Maricopa County Air Quality Department
3800 N Central Ave, Suite 1400, Phoenix, AZ 85012
Phone (602) 506-6010 Fax (602) 372-0587
AQPermits@maricopa.gov

DUST CONTROL PLAN CHANGE

Documents may be submitted in person at:
3800 N. Central Ave. Suite 1400, Phoenix, AZ 85012 or 501 N. 44th Street, Suite 200, Phoenix, AZ 85008.

Important: Please note that email will be our primary means for routine communication with you, unless you do not have an email account. Please be sure that your email address is entered correctly.

Permit Number: E190417 Permit Holder: RCCM, LLC

Date: 05/15/2019 Project Name: Alamar Phase 1

Project Address: SWC of Avondale Blvd & Broadway City: Avondale State: AZ Zip: 85323

Reason for plan change: Need to add an area

Sections changed (including page # and section name):

1. Sheet 11 - Add area in Yellow on Avondale Blvd & Broadway Rd.
2. _____
3. _____
4. _____
5. _____

SPECIAL INSTRUCTIONS
Attach the revised dust control plan and a new site plan if necessary.

Certification by the permit holder: I certify that the information provided in this application and accompanying documents is true, correct and complete to the best of my knowledge.

Signature: James Thompson *James M. Thompson* Title: Construction Manager

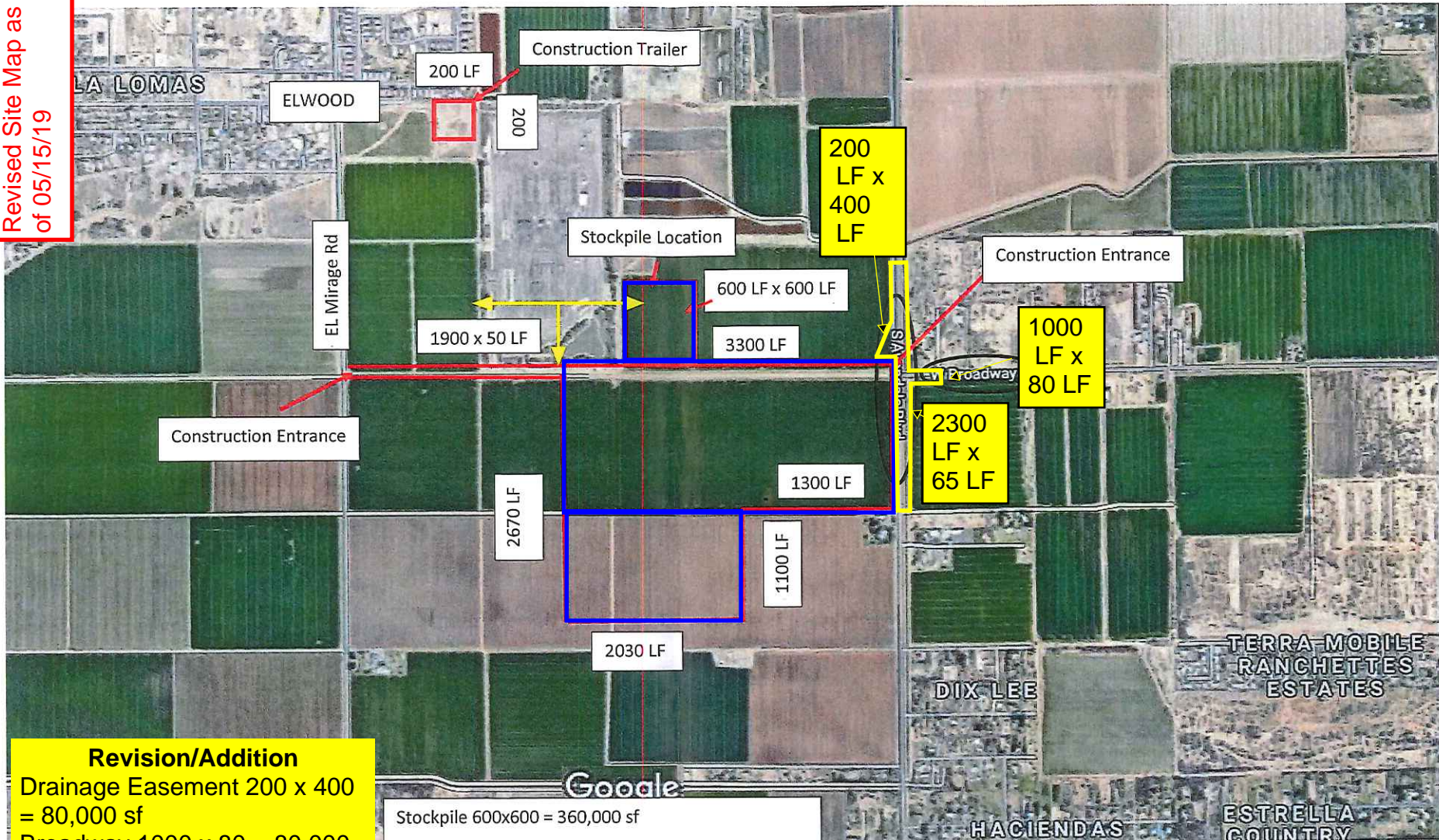
Email: James@rccmllc.com Date: 05/15/2019

Submit by Email

OFFICE USE ONLY

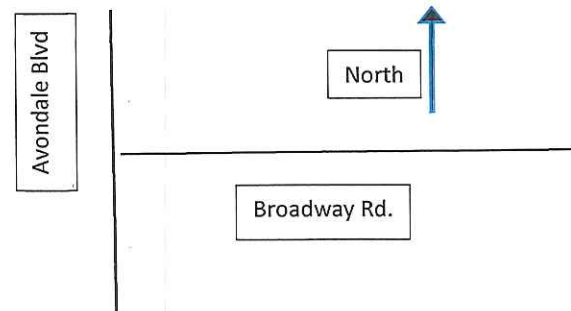
Approved By: _____ Date: _____
APPROVED
By Mark Thompson at 4:33 pm, May 15, 2019

Revised Site Map as of 05/15/19



Revision/Addition
 Drainage Easement 200 x 400 = 80,000 sf
 Broadway 1000 x 80 = 80,000 sf
 Avondale 2300 x 65 = 149,500 sf
Total Addition 309,500 = 7 ac
Overall Project Total = 7,657,500 sf = 176 ac

Stockpile 600x600 = 360,000 sf
 Construction Trailer 200x200 = 40,000 sf
 Construction Entrance/Access RD
 1900x50 = 95,000 sf
 Construction Grading 1400x3300 = 4,620,000,
 1100x2300 = 2,233,000 = 6,853,000
 Total = 7,348,000 sf / 43,560 = 168 ac





Maricopa County

Air Quality Department

3800 N Central Ave, Suite 1400, Phoenix, AZ 85012

Phone (602) 506-6010 Fax (602) 372-0587

AQPermits@maricopa.gov

NOTICE OF REGULATORY REFORM

Notice of Regulatory Reform

In accordance with A.R.S. §11-1604:

A. A county shall not base a licensing decision in whole or in part on a licensing requirement or condition that is not specifically authorized by statute, rule, ordinance or delegation agreement. A general grant of authority does not constitute a basis for imposing a licensing requirement or condition unless the authority specifically authorizes the requirement or condition.

B. Unless specifically authorized, a county shall avoid duplication of other laws that do not enhance regulatory clarity and shall avoid dual permitting to the maximum extent practicable.

C. This section does not prohibit county flexibility to issue licenses or adopt ordinances or codes.

D. A county shall not request or initiate discussions with a person about waiving that person's rights.

E. This section may be enforced in a private civil action and relief may be awarded against a county. The court may award reasonable attorney fees, damages and all fees associated with the license application to a party that prevails in an action against a county for a violation of this section.

F. A county employee may not intentionally or knowingly violate this section. A violation of this section is cause for disciplinary action or dismissal pursuant to the county's adopted personnel policy.

G. This section does not abrogate the immunity provided by section 12-820.01 or 12-820.02.

No NOV
No Prior

Walkin oss

AIR QUALITY DEPT ~~PH~~

FEB 12 2019
ONE STOP SHOP

Return completed form to:
Maricopa County Air Quality Department
3800 N Central Ave, Suite 1400, Phoenix, AZ 85012
Phone (602) 506-6010 Fax (602) 372-0587
AQPermits@maricopa.gov



DUST CONTROL PERMIT APPLICATION PACKAGE, SECTION 1: DUST CONTROL PERMIT APPLICATION FORM

Important: Please note that email will be our primary means for routine communication with you, unless you do not have an email account. Please be sure that your email address is entered correctly.

For Office Use Only			
Approved By:	APPROVED By Mark Dunnigan at 4:05 pm, Feb 19, 2019	Date Issued:	Permit Number: E190417

Provide an email address where we can send the permit, for faster service:

Did you receive a no-permit violation? Yes No

If yes, enter the permit number given by the inspector:

Questions? Click on the Yellow Question Marks **?** for Additional Instructions

Permit Application Form, Part A: Applicant Information

1. Applicant ?			
Relationship to property (Check all that apply):			
<input type="checkbox"/> Property Owner	<input type="checkbox"/> General/Prime Contractor	<input checked="" type="checkbox"/> Developer	<input type="checkbox"/> Lessee
Type of Entity: Limited Liability Company or Partnership			
Name:	RCCM, LLC		
Address:	7520 E Adobe Drive		
City:	Scottsdale	State:	AZ
Zip:	85255		
Phone:	(480)-222-9922	E-Mail Address:	james@rccmlc.com
2. Applicant President/Owner ?			
Name:	Rod Rummel		
Address:	7520 E Adobe Drive		
City:	Scottsdale	State:	AZ
Zip:	85255		
Phone:	(480)-222-9922	E-Mail Address:	james@rccmlc.com
3. Is the Applicant a wholly owned subsidiary of another Company? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ?			
Parent Company Name:	Rummel Holding Group		
Type of Entity:	Corporation		
Address:	7520 E Adobe Drive		
City:	Scottsdale	State:	AZ
Zip:	85255		
Phone:	(480)-222-9922	E-Mail Address:	james@rccmlc.com
State of Incorporation or Registration:	Arizona		
4. Is the Applicant the Property Owner or Developer? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ?			
Owner/Developer Information		Type of Entity	
		Limited Liability Company or Partnership	
Name:	RCCM LLC		
Address:	7520 E Adobe Drive		
City:	Scottsdale	State:	AZ
Zip:	85255		
Phone:	(480)-222-9922	Fax:	(480)-222-9923
Contact Person:	James Thompson		
Contact Person Phone:	(602)-885-1783	Contact Person E-Mail Address:	james@rccmlc.com

Azee



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DUST CONTROL PERMIT APPLICATION PACKAGE, SECTION 1: DUST CONTROL PERMIT APPLICATION FORM

5. Primary Project Contact		?	
Name:	James Thompson	E-mail Address:	james@rccmllc.com
Title:	Construction Manager	Company Name:	RCCM
On-Site Phone:	(602)-885-1783	Mobile:	(602)-885-1783
		Fax:	(480)-222-9923
6. Dust Control Coordinator		Any site of 5 acres or more must have a dust control coordinator	
		Is the site 5 acres or more? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No ?	
		Is the dust control coordinator the same person as the primary project contact listed in Question 5? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
If "No", provide all requested information below. List any additional Dust Control Coordinators on a separate sheet.			
Name:	James Thompson	E-mail Address:	james@rccmllc.com
Title:	Construction Manager	Company Name:	RCCM
On-Site Phone:	(602)-885-1783	Mobile:	(602)-885-1783
		Fax:	(480)-222-9923

Permit Application Form, Part B: Project Information

7. Name of Project:	Alamar Phase 1, Brookfield Master Planned Community		
8. Project Location	?		
Address:	SWC of S Avondale Blvd & W Broadway Rd		
City:	Avondale	State:	AZ Zip: 85353
Nearest Major Cross Street North/South:	Avondale Blvd		
Nearest Major Cross Street East/West:	Broadway Rd		
County Assessor's Parcel Number(s) [required]:	500-67-004C		
Master Plan Community Number(s) [if applicable]:			
Geographic Coordinates (XY coordinates of site entrance):	33.4060 -112.3064		
9. Project Location by Township (N or S), Range (E or W), Section (1-36):	?		
Township:	1N	Range:	1W
		Section:	24
10. Brief Project Description:	Master Planned Community		
11. Size of Project and Estimated Bulk Materials (See Instructions and Rule 310, Section 203)	?		
Total acres that will be disturbed throughout the duration of this Permit, including staging areas, stockpiles, access and haul roads, parking, driveways, and temporary storage yards:	450, 168 AC		
Estimated cubic yards of Bulk Material to be imported/exported:			
12. Project Site Drawing (NOTE: A Dust Control Permit will not be issued unless a drawing is submitted)	Attach a Site Drawing. Include on the site drawing:		
	Entire project site boundaries		
	Nearest main crossroads		?
	North arrow		
	Area to be disturbed, with linear dimensions		
	Access point(s) onto paved areas accessible to the public		
13. Is this a Re-application?	<input type="checkbox"/> Yes	Previous Permit #	<input checked="" type="checkbox"/> No ?
14. Estimated Project Start Date	Feb 18, 2019		?
15. Estimated Project Completion Date	Nov 27, 2020		?



Return completed form to:
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DUST CONTROL PERMIT APPLICATION PACKAGE, SECTION 1: DUST CONTROL PERMIT APPLICATION FORM

Permit Application Form, Part C: Asbestos NESHAP Information

16. Asbestos NESHAP Notification requirements	?
Definitions	
Demolition: The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of a facility.	
Renovation: Altering a facility or one or more facility components in any way, including the stripping or removal of Regulated Asbestos Containing Material (RACM) from a facility component.	
16a. Does the Project include any demolition or renovation?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Signature(s)

17. Certification by a Responsible Official of the Applicant	
<p>A Responsible Official of the Applicant is the person who will be contacted or named in any enforcement action initiated by the Maricopa County Air Quality Department or the Maricopa County Attorney's Office. Pursuant to Rule 310, Section 401.3, the signature on the Dust Control Permit Application shall constitute agreement to accept responsibility for meeting the conditions of the Dust Control Permit and for ensuring that control measures are implemented throughout the project site and during the duration of the project.</p> <p>Arizona Revised Statute § 13-2704 makes it a criminal offense to knowingly make a false material statement to a public servant in connection with an application for any benefit, privilege, or license.</p> <p>I hereby certify that, based on information and belief formed after reasonable inquiry, the statements and information in the Dust Control Permit Application, including Applicant Information, Project Information, and the Dust Control Plan, are true, accurate, and complete.</p>	
Signature*:	Date: <input type="text" value="Jan 30, 2019"/>
*Note: A signature is not required if this form is submitted online.	
Printed Name: <input type="text" value="James Thompson"/>	Title: <input type="text" value="Construction Manager"/>
18. Application Completed by (If other than Signatory):	
Signature:	Date: <input type="text"/>
Printed Name: <input type="text"/>	Title: <input type="text"/>
Phone: <input type="text"/>	Fax: <input type="text"/>
Email Address: <input type="text"/>	

Save your work! Changes to this form will be lost if you exit the form without saving it first.

Remember to complete the [Dust Control Plan](#). Your Dust Control Permit Application Package is not complete unless it is accompanied by a Dust Control Plan.

After both the Dust Control Application and the Dust Control Plan have been completed and saved, the Dust Control Permit Application Package and payment may be submitted online. Instructions are on the [online submittal web page](#).

Check Form for Required Fields



This Dust Control Plan must be submitted with a Dust Control Permit Application. See [Dust Sources](#) or call (602) 506-6010 for more information

DUST CONTROL PERMIT APPLICATION PACKAGE, SECTION 2: DUST CONTROL PLAN

The following will become the dust control plan that will be followed for the project named in this permit. Once fully completed and approved this Dust Control Plan must be posted on-site with the Dust Control Permit and supplied to all contractors and subcontractors.

Primary and Contingency Control Measures

Every category (except Category A) and/or sub-category requires at least one Primary control measure and at least one Contingency control measure. Contingency control measures are the back-up or secondary action(s) that need to be implemented immediately when the primary control measure(s) fail to adequately control dust emissions at the named project.

To indicate your choice, select them in the drop-down lists next to 'primary' or 'contingency'. To add additional measures, click 'Add Primary' or 'Add Contingency' to the right of the drop-downs. To remove measures, click 'Remove Primary' or 'Remove Contingency' to the right of the drop-downs.

Required Control Measures

Some categories have required control measures. Every control measure with a description that begins with 'Required' is a required control measure. In addition to the required primary measure(s), at least one contingency measure must be chosen for these dust-generating operations if they are applicable to your project (except in Category A).

Categories and/or sub-categories that are not applicable

In some categories, when a category and/or sub-category does not apply to the named project, this must be acknowledged by completely filling out the final entry in the category and/or sub-category. An explanation must be supplied for WHY the category and/or sub-category is not applicable. Simply writing "NA" or "not applicable" is not sufficient.

'Other' as a Primary Dust Control Measure

If 'Other' is selected as a primary dust control measure in any section of this Plan, then the measure must clearly meet the requirements of Rule 310 for any dust-generating operation. Attach a separate sheet, if needed, for the description. MCAQD will apply the following minimum criteria when evaluating any unlisted dust control measures:

The dust control measure technique is a new or alternative technology that is demonstrated to be equally or more effective in meeting the dust control requirements than the existing dust control measures provided in the Dust Control Permit Application;

Site logistics do not practically allow for implementation of a listed dust control measure as written (e.g., road width or pre-existing barriers limit the size or width of a gravel pad); and

The owner and/or operator demonstrates that a listed dust control measure is technically infeasible due to site-specific or material-specific conditions, such that implementation of the dust control measure will not provide a benefit in reducing fugitive dust (e.g., pre-soaking screened, washed rock when handling).

After your Dust Control Permit Application has been approved, you must post your Dust Control Permit along with this Dust Control Plan on-site, as required by Rule 310, Section 409.

Category A: Wind-Blown Dust

If wind conditions cause fugitive dust to exceed the 20% opacity requirement (Rule 310, Section 303.1(a)), then the following actions must be performed.

NOTE that there must be a plan to address a possible wind-blown dust event when no one is on site, such as on a weekend or a holiday.

- Required: Ensure that all control measures and requirements of the Dust Control Plan are implemented and that violations cannot be prevented by better application, operation, or maintenance of these measures and requirements.
- Required: Cease dust-generating operations.
- Required: Stabilize any disturbed surface area (as specified in Rule 310, Section 304.3). Select one or more of the following stabilization methods:

<input checked="" type="checkbox"/> Maintain a soil crust.	<input type="checkbox"/> Maintain a threshold friction velocity (TFV) for disturbed surface areas corrected for non-erodible elements of 100 cm/second or higher.
<input type="checkbox"/> Maintain a vegetative ground cover.	<input type="checkbox"/> Other: <input style="width: 150px;" type="text"/>
- Required: Compile records consistent with Rule 310, Sections 502 and 503 and document the implementation of control measures and other Dust Control Plan requirements.



This Dust Control Plan must be submitted with a Dust Control Permit Application. See [Dust Sources](#) or call (602) 506-6010 for more information

DUST CONTROL PERMIT APPLICATION PACKAGE, SECTION 2: DUST CONTROL PLAN

Category B: Will Vehicles/Motorized Equipment Be Used on Either of the Following?

B.1 Will Vehicles/Motorized Equipment Be Used on Unpaved Staging Areas, Unpaved Parking Areas, and/or Unpaved Storage Areas? Yes No

Primary	Apply water (complete Water Supply and Application at the end of this Plan)	Add Primary	Remove Primary
Contingency	Apply and maintain gravel, recycled asphalt, or other suitable material	Add Contingency	Remove Contingency

B.2 Will Vehicles/Motorized Equipment Be Used on Unpaved Access Areas/Haul Roads? Yes No

Primary	Apply water (complete Water Supply and Application at the end of this Plan)	Add Primary	Remove Primary
Contingency	Apply and maintain gravel, recycled asphalt, or other suitable material	Add Contingency	Remove Contingency

Category C: How Will Disturbed Surface Areas Be Stabilized During Each of the Following Time Periods?

Disturbed surface areas may include parking, staging, and stockpiling areas, as well as driving over previously undisturbed areas.

C.1 Before Active Operations Occur

Primary	Pre-water site to depth of cuts, allowing time for water to penetrate	Add Primary	Remove Primary
Contingency	Other (specify below)	Add Contingency	Remove Contingency
If phased work is chosen, attach a map showing the phases, their start & stop times, and their extents			
Other:	Area's we are not working in will be fenced off with silt fence or orange construction fence.		

C.2 During Active Operations

Primary	Apply water to keep soil visibly moist (Complete Water Supply & Appl. at end of Plan)	Add Primary	Remove Primary
Contingency	Apply water to maintain soil moisture content at a minimum of 12%.	Add Contingency	Remove Contingency
Minimum soil moisture must be 12%, or at least 70% of the optimum soil moisture content for areas that have an optimum moisture content of less than 12%. See Rule 310, Section 305.11(b)(2) for details. If this measure is selected, complete Water Supply and Application information at the end of this Plan.			

C.3 During Any Inactive Period, of Any Length, 24 Hours per Day, Seven Days per Week (including Weekends, after Work Hours, and Holidays)

Primary	Apply water (See below & complete Water Supply and Application at end of this Plan)	Add Primary	Remove Primary
Contingency	Apply and maintain surface gravel	Add Contingency	Remove Contingency
If "Apply water..." is selected for Item C3, water must be applied with the following frequencies. <u>Disturbed Surface Areas:</u> Three times per day, increased to a minimum of four times per day if there is evidence of wind-blown dust. <u>Open Storage Piles (temporarily disturbed):</u> At least twice per hour in a PM10 nonattainment area; at least once per hour in a PM10 attainment area.			

C.4 Permanent Stabilization of Disturbed Surface Areas.

NOTE: These measures must be completed within ten days following the completion of the dust-generating operation (if the operation is finished) or following the suspension of the dust-generating operation (if it is suspended for a period of 30 days or longer).

Primary	Apply water (sufficient to maintain a visible soil crust) & prevent access/trespass	Add Primary	Remove Primary
Contingency	In addition to other control measures, restrict vehicle access to the area	Add Contingency	Remove Contingency
Prevent access/trespass by (check all that apply)			
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ditches	fences	berms	shrubs
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
trees	other:		

Category D: Bulk Material Handling

Note: The requirements in this section are in addition to the track-out control and cleaning requirements in Section E (below).

D.1 Will Materials be Hauled from the Site onto or crossing Areas Accessible to the Public? Yes No



This Dust Control Plan must be submitted with a Dust Control Permit Application. See [Dust Sources](#) or call (602) 506-6010 for more information

DUST CONTROL PERMIT APPLICATION PACKAGE, SECTION 2: DUST CONTROL PLAN

D.2 Will Materials be Hauled or Transported within the Boundaries of the Work Site (but will not cross an Area Accessible to the Public)? Yes No

Primary	Apply water to the top of the load	Add Primary	Remove Primary
Contingency	Limit vehicle speed (See note below)	Add Contingency	Remove Contingency
Limit vehicle speed to 15 m.p.h. or less while traveling on the work site such that visible emissions coming off the load do not exceed 20% opacity			

D.3 Will Materials be Hauled or Transported within the Boundaries of the Work Site (AND will also cross or access an Area Accessible to the Public while doing so)? Yes No

If materials will be hauled or transported within the work site by travelling along the side of the work site, and the area where the materials will be hauled is not barricaded to prevent public access, then answer YES to this question.
 If materials will be hauled or transported within the work site by travelling across an area accessible to the public, then answer YES to this question.

D.4 Will Bulk Materials be Loaded, Unloaded, and/or Stacked? Yes No

Primary	Apply water (complete Water Supply and Application at the end of this Plan)	Add Primary	Remove Primary
Contingency	Cease operations (Note: this option may not be used as a primary control measure)	Add Contingency	Remove Contingency

D.5 Will there be Open Storage Piles for Any Amount of Time? Yes No

Primary	Apply water to maintain soil moisture (See note below)	Add Primary	Remove Primary
Contingency	Maintain a visible soil crust	Add Contingency	Remove Contingency
Minimum soil moisture must be 12%, or at least 70% of the optimum soil moisture content for areas that have an optimum moisture content of less than 12%. See Rule 310, Section 305.11(b)(2) for details.			

Category E: Trackout, Carry-out, Spillage, and Erosion

E.1 Cleaning

Trackout/carry-out must be cleaned up immediately if trackout/carry-out extends a cumulative distance of 25 linear feet or more along a paved area accessible to the public (including curbs, gutters, and sidewalks).
 All other trackout/carry-out must be cleaned up no later than the end of the work day. (End of Work Day is the end of a working period that may include one or more work shifts. If working 24 hours a day, the end of a working period shall be considered no later than 8:00 p.m.)

Primary	Manually sweep up deposits	Add Primary	Remove Primary
Contingency	Operate a street sweeper or wet broom (See note below)	Add Contingency	Remove Contingency
Operate a street sweeper or wet broom with sufficient water and at the manufacturer's recommended speed (e.g., kick broom, steel bristle broom, Teflon broom, vacuum).			

E.2 Trackout Control Device

Does this site have 2 or more acres of disturbed surface area? Yes No

Will 100 or more cubic yards of bulk material be hauled on-site or off-site each day? Yes No

Required: Install, maintain, and use, at all exits to an area accessible to the public, a suitable trackout control device that controls and prevents trackout and/or removes particulate matter from tires and the exterior surfaces of haul trucks and/or motor vehicles that traverse the site. Choose at least one of the following:
 gravel pad grizzly or rumble grate wheel wash system paved area

Other Primary (In Addition to Above)		Add Primary	Remove Primary
Contingency	Cease operations	Add Contingency	Remove Contingency



This Dust Control Plan must be submitted with a Dust Control Permit Application. See [Dust Sources](#) or call (602) 506-6010 for more information

DUST CONTROL PERMIT APPLICATION PACKAGE, SECTION 2: DUST CONTROL PLAN

Category F: Grading

Mass grading is grading on a large scale over a large area prior to precise grading of individual lots or preliminary grading of final pads. It typically alters the ground contours through cutting and filling of soils to bring them within two vertical feet of the site's final grade elevations.

Fine grading is precise grading of individual lots and/or grading of final pads. It typically does not involve importing or exporting of materials beyond trench and fine grading spoils.

F.1 Will there be any mass grading on this site? Yes No

Complete Water Supply and Application information at the end of this Plan.

F.2 Will there be any fine grading on this site? Yes No

Complete Water Supply and Application information at the end of this Plan.

Category G: Underground Utilities, Structure Excavation, and Vertical Construction

Structure excavation includes excavation for stem walls, footings, culverts, abutments, caissons, etc.

G.1 Will there be any underground utilities installed or prepared and/or any excavation done for structures to be built on the site? Yes No

Complete Water Supply and Application information at the end of this Plan.

G.2 Will there be any vertical structures built on this site? Yes No

Complete Water Supply and Application information at the end of this Plan.

Category H: Demolition Activities

Demolition activities are the wrecking and/or removal of any supporting structural member of a facility and any related handling operations. They include activities such as removal of walls, stucco, concrete, freestanding structures, buildings, load-bearing walls, and transit pipes.

Will there be any demolition activities on this site? Yes No *concrete ditches only*

Required: Apply water or water in combination with dust suppressant(s) to demolition debris immediately following demolition activity (Complete Water Supply and Application at the end of this Plan. If dust suppressants other than water are used, click here and complete the Dust Suppressants information, below.)

Required: Apply water or water in combination with dust suppressant(s) to all surrounding areas and to all disturbed soil surfaces immediately following demolition activity. (Complete Water Supply and Application at the end of this Plan. If dust suppressants other than water are used, click here, and complete the Dust Suppressants information, below.)

NOTE: The following options CANNOT be considered for a primary control measure.

Contingency	Thoroughly clean debris from paved & other surfaces following demolition activity	Add Contingency	Remove Contingency
-------------	---	-----------------	--------------------

Category I: Weed Abatement by Discing or Blading

Will there be any weed abatement by discing or blading on this site? Yes No

I.1 Disturbance Operations before and during Weed Abatement
 Required: Pre-water site AND apply water during weed abatement by discing or blading. (Complete Water Supply and Application, at the end of this Plan.)

NOTE: The following options CANNOT be considered for a primary control measure.

Contingency	Cease operations (Note: this option may not be used as a primary control measure)	Add Contingency	Remove Contingency
-------------	---	-----------------	--------------------

Primary	Apply water (Complete Water Supply and Application at the end of this Plan)	Add Primary	Remove Primary
Contingency	Apply gravel	Add Contingency	Remove Contingency

Category J: Blasting Operations

Will there be any blasting on this site? Yes No



This Dust Control Plan must be submitted with a Dust Control Permit Application. See [Dust Sources](#) or call (602) 506-6010 for more information

DUST CONTROL PERMIT APPLICATION PACKAGE, SECTION 2: DUST CONTROL PLAN

Category K. Water Supply and Application

SOIL TEXTURE: If the soil on the work site has been tested, then you should rely on the test results to complete the table and you should attach a copy of the site soil report to this application.
 If the soil on the work site has not been tested, then use Appendix F in the Maricopa County Air Pollution Control Regulations to complete the table below. (**WARNING:** If you have this form open in a web browser, be sure to **save your work** and then open Appendix F in a new window. **Otherwise, you may lose your work.** For Appendix F, go to: <http://www.maricopa.gov/DocumentCenter/View/5309>.)

Texture of soil naturally present on work site			Texture of soil to be imported to work site		
Soil Type	Severe - Clay, Silty Clay, Sandy Clay	?	Soil Type	No soil to be imported	?

Water Source(s): Please list ALL water supplies that will be used at any point throughout the duration of the project. [Add as many as needed using the Add Source buttons on the right.]

Source	Water Pond	Qty	1	Size	1 Million Gallon	Add Source	Remove Source
Source	Metered Hydrant	Qty	1	Size	2 1/2 inch	Add Source	Remove Source

Water Method(s) of Application: Please list ALL water application methods that will be used at any point throughout the duration of the project. [Add as many as needed using the Add Method buttons on the right.]

Method	Water Pull	Qty	2	Size	8000 Gallon	Add Method	Remove Method
Method	Water Truck	Qty	4	Size	2000 Gallon	Add Method	Remove Method
Method	Hose	Qty	2	Size	1 1/2"	Add Method	Remove Method

Attention: The permit holder is required to supply the minimum daily amount of water for each phase listed below. Failure to allot this amount may lead to a violation and associated fines. Furthermore, regardless of the minimum amount of water that is required, the owner and/or operator of the job site shall never cause or allow fugitive dust emissions to exceed 20% opacity. [See Rule 310, Section 303(1)(a).]

Category (Section from Dust Plan, above)	Average Daily Disturbed Area (in Acres) for this Phase	Required Minimum Amount of Water Available for this Phase of the Project
B1: Unpaved Staging, Parking & Storage Areas	5	2 - 10 Acres Daily Minimum Requirement 750 - 3,500 Gallons
B2: Unpaved Access Areas/ Haul Roads	5	2 - 10 Acres Daily Minimum Requirement 750 - 3,500 Gallons
C2: Disturbed Surfaces (During Active Operations)	5	2 - 10 Acres Daily Minimum Requirement 750 - 3,500 Gallons
C3: Disturbed Surfaces (During Inactive Periods)	1	0 - 2 Acres Daily Minimum Requirement 375 - 750 Gallons
F2: Fine Grading	5	2 - 10 Acres Daily Minimum Requirement 1,000 - 5,000 Gallons
G1: Underground Utilities/ Structure Excavation	1	0 - 2 Acres Daily Minimum Requirement 500 - 1,000 Gallons
G2: Construction of Vertical Structures	1	0 - 2 Acres Daily Minimum Requirement 250 - 500 Gallons
H: Demolition Activities	1	0 - 2 Acres Daily Minimum Requirement 375 - 750 Gallons
I1: During Weed Abatement	5	2 - 10 Acres Daily Minimum Requirement 1,000 - 5,000 Gallons
I2: Stabilization following Weed Abatement	5	2 - 10 Acres Daily Minimum Requirement 1,000 - 5,000 Gallons



This Dust Control Plan must be submitted with a Dust Control Permit Application. See [Dust Sources](#) or call (602) 506-6010 for more information

DUST CONTROL PERMIT APPLICATION PACKAGE, SECTION 2: DUST CONTROL PLAN

Category D4: Bulk Material Loading, Unloading & Stacking	Number of Yards to be Imported/ Exported	Multiply by 30 gallons per yard; Result Appears in Next Column	Equals Total Gallons of Water Required	Number of Days of Importing/ Exporting Operations	Divide Total Gallons Required by Number of Days; Result Appears in Next Column	Required Minimum Number of Gallons per Day Available
	0			0		
Category F1: Mass Grading (from Dust Plan, above)	Average Daily Disturbance (in Acres) for This Phase	NOTE: Mass Grading water requirements differ depending on the time of year--complete both sections if necessary		Required Minimum Amount of Water Available for this Phase of the Project = Average Daily Disturbance X Daily Minimum Gallons Required		
F1: Mass Grading (November-February)	10	Required minimum amount of water = <u>5,000 gallons/acre/day & 30 gallons/cubic yard of material moved</u>		50,000		
F1: Mass Grading (March- October)	10	Required minimum amount of water = <u>10,000 gallons/acre/day & 30 gallons/cubic yard of material moved</u>		100,000		

Click the button below to check to see if required fields have been completed. If any required fields need attention, follow the instructions in the pop-up boxes and complete any parts of the form highlighted in orange.

If no messages are received after clicking the button below, then all required fields have been completed.

NOTE: This process does **not** check for completion of any additional boxes that popped up based on your choices.

Check Form for Required Fields



**ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY**



1110 West Washington Street Phoenix, Arizona 85007
(602) 771-2300 www.azdeq.gov

Notice of Intent (NOI) Certificate

LTF#: 74220

ID#:AZCN74220

Type:**AZPDES Stormwater Construction General Permit (CGP)**

Issue Date:**11/09/2018**

Please note, that pursuant to Arizona Administrative Code, Title 18, Chapter 14, Article 109(C), you will be billed an annual permit fee equal to the initial fee until such time as you submit a Notice of Termination to close out your permit coverage.

Coverage Issued to:

Name:**BROOKFIELD LAKIN LLC**

Address Line 1:**14646 N KIERLAND BLVD #165**

City:**SCOTTSDALE**

State:**AZ** zip : **85254**

Construction Site Information:

Name:**Alamar Phase 1**

Latitude/Longitude:**33.404008 / -112.308663**

Acres Disturbed:**139**

Outfall Location(s):

SWC OF PHASE 1 | 33.400060 | -112.313325 | Gila River-Salt River - Agua

Main Office

1110 W.Washington Street . Phoenix, AZ 85007
(602)771-2300

Southern Regional Office

400 W.Congress Street . Suite 433 . Tucson, AZ 85701
(520)628-6733

www.azdeq.gov

Fria River

Discharge Monitoring Report (DMR) Required:**No**

SWPPP Contact Information:

First Name:**Scott**

Last Name:**Nunemaker**

Phone:**4802229922**

Work Email :**scott@rccmlc.com**

Main Office

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**STATE OF ARIZONA
DEPARTMENT OF**

ENVIRONMENTAL QUALITY

**WATER QUALITY DIVISION
PHOENIX, ARIZONA 85007**

**ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM
GENERAL PERMIT FOR STORMWATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION ACTIVITY
TO WATERS OF THE UNITED STATES**

This permit provides authorization to discharge under the Arizona Pollutant Discharge Elimination System (AZPDES) program, in compliance with the provisions of the Arizona Revised Statutes, Title 49, Chapter 2, Article 3.1, the Arizona Administrative Code (A.C.C.), Title 18, Chapter 9, Articles 9 and Chapter 11, Article 1, and the Clean Water Act as amended (33 U.S.C. 1251 et seq.).

This general permit specifically authorizes stormwater discharges associated with construction activity, pursuant to 40 CFR § 122.26(b)(14)(x) and 40 CFR § 122.26(b)(15) in Arizona. All discharges authorized by this general permit shall be consistent with the terms and conditions of this general permit. Permit coverage is required from the "commencement of construction activities" until "final stabilization", as these terms are defined in this permit.

This general permit becomes effective on June 3, 2013.

This general permit and the authorization to discharge expire at midnight, June 2, 2018.

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1.0 COVERAGE UNDER THIS GENERAL PERMIT

1.1 Permit Area.

This general permit covers the state of Arizona. This permit is not authorized for use by operators with stormwater discharges associated with construction activities on any Indian Country lands in Arizona. USEPA Region 9 is the permitting authority for Indian lands in Arizona.

1.2 Eligibility.

This general permit authorizes stormwater discharges associated with “construction activities”, as defined in Appendix A that will disturb one or more acres of land, or will disturb less than one acre, but is part of a common plan of development or sale that will ultimately disturb one acre or more. This general permit is also applicable to stormwater discharges associated with support activities from temporary plants or operations set up to produce concrete, asphalt, or other materials exclusively for the permitted construction project. See 40 CFR 122.26(b)(14)(x) and (15).

Operators of small construction sites (less than five (5) acres – see 40 CFR 122.26(b)(15) and Appendix A) may, if eligible, choose a waiver from coverage under this permit, provided that site remains in compliance with the applicable requirements of Part 1.5 during construction.

Coverage under this permit may be required for any discharge that ADEQ determines is needed in accordance with A.A.C. R18-9-A902(B)(8)(d).

Any discharges that are not consistent with the eligibility conditions of this permit are not authorized by this permit. A person shall either apply for a separate Arizona Pollutant Discharge Elimination System (AZPDES) permit to cover such ineligible discharge(s), cease the discharge(s), or take necessary steps to make the discharge(s) eligible for coverage under this permit.

Individual Permit Requirements. An operator who desires to obtain an individual stormwater permit (in accordance with the requirements of A.A.C. R18-9-C902(B), or is required by ADEQ to obtain an individual stormwater permit (in accordance with A.A.C. R18-9-C902(A)), shall comply with the requirements of Appendix B, Subsections 17 and 18(a)(i).

1.3 Authorized Discharges.

1. Allowable Stormwater Discharges. An operator may discharge pollutants in:
 - a. Stormwater runoff associated with construction activities provided the discharge is conducted in compliance with this permit;
 - b. Discharges requiring a stormwater permit under 40 CFR 122.26(a)(1)(v); 40 CFR 122.26(b)(15)(ii); or under 40 CFR 122.26(a)(9);
 - c. Stormwater discharges from construction support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided:
 - i. The support activity is directly related to a construction site that is required to have AZPDES permit coverage for discharges of stormwater associated with construction activity;
 - ii. The support activity is not a commercial operation (serving multiple unrelated construction projects by different operators) and does not operate beyond the completion of the construction activity for which the support activity is directly associated.
 - iii. The support activity is not otherwise covered by a separate AZPDES permit; and
 - iv. Appropriate control measures for the discharges from the support activity areas are identified in the Stormwater Pollution Prevention Plan (SWPPP) and implemented.

2. Allowable Non-Stormwater Discharges.

- a. The following are the only non-stormwater discharges allowed under this permit. These discharges are allowed provided they are reduced or eliminated to the extent practicable. When allowable non-stormwater discharges can not be practicably eliminated, the operator shall install appropriate control measures to reduce or eliminate pollutants in the discharge to assure compliance with Part 3 of this permit:
 - i. Discharges from emergency fire-fighting activities;
 - ii. Water used to control dust, provided reclaimed water or other process wastewaters are not used;
 - iii. Routine external building wash down where detergents are not used;
 - iv. Water used to rinse vehicles and equipment, provided that reclaimed water or other wastewater is not used and no soaps, solvents, detergents, oils, grease or fuels are present in the rinsate;
 - v. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
 - vi. Uncontaminated air conditioning or compressor condensate;
 - vii. Uncontaminated groundwater or spring water;
 - viii. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
 - ix. Water from fire fighting system testing and maintenance, including hydrant flushings;
 - x. Discharges related to installation and maintenance of potable water supply systems, including disinfection and flushing activities, discharges resulting from pressure releases or overflows, and discharges from wells approved by ADEQ for drinking water use;
 - xi. Hydrostatic testing of new pipes, tanks or vessels using potable water, surface water, or uncontaminated groundwater;
 - xii. Water used for compacting soil, provided reclaimed water or other wastewaters are not used;
 - xiii. Water used for drilling and coring such as for evaluation of foundation materials, where flows are not contaminated with additives; and
 - xiv. Uncontaminated waters obtained from dewatering operations/ foundations in preparation for and during excavation and construction provided the discharge are managed as specified in Part 3.1.4 of this permit.

Note: This permit does not prohibit the use of reclaimed or other process wastewaters on-site for dust control, soil compaction or for landscape irrigation. However, such activities shall be managed in a way that they are not discharged off site or applied during rain events consistent with A.A.C. R18-9-704(G)(3)(c) of the reclaimed water rules. Therefore, they are not permissible 'discharges'.

- b. If the site is within 1/4 mile of an outstanding Arizona water (OAW), the operator shall not discharge any non-stormwater under this permit, except for emergency fire-fighting activities, unless specifically authorized by the Department.

1.4 Prohibited Discharges.

The operator shall not allow any non-stormwater discharges from the site except as provided in Part 1.3(2). All other non-stormwater discharges (not listed above) shall be eliminated or authorized under a separate AZPDES permit, as those discharges are not authorized under this permit. Stormwater

discharges that are mixed with non-stormwater, other than the allowable non-stormwater discharges listed in Part 1.3(2) are not eligible for coverage under this permit. The following discharges are prohibited:

1. Wastewater from washout of concrete, unless managed by an appropriate control as described in Part 3.1.3.1(1);
2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials, unless managed by an appropriate control as described in Part 3.1.3.1(3);
3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
4. Soaps or solvents used in vehicle and equipment washing; and
5. Toxic or hazardous substances from a spill or other release.

1.5 Limitations of Coverage.

1. Post-Construction Discharges. This general permit does not authorize stormwater discharges that originate from the site after construction activities have been completed and the site, including any temporary support activity site, has achieved final stabilization and a Notice of Termination (NOT) has been submitted to ADEQ. Post-construction stormwater discharges from industrial sites may need to be covered by a separate AZPDES permit.
2. Discharges Covered by Another AZPDES Permit. This general permit does not authorize stormwater discharges associated with construction activity that are covered under an individual permit or another applicable general permit.
3. Impaired Waters. The following conditions and requirements apply if any portion of the construction site is located within 1/4 mile of a receiving water listed as impaired under section 303(d) of the Clean Water Act:
 - a. The operator must submit a copy of the SWPPP and associated review fee with the NOI to ADEQ;
 - b. The SWPPP must include a sampling and analysis plan (see Part 7.3(5)) for analytical monitoring if there is potential for discharges from the site to include the pollutant(s) for which the receiving water is impaired. However, if the operator can demonstrate there is no reasonable potential that construction activities could be an additional source of the identified pollutant(s), analytical monitoring is not required. As part of this demonstration, the operator must consider all on-site activities, including the potential for the pollutants (metals, nutrients, etc.) to be present in site soils. The demonstration must be included in the SWPPP submitted for ADEQ's review;
 - c. If a discharge contains pollutants for which an approved Total Maximum Daily Load (TMDL) has been established, the SWPPP shall specifically identify control measures necessary to ensure the discharges will be consistent with the provisions of the TMDL:
4. Outstanding Arizona waters (OAW). The following conditions and requirements apply if any portion of the construction site is located within 1/4 mile of a receiving water listed as an OAW in A.A.C. R18-11-112(G):
 - a. The operator must submit a copy of the SWPPP and associated review fee with the NOI to ADEQ;
 - b. The SWPPP must include a sampling and analysis plan for analytical monitoring (see Part 7.3(5)) of pollutants expected to discharge from the site, including sediment;

1.6 Erosivity Waivers for Small Construction Activities.

A person performing construction activity which disturbs between one and five acres may be exempt from obtaining coverage under this permit for the duration of the project based on a low potential for

soil erosion for the duration of the project (i.e., the Erosivity Waiver).

Note: Construction activities that disturb five acres or greater, or less than five acres but are part of a common plan of development or sale, are not eligible for any of this waiver.

1. Calculating the Erosivity Waiver. Low potential for erosion is defined as a rainfall erosivity (R) factor of less than five as calculated using ADEQ's Smart NOI Web site.

The small construction project's rainfall erosivity factor calculation shall be less than five during the **entire** period of construction activity. The period of construction activity begins at initial earth disturbance (commencement of construction activities) and ends with final site stabilization.

The applicant shall certify to ADEQ that construction activity will occur only when the rainfall erosivity factor is less than five.

If any portion of the construction site is located within 1/4 mile of an impaired water or OAW, the site is not eligible for the erosivity waiver. The erosivity waiver is predicated on the above criteria being met and proper application procedures being followed.

Projects Which Extend Past Certified Period. If the small construction project continues beyond the calculated "end date" as shown on the Permit Waiver Certification, the operator is in violation of this permit. If this occurs, the operator shall prepare a SWPPP and submit an NOI as required under Parts 2.3 and 6.0 before the end of the certified waiver period.

2. Permit Waiver Certification. The operator shall obtain an AZPDES Permit Waiver Certification before commencing construction activities. All waiver certifications require an AZPDES fee in accordance with A.A.C. R18-14-109, Table 6. ADEQ will not issue a waiver until the proper fee is paid.

An operator of a construction activity that is eligible for one of the above waivers shall provide the following information:

- a. The name, address, and telephone number of the construction site operator(s);
- b. The name (or other identifier), address, county, and parcel or lot number as recorded by the county, of the construction project or site;
- c. An accurate (within 15 seconds) latitude and longitude (in degrees/ minutes/ seconds format) of the construction project or site at the point of discharge nearest to the receiving water;
- d. The project start and completion (final stabilization) dates;
- e. The total project acreage and the acreage to be disturbed by the operator submitting the NOI, to the nearest 0.5 acre;
- f. If there is potential for discharge to a municipal separate storm sewer system (including municipal streets and other improvements that can convey stormwater), the name of the municipal operator of the storm sewer;
- g. The name of the waterbody(s) that would be receiving stormwater discharges from the construction project;
- h. For the erosivity waiver, verification that the rainfall erosivity factor calculation that applies to the active construction phase at the project site is less than five calculated using ADEQ's Smart NOI Web site; and
- i. The waiver certification form shall be signed using the electronic signature feature on the Smart NOI Web site and in accordance with the signatory requirements of Appendix B, Subsection 9.

2.0 AUTHORIZATION UNDER THIS GENERAL PERMIT

The operator shall review all the conditions and requirements of this permit before submitting any of the forms described in Part 2.

2.1 Responsibilities of Operators.

2.1.1 All operators. All operators are required to obtain coverage for stormwater discharges associated with construction activity under this permit or an alternative AZPDES permit. For the purposes of this permit, an “operator” is any person associated with a construction project that meets either of the following two criteria:

1. The person has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
2. The person has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit).

Subcontractors generally are not considered operators for the purposes of this permit.

2.1.2 Multiple Operators. Where there are multiple operators associated with the same project, all operators are required to obtain permit coverage. The following applies in these situations:

1. If one operator has control over plans and specifications and a different operator has control over activities at the project site, they may divide responsibility for compliance with the terms of this permit as long as they jointly develop a common SWPPP (see Part 6.1(1)), which documents which operator has responsibility for each requirement of the permit.
2. If an operator only has operational control over a portion of a larger project (e.g., one of four homebuilders in a subdivision), the operator is responsible for compliance with applicable effluent limits (see Part 3), terms, and conditions of this permit as it relates to their activities on their portion of the construction site and implementation of control measures described in the SWPPP in the areas under their control.
3. Operators must ensure either directly or through coordination with other operators, that their activities do not render another person’s pollutant discharge controls ineffective.
4. If the operator of a construction support activity (see Part 1.3(1)(c)) is different than the operator of the main construction site, that operator is also required to obtain permit coverage.

2.2 Prerequisites for Submitting a Notice of Intent (NOI).

A person may be authorized to discharge under this permit only if the stormwater discharge is associated with construction activities from the project site. Prior to submission of an NOI, an applicant seeking authorization to discharge under this general permit shall:

1. Meet the eligibility requirements under Part 1.2; and
2. Develop a SWPPP that meets the requirements of Part 6 of this permit and that covers either the entire site or all portions of the site for which the person is an operator.
 - a. The SWPPP shall be prepared prior to submission of the NOI and shall be implemented prior to the start of construction.
 - b. The SWPPP is not required to be submitted to ADEQ (unless the project is within 1/4 mile of an impaired water or OAW as described in Parts 1.5(3) and 1.5(4)) but shall be retained and made available in accordance with Part 6.7.

Note: Emergency-related construction activities (see Part 2.4) are automatically authorized to discharge under this permit (see Appendix A).

2.3 Submitting an NOI.

1. Application Required.
 - a. The operator shall submit separate, accurate and complete NOIs to ADEQ for each project that disturbs one or more acres of land. The operator of a common plan of development or sale that will ultimately disturb one or more acres must submit completed NOIs to ADEQ at the address specified in Part 8.2.
 - b. Submission of the NOI demonstrates the operator's intent to be covered by this permit; it is not a determination by ADEQ that the operator has met the eligibility requirements for the permit. Discharges are not authorized if ADEQ notifies the operator that further evaluation is necessary, or the discharges are not eligible for coverage under this permit.
 - c. Whenever the operator changes or another is added during the construction project, the new operator shall also submit an NOI to be authorized under this permit before taking over operational control or commencing construction activities at the site.
2. NOI Requirements. Construction site operators seeking authorization for stormwater discharges under this general permit shall submit a complete and accurate AZPDES NOI form to ADEQ. Submit to the Department a complete and accurate NOI form electronically via the Smart NOI Web site at: <https://az.gov/app/smartnoi/> or submit a paper copy with original signature in accordance with A.A.C. R18-9-C901(D) to the address listed in Part 8.2.

The NOI form is available at <http://www.azdeq.gov/environ/water/permits/cgp.html>

The NOI form requires, at a minimum, the following information:

- a. The name, address, and telephone number of the construction site operator;
- b. The type of project (e.g., school, commercial, subdivision, roadway, etc.) shall be specifically identified on the NOI;
- c. Whether the project is part of a greater plan of development;
- d. Estimates of the total project acreage and the acreage to be disturbed by the operator submitting the NOI;
- e. The printed name (or other identifier), address, county, lot number or parcel or lot number as recorded by the county, of the construction project or site;
- f. An accurate (within 15 seconds) latitude and longitude (in degrees/ minutes/ seconds format) of the construction site at the point nearest the closest receiving water. If the site is located within 1/4 mile of an impaired water or OAW, the operator shall provide the latitude and longitude of the property that is closest to the impaired water or OAW. If the site is part of a larger common plan of development, the operator shall provide the latitude and longitude of the discharge point for the portion of the site covered by that NOI;
- g. Whether any part of the site is located on Indian Country;
- h. Confirmation that a SWPPP meeting the requirements in Part 6 of this permit has been developed and will be implemented prior to commencement of construction activities. If the NOI is a late application, the operator shall certify that a SWPPP has been developed and implemented prior to submittal of the NOI;
- i. The onsite location where the SWPPP may be viewed and the name and telephone number of a contact person;
- j. Provide the name of the closest receiving water, which may include an unnamed wash;
- k. The name(s) of the MS4 into which there is a potential to discharge, if applicable;

- l. The project's estimated start and completion dates;
 - m. Whether the project has or will need any other water quality permits or approvals, including, but not limited to, subdivision approvals, a Clean Water Act (CWA) section 404 permit, and the permit number(s), if applicable;
 - n. Whether any portion is within 1/4 mile of an impaired or OAW; and
 - o. All Notice of Intent forms must be signed in accordance with the signatory requirements of Appendix B, Subsection 9.
 - p. An NOI is not complete unless the appropriate fee is paid.
3. Effective Date of Permit Coverage.
- a. Incomplete NOI Submitted. If ADEQ notifies the operator that an NOI is incomplete or incorrect, the operator shall submit an amended NOI if the operator still intends to obtain coverage under this permit.
 - b. Discharges to Impaired or outstanding Arizona waters. Applicants seeking coverage for a construction site that is located within 1/4 mile of an impaired or outstanding Arizona water are not authorized under this permit for a minimum of 30 calendar days following receipt of the signed NOI, SWPPP and initial application fee. ADEQ may notify operators within this time-frame that there is cause for a SWPPP amendment or denial of coverage as specified in Parts 1.5(3) and 1.5(4) of this permit. If notification is not received in the 30 calendar day time period, the operator may assume coverage under this permit; the operator must verify with the Department that the Surface Water Section received the NOI and SWPPP prior to commencement of construction activities.
 - c. NOIs Requiring Additional Evaluation. ADEQ may notify an operator that authorization to discharge shall not occur for up to 30 calendar days in the event that review of the NOI identifies information requiring further evaluation, including that the SWPPP be submitted to ADEQ. This notification may be made either in writing, email, by fax or phone contact. Operators receiving notice of a delay in coverage may discharge 30 calendar days after the date the signed NOI is received unless further notice is received from the Department during this time period. Such further notice may confirm authorization to discharge or deny permit coverage and require an application for an individual permit.

If the operator receives notification from ADEQ that the SWPPP is incomplete or otherwise deficient, the operator shall submit a revised SWPPP to ADEQ that addresses the Department's comments if the operator still intends to obtain permit coverage. If review of the revised SWPPP reveals that a discharge of pollutants may cause or contribute to an exceedance of an applicable water quality standard, monitoring may be required, in accordance with Part 7. The revised SWPPP must include the applicable re-review fee. Permit coverage is suspended until the Department issues the permit authorization certificate.
 - d. Routine Coverage. Except as provided in Parts 2.3(3)(a) through (c), an eligible operator is authorized to discharge stormwater from a construction project 7 calendar days after a complete and accurate NOI is received by ADEQ's Surface Water Section or when an authorization certificate is issued, whichever is earlier. However, in order to rely on the 7 calendar day "default" provision, the operator must submit the NOI in a manner that documents the date of ADEQ's receipt (i.e., certified mail, hand delivery, etc.).

Alternatively, applicants that submit a SMART NOI using the electronic signature feature will typically obtain immediate authorization unless any portion of the site is located within 1/4 mile of an impaired water or OAW.
 - e. Ongoing Construction Projects. For operators of construction projects ongoing as of the

effective date of this permit that received authorization to discharge for these projects under the expired Construction General Permit (AZG2008-001), coverage will automatically transfer to CGP 2013 and remain in effect until the operator submits an NOT (in accordance with Part 2.5). An operator that has had authorization automatically transferred and re-issued shall comply with the terms of this permit, as described in i., ii. and iii. below. Parts 2.3(3)(b), (c) and (d) do not apply to operators of on-going construction projects that were authorized to discharge under AZG2008-001.

- i. Within the first 120 days from the effective date of this permit, the operator shall update the SWPPP as necessary to comply with the requirements of Part 6 of this permit.
 - ii. The operator may continue to comply with the terms and conditions of the expired AZG2008-001 until the SWPPP is updated, within the first 120 days from the effective date of this permit.
 - iii. An operator may submit an NOT within the first 120 days from the effective date of this permit, if the operator is eligible to submit an NOT (e.g., construction is finished and final stabilization has been achieved).
- f. Change in Operators. For construction projects where the operator changes, including instances where an operator is added after an NOI has been submitted, the new operator shall submit an NOI and receive an authorization certificate before assuming operational control or commencing work on-site (see Appendix B, Subsection 19).
 - g. Certificate of Authorization. The operator will receive an authorization certificate (by mail, or electronically via the Smart NOI system for electronic submittals with e-signatures) assigning an authorization number and approval date.

Note: The Certificate of Authorization is not the permit. The authorization certificate acknowledges that the Department received the NOI and that the operator is authorized to discharge subject to the terms and conditions of this permit. Correspondence with ADEQ concerning any construction activity covered by this permit shall reference the authorization number.

4. Late Applications. The operator is only permitted for discharges that occur after a complete and accurate NOI is received by ADEQ and authorization is granted. ADEQ reserves the right to take enforcement action for any un-permitted discharges or permit noncompliance that occur between the time construction commenced and either permit authorization is granted, denied, or a complete and accurate Permit Waiver Certification form is submitted and the waiver is approved.
5. Discharges to a regulated MS4. Construction sites located within a regulated MS4 shall submit a copy of the Department's Authorization to Discharge to the MS4 operator. A list of regulated MS4s is found at <http://www.azdeq.gov/environ/water/permits/stormwater.html#ms4s>.
6. Revised NOI. If personnel contact information or the operator address on the NOI filed for permit coverage changes during permit coverage, the operator shall submit a revised NOI to ADEQ indicating the updated information. If information other than personnel contact or the operator's address changes, a new NOI shall be submitted to the address specified in Part 8.2. No fee is assessed for submitting a revised NOI.

2.4 Authorization of Emergency-Related Construction Activities

Emergency-related construction activities are automatically authorized provided that:

1. The project is being performed in order to avoid imminent endangerment to human health or the environment or in response to a emergency and the activity requires immediate authorization;

2. If the activity continues past 30 calendar days of commencing construction activities (see Part 2.2), the operator shall prepare a SWPPP and submit a complete and accurate NOI;
3. The operator provides documentation in the SWPPP to substantiate the occurrence of the public emergency; and
4. The operator complies with all other applicable requirements in the permit regarding discharges associated with the construction activities.

Note: Operators of emergency-related construction activities are considered provisionally covered under the terms and conditions of this permit immediately, unless ADEQ notifies the operator that the authorization has been delayed or denied.

2.5 Terminating Coverage.

1. Notice Required. To terminate permit coverage, the operator shall submit a complete and accurate Notice of Termination (NOT) form to the address listed in Part 8.2. Other NOT options (i.e., electronic submission) may also be used if ADEQ makes the information available on the Internet or by public notice. The operator is responsible for meeting the terms and conditions of this permit until the construction site's authorization is terminated.

All NOT forms must be signed in accordance with the signatory requirements of Appendix B, Subsection 9.

The operator may submit a complete and accurate NOT form to ADEQ after any of the following conditions have been met:

- a. The operator has established final stabilization on all portions of the site for which the operator is responsible, in accordance with Part 3.1.2.2.
- b. Another operator who has a valid authorization number under this general permit or an individual AZPDES permit has assumed control over all areas of the site that have not been finally stabilized (see Appendix B, Subsection 19);
- c. For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner (or a homeowner's association) in accordance with Part 3.1.2.2(2)(b);
- d. The planned construction activity identified on the original NOI was never initiated (i.e., no grading or earthwork was ever started) and plans for construction have been permanently abandoned or indefinitely postponed;
- e. The operator has obtained coverage for the site under another AZPDES permit;
- f. The operator qualifies for one of the stabilization alternatives in Part 3.1.2.3. If qualifying for either alternative, the operator shall submit the required documentation with the NOT demonstrating compliance with Part 3.1.2.3.

Note: NOTs can only be submitted to ADEQ for those sites which obtained timely permit authorization by submitting a complete and accurate NOI. Sites which did not receive permit authorization have no permit coverage to terminate.

2. NOT Requirements. The operator shall submit to ADEQ a complete and accurate NOT form electronically via the Smart NOI Web site at: <https://az.gov/app/smartnoi/> or submit a paper copy (photocopy/ fax/ e-mail/ electronic) to the address listed in Part 8.2. All NOT forms must be signed in accordance with the signatory requirements of Appendix B, Subsection 9.

Note: The operator shall receive an acknowledgement letter upon ADEQ's receipt of the operator's completed NOT form.

3. Notification to Municipal Separate Storm Sewer Systems. If the construction site was located within a regulated MS4, the operator shall send a copy of the NOT acknowledgement letter to the MS4 operator. A list of regulated MS4s is found at <http://www.azdeq.gov/envirom/water/permits/stormwater.html#ms4s>.

4. Effective Date of Permit Termination. Authorization to discharge terminates under this permit at midnight on the date the complete NOT is received by the Department.

2.6 Change of Operator Request due to Foreclosure or Bankruptcy.

If a lending institution or another person takes operational control of the permitted construction site due to foreclosure or bankruptcy then that person is responsible for discharges from the construction site and shall submit an application for permit coverage within 14 days prior to taking control of the site if the construction site has not achieved final stabilization as defined in Part 3.1.2.2.

In the event the person taking control of the construction site fails to submit an application for the construction site, the permittee may submit a petition to the department to terminate permit coverage by submitting a Change of Operator Request (COR) form (available at <http://www.azdeq.gov/envIRON/water/permits/cgp.html>). In making this request, the permittee must no longer have access to the property and shall submit the following information:

1. The date of the loss of control of the construction site;
2. identifies the person that has control of the construction site;
3. Identifies the reasons for being unable to submit a NOT that complies with the requirements of Part 2.5;
4. Submits a copy of the SWPPP and associated review fee with the COR;
5. The permittee shall provide an update in the SWPPP documenting conditions at the time of loss of control. The permittee shall indicate areas of exposed soils and material stockpiles; the location, type and quantity of chemicals storage; the existing BMPs left in place and their condition; and areas that have been stabilized. The permittee shall indicate if there is public access to the site (e.g., perimeter fence, gate, etc). The Permittee shall also identify any conditions which may be dangerous or hazardous, or may pose a significant environmental threat.
6. Documentation that the permittee informed the person taking control of the construction site of the requirements of this permit; and
7. If the construction site has the potential to discharge to a regulated MS4, documentation that the permittee notified the MS4 of the change in control and the identity and contact information for the person that has control.

ADEQ will review the COR and related information to determine appropriate actions, including (but not limited to) terminating permit coverage for the original permittee. As part of this assessment, the department may conduct a site inspection. Submitting a COR does not suspend ongoing enforcement actions and does not preclude the department from taking enforcement actions for violations of this permit.

3.0 EFFLUENT LIMITATIONS AND WATER QUALITY STANDARDS APPLICABLE TO ALL DISCHARGES FROM CONSTRUCTION SITES

The control requirements in this Part implement the technology-based effluent limitations to meet water quality standards that, where applicable, apply to all stormwater and allowable non-stormwater discharges from construction sites eligible for coverage under this permit. These requirements apply the national effluent limitations guidelines and new source performance standards found at 40 CFR Part 450. The operator shall comply with the control measures requirements included in Part 3 through site planning and designing, installing, and maintaining these controls.

Exception for ongoing construction projects

Note: If a project is an “ongoing construction project” (see Part 2.3(3)(e)), and it is infeasible for the operator to comply with a specific requirement in Part 3.1 because (1) the requirement was not part of the permit the project was previously covered under (i.e., AZG2008-001) and (2) the operator is prevented from compliance due to the nature or location of earth disturbances at the site or the operator is unable to comply with the requirement due to the manner in which control measures have already been installed or were already designed prior to October 1, 2013, the operator does not have to comply with that requirement provided that this fact is documented in the SWPPP. This exception only applies to those portions of a project that have already commenced earth-disturbing activities or where control measures implemented in compliance with the previous permit have already been installed.

3.1. Non-numeric Effluent Limitations and Associated Control Measures

Whenever applicable, the operator shall design, install and maintain the following control measures at construction sites:

- Erosion and sediment control (Part 3.1.1)
- Site stabilization (Part 3.1.2)
- Pollution prevention (Part 3.1.3)
- Controls for Allowable Non-Stormwater Discharges and Dewatering Activities (Part 3.1.4)

General Maintenance Requirements.

1. Ensure that all control measures required in this Part remain in effective operating condition during permit coverage and are protected from activities that would reduce their effectiveness.
2. Inspect all control measures in accordance with the inspection requirements in Part 4. The operator shall document the findings in accordance with Part 4.5. When controls need to be replaced, repaired, or maintained, make the necessary repairs or modifications. Routine maintenance does not constitute a corrective action (see Part 5.1). The operator shall comply with the following schedule:
 - a. Initiate work to fix the problem immediately after discovery, and complete such work by the close of the next work day, if feasible and the problem does not require significant maintenance, repair or replacement, or if the problem can be corrected through routine maintenance. SWPPP recordkeeping is not required for actions taken under this paragraph.
 - b. When installation of a new control that is not in response to a corrective action in Part 5.1, or a significant repair of existing controls is needed, install the new or modified control and make it operational, or complete the repair, by no later than 7 calendar days from the time of discovery, or before the next storm event (whichever is sooner) where feasible. If it is infeasible to complete the installation or repair within 7 calendar days or before the next storm event, SWPPP records must document why it is infeasible. The SWPPP must also document the schedule for installing the control(s) and making it operational as soon as practicable after the 7-day timeframe. Where these actions result in changes to any of the

controls or procedures documented in the SWPPP, modify the SWPPP accordingly within 7 calendar days of completing this work.

3.1.1 Erosion and Sediment Control Requirements.

Design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. The operator shall minimize the amount of soil exposed during construction activities. The operator is also subject to the deadlines for temporarily and/or permanently stabilizing exposed portions of the site in accordance with Part 3.1.2.

The following general requirements are applicable to all construction sites that implement the erosion and sediment controls in Part 3.1.1.

A. Design Requirements.

1. The operator shall account for the following factors in designing control measures:
 - a. The expected amount, frequency, intensity, and duration of precipitation;
 - b. The nature of stormwater runoff and run-on at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. If any stormwater flow will be channelized at the site, control measures must be designed to control both peak flowrates and total stormwater volume to minimize erosion at outlets and to minimize downstream channel and streambank erosion; and
 - c. The range of soil particle sizes expected to be present on the site.
2. The operator shall direct discharges to vegetated areas of the site to increase sediment removal and maximize stormwater infiltration, including any natural buffers established under Part 3.1.1.6(1), unless infeasible. Use velocity dissipation devices if necessary to prevent erosion when directing stormwater to vegetated areas.

B. Installation Requirements.

1. Complete the installation of control measures by the time each phase of earth-disturbance has begun. In the event it is infeasible to install one or more control measures prior to construction activity, the operator shall ensure that those controls are installed as soon as possible. SWPPP records must document why it is infeasible.

Following the installation of these initial control measures, all other controls planned for this portion of the site and described in the SWPPP must be installed and made operational as soon as conditions on the site allow. The requirement to install control measures prior to earth-disturbance for each phase of the project does not apply to the earth disturbance associated with the actual installation of these controls.

2. Use good engineering practices and follow manufacturer's specifications. The operator shall install all control measures in accordance with good engineering practices, including applicable design specifications. Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or local ordinances. Any departures from such specifications must reflect good engineering practice and must be explained in the SWPPP.

3.1.1.1 Control stormwater volume and velocity within the site to minimize soil erosion;

1. Run-on Management. If off site areas direct flow onto the construction site, divert run-on flows, or otherwise provide other appropriate control measures to account for off site contributions of stormwater and non-stormwater flow.

If stormwater conveyance channels are used at the site, the operator shall design and construct them to avoid unstabilized areas and to reduce erosion, unless infeasible. Minimize erosion of channels and their embankments, outlets, adjacent streambanks, slopes, and downstream waters during discharge conditions through the use of erosion

controls and velocity dissipation devices within and along the length of any constructed stormwater conveyance channel, and at any outlet to provide a non-erosive flow velocity.

2. Sediment Basins and Traps. If necessary, the operator shall install and maintain sediment basin(s) and / or traps to manage run-on, runoff, and sediment discharge from the construction site.
 - a. Design requirements. The SWPPP shall provide sizing and calculation requirements for sediment basin(s) and shall indicate whether the basin(s) will be temporary or permanent.
 - i. When discharging from the sediment basin, utilize outlet structures that minimize pollutants;
 - ii. Prevent erosion of (1) the sediment basin using stabilization controls (e.g., erosion control blankets), and (2) the inlet and outlet using erosion controls and velocity dissipation devices; and
 - iii. Sediment basins must be situated outside of surface waters and any natural buffers established under Part 3.1.1.5, unless approved under a CWA section 404 permit.
 - b. Maintenance requirements. The operator shall maintain sediment basins, ponds, and traps, and remove accumulated sediment when design capacity has been reduced by 50%.
 - c. An operator that uses polymers, flocculants, or other cationic treatment chemicals in a sediment basin shall select and use these chemicals in accordance with manufacturers' instructions so as to provide for adequate settling time and minimize or eliminate these chemicals in the discharge. Furthermore, the operator shall comply with the requirements in Part 6.3(10).
- 3.1.1.2 Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion;
 1. Culvert Stabilization. If culverts are present on the site, the SWPPP shall include measures to sufficiently minimize the threat of erosion at culvert locations to prevent the formation of rills and gullies during construction; and
 2. Velocity Dissipation Devices. The operator shall place velocity dissipation devices along the length of any outfall channel on-site, and at locations where discharges leave the construction site as necessary to provide a non-erosive flow velocity.
- 3.1.1.3 Minimize the amount of soil exposed and the disturbance of steep slopes during construction activity;
 1. Preserving Natural Vegetation. Where practicable, existing vegetation should be preserved. If natural vegetation can be preserved, the operator shall clearly mark vegetation before clearing activities begin. Locations of trees and boundaries of environmentally sensitive areas and buffer zones to be preserved shall be identified on the SWPPP site map;
 2. Phase or sequence construction activities. Where practicable, minimize the area of disturbance at any one time.
 3. Steep slopes. Where practicable, implement standard erosion and sediment control practices, such as phasing disturbances to these areas and using stabilization practices designed to be used on steep grades.
- 3.1.1.4 Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;

1. Perimeter Control. The operator shall use appropriate control measures (e.g., fiber rolls, berms, silt fences, vegetative buffer strips, sediment traps, or equivalent sediment controls) at all times for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction site.

For sites where stormwater from disturbed areas, exclusive of rights-of-way, is conveyed to one or more retention basins that are designed to retain stormwater runoff from a local 100 yr/ 2 hr storm event, the operator is not required to utilize perimeter controls.

For linear projects (see Appendix A) with rights-of-way that restrict or prevent the use of such perimeter controls, the operator shall maximize the use of these controls where practicable and document in the SWPPP why it is impracticable in other areas of the project.

2. Control discharges from stockpiles of sediment or soil. As necessary, implement the following measures for any stockpiled or land clearing debris composed, in whole or in part, of sediment or soil:

- a. Place stockpiles outside of washes or other surface waters, or stormwater conveyances, such as curb and gutter systems, or streets leading to such conveyances. If infeasible, install appropriate sediment controls and document the reasons in the SWPPP.
- b. Locate the piles outside of any buffers established consistent with Part 3.1.1.5;
- c. Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier;
- d. Avoid rinsing sediment, debris, or other pollutants accumulated on pavement or other impervious surfaces after the stockpile has been removed into any stormwater conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water;
- e. To the extent practicable, implement control measures to prevent the generation of wind blown sediment and debris; and
- f. Use silt fences or other effective sediment control measures around soil stockpiles except when they are being actively worked.

3. Storm Drain Inlet Protection. The operator shall assess the need for and install inlet protection measures as necessary that remove sediment from the site's discharge. If the site discharges to any storm drain inlet that carries stormwater flow directly to a surface water (and it is not first directed to a sediment basin, sediment trap, or similarly effective control and the operator has authority to access the storm drain inlet), then inlet protection is required.

Note: Inlet protection measures can be removed in the event of flood conditions that may endanger the safety of the public. Such actions are allowable only under extreme conditions and shall be documented on the SWPPP. The operator shall evaluate alternatives to be used in the future to prevent a recurrence of this problem.

4. If existing control measures need to be repaired or modified or if additional control measures are necessary, implementation shall be completed within 7 calendar days or before the next storm event (whichever is sooner), unless otherwise prescribed in a. through d. below. If implementation before the next storm event is impracticable, the reason(s) for delay shall be documented in the SWPPP and alternative control measures shall be implemented as soon as possible. Additionally, the following maintenance activities shall be implemented as follows:
 - a. Remove accumulated sediment when it reaches a maximum of one-third the height of the silt fence or one-half the height of a fiber roll.

- b. Sediment shall be removed from temporary and permanent sedimentation basins, ponds and traps when the depth of sediment collected in the basin reaches 50% of the storage capacity.
- c. Construction site egress location(s) shall be inspected for evidence of off-site tracking of sediment, debris, and other pollutants onto paved surfaces. Removal of sediment, debris, and other pollutants from all off-site paved areas shall be completed as soon as practicable.
- d. Accumulations of sediment, debris, and other pollutants observed in off-site surface waters, drainage ways, catch basins, and other drainage features shall be removed in a manner and at a frequency sufficient to minimize impacts and to ensure no adverse effects on water quality.

3.1.1.5 Maintain natural buffers adjacent to perennial waters and direct stormwater to vegetated areas to increase sediment removal, unless infeasible.

1. Provide Natural Buffers or Equivalent Sediment Controls. This requirement only applies when a perennial water (including lakes, unless infeasible) is located within 50 feet of the project's earth disturbances.

Areas not owned or that are otherwise outside the operational control of the operator may be considered areas of undisturbed natural buffer for purposes of compliance with this part.

The operator shall ensure that any discharges to perennial waters through the area between the disturbed portions of the property and any perennial waters located within 50 feet of the site are treated by an area of undisturbed natural buffer and/or additional erosion and sediment controls in order to achieve a reduction in sediment load equivalent to that achieved by a 50-foot natural buffer. Refer to Part 3.1.1.5(3) for exceptions to this requirement.

2. Alternatives. In areas where it is infeasible to maintain the 50 foot buffer, the operator shall:
 - a. Document in the SWPPP the reasons why the 50 foot buffer cannot be maintained, and identify the additional erosion and sediment controls selected;
 - b. Preserve as much buffer as possible and design, implement and maintain additional erosion and sediment controls (such as berms, diversion dikes, sediment basins, etc.);
 - c. Ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls, and use velocity dissipation devices if necessary to prevent erosion caused by stormwater within the buffer;
 - d. Document in the SWPPP the natural buffer width retained on the property, and show the buffer boundary on the site plan;
 - e. Delineate, and clearly mark off, with flags, tape, or other similar marking device all natural buffer areas; and
 - f. Follow the additional stabilization requirements described in Part 3.1.2.1.

Note: The operator is not required to enhance the quality of the vegetation that already exists in the buffer, or provide vegetation if none exists.

3. Exceptions.
 - a. If there is no discharge of stormwater to perennial waters through the area between the site and any perennial waters located within 50 feet of the site, the operator is not required to comply with the requirements in this Part. This includes situations where control measures, such as a berm or other barrier that will prevent such discharges, have been implemented.

- b. Where no natural buffer exists due to preexisting development disturbances (e.g., structures, impervious surfaces) that occurred prior to the initiation of planning for the current development of the site, operators are not required to comply with the requirements in this Part, unless portions of the preexisting development are removed.

Where some natural buffer exists but portions of the area within 50 feet of the perennial water are occupied by preexisting development disturbances, operators are required to comply with the requirements in this Part. For the purposes of calculating the sediment load reduction, an operator is not expected to compensate for the reduction in buffer function from the area covered by these preexisting disturbances.

If, during the life of the project, any portion of these preexisting disturbances will be disturbed, the area disturbed will be deducted from the area treated as natural buffer.

- c. Linear projects are not required to comply with the requirements in this Part if site constraints (e.g., limited right-of-way) prevent the operator from meeting any of the compliance alternatives in Part 3.1.1.5(2), provided that, to the extent practicable, disturbances are limited to within 50 feet of the perennial water and/or the operator provides supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the perennial water. The operator shall document in the rationale for why it is infeasible to comply with the requirements in Part 3.1.1.5(2) in the SWPPP, and describe any buffer width retained and/or supplemental erosion and sediment controls installed.
- d. "Small residential lot" construction (see Appendix A) is exempt from buffer requirements, provided that the operator minimizes the discharge of pollutants by complying with the requirements of Parts 3.1.1.1 through 3.1.1.4.
- e. The following disturbances within 50 feet of a perennial water are exempt from the requirements in this Part:
- Construction approved under a CWA section 404 permit; or
 - Construction of a water-dependent structure or water access area (e.g., pier, boat ramp, trail).

Any of the above disturbances that may occur within the buffer area shall be documented in the SWPPP.

- 3.1.1.6 The operator shall minimize soil compaction and, unless infeasible, preserve topsoil (for later revegetation).

Minimize soil compaction in areas of the site where final vegetative stabilization will occur or where infiltration practices will be installed.

3.1.2 Site Stabilization Requirements, Schedules and Deadlines.

The operator shall comply with the stabilization requirements in this Part to minimize the discharge of pollutants.

3.1.2.1 Temporary Stabilization.

The operator must provide temporary stabilization, or initiate permanent stabilization, of disturbed areas within 14 calendar days of the most recent land disturbance in areas where construction or support activities have been temporarily suspended or have permanently ceased, except as follows:

1. Where stabilization by the 14th day is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable;
2. When the site is using vegetative stabilization and is located in an area of the state experiencing drought conditions (see Appendix A), vegetative stabilization measures shall be initiated as soon as practicable, when growing conditions are best for planting or seeding;

3. Stabilization shall be initiated within 7 calendar days, for areas within 50 feet of an impaired water or OAW.
4. Where disturbed areas are awaiting vegetative stabilization for periods greater than 14 calendar days after the most recent disturbance, non-vegetative methods of stabilization shall be employed. These methods shall be described in the SWPPP.
5. Seeding/ Vegetation. If revegetation plans include seeding, the SWPPP shall include seed mix and application specifications that will be used for vegetative stabilization. If the operator uses fertilizers or tackifiers on-site to establish vegetation, control measures shall be established to minimize the presence of these chemicals in the discharge.

Note: The operator is not expected to apply temporary or permanent stabilization measures to areas that are intended to remain unvegetated or unstabilized following construction (e.g., dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, or materials).

3.1.2.2 Final Stabilization.

Final stabilization means that one of the following conditions (1, 2, or 3) is met:

1. All soil disturbing activities at the site have been completed; all construction materials, waste, and temporary erosion and sediment control measures (including any sediment that was being retained by the temporary erosion and sediment control measures) have been removed and properly disposed; and either a. and/ or b. below is met:
 - a. A uniform (i.e., evenly distributed, without large bare areas) vegetative cover with a density of 70% of the native background vegetative cover for the area is in place on all unpaved areas and areas not covered by permanent structures.

When preconstruction native background vegetation covered less than 100% of the ground (e.g., arid areas, beaches), the 70% coverage criteria is adjusted as follows: if the native vegetation covered 50% of the ground, 70% of 50% (.70 X .50 = .35) or 35% cover density would be required, or
 - b. Equivalent permanent stabilization measures (such as the use of riprap, gabions, gravel, or geotextiles) have been employed.
2. For individual lots in residential construction, final stabilization means that the homebuilder:
 - a. Has completed final stabilization as specified in Part 3.1.2.2(1)(a) above, or
 - b. Has established temporary stabilization, including perimeter controls, for an individual lot prior to occupation of the home by the homeowner and has informed the homeowner of the need for, and benefits of, final stabilization.
3. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to water of the U.S., and areas that are not being returned to their preconstruction agricultural use shall meet the final stabilization criteria above.

Any non-vegetative stabilization methods must achieve the same levels of stabilization as specified in Part 3.1.2.2(1).

3.1.2.3 Site Stabilization Alternatives.

An operator with an eligible site may choose either of the following alternatives instead of implementing the stabilization requirements in Parts 3.1.2.1 or 3.1.2.2:

1. *Sites with additional retention capacity (see A.R.S. § 49 – 255.01(L)).* Stabilization deadline requirements in this permit do not apply to sites with retention capacity that meets or

exceeds the 100 year/ 2 hour storm event as calculated by an Arizona registered professional engineer, geologist or landscape architect (A.R.S. § 32-144) and that meet the following conditions:

- a. The nearest receiving water is ephemeral and not within 2.5 miles of a perennial or intermittent water body;
- b. All stormwater generated by disturbed areas of the site, exclusive of public rights-of-way, is directed to one or more retention basins;
- c. The operator complies with good housekeeping measures;
- d. The operator maintains capacity of retention basin(s); and
- e. The operator determines temporary and final stabilization requirements for the site to reduce or minimize the discharge of sediment and other pollutants to meet the requirements of Part 3.2.

Note: for the purposes of this permit, retention and detention are equivalent terms and mean that stormwater is held in a basin on-site up to the design capacity of the basin. However, local ordinances may have specific requirements for on-site stormwater detention/ retention.

2. *Sites returned to pre-construction discharge conditions.* Construction operators may qualify for this exemption by demonstrating that stormwater discharge from the site's pre- and post-construction activities is equal or less than in volume and pollutant load from disturbed areas as calculated by an Arizona registered professional engineer, geologist or landscape architect and where the site is not located within 2.5 miles of an impaired water or OAW.

The above demonstrations must be documented and retained with the SWPPP and submitted with the NOT, in accordance with Part 2.5(1)(f).

3.1.3 Pollution Prevention Requirements.

The operator shall design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. To meet this requirement, the operator shall comply with the following:

- Eliminate certain pollutant discharges from the site (see Part 1.4, Prohibited Discharges);
- Properly maintain all pollution prevention controls (see Part 3.1, General Maintenance Requirements); and
- Comply with pollution prevention standards for pollutant-generating activities that occur at the site (see Parts 3.1.3.1 through 3.1.3.3).

The operator shall comply with the pollution prevention standards in this Part if any of the following activities are conducted at the site or at any construction support activity areas covered by this permit (see Part 1.3(1)(c)).

3.1.3.1 Minimize the Discharge of Pollutants – from equipment and vehicle washing, wheel wash water, and other wash waters.

1. Concrete Washout. To comply with the prohibition in Part 1.4(1) for discharges of wastewater from washout of concrete:
 - a. Where possible, concrete suppliers should conduct washout activities at their own plants or dispatch facilities.
 - b. If conducted at the construction site, the operator shall employ measures to contain and manage on-site concrete washout to prevent discharge (see Part 6.3).
 - c. Specify locations of concrete washout activities that will occur at the construction site.
2. Washing of equipment and vehicles. Any operator that washes equipment or vehicles on site shall implement the following control measures:

- a. Provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of washing; and
 - b. To comply with the prohibition in Part 1.4(4), for storage of soaps, detergents, or solvents, the operator shall provide either (1) cover (e.g., plastic sheeting or temporary roofs) to prevent these detergents from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas.
3. Washing of Applicators and Containers used for Paint or Other Materials. To comply with the prohibition in Part 1.4(2), the operator shall provide an effective means of eliminating the discharge of water from the washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials. To comply with this requirement, the operator shall:
- a. Direct all washwater into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation;
 - b. Locate any washout or cleanout activities as far away as possible from surface waters and stormwater inlets or conveyances, and, to the extent practicable, designate areas to be used for these activities and conduct such activities only in these areas; and
 - c. Handle washout or cleanout wastes as follows:
 - i. Do not dump liquid wastes in storm sewers;
 - ii. Dispose of liquid wastes in accordance with applicable requirements in Part 3.1.3.3;
4. Fueling and Maintenance of Equipment or Vehicles. Any operator that conducts fueling and/or maintenance of equipment or vehicles at the site shall provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuel, from the area where these activities will take place.

To comply with the prohibition in Part 1.4(3), operators shall:

- a. If applicable, comply with the Spill Prevention Control and Countermeasures (SPCC) requirements in 40 CFR 112 and Section 311 of the CWA;
- b. Ensure adequate supplies are available at all times to handle spills, leaks, and disposal of used liquids;
- c. Use drip pans and absorbents under or around leaky vehicles;
- d. Dispose of or recycle oil and oily wastes in accordance with other federal, state, tribal, or local requirements;
- e. Clean up spills or contaminated surfaces immediately, using dry clean up measures where possible, and eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge; and
- f. Do not clean surfaces by hosing the area down.

- 3.1.3.2 Construction Site Egress. The operator shall implement effective control measures to minimize tracking of sediments, debris and other pollutants from vehicles and equipment leaving the site (e.g., stone pads, concrete or steel wash racks, or equivalent systems).

If site conditions make it infeasible to install structural controls to prevent track-out (e.g., a linear operator conducting earth disturbing activities within a paved right-of-way or immediately adjacent and parallel to a paved right-of-way), the operator shall explain in the SWPPP why such controls cannot be installed; what alternative measures will be used to prevent sediment from being tracked-out or accumulated on paved areas; and what procedures will be used to ensure track-out is discovered and removed as soon as practicable.

The reasons for any departure from the use of standard ingress/ egress control measures to control track-out shall be documented in the SWPPP:

1. Explain why structural control measures cannot be installed;
2. Describe what alternative measures will be used to prevent sediment from being tracked-out or accumulated on paved areas; and
3. Describe what procedures will be used to ensure track-out is discovered and removed as soon as practicable.

Note: Some fine grains may remain visible on the surfaces of paved roads even after implementing sediment removal practices. Such “staining” is not a violation of Part 3.1.3.2.

3.1.3.3 The operator shall minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater.

1. Good Housekeeping Measures. The operator shall implement good housekeeping procedures to prevent litter, construction debris, and construction chemicals exposed to stormwater from becoming a pollutant source for stormwater discharges. These procedures shall include storage practices to minimize exposure of the materials to stormwater, and spill prevention and response practices.
2. Storage, Handling, and Disposal of Construction Products, Materials, and Wastes. The operator shall minimize the exposure to stormwater of any of the products, materials, or wastes specified below that are present at the site by complying with the requirements in this Part.

Note: These requirements do not apply to those products, materials, or wastes that are not a source of stormwater contamination or that are designed to be exposed to stormwater.

The operator shall consider and implement the following control measures, as appropriate:

- a. For building products: In storage areas, provide either (1) cover (e.g., plastic sheeting or temporary roofs) to prevent these products from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas.
- b. For pesticides, herbicides, insecticides, fertilizers, and landscape materials:
 - i. In storage areas, provide either (1) cover (e.g., plastic sheeting or temporary roofs) to prevent these chemicals from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas; and
 - ii. Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label.
- c. For diesel fuel, oil, hydraulic fluids, other petroleum products, and other chemicals:
 - i. To comply with the prohibition in Part 1.4(3), store chemicals in water-tight containers, and provide either (1) cover (e.g., plastic sheeting or temporary roofs) to prevent these containers from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas (e.g., spill kits), or provide secondary containment (e.g., spill berms, decks, spill containment pallets); and
 - ii. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. Do not clean surfaces or spills by hosing the area down. Eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.

- d. For hazardous or toxic waste:
 - i. Separate hazardous or toxic waste from construction and domestic waste;
 - ii. Store in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable federal, state, tribal, or local requirements;
 - iii. Store all containers that will be stored outside within appropriately-sized secondary containment (e.g., spill berms, decks, spill containment pallets) to prevent spills from being discharged, or provide a similarly effective means designed to prevent the discharge of pollutants from these areas (e.g., storing chemicals in covered area or having a spill kit available on site);
 - iv. Dispose of hazardous or toxic waste in accordance with the manufacturer's recommended method of disposal and in compliance with federal, state, tribal, and local requirements; and
 - v. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. Do not clean surfaces or spills by hosing the area down. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.
- e. For construction and domestic waste: Provide waste containers (e.g., dumpster or trash receptacle with covers/ lids) of sufficient size and number to contain construction and domestic wastes. In addition:
 - i. On work days, clean up and dispose of waste in designated waste containers; and
 - ii. Clean up immediately if containers overflow.
- f. For sanitary waste: Position portable toilets outside of areas of stormwater flow and ensure that they are secure and will not be tipped over.

3.1.3.4 Spill Prevention and Response Procedures. Operators are prohibited from discharging toxic or hazardous substances from a spill or other release, consistent with Part 1.4. The operator shall minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for timely and effective clean-up of spills if or when they occur by implementing measures such as:

- Procedures for plainly labeling containers (e.g., "Used Oil," "Spent Solvents," "Fertilizers and Pesticides," etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;
- Preventative measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;
- Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause or detect a spill or leak should be knowledgeable in the proper reporting procedures established by their facility. Employees who are responsible for spill response and/or cleanup, must be properly trained and have necessary spill response equipment available; and
- Procedures for notification of appropriate facility personnel and emergency response. Where a leak, spill, or other release occurs that contains a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, the operator shall notify ADEQ Emergency Response Duty Office at (602) 771-2330 or, toll free, at (800) 234-5677. Contact information must be in locations that are readily accessible and available. Within 7 calendar days of knowledge of the release, operators shall provide a description in the SWPPP of: the release; the circumstances leading to the release; and the date of the release. Local requirements may

necessitate additional reporting of spills or discharges to local emergency response, public health, or drinking water supply agencies.

3.1.3.5 Fertilizer Discharge Restrictions.

Operators are required to minimize discharges of fertilizers containing nitrogen or phosphorus by applying these products consistent with manufacturer's specifications.

3.1.4 Controls for Allowable Non-Stormwater Discharges and Dewatering Activities.

Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls. Appropriate controls include, but may not be limited to: sediment basins or traps; dewatering tanks; tube settlers; weir tanks; or filtration systems (e.g., bag or sand filters) that are designed to remove sediment.

The operator shall ensure all water from dewatering or basin draining activities is discharged in a manner that does not cause nuisance conditions, including erosion in receiving channels or on surrounding properties.

The operator shall retain superchlorinated wastewaters (i.e., containing chlorine above residual levels acceptable in drinking water systems) on-site until the chlorine dissipates, or shall otherwise effectively dechlorinate the water prior to discharge.

Note: As with any non-stormwater, if acceptable to the local sanitary sewer authority, this wastewater may be discharged to the sanitary sewer. In this case, dechlorination is not required by this permit.

3.2 Water Quality Standards

3.2.1 Water Quality Standards

The operator shall control discharges from the site as necessary to not cause or contribute to an exceedance of an applicable water quality standard.

ADEQ expects that compliance with other conditions in this permit will control discharges as necessary to not cause or contribute to an exceedance of an applicable water quality standard (A.A.C.R18-11, Article 1). However, if at any time the operator becomes aware, or ADEQ determines, that the facility's discharge causes or contributes to an exceedance of an applicable water quality standard, the operator shall take corrective action as required in Part 5.1, document the corrective actions as required in Parts 5.3 and 6.4, and report the corrective actions to ADEQ as required in Part 8.2(3).

Additionally, ADEQ may impose additional water quality-based requirements on a site-specific basis, or require the operator to obtain coverage under an individual permit in accordance with Part 1.2, if information in the NOI, required reports, or from other sources indicates that additional controls are necessary to not cause or contribute to an exceedance of an applicable water quality standard.

3.2.2 Discharge Limitations for Impaired Waters and OAWs.

Operators of construction sites that are located within 1/4 mile of an impaired water or OAW are required to comply with the following requirements, which supplement the requirements applicable to the site in other corresponding parts of this permit:

1. Frequency of Site Inspections. The operator shall conduct inspections at the frequency specified in Part 4.2(3).
2. Deadline to Complete Stabilization. The operator shall comply with the deadlines for completing site stabilization as specified in Part 3.1.2.

If the discharge is to an impaired water, ADEQ may inform the operator that additional limits or controls are necessary to meet water quality standards or any applicable wasteload allocation (WLA), or to prevent the site from contributing to the impairment, or if coverage under an individual permit is necessary in accordance with Appendix B, Subsection 17.

If during coverage under a previous permit, the operator was required to install and maintain control measures specifically to meet the assumptions and requirements of an USEPA-approved or established TMDL (for any parameter) or to otherwise control a discharge to meet water quality standards, the operator shall continue to implement such controls as part of this permit.

4.0 INSPECTIONS

4.1 Inspector Qualifications.

The operator shall provide qualified personnel (as defined in Appendix A) to perform inspections according to the selected inspection schedule identified in the SWPPP. The operator shall conduct inspections of the site in accordance with Parts 4.2 through 4.5 of this permit.

4.2 Inspection Schedule.

At a minimum, operator shall conduct a site inspection in accordance with one of the schedules listed below. The operator shall document in the SWPPP which schedule is being used and, when necessary, the location of the rain gauge or weather station used to obtain rainfall information. The Department encourages adding inspections **before** and/ or **during** predicted storm events and “spot” inspections to ensure control measures will be effective in managing stormwater runoff and associated pollutants.

1. Routine Inspection Schedule. The operator shall ensure inspections are performed at the site as indicated below to ensure control measures are functional and that the SWPPP is being properly implemented. To determine the amount of rainfall from a storm event that occurs on the site (in accordance with options b. or c.), the operator shall obtain rainfall information (in accordance with Part 4.4(3)) from either a properly maintained rain gauge on the site, or a weather station that is representative of the site's location. For any day of rainfall during normal business hours that measures 0.25 inch or greater, the total rainfall measured for that day shall be recorded in accordance with Part 4.4(3).
 - a. The site will be inspected a minimum of once every 7 calendar days, or
 - b. The site will be inspected a minimum of once every 14 calendar days, and also within 24 hours of each storm event of 0.5 inch or greater in 24 hours; or
 - c. The site will be inspected a minimum of once per month, but not within 14 calendar days of the previous inspection and within 24 hours of the occurrence of a storm event of 0.25 inch or greater.
2. Reduced Inspection Schedule. The operator may reduce inspection if the entire site has been temporarily stabilized, discharges are unlikely based on seasonal rainfall patterns, or runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or frozen ground exists). With a reduced inspection schedule, the site shall be inspected at least once per month (but not within 14 calendar days of the previous inspection) and before an anticipated storm event and within 24 hours of each storm event of 0.5 inch or greater in 24 hours.
3. Inspection Schedule for Sites within 1/4 mile of Impaired Waters or OAWs. If any portion of the construction site is within 1/4 mile of an impaired water or OAW, the operator shall inspect the site at least once every 7 calendar days. The operator may reduce inspections to the schedule specified in Part 4.2(2) for those areas of the construction site that have undergone temporary or final stabilization.
4. Inspection Schedule for Inactive and Unstaffed Sites. A site is inactive and unstaffed that will have an anticipated period of no construction activity for at least six consecutive months. *Inactive and unstaffed sites within 1/4 mile of an impaired water or OAW are not eligible for this reduced inspection frequency unless they have undergone temporary stabilization.*

Operator's responsibilities include:

- a. Immediately before becoming inactive and unstaffed, the operator shall perform an inspection in accordance with Part 4.4. All control measures must be in operational condition in accordance with Part 3.1 prior to becoming inactive and unstaffed;
- b. During the time the site is inactive and unstaffed, the operator shall perform an inspection at least once every six months and within 24 hours of each storm event of 0.5 inch or greater in 24 hours;

- c. Non-storm event inspections must be at least three months apart;
- d. All control measures must be maintained in operational condition;
- e. The site shall be secured, such as limited access, blocking or fencing;
- f. Maintain a statement in the SWPPP as required in Part 6.4(11) indicating that the construction site is inactive and unstaffed. The statement must be signed and certified in accordance with Appendix B, Subsection 9; and
- g. If circumstances change and the site becomes active and/or staffed, this exception no longer applies and the operator shall immediately resume the routine inspection schedule.

ADEQ retains the authority to revoke this exception from routine inspections where it is determined that the discharge causes, has a reasonable potential to cause, or contribute to an exceedance of an applicable water quality standard, including designated uses.

5. Inspections are only required during the project's normal working hours. If an inspection day (except those required relative to a rainfall event) falls on a Saturday or holiday, the inspection may be conducted on the preceding workday. If the inspection day falls on a Sunday, the inspection may be conducted on the following Monday. If rainfall events occur on the weekend or holiday, an inspection relative to that event may be conducted the following workday.
6. Inspections are not required under Adverse Conditions. The operator is not required to inspect areas that, at the time of the inspection, are considered unsafe for inspection personnel. Inspections may be postponed when conditions such as local flooding, high winds, or electrical storms, or situations that otherwise make inspections unsafe. The inspection must resume as soon as conditions are safe.

4.3 Scope of Inspections.

At a minimum, the inspector shall examine each of the following during each inspection:

1. All structural controls identified in the SWPPP to ensure they are in place and functioning as intended. Repair, replace, or maintain any controls as necessary in accordance with Part 3.1;
2. The effectiveness of non-structural controls and practices (such as good housekeeping practices and pollution prevention measures);
3. All areas of the site used for storage of materials that are exposed to precipitation;
4. All locations where new or modified control measures are necessary to meet the requirements of Part 3;
5. Locations where vehicles and equipment enter or exit the site for evidence of tracking sediment, debris, and other pollutants onto and off the site;
6. Site conditions for evidence of, or the potential for, pollutants entering the municipal separate storm sewer;
7. The presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the site;
8. Accessible discharge locations or discharge points to ascertain whether erosion and sediment control measures are effective in preventing significant impacts to receiving waters;
9. Where discharge locations are inaccessible, nearby downstream locations to the extent that the inspections are practicable;
10. All locations where temporary stabilization measures have been implemented; and
11. When a discharge is occurring during an inspection, observe and note the physical characteristics (color, odor, clarity, floating, settled, or suspended solids, foam, oil sheen, and other obvious indicators of stormwater pollutants). In addition, when there is no discharge, examine each discharge location for evidence of erosion, sedimentation and other pollutants,

and the presence of current (and indications of prior) discharges and their sources.

4.4 Inspection Report Form.

For each inspection, the operator shall complete an inspection report either on a form provided by the Department online at <http://www.azdeq.gov/envirom/water/permits/cgp.html> or an alternative form developed by the operator that documents all of the information required by this permit. The operator may supplement the inspection report form as necessary with additional information, forms or drawings. Within 7 calendar days of completing the inspection, the corresponding inspection report shall be placed with previous reports (in chronological order) and kept with the SWPPP. At a minimum, the report shall include:

1. The inspection date;
2. Name(s) and title(s) of qualified person(s) making the inspection;
3. Weather information for the period since the last inspection (or since commencement of construction activity for the first inspection) including:
 - a. Best estimate of the beginning of each storm event;
 - b. Duration of each event;
 - c. Time elapsed since last storm event; and
 - d. Approximate amount of rainfall for each event (in inches).
4. Identification of discharges of sediment or other pollutants from the site. Identify the discharge location(s) and associated control measures on the site map(s), in accordance with Part 6.3(6);
5. For inspections occurring during or after a storm event:
 - a. A description of the physical characteristics of the stormwater discharge (Part 4.3(11)) from the site, when present;
 - b. Document the evidence of erosion, sedimentation and other pollutants; and
 - c. Document the presence of control measures in all areas inspected and whether such controls are operating effectively.
6. Identification of control measures that need to be maintained, failed to operate as designed, or proved inadequate. Until removed from the site, identify the location(s) of these control measures on the site map(s), in accordance with Part 6.3(6);
7. Identification of what additional control measures are needed, if any, that did not exist at the time of the inspection. Identify the location(s) of these control measures on the site map(s), in accordance with Part 6.3(6);
8. Identification of all sources of non-stormwater discharges occurring at the site and associated control measures in place;
9. Identification of material storage areas and, evidence of or potential for, pollutant discharge from such areas;
10. Corrective actions required (in accordance with Part 5.3), including any necessary changes to the SWPPP, and implementation dates (of corrective actions and SWPPP changes); and
11. Identification of any other instances of non-compliance with the conditions of this permit that are not associated with Part 4.4(10), or where the inspector does not identify any incidents of non-compliance, the inspection report shall contain a certification that the construction project or site is being operated in compliance with the SWPPP and this permit.
12. Document Adverse Conditions. If the operator determines that certain area(s) of the site are unsafe to inspect, the Inspection Report shall document the unsafe condition(s) and specify the locations where the unsafe condition(s) exists.

4.5 Inspection Follow-up.

1. Control Measure Assessment. Based on the findings and observations of the inspection, the operator shall implement the changes necessary to comply with the conditions in Part 3 and revise the SWPPP as needed in accordance with Part 6.5. The changes shall be implemented in accordance with the schedule described in “General Maintenance Requirements” in Part 3.1.
2. Corrective Actions. Based on the scope of inspection conducted in accordance with Part 4.3, the operator shall determine and implement appropriate corrective actions, and meet the applicable deadlines pursuant to Part 5.

5.0 CORRECTIVE ACTIONS.

5.1 Corrective Action Triggers.

Corrective actions are actions the operator takes in compliance with this Part to modify, or replace any control measure that failed to meet the conditions of Part 3. ADEQ does not consider routine maintenance or repairs as corrective actions. If any of the following conditions at the construction site occur resulting in or from a failure of a control measure, the operator shall implement new or modified control(s):

1. A necessary control measure was never installed, was installed incorrectly, or not in accordance with the requirements in Parts 3.1 and/ or 3.2; or
2. One of the prohibited discharges in Part 1.4 is occurring or has occurred; or
3. ADEQ or USEPA determines that modifications to the control measures are necessary to meet the requirements of Part 3.

On the same day a condition requiring corrective action is discovered, the operator shall take all reasonable steps to minimize or prevent the discharge of pollutants until a permanent solution is installed and made operational. However, if the problem is identified when it is too late in the work day to initiate a corrective action, the corrective action shall be initiated on the following work day, unless the condition poses imminent endangerment to human health or the environment, in which case the operator shall take immediate action.

5.2 Corrective Action Deadlines.

Any control measures or repairs required must be made operational, or completed, by no later than 7 calendar days from the time of discovery. If the operator cannot complete the necessary repairs or installation of controls within 7 calendar days, the SWPPP shall include the following:

1. The reason it is infeasible to complete the installation or repair within the 7 calendar day timeframe; and
2. The schedule for installing and making the control measure(s) operational as soon as practicable after the 7-day timeframe.

Any corrective actions that result in changes to any of the control measures or procedures shall be documented in the SWPPP within 7 calendar days of completing the corrective action work.

The operator shall complete all corrective actions in accordance with the deadlines specified in this Part.

5.3 Corrective Action Report.

For each corrective action taken in accordance with this Part, the operator shall document the details of the corrective action in the inspection report required by Part 4.4. These reports shall be signed in accordance with the signatory requirements in Appendix B, Subsection 9 and maintained with the SWPPP in accordance with the record keeping requirements in Appendix B, Subsection 11.

1. Construction Sites Located within 1/4 Mile of an Impaired Water or OAW. When any condition listed in Part 5.1 occurs, the operator of a construction site that discharges to an impaired water or OAW (in accordance with Parts 1.5(3) or (4)) shall submit this documentation in accordance with Part 8.2(2). The operator shall retain a copy of the inspection report documenting the corrective action(s) onsite with the SWPPP as required in Part 6.4.
2. Report Schedule. Within 7 calendar days of discovery of any condition listed in Part 5.1, the operator shall document and maintain with the SWPPP the following information:
 - a. Summary of corrective action taken or to be taken;
 - b. Whether SWPPP modifications are required as a result of this discovery or corrective action;
 - c. Date corrective action initiated or will be initiated; and
 - d. Date corrective action completed or expected to be completed.

6.0 STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARATION

6.1 General Information.

1. The operator shall develop a stormwater pollution prevention plan (SWPPP) before submitting the NOI for permit coverage and prior to conducting any construction activity. Any SWPPP prepared for coverage under a previous version of this AZPDES construction general permit must be reviewed and updated by the operator to comply with this permit's requirements prior to submitting the NOI in accordance with Part 2.3(3)(e).

Note: For projects that did not prepare a SWPPP and submit an NOI before commencement of construction activity, see Part 2.3(2)(h) (late NOI submittal).

At least one SWPPP must be developed for each construction project or site covered by this permit. A "joint" or "common" SWPPP may be developed and implemented as a cooperative effort where there is more than one operator at a site. All operators shall either implement their portion of a common SWPPP or develop and implement their own SWPPP.

2. The SWPPP shall be prepared and implemented in accordance with good engineering practices and shall:
 - a. Identify all potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the construction site;
 - b. Identify, describe, and ensure implementation of control measures that will be used to reduce pollutants in stormwater discharges from the construction site;
 - c. Assure compliance with the terms and conditions of this permit; and
 - d. Identify the responsible person for on-site SWPPP implementation.
3. All operator(s) shall sign and certify the SWPPP in accordance with the signatory requirements of Appendix B, Subsection 9.
4. The operator shall implement the SWPPP from initial commencement of construction activity until an NOT is submitted to ADEQ in accordance with Parts 2.5(1) or 2.6.
5. SWPPPs that do not meet all provisions of this permit are considered incomplete. Operating under an incomplete or inadequate SWPPP is a violation of the permit.
6. Emergency-Related Projects. Operators conducting construction activities in response to an emergency (see Part 2.4), shall document the cause of the emergency (e.g., natural disaster, extreme flooding conditions, etc.), information substantiating its occurrence (e.g., state disaster declaration or similar state or local declaration), and describe the construction necessary to reestablish effected public services.

6.2 Types of Operators

1. Operator Requirements. Either Part 6.1(2)(a) or (b), or both, will apply depending on the type of operational control a person exerts over the site. Part 6.1(2)(c) applies to all operators who have control over only a portion of a construction site.
 - a. Operators with Operational Control over Construction Plans and Specifications shall ensure that:
 - i. The SWPPP indicates the areas of the project where the operator has operational control over project specifications, including the ability to make modifications in specifications;
 - ii. All other operators implementing portions of the SWPPP impacted by any changes made to the SWPPP are notified of such modifications in a timely manner; and
 - iii. The SWPPP indicates the name(s) of the person(s) with day-to-day operational

control of those activities necessary to ensure compliance with the SWPPP or other permit conditions.

- b. Operators with Control over Day-to-Day Activities shall ensure that:
 - i. The SWPPP identifies the persons responsible for implementation of control measures identified in the SWPPP;
 - ii. The SWPPP indicates areas of the project where each operator has operational control over day-to-day activities; and
 - iii. The SWPPP indicates the name(s) of the person(s) with operational control over project specifications (including the ability to make modifications in specifications).
- c. Operators with Control over Only a Portion of a Larger Project are responsible for compliance with the terms and conditions of this permit as it relates to the activities on the operator's portion of the construction site (including implementation of control measures required by the SWPPP). Operators shall ensure either directly or through coordination with other operators, that activities do not render another person's control measure(s) ineffective.

6.3 SWPPP Contents

1. Stormwater Team.

Each operator, or group of operators, must assemble a "stormwater team," which is responsible for overseeing the development of the SWPPP, any later modifications to it, and for compliance with the requirements in this permit.

The SWPPP must identify the name, title and a description of the qualifications and a copy of any training certificates of team members, including inspector(s), as well as their individual responsibilities. Each member of the stormwater team must have ready access to an electronic or paper copy of applicable portions of this permit, the most updated copy of the SWPPP, and other relevant documents or information that must be kept with the SWPPP.

The team may include members who are not employed by the operator (such as third party consultants).

2. Identification of Operators.

The SWPPP shall identify all operators, including contact information, for the project site and the areas and phases over which each operator has control.

3. Nature of Construction Activities.

The SWPPP must describe the nature of construction activities, including the size of the property (in acres) and the total area expected to be disturbed by the construction activities (in acres), construction support activity areas covered by this permit (see Part 1.3(1)(c)), and the maximum area expected to be disturbed at any one time.

4. Sequence and Estimated Dates of Construction Activities.

The SWPPP must include a description of the intended sequence of construction activities, including a schedule of the estimated start dates and the duration of the activity, for the following activities:

- a. Installation of control measures, and when they will be made operational, including an explanation of the sequence and schedule for installation of the control measures;
- b. Commencement and duration of construction activities, including clearing and grubbing, grading, site preparation (i.e., excavating, cutting and filling), underground utility installation, infrastructure installation, final grading, and creation of soil and vegetation stockpiles requiring stabilization;

- c. Cessation, temporarily or permanently, of construction activities on the site, or in designated portions of the site including the beginning and ending dates of inactive/unstaffed status, when applicable;
- d. Final or temporary stabilization of areas of exposed soil. The dates for stabilization must reflect the applicable deadlines to which the operator is subject in Part 3.1.2; and
- e. Removal of temporary stormwater conveyances/ channels and other control measures, removal of construction equipment and vehicles, and cessation of any pollutant-generating activities.

Note: If plans change due to unforeseen circumstances or for other reasons, the requirement to describe the sequence and estimated dates of construction activities is not meant to “lock in” the operator to meeting these projections. When departures from initial projections are necessary, this should be documented in the SWPPP itself or in associated records, as appropriate.

5. Site Description. The SWPPP shall describe the construction site, including:
 - a. A description of the site and its intended use after the NOT is submitted to ADEQ (e.g. low density residential, shopping mall, highway, etc.);
 - b. The total area of the site, and an estimate of the total area of the site expected to be disturbed by construction activities including off-site supporting activities, borrow and fill areas, staging and equipment storage areas;
 - c. The percentage of the site that is impervious (e.g., paved, roofed, etc.) before and after construction;
 - d. A description of the site’s soils including potential for erosion;
 - e. Areas where it is infeasible to maintain a 50 foot buffer in accordance with Part 3.1.1.5(1), describe which alternative was selected for the site, and comply with any additional requirements to provide documentation (Part 3.1.1.5(2));
 - f. On-site and Offsite Material Storage. The operator shall identify and describe all material storage areas (including overburden and stockpiles of dirt, borrow areas, etc.) used for the permitted project in the SWPPP unless those areas are covered by another AZPDES permit; and
 - g. A general location map (e.g., USGS quadrangle map, a portion of a city or county map, or other map) – with enough detail to identify:
 - i. The location of the construction site and one mile radius; and
 - ii. The waters of the U.S. including tributaries within one mile radius of the site.

6. Site Map(s). The SWPPP shall contain legible site map or series of maps completed to scale, showing the entire site that identifies:

Note: If a marked-up site map is too full to be easily read, the operator should date and fold it, put it in the SWPPP for documentation, and start a new one.

- a. Topography of the site, existing types of cover (e.g., forest, pasture, pavement, structures), and drainage pattern(s) of flow onto, over, and from the site property before and after major grading activities;
- b. Drainage divides and direction of stormwater flow for all drainage areas located within the project limits (i.e., use arrows to show which way stormwater will flow);
- c. Areas of soil disturbance and areas that will not be disturbed. Boundaries of the property and of the locations where construction activities will occur, including:
 - i. Locations where construction activities will occur, noting any phasing of construction activities;
 - ii. Locations where sediment or soil will be stockpiled;

- iii. Locations of any crossings of surface waters;
 - iv. Designated points on the site where vehicles will exit onto paved roads; and
 - v. Locations of construction support activity areas covered by this permit (see Part 1.3(1)(c)).
- d. Locations of temporary and permanent control measures identified in the SWPPP;
 - e. Locations where stabilization control measures are expected to occur;
 - f. Areas protected by buffers (i.e., either the 50-foot buffer or other buffer areas retained on site when within 50 feet of a perennial water) consistent with Part 3.1.1.5. The site map must show the boundary line of all such buffers;
 - g. Locations of on-site material, waste, borrow areas, or equipment storage areas, and other supporting activities (per Part 1.3(1)(c));
 - h. Locations of all potential pollutant-generating activities identified in Part 6.3(9). Examples include, but are not limited to: the pollutant-generating activities listed in Part 3.1.3.1 (fueling and maintenance operations; concrete, paint, and stucco washout); waste disposal; solid waste storage and disposal (Part 3.1.3.3); and dewatering operations (Part 3.1.4);
 - i. Locations of all surface waters and any impaired waters or OAWs within 1/4 mile of the facility. If none exist on site, the SWPPP shall indicate so;
 - j. Stormwater discharge location(s), using arrows to indicate discharge direction. Include the following:
 - i. Location(s) where stormwater and/or allowable non-stormwater discharges are discharged to waters of the U.S. (in accordance with Part 1.3); and
 - ii. Location(s) of any discharges to municipal separate storm sewer systems (MS4s) from the construction site.

Note: Where surface waters and/or MS4s receiving stormwater will not fit on the plan sheet, they shall be identified with an arrow indicating the direction and distance to the surface water and/or MS4;
 - k. Locations and registration numbers of all on-site drywells and drywells on adjacent properties that have the potential to receive stormwater from the site (If none exist the SWPPP shall indicate so);
 - l. Areas where final stabilization has been accomplished and no further construction permit requirements apply (if none, the SWPPP shall indicate so); and
 - m. Location and boundaries of environmentally sensitive areas and buffer zones to be preserved.

7. Receiving Waters. The SWPPP shall identify the nearest receiving water(s), including ephemeral and intermittent streams, dry washes, and arroyos. If applicable, the SWPPP shall also identify the areal extent and describe any wetlands near the site that could be disturbed or that could potentially receive discharges from disturbed areas of the project.

Indicate if the receiving water is listed as impaired, or an OAW.

Note: Operators may determine whether their sites are located within 1/4 mile of any impaired waters or OAWs by using ADEQ's Smart NOI system or by obtaining a list of impaired waters at <http://www.azdeq.gov/environ/water/assessment/assess.html>. OAWs are listed in A.A.C. R18-11-112(G).

8. Control Measures to be used During Construction Activity. The SWPPP shall describe all control measures as required in Part 3.1 and that will be implemented and maintained as part of the construction project to control pollutants in discharges. For each control measure, the SWPPP shall contain:
- a. For each major activity identified at Part 6.3 in the project sequence of activities

description, a description of:

- i. The appropriate control measures, including controls to minimize or eliminate non-stormwater discharges;
 - ii. The general sequence during the construction process or schedule that the control measures will be implemented; and
 - iii. Which operator is responsible for the implementation of control measures.
 - b. Standard detail drawings and/or specifications for the structural control measures, including design or installation details, used on the project;
 - c. What specific sediment controls will be installed and made operational prior to conducting earth-disturbing activities in any given portion of the site to meet the requirement of Part 3.1.1;
 - d. For site egress points, document the control measures that are intended to minimize tracking of pollutants from vehicles leaving the site consistent with Part 3.1.3.2.
9. Summary of Potential Pollutant Sources. The SWPPP shall identify the location and describe any pollutant sources, including any non-stormwater discharges expected to be associated with the project, from areas other than construction (i.e., support activities including stormwater discharges from dedicated asphalt or concrete plants and any other non-construction pollutant sources such as fueling and maintenance operations, materials stored on-site, waste piles, equipment staging yards, etc.). The operator shall implement control measures in these areas to minimize pollutant discharges and shall detail these controls in the SWPPP.

If any portion of the construction site is within 1/4 mile of an impaired water, the SWPPP shall identify sources of the pollutants of concern listed on the 303(d) list that may potentially be discharged from the construction site and describe additional or enhanced control measures to minimize discharges of these pollutants.

10. Use of Treatment Chemicals. If polymers, flocculants, or other cationic treatment chemicals will be used at the site, the SWPPP shall include:
- a. A justification for the need for such chemicals and an assessment of potential water quality impacts;
 - b. A description of the training specific personnel have or will receive on the use and storage of any cationic treatment chemicals and/or chemical treatment systems at the construction site;
 - c. A listing of all treatment chemicals to be used at the site, a description of how the chemicals will be stored, and why the selection of these chemicals is suited to the soil characteristics of the site;
 - d. The dosage of all treatment chemicals that will be used at the site or the methodology that will be used to determine dosage;
 - e. A copy of any applicable Material Safety Data Sheets (MSDS);
 - f. Schematic drawings of any chemically-enhanced controls or chemical treatment systems to be used for application of the treatment chemicals;
 - g. Copies of applicable manufacturer's specifications regarding the use of specific treatment chemicals and/or chemical treatment systems and references to state or local requirements affecting the use of these chemicals.
11. Pollution Prevention Procedures.
- a. Spill Prevention and Response Procedures. The SWPPP must describe procedures to prevent and respond to spills, leaks, and other releases consistent with Part 3.1.3, including:

- i. Procedures for plainly labeling containers (e.g., “Used Oil,” “Spent Solvents,” “Fertilizers and Pesticides,” etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;
- ii. Preventative measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling;
- iii. Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or position of the employee(s) responsible for detection and response of spills or leaks; and
- iv. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 3.1.3.4 and established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, occurs during a 24-hour period. Contact information must be in locations that are readily accessible and available.

The operator may reference the existence of other plans, such as the Spill Prevention Control and Countermeasure (SPCC) plans developed for the construction activity under Part 311 of the CWA, or spill control programs otherwise required by an AZPDES permit for the construction activity, provided that a copy of that other plan is kept with the SWPPP onsite. If an SPCC or other spill prevention plan already exists, the operator may use such plans and incorporate them by reference in the SWPPP.

- b. Waste Management Procedures. The SWPPP must describe procedures for handling and disposing all wastes generated at the site, including, but not limited to, clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste.

6.4 Documentation Requirements including Permit Related Records

The operator shall keep the following inspection, monitoring, and certification records complete and up-to-date. Retaining these records with the SWPPP (unless otherwise specified below) is necessary to demonstrate compliance with the conditions of this permit.

1. A copy of this permit (an electronic copy easily available to SWPPP personnel is also acceptable);
2. A copy of the NOI submitted to ADEQ, including any correspondence exchanged between the operator and ADEQ specific to coverage under this permit;
3. A copy of the authorization certificate received from ADEQ;
4. Identification of any municipality that received a copy of the authorization certificate;
5. Copies of any other agreements (such as a CWA section 404 permit, local grading permit, etc.) with any state, local, or federal agencies that would affect the provisions or implementation of the SWPPP, if applicable;
6. Descriptions and dates of any incidences of significant spills, leaks, or other releases that resulted in discharges of pollutants in stormwater to a regulated MS4 or to waters of the U.S., the circumstances leading to the release and actions taken in response to the release and measures taken to prevent the recurrence of such releases (see Part 3.1.3.4);
7. Documentation of repairs of structural control measures, including the date(s) of discovery of areas in need of repair/replacement, date(s) that the structural control measure(s) returned to full function, and the justification for any extended repair schedules (see Part 3.1). The maintenance records shall include the date(s) of regular maintenance;

8. All inspection reports (see Part 4.4);
9. Description of any corrective action taken at the site, including triggering event and dates when problems were discovered and modifications occurred;
10. Buffer Documentation. If the construction site's earth disturbances are located within 50 feet of a perennial water, the operator shall describe which alternative was selected for the site, and comply with any additional documentation requirements in Part 3.1.1.5.
11. Documentation to support the operator's claim that the facility has changed its status from active to inactive and unstaffed with respect to the requirements to conduct inspections (see Part 4.2(4));
12. Post-Construction Stormwater Management.
 - a. The SWPPP shall include a description of post-construction stormwater management control measures that will be installed during the construction process to control pollutants in stormwater discharges after construction has been completed.
 - b. If 'temporary' sediment basins are to be used as/converted to retention or detention basins in the post-construction phase, the operator shall remove and properly dispose of all sediments accumulated in the basin during construction activities prior to filing an NOT.
 - c. New discharge connections or permanent stormwater outfalls directly to OAWs are prohibited under this permit.

Note: The installation of these devices may also require a separate permit under section 404 of the Clean Water Act.

Note: This permit only authorizes and requires the operator to install and maintain stormwater management measures up to and including final stabilization of the site, and does not require continued maintenance after stormwater discharges associated with the construction activity have been eliminated from the site and an NOT has been submitted to ADEQ. However, post-construction control measures that discharge pollutants from point sources once construction is complete may require authorization under a separate AZPDES permit.

6.5 SWPPP Updates and Modification Requirements

6.5.1 Maintaining an Updated SWPPP.

The SWPPP shall be revised as necessary during permit coverage to reflect current conditions and to maintain accuracy. The operator shall make any required amendments to the SWPPP within 7 calendar days whenever:

1. There is a change in design, construction, operation, or maintenance at the construction site that may have a significant effect on the discharge of pollutants to the waters of the U.S. that has not been previously addressed in the SWPPP; or
2. During inspections, monitoring if required, or investigations by the operator or by ADEQ or USEPA, it is determined the discharges are causing or contributing to water quality exceedances or the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the construction site; or
3. There is a change to the stormwater team.

6.5.2 Conditions Requiring SWPPP Modification.

The operator shall complete required revisions to the SWPPP within 7 calendar days following the occurrence of any of the conditions listed below. The operator shall modify the SWPPP, including the site map(s), in response to any of the following conditions:

1. New operators become active in construction activities at the site, construction plans are changed (that will affect the quality of the discharge), control measures, pollution

prevention measures, or other activities at the site are no longer accurately reflected in the SWPPP. This includes changes made in response to corrective actions triggered under Part 5.1. Operators do not need to modify their SWPPPs if the estimated dates in Part 6.3(6) change during the course of construction;

2. Areas on the site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;
3. If inspections or investigations by site staff, or by local, state, or federal officials determine that SWPPP modifications are necessary for compliance with this permit;
4. ADEQ determines it is necessary to impose additional requirements on the discharge (in accordance with Part 6.5.1), the following must be included in the SWPPP:
 - a. A copy of any correspondence describing such requirements; and
 - b. A description of the control measures that will be used to meet such requirements.
5. To reflect any revisions to applicable federal, state, tribal, or local requirements that affect the control measures implemented at the site; and
6. If applicable, if a change in chemical treatment systems or chemically-enhanced control is made, including use of a different treatment chemical, different dosage rate, or different area of application.
7. SWPPP Modification Records. Operators are required to maintain records showing the dates of all SWPPP modifications. The records must include the name of the person authorizing each change (see Part 6.1(3)) and a brief summary of all changes.

6.5.3 Certification Requirements.

All modifications made to the SWPPP consistent with Part 6.5.2 must be authorized by a person identified in Appendix B, Subsection 9.

6.5.4 Required Notice to Other Operators.

When the operator determines that a modification to the SWPPP is required and there are multiple operators covered under a common SWPPP, any operators who may be impacted by the change to the SWPPP shall be notified at the address of record in the SWPPP.

6.6 Deficiencies in the SWPPP

ADEQ may notify the operator at any time that the SWPPP does not meet one or more of the requirements of this permit. The notification shall identify the parts of this permit that are not being met and parts of the SWPPP that require modification to comply with permit. Within 15 calendar days of receipt of the notification from ADEQ (or as otherwise provided by ADEQ), the operator shall make the required changes to the SWPPP and submit to ADEQ a written certification that the changes have been made. ADEQ may require re-submittal of the SWPPP to confirm all deficiencies have been adequately addressed.

In accordance with Appendix B, Subsection 1, ADEQ also is not precluded from taking enforcement action for any period of time the operator was operating under a SWPPP that did not meet the minimum requirements of this permit.

6.7 Posting, SWPPP Review and Making SWPPPs Available

1. The operator must post the authorization number(s) in a conspicuous location near the main entrance of the construction site and retain a copy of the authorization certificate in the SWPPP. For linear projects, the authorization number(s) must be posted near the entrance where most of the construction activity is occurring.
2. A copy of the site specific SWPPP shall be on-site whenever construction or support activities are actively underway, and shall be available to the Department or any other federal, state or local authority having jurisdiction over the project at any reasonable time (generally Monday

through Friday, 8:00 a.m. to 5:00 p.m.).

3. The SWPPP shall be made available to the Department or any other federal, state, tribal, or local authority having jurisdiction over stormwater discharges from the project at the time of an on-site inspection.
4. Any person, including, tribal authority, state, federal or local agency may make a written request to ADEQ for access to a copy of the SWPPP. ADEQ may request, and within 7 calendar days the operator shall provide, a copy for ADEQ to make available for public review;
5. *Inactive and Unstaffed Sites:* Operators with sites that meet the requirements for inactive and unstaffed are not required to maintain the SWPPP on-site. However, the SWPPP must be locally available (i.e., in Arizona) and must be on-site when conducting the inspections required by Part 4. For the purpose of a regulatory inspection, the SWPPP shall be made available to ADEQ, USEPA, or other Federal, State or local authority having stormwater program authority, within 48 hours of request. If otherwise requested by ADEQ, the operator shall submit copies of these documents within 14 calendar days of request.

6.8 Procedures for Inspection, Maintenance, and Corrective Action

The SWPPP must describe the procedures operators will follow for maintaining their control measures, conducting site inspections, and, where necessary, taking corrective actions, in accordance with Part 3.1, Part 4, and Part 5 of the permit. The following information must also be included in the SWPPP:

- 1 Personnel responsible for conducting inspections;
- 2 The inspection schedule that will be followed based on whether the site is subject to Part 4.2(1) or 4.2(3), and whether the site qualifies for any of the reduced inspection frequencies in Part 4.2(2) or 4.2(4). If conducting inspections in accordance with the inspection schedule in Part 4.2(1) or 4.2(3), document the weather information required in the inspection report (see Part 4.5);
- 3 If reducing the inspection frequency in accordance with Part 4.2(2) or 4.2(4), the beginning and ending dates of the reduced inspection period; and
- 4 Any inspection or maintenance checklists or other forms that will be used.
5. The operator shall ensure that all qualified personnel (see Appendix A) review the requirements of this permit. Qualified personnel are responsible for:
 - The design, installation, maintenance, and/ or repair of control measures (including pollution prevention measures);
 - The application and storage of treatment chemicals (if applicable);
 - Conducting inspections as required in Part 4.1; and
 - Taking corrective actions as required in Part 5.

7.0 STORMWATER MONITORING

The provisions of Part 7 apply only to operators with construction projects located within 1/4 mile of an impaired or outstanding Arizona water (OAW), or as otherwise specified by ADEQ. Any portion of the project area that extends within this distance is subject to the requirements of this Part, unless the operator provides a justification for not monitoring, consistent with Part 7.1. The monitoring plan, or justification, must be a part of the SWPPP and submitted along with it to ADEQ for approval.

The Department may notify the permittee, in writing, of additional discharge monitoring required to ensure protection of receiving water quality if it is determined that the pollutant may be causing or contributing to an exceedance of a water quality standard.

7.1 Monitoring Program.

Operators of projects that are located within 1/4 mile of impaired or outstanding Arizona waters (OAW) shall prepare and implement a monitoring program that meets the requirements of this Part. Sites can be exempted from monitoring if the operator provides a demonstration acceptable to ADEQ that there is no potential for the discharge to reach the OAW or impaired receiving water.

For any portion of a construction site that is located within 1/4 mile of an impaired water, if the operator can demonstrate that there is no reasonable potential that construction activities will be an additional source of the specific pollutant for which the water is impaired, analytical monitoring for that parameter is not required. As part of this demonstration, the operator must consider all on-site activities and sources, as well as the potential for any pollutants (metals, nutrients, etc.) to be present in the on-site soils that will be disturbed.

7.2 General Requirements.

The operator shall develop a written site-specific monitoring program for analytical monitoring of stormwater unless an acceptable rationale demonstrates that stormwater monitoring is not necessary, in accordance with Part 7.1. . The monitoring program shall be a part of the SWPPP as either an appendix or separate SWPPP section. The monitoring program shall include:

1. Locations of monitoring sites;
2. The name(s) and title of the person(s) who will perform the monitoring;
3. A map showing the segments or portions of the receiving water that are most likely to be impacted by the discharge of pollutant(s);
4. Water quality parameters/ pollutants to be sampled;
5. The citation and description of the sampling protocols to be used; and
6. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required. Method detection limits shall be below applicable surface water quality standards when possible.
7. Additionally, for construction sites within 1/4 mile of an impaired water, the monitoring program shall include:
 - a. An identification of the pollutant(s) of concern based on the most recent 305(b) / 303(d) listing or other information available; and
 - b. A description of potential source(s) of this pollutant(s) from the project, if any.

7.3 Analytical Monitoring Requirements.

1. Analytical Monitoring Schedule. The operator shall conduct analytical monitoring a minimum of two times per wet season throughout the duration of permit coverage. Analytical monitoring is only required when stormwater or snowmelt exits the construction site by way of a discharge point in sufficient quantity to allow for sample collection and analysis.

Wet seasons, for the purposes of analytical monitoring, are defined as follows:

- Summer wet season: June 1 – October 31
 - Winter wet season: November 1 – May 31
2. Adverse Conditions. The operator is not required to collect samples under adverse conditions, in accordance with Part 4.2(6). Information about any adverse conditions that prevented sampling shall be documented in the SWPPP.
 3. Analytical Monitoring Locations. The operator shall conduct discharge sampling at locations observed or suspected to contain the greatest pollutant load resulting from the construction activities. If any portion of the construction site is located within 1/4 mile of an impaired water or OAW, the operator shall use Table 7-1 to determine the minimum number of samples to collect for purposes of analytical monitoring.

Table 7-1. Minimum number of samples to collect	
<u>Number of Discharge Points</u>	<u>Number of Samples</u>
1 to 4	1
5 to 19	2
20 or more	10% of total

- a. Where the construction site is adjacent to or otherwise discharges directly to an OAW, the operator shall sample for turbidity both immediately upstream and downstream of each discharge point. If there are two or more discharge locations from the site to the same OAW, the operator may sample at one upstream and one downstream location in the stream
 - b. If the impaired water or OAW is a lake, a site-specific proposal for sampling the impact area shall be submitted.
4. Analytical Monitoring Parameters.
 - a. All operators with construction sites that are located within 1/4 mile of an OAW shall monitor for turbidity. The operator shall compare turbidity values from the sample locations referenced in Part 7.3(3)(a). If there is a 25% or more increase at the downstream monitoring location, or for lakes, in the area of impact, the operator shall evaluate and replace, maintain, or install additional control measures as necessary to reduce sediment transport.
 - b. For sites with discharges to OAWs, the operator shall also sample for any pollutants known to be present at the site or that have the potential to be discharged from the site.
 - c. All operators with construction sites that are located within 1/4 mile of an impaired water shall monitor for the pollutant(s) for which the water is impaired.
 5. Sampling and Analysis Plan (SAP). The operator shall establish written procedures for sample collection, preservation, tracking, handling, and analyses. The approved SAP (in accordance with Parts 1.5(3) and 1.5(4)) shall be a part of the SWPPP, either as an appendix or a separate SWPPP section. The SAP shall include the following:
 - a. Sample Collection, Preservation, Tracking, Handling and Analyses.
 - Designate and train personnel to collect, maintain, and handle samples in accordance with the appropriate sample protocols.
 - Identify water quality parameters/pollutants to be sampled including any pollutant(s) of concern in accordance with this Part;
 - Identify the required sample analyses and associated analytical methods (analytical laboratory and field analyses).

- Written procedures for:
 - Sample collection (equipment and containers, calibration procedures, document site conditions during sampling, field notes and conditions under which the sample was taken),
 - Preservation (sample preparation to meet holding times),
 - Tracking (including chain-of-custody procedures), and
 - Handling (packing, transporting and shipping procedures to maximize sample integrity).
- b. Calibration and Maintenance of Equipment and Monitoring Methods.

All monitoring instruments and equipment (including operators' own field instruments for measuring pH and turbidity) shall be calibrated and maintained in accordance with manufacturers' recommendations. All laboratory analyses shall be conducted according to test procedures specified in 40 CFR Part 136, unless other test procedures have been specified in this general permit.

All samples collected for analytical monitoring shall be analyzed by a laboratory that is licensed by the Arizona Department of Health Service (ADHS) Office of Laboratory Licensure and Certification. This requirement does not apply to parameters that require analysis at the time of sample collection as long as the testing methods used are approved by ADHS or ADEQ. These parameters may include flow, dissolved oxygen, pH, temperature, and total residual chlorine. The operator may conduct field analysis of turbidity if the operator has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to properly perform the field analysis.

8.0 FEES, REPORTING AND RECORDKEEPING

8.1 Fee Requirements.

In accordance with A.A.C R18-14-109, the operator shall pay the initial AZPDES water quality protection services fee for coverage under this permit at the time the NOI is submitted. In addition, the operator shall pay the applicable annual fee when billed, unless a notice of termination has been submitted to ADEQ. The annual fee is due on the anniversary of the date the authorization certificate (see Part 2.3(3)(d)). Both fees are based on the amount of acreage identified in the NOI, in accordance with A.A.C. R18-14-109, Table 6.

8.2 Records.

1. Address for Submittal of All Forms and Reports. All documents required by this permit (signed copies of NOIs, NOTs, DMRs and paper copies of any reports required in Parts 4, 5, 6, 7 and 8) and any other written correspondence concerning discharges covered under this permit shall be signed and dated in accordance with Appendix B, Subsection 9 of this permit and submitted to ADEQ at the address below. Other options (i.e., electronic submittal) may also be used if ADEQ makes the information available on the Internet or by public notice.

Arizona Department of Environmental Quality
Surface Water Section, Stormwater Permits Unit—CGP Monitoring
1110 W. Washington Street, Mail Code 5415 A-1
Phoenix, AZ 85007

Reports of non-compliance shall be reported to:

Arizona Department of Environmental Quality
Water Quality Compliance Section
1110 W. Washington Street, Mail Code 5515 B-1
Phoenix, AZ 85007
Office: 602/ 771 – 4497; Fax 602/ 771 – 4505

2. Record Submittal. Operators of construction sites that are required to monitor, in accordance with Part 7, shall submit analytical monitoring results annually. Monitoring records for the period between January 1 and December 31 shall be submitted to ADEQ by January 31 of each year or at the time of final stabilization and NOT submittal, whichever is sooner.

Monitoring results must be reported on a Discharge Monitoring Report (DMR) form available at <http://www.azdeq.gov/environ/water/permits/cgp.html> or other format specified by the Director, and submitted to:

Arizona Department of Environmental Quality
Surface Water Section
Stormwater and General Permits Unit/NOI (5415A-1)
1110 W. Washington Street
Phoenix, Arizona 85007

3. Record Retention. The operator shall retain records of all stormwater monitoring information, corrective actions, inspection and other reports with the SWPPP for a period of at least three years from the date the NOT was submitted to ADEQ.

APPENDIX A. DEFINITIONS and ACRONYMS (for the purposes of this permit).**A – 1. DEFINITIONS**

“**24 hour period**” – any consecutive 24-hour period.

“**Anticipated storm event**” – any storm event with at least a 30% chance of precipitation as predicted by the National Weather Service for the area local to the construction site.

“**Approved Total Maximum Daily Loads (TMDLs)**” – Approved TMDLs are those that are developed by the Arizona Department of Environmental Quality and approved by USEPA. See also, Total Maximum Daily Load.

“**Arid areas**” – the parts of Arizona that receive an annual rainfall of less than 20 inches.

“**Best management practices**” (BMPs) – those methods, measures or practices to prevent or reduce discharges and includes structural and nonstructural BMPs and operation and maintenance procedures. Best management practices may be applied before, during and after discharges to reduce or eliminate the introduction of pollutants into receiving waters. In addition, the term shall include erosion and sediment control BMPs, stormwater conveyance, stormwater diversion, and treatment structures, and any procedure or facility used to minimize the exposure of pollutants to stormwater or to remove pollutants from stormwater.

“**Borrow Areas**” – the areas where materials are dug for use as fill, either onsite or off-site.

“**Calendar day**” – a calendar day or any 24-hour period that reasonably represents the calendar day.

“**Cationic Treatment Chemical**” – polymers, flocculants, or other chemicals that contain an overall positive charge. Among other things, they are used to reduce turbidity in stormwater discharges by chemically bonding to the overall negative charge of suspended silts and other soil materials and causing them to bind together and settle out. Common examples of cationic treatment chemicals are chitosan and cationic PAM.

“**Commencement of construction activities**” – the initial disturbance of soils (or ‘breaking ground’) associated with clearing, grading, excavating, or stockpiling of fill material activities or other construction-related activities (such as the placement of fertilizers, pesticides, herbicides, detergents, fuels, oils, or other chemicals, or the occurrence of authorized non-stormwater washout activities, or dewatering activities have begun on the site).

“**Common plan of development**” – a contiguous area where multiple separate and distinct land disturbing activities may be taking place at different times, on different schedules, but under one plan. A ‘plan’ is broadly defined to include design, permit application, advertisement or physical demarcation indicating that land-disturbing activities may occur.

“**Construction activity**” – earth-disturbing activities such as, clearing, grading, excavating, stockpiling of fill material and other similar activities. This definition encompasses both large construction activities defined in 40 CFR 122.26 (b)(14)(x) and small construction activities in 40 CFR 122.26 (b)(15)(i) and includes construction support activities.

“**Construction and Development Effluent Limitations and New Source Performance Standards**” (C&D Rule) – as published in 40 CFR § 450 is the regulation requiring effluent limitations guidelines (ELGs) and new source performance standards (NSPS) for controlling the discharge of pollutants from construction sites.

“**Construction site**” or “**site**” – the land or water area where construction activities will occur, including construction support activities, and where control measures will be installed and maintained. The construction support activities may be located at a different part of the property from where the primary construction activity will take place, or on a different piece of property altogether. The construction site is often a smaller subset of the lot or parcel within which the project is taking place.

“Construction support activity” – a construction-related activity that exclusively supports the construction activity and involves earth disturbance or pollutant-generating activities of its own, and can include activities associated with concrete or asphalt batch plants, equipment staging yards, materials storage areas, excavated material disposal areas, and borrow areas. When the term “support activities” is used without clarification, it means “construction support activities”.

“Construction waste” – discarded material (such as packaging materials, scrap construction materials, masonry products, timber, steel, pipe, and electrical cuttings, plastics, and Styrofoam).

“Control measure” – refers to any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

“Conveyance channel” – a temporary or permanent waterway designed and installed to safely convey stormwater flow within and out of a construction site.

“Corrective action” – any action taken to (1) modify, or replace any ineffective control measure used at the site; (2) mitigate any conditions that resulted in a discharge of pollutants above surface water quality standards; or (3) remedy a permit violation.

“Department” – the Arizona Department of Environmental Quality.

“Discharge” – any addition of any pollutant to waters of the United States or to a MS4 from any point source.

“Discharge of a pollutant” – any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man. See 40 CFR 122.2.

“Discharge point” – the location where stormwater flows exit the construction site.

“Domestic waste” – typical household trash, garbage or rubbish items generated by construction activities.

“Drought” – weather conditions considered “severely” or “extremely” dry (i.e., has a value of -1.50 or less) as evaluated by the 3-month Standardized Precipitation Index (SPI) which compares current cumulative precipitation to average conditions.

“Effective operating condition” – a control measure is kept in effective operating condition if it has been implemented and maintained in such a manner that it is working as designed to minimize pollutant discharges.

“Effluent limitations” – any of the Part 1.4 or Part 3 requirements.

“Effluent Limitations Guideline” (ELG) – defined in 40 CFR § 122.2 as a regulation published by the Administrator under section 304(b) of CWA to adopt or revise effluent limitations.

“Emergency-related construction activity” – an activity initiated in response to a emergency (e.g., natural disaster, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services.

“Ephemeral water” – a surface water that has a channel that is at all times above the water table, and that flows only in direct response to precipitation. [A.A.C. R18-11-101(22)]

“Erosion control” – temporary or permanent measures to prevent soil particles from detaching and being transported in stormwater.

“Hazardous materials” or **“Hazardous substances”** or **“Hazardous or toxic waste”** – any liquid, solid, or contained gas that contain properties that are dangerous or potentially harmful to human health or the environment. See also 40 CFR §261.2.

“Impaired water” – waters that have been assessed by ADEQ, under the Clean Water Act, as not attaining a water quality standard for at least one designated use, and are listed in Arizona’s current 303(d) List or on the 305(b) Category 4 list.

“Intermittent water” or **“Intermittent stream”** – a stream or reach that flows continuously only at certain times of the year, as when it receives water from a spring or from another surface source, such as melting snow. [A.A.C. R18-11-101(25)]

“Linear project” – includes the construction of roads, bridges, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

“Minimize” – to reduce and/or eliminate to the extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practices.

“Municipal separate storm sewer” – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

- i. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or a designated and approved management agency under section 208 of the Clean Water Act (33 U.S.C. 1288) that discharges to waters of the United States;
- ii. Designed or used for collecting or conveying stormwater;
- iii. Which is not a combined sewer; and
- iv. Which is not part of a Publicly Owned Treatment Works.

“Municipal separate storm sewer system” (MS4) – all separate storm sewers defined as “large,” “medium,” or “small” municipal separate storm sewer systems or any municipal separate storm sewers on a system-wide or jurisdiction-wide basis as determined by the Director under A.A.C. R18-9-C902(A)(1)(g)(i) through (iv). [A.A.C. R18-9-A901(23)]. This also includes similar systems owned or operated by separate storm sewer municipal jurisdictions not required to obtain stormwater discharge authorization.

“Notice of Intent” (NOI) – the application to operate under this general permit.

“Notice of Termination” (NOT) – the application to terminate coverage under this general permit.

“Outstanding Arizona Water” – a surface water that has been designated by ADEQ as an outstanding state resource under A.A.C. R18-11-112.

“Perennial water” – a surface water that flows continuously throughout the year (A.A.C. R18-11-101(30)).

“Person” – an individual, employee, officer, managing body, trust, firm, joint stock company, consortium, public or private corporation, including a government corporation, partnership, association or state, a political subdivision of this state, a commission, the United States government or any federal facility, interstate body or other entity. [A.R.S. § 49-201(27)]

“Point(s) of discharge” – see “Discharge Point.”

“Point source” – any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding

operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

“Pollutant” – sediment, fluids, contaminants, toxic wastes, toxic pollutants, dredged spoil, solid waste, substances and chemicals, pesticides, herbicides, fertilizers and other agricultural chemicals, incinerator residue, sewage, garbage, sewage sludge, munitions, petroleum products, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt (e.g., overburden material), and mining, industrial, municipal and agricultural wastes or any other liquid, solid, gaseous or hazardous substances. [A.R.S. § 49-201(29)]

“Pollutant-generating activities” – at construction sites, those activities that lead to or could lead to the discharge of pollutants, either as a result of construction activity or construction support activity. Types of pollutants that are typically associated with construction sites include, but are not limited to:

- Sediment;
- Nutrients;
- Heavy metals;
- Pesticides and herbicides;
- Oil and grease;
- Bacteria and viruses;
- Trash, debris, and solids;
- Treatment polymers; and
- Any other toxic chemicals.

“Pollution prevention measures” – control measures designed to reduce or eliminate the addition of pollutants to construction site discharges through analysis of pollutant sources, implementation of proper handling/ disposal practices, employee education, and other actions.

“Polymers” – coagulants and flocculants used to control erosion on soil or to enhance the sediment removal capabilities of sediment traps or basins. Common construction site polymers include polyacrylamide (PAM), chitosan, alum, polyaluminum chloride, and gypsum.

“Prohibited discharges” – discharges that are not allowed under this permit, including:

1. Wastewater from washout of concrete;
2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
4. Soaps or solvents used in vehicle and equipment washing; and
5. Toxic or hazardous substances from a spill or other release.

“Provisionally covered under this permit” – ADEQ provides temporary coverage under this permit for emergency-related projects prior to receipt of a complete and accurate NOI. Discharges from earth-disturbing activities associated with the emergency-related projects are subject to the terms and conditions of the permit during the period of temporary coverage.

“Qualified person” or **“Qualified personnel”** – Qualified personnel are those (either the operator’s employees or outside personnel) who are knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possess the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any control measures selected to control the quality of stormwater discharges from the construction activity.

“Received” – for the purposes of this permit and in reference to NOIs or NOTs or Permit Waiver Certificate forms means:

1. The day the information was signed electronically via the Smart NOI system and submitted to ADEQ,
2. The date of hand-delivery of the signed form to ADEQ, or
3. The date ADEQ signs for certified mail containing the signed form.

“Receiving water” – a “Water of the United States” as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

“Reclaimed water” – water that has been treated or processed by a wastewater treatment plant or an on-site wastewater treatment facility. A.R.S. § 49-201(31).

“Run-on” – stormwater that drains from land located upslope or upstream from the regulated site in question.

“Sediment control” – measures designed to intercept and settle out soil particles that have become detached and transported by water. Sediment control measures complement soil stabilization measures (erosion control).

“Site” – see “construction site”.

“Small construction activity” – defined at 40 CFR §122.26(b)(15) and incorporated here by reference. A small construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than one (1) acre and less than five (5) acres of land or will disturb less than one (1) acre of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one (1) acre and less than five (5) acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

“Spill” – the release of a hazardous or toxic substance from its container or containment (see Part 3.1.3.5).

“Stabilization” – covering or maintaining an existing cover over soil that reduces and minimizes erosion. The use of vegetative and/or non-vegetative cover to prevent erosion and sediment loss in areas exposed through the construction process.

“Storm event” – a precipitation event that results in a measurable amount of precipitation.

“Stormwater” – stormwater runoff, snow melt runoff, and surface runoff and drainage. See 40 CFR 122.26(b)(13).

“Stormwater discharges associated with construction activity” – a discharge of pollutants in stormwater runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavating), construction materials, or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located. See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15).

“Stormwater Pollution Prevention Plan” (SWPPP) – a site-specific, written document that, among other things: (1) identifies potential sources of stormwater pollution at the construction site; (2) describes control measures to reduce or eliminate pollutants in stormwater discharges from the construction site; and (3) identifies procedures the operator will implement to comply with the terms and conditions of this general permit.

“Stormwater team” – an individual or group of individuals responsible for oversight of the development and modifications of the SWPPP, and oversight of compliance with the permit requirements. The individual(s) on the “Stormwater Team” must be identified in the SWPPP.

“Surface Water” – a “Water of the United States” as defined in 40 CFR §122.2.

“Temporary stabilization” – a condition where exposed soils or disturbed areas are provided a temporary vegetative and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb this area.

“Total Maximum Daily Load” (TMDL) – an estimation of the total amount of a pollutant from all sources that may be added to a water while still allowing the water to achieve and maintain applicable surface water quality standards. Each total maximum daily load shall include allocations for sources that contribute the pollutant to the water, as required by section 303(d) of the clean water act (33 United States Code, Section 1313(d)) and regulations implementing that statute to achieve applicable surface water quality standards. [A.R.S. § 49-231(4)]

“Toxic waste” – see “Hazardous Materials”

“Turbidity” – a condition of water quality characterized by the presence of suspended solids and/or organic material; expressed as nephelometric turbidity units (NTU).

“Waters of the United States” (U.S.) – defined in 40 CFR 122.2.

“Waste Load Allocation” – The maximum load of pollutants each discharger of waste is allowed to release into a particular waterway. Discharge limits are usually required for each specific water quality criterion being, or expected to be, violated. WLAs constitute a type of water quality-based effluent limitation. (See 40 C.F.R. § 130.2(h))

“Water Quality Standards” – A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses. States and USEPA adopt water quality standards to protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act (See CWA sections 101(a)2 and 303(c)). Water quality standards also include an antidegradation policy. See P.U.D. o. 1 of Jefferson County et al v. Wash Dept of Ecology et al, 511 US 701, 705 (1994).

“Wetland” – an area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. A wetland includes a swamp, marsh, bog, cienega, tinaja, and similar areas. [A.A.C. R18-11-101(49)]

“Work day” – a calendar day on which construction activities will take place.

A – 2. ACRONYMS

AAC	Arizona Administrative Code	NOI	Notice of Intent
ADEQ	Arizona Department of Environmental Quality	NOT	Notice of Termination
ARS	Arizona Revised Statute	NPDES	National Pollutant Discharge Elimination System
AZPDES	Arizona Pollutant Discharge Elimination System	SWPPP	Stormwater Pollution Prevention Plan
CFR	Code of Federal Regulations	TMDL	Total Maximum Daily Load
CWA	Clean Water Act	USEPA	United States Environmental Protection Agency
MS4	Municipal Separate Storm Sewer System	USGS	United States Geological Survey

APPENDIX B. STANDARD PERMIT CONDITIONS.

Standard permit conditions in Appendix B are consistent with the general permit provisions required under 40 CFR 122.41 and A.A.C. R-18-9-A905(A)(3).

- 1. Duty to Comply.** [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(a)(1) and A.R.S. §§ 49-261, 262, 263.01, and 263.02.]
 - a. The operator shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act; A.R.S. Title 49, Chapter 2, Article 3.1; and A.A.C. Title 18, Chapter 9, Article 9, and is grounds for enforcement action, permit termination, revocation and reissuance, or modification, or denial of a permit renewal application.
 - b. The issuance of this permit does not waive any federal, state, county, or local regulations or permit requirements with which a person discharging under this permit is required to comply.
 - c. The operator shall comply with any effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

- 2. Duty to Reapply / Continuation of the Expired General Permit.** [A.A.C. R18-9-A905, which incorporates 40 CFR 122.41(b) and A.A.C. R18-9-C903]
 - a. Upon reissuance of the general permit, the permittee shall file an NOI, within the timeframe specified in the new general permit, and shall obtain new written authorization to discharge from the Director.
 - b. If the Director does not reissue the general permit before the expiration date, the current general permit will be administratively continued and remain in force and effect until the general permit is reissued.
 - c. Any operator granted authorization to discharge under the general permit before the expiration date automatically remains covered by the continued general permit until the earlier of:
 - i. Reissuance or replacement of the general permit, at which time the operator shall comply with the NOI conditions of the new general permit to maintain authorization to discharge; or
 - ii. The date the operator has submitted a Notice of Termination; or
 - iii. The date the Director has issued an individual permit for the discharge; or
 - iv. The date the Director has issued a formal permit decision not to reissue the general permit, at which time the operator shall seek coverage under an alternative general permit or an individual permit, or cease discharge.

- 3. Need To Halt or Reduce Activity Not a Defense.** [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(c)]

It shall not be a defense for an operator in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

- 4. Duty to Mitigate.** [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(d)]

The operator shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment per A.R.S. § 49-255.01(E)(1)(d).

5. Proper Operation and Maintenance. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(e)]

The operator shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the operator to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures.

6. Permit Actions. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. Filing a request by the operator for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

7. Property Rights. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, nor any infringement of federal, state, Indian tribe, or local laws or regulations.

8. Duty to Provide Information. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(h)]

The operator shall furnish to ADEQ, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The operator shall also furnish to ADEQ upon request, copies of records required to be kept by this permit.

9. Signatory Requirements. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(k) and (l); A.A.C. R18-9-A905(A)(1)(c), which incorporates 40 CFR 122.22]

All Notices of Intent (NOI) and Notices of Termination (NOT) must be signed as follows:

a. NOIs:

- i. For a corporation: By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
 - ii. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or
 - iii. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a federal (or state) agency includes: (1) The chief executive officer (or director) of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.
- b. All NOTs, reports, including SWPPPs, inspection reports, monitoring reports, and other information required by this permit must be signed by a person described in Appendix B, Subsection 9(a) above or by a duly authorized representative of that person. A person is a

duly authorized representative only if:

- i. The authorization is made in writing by a person described in Subsection 9(a) above;
 - ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of manager, operator, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may be either a named individual or any individual occupying a named position); and
 - iii. The signed and dated written authorization is included in the SWPPP. A copy must be submitted to ADEQ, upon request.
- c. Certification. Any person signing documents under the terms of this permit shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

10. Inspection and Entry. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(i)]

The operator shall allow the Director or an authorized representative upon the presentation of credentials and such other documents as may be required by law to:

- a. Enter upon the operator's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;
- b. Have access to and copy at reasonable times, any records that must be kept under the conditions of this general permit;
- c. Inspect at reasonable times any facility or equipment (including monitoring and control equipment), practices or operations regulated or required under this permit;
- d. Sample or monitor at reasonable times any substances or parameters at any location, for the purposes of assuring permit compliance or as otherwise authorized by A.R.S. Title 49, Chapter 2, Article 3.1, and 18 A.A.C. 9, Articles 9.

11. Monitoring and Records. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(j)]

- a. Representative Samples/Measurements. Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.
- b. Retention of Records. The operator shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date permit coverage ends. Operators shall submit any such records to the Director upon request. The operator shall retain the SWPPP developed in accordance with Part 6 of this permit, for at least three (3) years after the last modification or amendment is made to the plan. The Director may extend this retention period upon request by notifying the operator in writing at any time prior to the end of the standard three year retention period.
- c. Records Contents. Records of monitoring information must include:
 - i. The date, exact place, and time of sampling or measurements;
 - ii. The initials or name(s) of the individual(s) who performed the sampling or measurements;
 - iii. The date(s) analyses were performed;

- iv. The time(s) analyses were initiated;
 - v. The initials or name(s) of the individual(s) who performed the analyses;
 - vi. References and written procedures, when available, for the analytical techniques or methods used;
 - vii. The analytical techniques or methods used; and
 - viii. The results of such analyses.
- d. Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained in this permit is subject to the enforcement actions established under A.R.S. Title 49, Chapter 2, Article 4, which includes the possibility of fines and/or imprisonment.

12. Reporting Requirements. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(l)]

- a. Planned changes. The operator shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:
 - i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b) (incorporated by reference at A.A.C. R18-9-A905(A)(1)(e)); or
 - ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1) (incorporated by reference at A.A.C. R18-9-A905(A)(3)(b)).
- b. Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit.
 - i. Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms (paper or electronic) provided or specified by ADEQ. Pursuant to Part 8.2(2), all monitoring data collected pursuant to Part 7 must be submitted to the Department using the Discharge Monitoring Report (DMR) form, available at <http://www.azdeq.gov/environ/water/permits/cgp.html>.
 - ii. If the operator monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.
 - iii. Calculations for all limitations which require averaging of measurements must use an arithmetic mean and non-detected results must be incorporated in calculations as the limit of quantitation for the analysis.
- c. Anticipated noncompliance. The operator shall give advance notice to the Director of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.
- d. Twenty-four hour reporting.
 - i. The operator shall report to ADEQ any noncompliance with this permit which may endanger human health or the environment. The operator shall orally notify the office listed below within 24 hours:

Arizona Department of Environmental Quality – Water Quality Compliance
1110 W. Washington Street, Mail Code 5515 B-1
Phoenix, AZ 85007
Office: 602-771 – 2330; Fax 602-771 – 4505
 - ii. A written submission shall also be provided to the office identified above within five (5) days of the time the operator becomes aware of the circumstances. The written

submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

- iii. The following shall be included as information which must be reported within 24 hours under this paragraph.
 - 1) Any upset which exceeds any effluent limitation in the permit.
 - 2) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within 24 hours. (See 40 CFR 122.44(g) which is incorporated by reference at A.A.C. R18-9-A905(A)(3)(d)).
- iv. ADEQ may waive the written report on a case-by-case basis for reports under this subsection if the oral report has been received within 24 hours.
- e. Other noncompliance. The operator shall report all instances of noncompliance not otherwise required to be reported under this subsection, at the time monitoring reports are submitted. The reports shall contain the information listed in subsection 12(d).
- f. Other information. When the operator becomes aware that it failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Department, the operator shall promptly submit the facts or information to ADEQ at the address listed in Part 8.2.

13. Reopener Clause. [A.A.C. R18-9-A905(A)(3)(d), which incorporates 40 CFR 122.44(c)]

The Department may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines, which may be promulgated in the course of the current permit cycle.

14. Other Environmental Laws.

No condition of this general permit releases the operator from any responsibility or requirements under other environmental statutes or regulations. For example, this permit does not authorize the “taking” of endangered or threatened species as prohibited by Section 9 of the Endangered Species Act, 16 U.S.C. 1538. Information regarding the location of endangered and threatened species and guidance on what activities constitute a “taking” are available from the U.S. Fish and Wildlife Service. The operator shall also comply with applicable State and Federal laws, including Spill Prevention Control and Countermeasures (SPCC).

15. State or Tribal Law. [Pursuant to A.A.C. R18-9-A904(C)]

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the operator from any responsibilities, liabilities, or penalties established pursuant to any applicable State or Tribal law or regulation under authority preserved by Section 510 of the Clean Water Act.

16. Severability.

The provisions of this general permit are severable, and if any provision of this general permit, or the application of any provision of this general permit to any circumstance, is held invalid, the application of the provision to other circumstances, and the remainder of this general permit shall not be affected.

17. Requiring Coverage under an Individual Permit or an Alternative General Permit. [Pursuant to A.A.C. R18-9-C902 and R18-9-A909]

- a. The Director may require a person authorized by this permit to apply for and/or obtain either an individual AZPDES permit or an alternative AZPDES general permit. Any interested person may petition the Department to take action under this section. The Department may

require an operator authorized to discharge under this permit to apply for an individual permit in any of the following cases:

- i. A change occurs in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source;
 - ii. Effluent limitation guidelines are promulgated for point sources covered by the general permit;
 - iii. An Arizona Water Quality Management Plan containing requirements applicable to the point sources is approved;
 - iv. Circumstances change after the time of the request to be covered so that the discharger is no longer appropriately controlled under the general permit, or either a temporary or permanent reduction or elimination of the authorized discharge is necessary;
 - v. If the Director determines that the discharge is a significant contributor of pollutants. When making this determination, the Director shall consider:
 - 1) The location of the discharge with respect to waters of the United States,
 - 2) The size of the discharge,
 - 3) The quantity and nature of the pollutants discharged to waters of the U.S., and
 - 4) Any other relevant factor.
- b. If an individual permit is required, the Director shall notify the discharger in writing of the decision. The notice shall include:
- i. A brief statement of the reasons for the decision;
 - ii. An application form;
 - iii. A statement setting a deadline to file the application;
 - iv. A statement that on the effective date of issuance or denial of the individual permit, coverage under the general permit will automatically terminate;
 - v. The applicant's right to appeal the individual permit requirement with the Water Quality Appeals Board under A.R.S. § 49-323, the number of days the applicant has to file a protest challenging the individual permit requirement, and the name and telephone number of the Department contact person who can answer questions regarding the appeals process; and
 - vi. The applicant's right to request an informal settlement conference under A.R.S. 41-1092.03(A) and 41-1092.06.
- c. The discharger shall apply for an individual permit within 90 days of receipt of the notice, unless the Director grants a later date. In no case shall the deadline be more than 180 days after the date of the notice.
- d. If the discharger fails to submit the individual permit application within the time period established in Appendix B, Subsection 17(c) the applicability of the general permit to the discharger is automatically terminated at the end of the day specified by the Director for application submittal.
- e. Coverage under the general permit shall continue until an individual permit is issued or denied unless the general permit coverage is terminated under Appendix B, Subsection 17(d).

18. Request for an Individual Permit. [Pursuant to A.A.C. R18-9-C902]

- a. An operator may request an exclusion from coverage of a general permit by applying for an individual permit.
 - i. The operator shall submit an individual permit application under R18-9-B901(B) and include the reasons supporting the request no later than 90 days after publication of the general permit.

- ii. The Director shall grant the request if the reasons cited by the operator are adequate to support the request.
- b. If an individual permit is issued to a person otherwise subject to a general permit, the applicability of the general permit to the discharge is automatically terminated on the effective date of the individual permit.

19. Change of Operator. [A.A.C. R18-9-C904]

If a change of ownership or operator occurs for a facility operating under a general permit:

- a. Permitted owner or operator. The operator shall provide the Department with a Notice of Termination by certified mail within 30 days after the new owner or operator assumes responsibility for the facility.
 - i. The Notice of Termination shall include all requirements for termination specified in the general permit for which the Notice of Termination is submitted.
 - ii. An operator shall comply with the permit conditions specified in the general permit for which the Notice of Termination is submitted until the Notice of Termination is received by the Department.
- b. New owner or operator.
 - i. The new owner or operator shall complete and file a Notice of Intent with the Department within the time period specified in the general permit before taking over operational control of, or initiation of activities at, the facility.
 - ii. If the previous operator was required to implement a stormwater pollution prevention plan, the new owner shall develop a new stormwater pollution prevention plan, or may modify, certify, and implement the old stormwater pollution prevention plan if the old stormwater pollution prevention plan complies with the requirements of the current general permit.
 - iii. The operator shall provide the Department with a Notice of Termination if a permitted facility ceases operation, ceases to discharge, or changes operator status. In the case of a construction site, the operator shall submit a Notice of Termination to the Department when:
 - 1) The facility ceases construction operations and the discharge is no longer associated with construction or construction-related activities,
 - 2) The construction is complete and final site stabilization is achieved, or
 - 3) The operator's status changes.

20. Bypass. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(m)]

- a. Definitions.
 - i. Bypass means the intentional diversion of waste streams from any portion of a treatment facility
 - ii. Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
- b. Bypass not exceeding limitations. The operator may allow any bypass to occur that does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions Appendix B, Subsections 20(c) and 20(d).

- c. Notice.
 - i. Anticipated bypass. If the operator knows in advance of the need for a bypass, if possible prior notice shall be submitted at least ten days before the date of the bypass.
 - ii. Unanticipated bypass. The operator shall submit notice of an unanticipated bypass as required in Appendix B, Subsection 12(d).
- d. Prohibition of bypass.
 - i. Bypass is prohibited, and ADEQ may take enforcement action against the operator for bypass, unless:
 - 1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - 2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - 3) The operator submitted notices as required under Appendix B, Subsection 20(c).
 - ii. ADEQ may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three conditions listed above in this Appendix B, Subsection 20(d).

21. Upset. [A.R.S. §§ 49-255(8) and 255.01(E), A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(n)]

- a. Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the operator. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
- b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix B, Subsection 21(c) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
- c. Conditions necessary for a demonstration of upset. An operator who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - i. An upset occurred and that the operator can identify the cause(s) of the upset;
 - ii. The permitted facility was at the time being properly operated;
 - iii. The operator submitted notice of the upset as required in Appendix B, Subsection 12(d)(iii); and
 - iv. The operator complied with any remedial measures required under Appendix B, Subsection 4.
- d. Burden of proof. In any enforcement proceeding, the operator, who is seeking to establish the occurrence of an upset, has the burden of proof.

22. Penalties for Violations of Permit Conditions.

Any permit noncompliance constitutes a violation and is grounds for an enforcement action, permit termination, revocation and reissuance, modification, or denial of a permit renewal

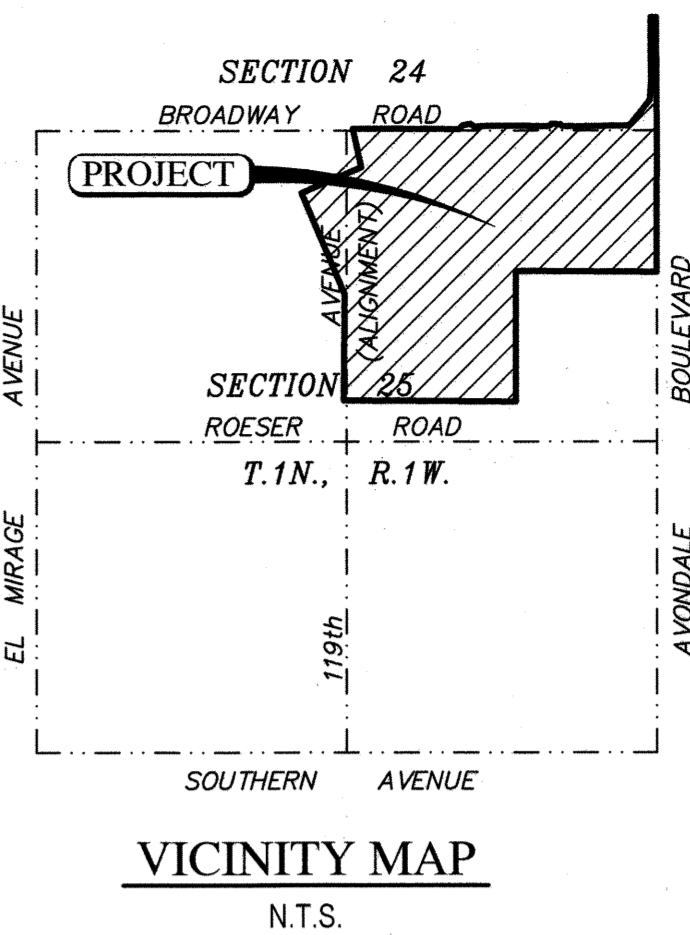
application.

- a. Civil Penalties. A.R.S. § 49-262 provides that any person who violates any provision of A.R.S. Title 49, Chapter 2, Article 2, 3 or 3.1 or a rule, permit, discharge limitation or order issued or adopted under A.R.S. Title 49, Chapter 2, Article 3.1 is subject to a civil penalty not to exceed \$25,000 per day per violation.
- b. Criminal Penalties. Any person who violates a condition of this general permit, or violates a provision under A.R.S. Title 49, Chapter 2, Article 3.1, or A.A.C. Title 18, Chapter 2, Article 9 is subject to the enforcement actions established under A.R.S. Title 49, Chapter 2, Article 4, which may include the possibility of fines and/or imprisonment.

EXHIBIT 6

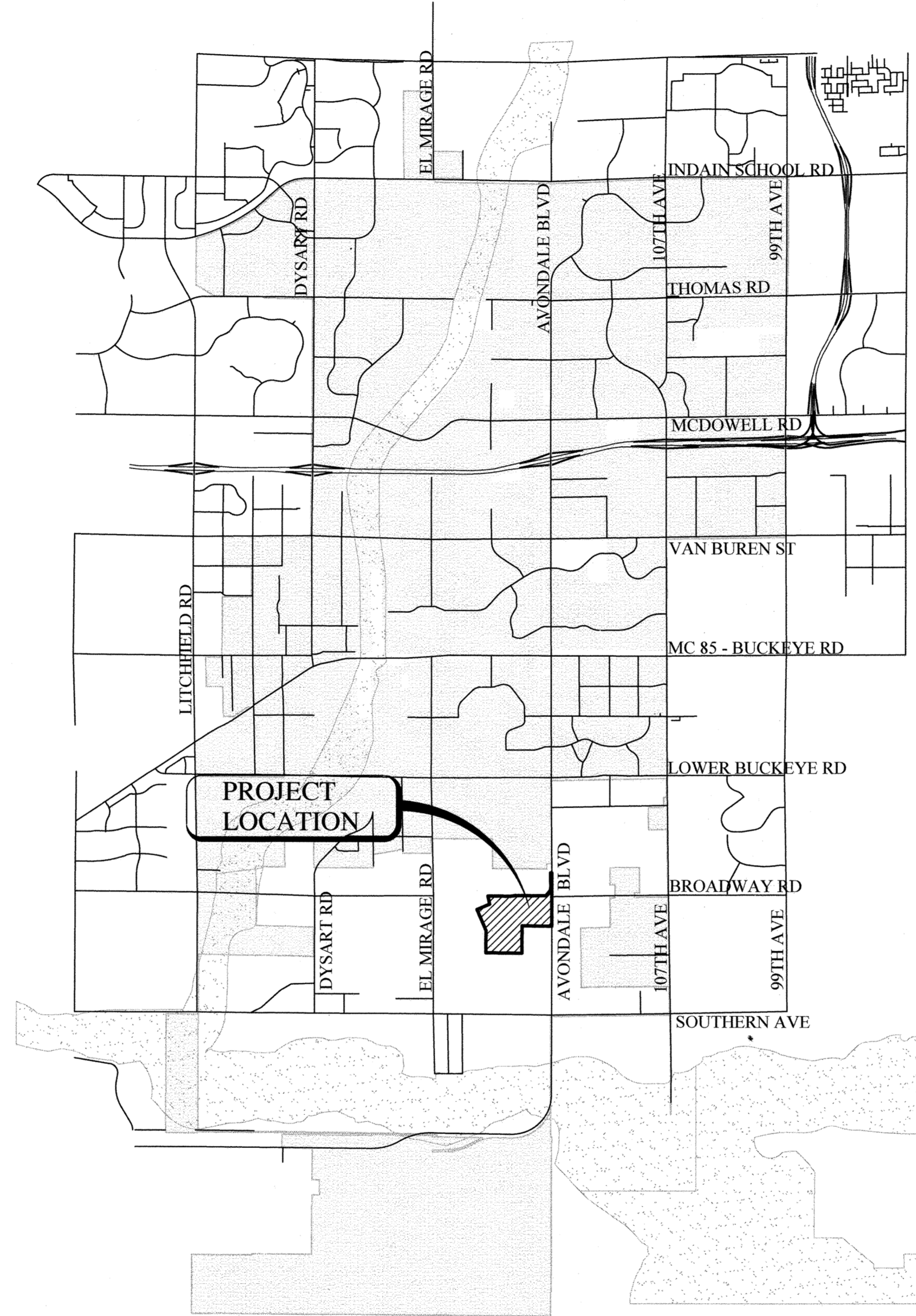
EROSION CONTROL PLAN ALAMAR - PHASE 1

A PROPOSED SUBDIVISION OF A PORTION OF THE
SOUTHEAST QUARTER OF SECTION 24 AND NORTH HALF OF SECTION 25,
TOWNSHIP 1 NORTH, RANGE 1 WEST, OF THE GILA AND SALT RIVER MERIDIAN,
MARICOPA COUNTY, ARIZONA



EROSION CONTROL PLAN GENERAL NOTES

- Approval of this erosion control plan (ECP) does not constitute an approval of permanent road or drainage design (e.g. size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).
- The implementation of these ECP plans and the construction, maintenance, replacement, and upgrading of these ECP BMPs is the responsibility of the applicant/contractor until all construction is completed and approved and vegetation/landscaping is established.
- If the project is phase the boundaries of the current phase clearing limits shall be shown on this plan and shall be defined in the field prior to construction. Future phases shall be protected and shown on this plan.
- The ECP BMPs shown on this plan must be constructed in conjunction with all cleaning and grading activities, and in such a manner as to insure that sediment and sediment laden water do not enter the drainage system, roadways, or violate applicable water standards.
- The ECP BMPs shown on this plan are the minimum requirements for anticipated site conditions. During the construction period, these ECP BMPs shall be upgraded as needed for unexpected storm events and to ensure that sediment and sediment laden water do not leave the site.
- The ECP BMPs shall be inspected daily by the applicant/contractor and maintained as necessary to ensure their continued functioning.
- The ECP BMPs on inactive sites shall be inspected and maintained a minimum of once a month or within 24 hours following a major storm event.
- At no time shall more than one foot of sediment be allowed to accumulate within a trapped catch basin. All catch basins and conveyance lines shall be cleaned prior to paving. The cleaning operation shall not flush sediment laden water into the downstream system.
- Stabilized construction entrances shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures may be required to ensure that all paved areas are kept clean for the duration of the project.
- A stabilized construction entrance consisting of a minimum of six (6) inches of one (1) inches to three (3) inches diameter, washed, well-graded gravel or crushed rock shall be installed per MCFCD EC-5; all construction traffic shall enter and exit through this entrance. The stabilized construction entrance shall be re-graded or replaced when it becomes saturated or matted with site soils. The paved street adjacent to the site entrance shall be swept on a regular basis to remove any excess mud or dirt tracked out from the site. The cleaning operation shall not flush sediment laden water into the downstream storm water system.
- Any disturbed areas where construction has permanently or temporarily ceased shall be stabilized to prevent erosion. An acceptable stabilization method is hydroseeding. Areas which will be redisturbed within 14 days do not have to be stabilized.
- All storm drain inlets shall be equipped with approved inlet protection per MCFCD SPC-7 or the wattle with geotextile fabric to prevent sedimentation from entering storm drain pipes.
- All storm drain outlets shall have erosion protection velocity-dissipaters or energy dissipaters per MCFCD EC-11 installed immediately after the installation of storm drain pipe to prevent erosion in outlet areas.
- Any sediment which accumulates in the catch basins shall be removed from the catch basins as necessary to maintain a minimum of 75% of the required capacity of the basin during construction and 100% thereafter.
- A copy of the contractor's NOI, ATD, and SWPPP Information Form must be submitted with these plans.
- The contract shall submit a copy of the NOT to the City at the termination of the project construction.



AREA MAP
NOT TO SCALE

SHEET INDEX:

- 1 - COVER
 - 2 - KEY MAP
 - 3-5 - EROSION CONTROL PLANS
 - 6-8 - BMP DETAILS
- TOTAL SHEETS - 8

OWNER/ DEVELOPER

BROOKFIELD LAKIN, LLC
14646 N. KIERLAND BOULEVARD,
SUITE 165
SCOTTSDALE, ARIZONA 85254
PHONE: (602) 903-7509
CONTACT: ROGER THEIS

BENCHMARK

NATIONAL GEODETIC SURVEY CONTROL POINT H 395, PID DV0444, LOCATED AT THE NORTHWEST CORNER OF EL MIRAGE ROAD AND BROADWAY ROAD, HAVING AN ELEVATION OF 939.03', NAVD 88 DATUM.

GEOTECHNICAL REPORT

GEOTECHNICAL INVESTIGATION, LAKIN RANCH PHASE 1
PROTEX - THE PT Xperts, LLC
JOB NO. 7649, APRIL 16, 2018.

ENGINEER & SURVEYOR

WOOD, PATEL & ASSOCIATES, INC.
2051 WEST NORTHERN AVENUE
SUITE 100
PHOENIX, ARIZONA 85021
PHONE: (602) 335-8500
CONTACT: FRANK KOO, P.E.

BASIS OF BEARING

GEODETIC "NORTH" BASED ON: MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION (MCDOT) GEODETIC DENSFICATION AND CADASTRAL SURVEY (GDACS) WEBSITE
WWW.MCDOT.MARICOPA.GOV, UNDER THE SURVEY INFORMATION LINK ON MARCH 1, 2017.
PROJECTION: CENTRAL ZONE, NAD 83, (EPOCH 2010) DATUM: GRS-80
UNITS: INTERNATIONAL FEET
GEOID MODEL: GEOID 2012A

NATIONAL GEODETIC SURVEY CONTROL POINT: H 395
PID: DV0444
LATITUDE: 33°24'22.55252"N
LONGITUDE: 112°19'25.08998"W
ELLIPSOID HEIGHT: 255.899 (METERS)
DESCRIPTION: BRASS DISK IN CONCRETE SLEEVE

MODIFIED TO GROUND AT (GRID) N: 875587.531, E: 575808.124,
USING A SCALE FACTOR OF 1.0001224277.

HORIZONTAL ADJUSTMENT: NONE
HORIZONTAL ROTATION: NONE

CITY OF AVONDALE

MAYOR

KENNETH WEISE

VICE MAYOR

PAT DENNIS

CITY MANGER

CHARLES MONTOYA

COUNCIL MEMBERS

CURTIS NIELSON TINA CONDE
VERONICA MALONE BRIAN KILGORE
MIKE PINEDA

CITY CLERK

MARCELLA CARRILLO

REVIEW

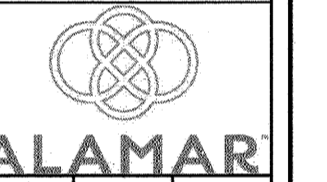
Development & Engineering Services Department

Elisabeth Kahn
Print

Elisabeth Kahn
Signature

2-7-19
Date

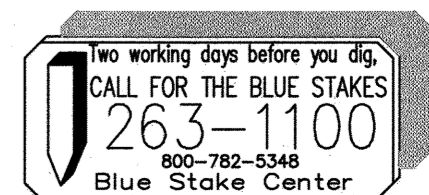
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BROOKFIELD LAKIN, LLC
PROJECT NAME: ALAMAR - PHASE 1
PLAN TYPE: EROSION CONTROL PLAN



01/03/2019
LATEST REVISION DATE
SHEET NUMBER
1 OF 8
PROJECT NUMBER
174612.04

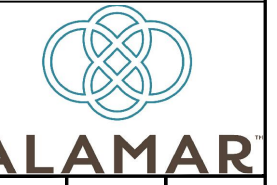


SHEET INDEX LEGEND

SHEET 1 GRADING SHEET NUMBER
 GRADING SHEET MATCHLINE

SCALE (HORIZ.)	N/A
SCALE (VERT.)	N/A

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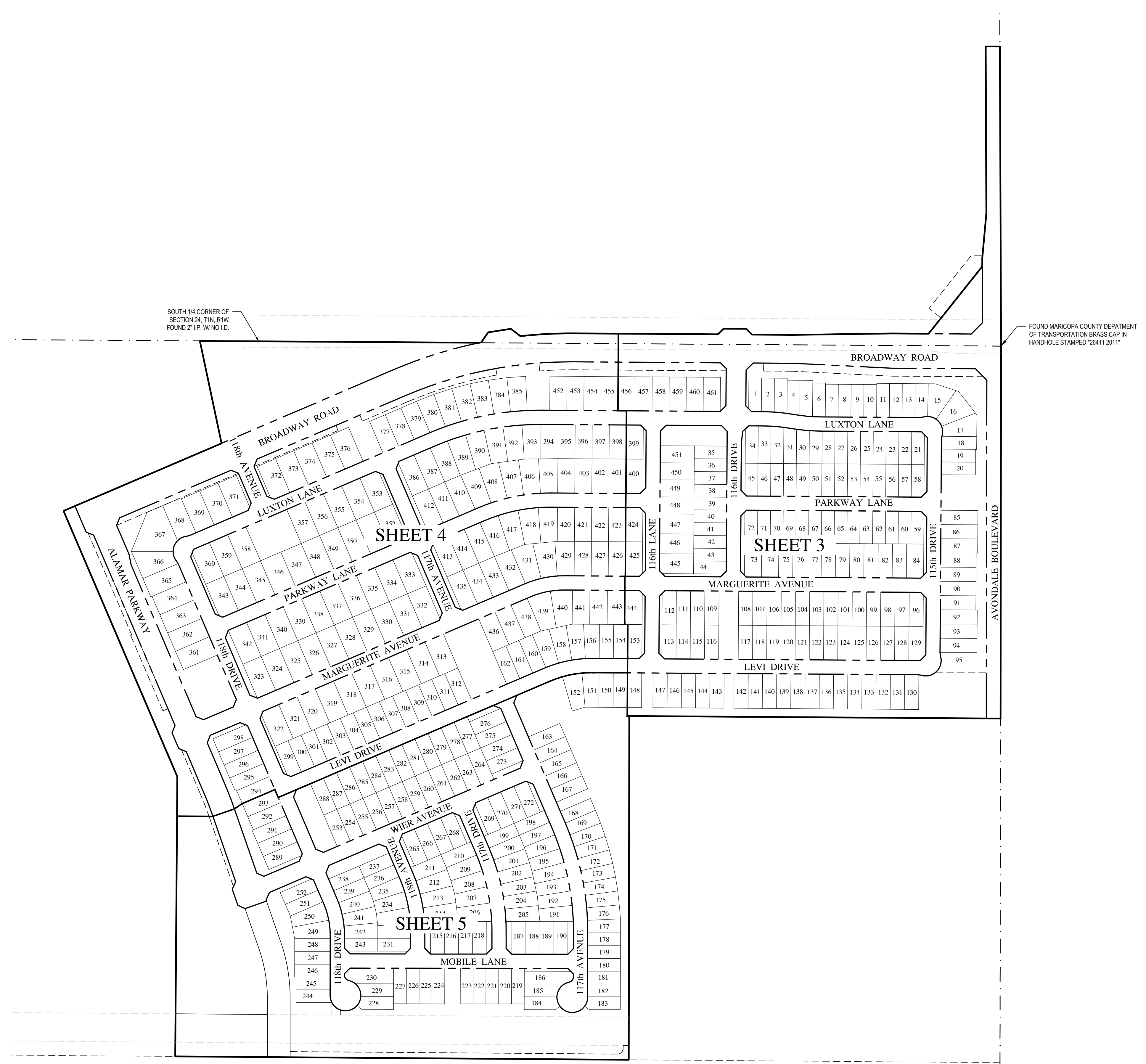


OWNER: BROOKFIELD LAKIN, LLC
 PROJECT NAME: ALAMAR - PHASE 1
 PLAN TYPE: EROSION CONTROL PLAN



PLAN DATE: 11/5/2018
 SHEET NUMBER: 2 OF 8
 PROJECT NUMBER: 174612.04

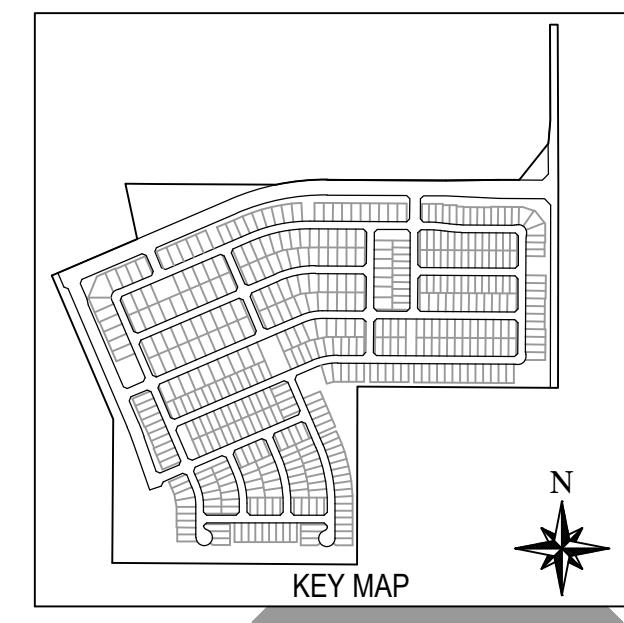
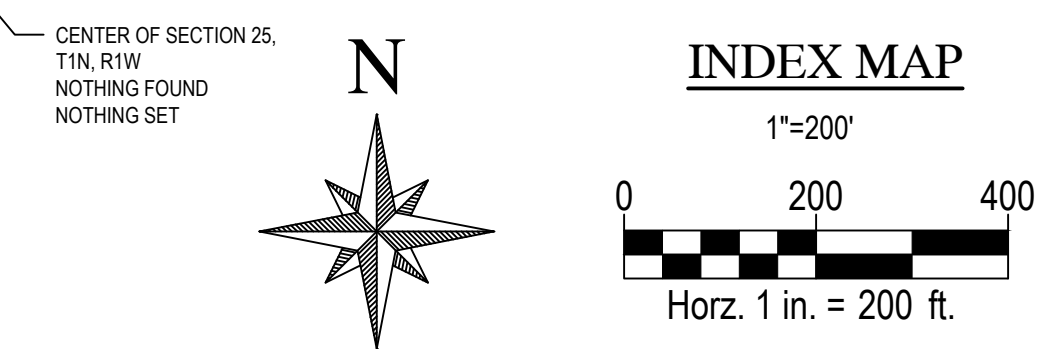
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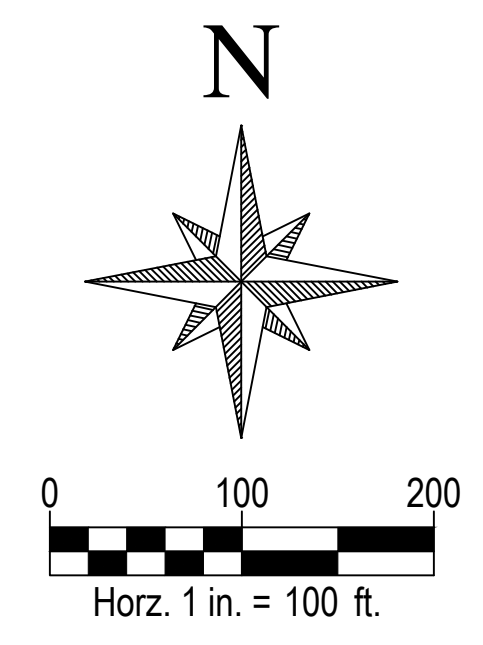
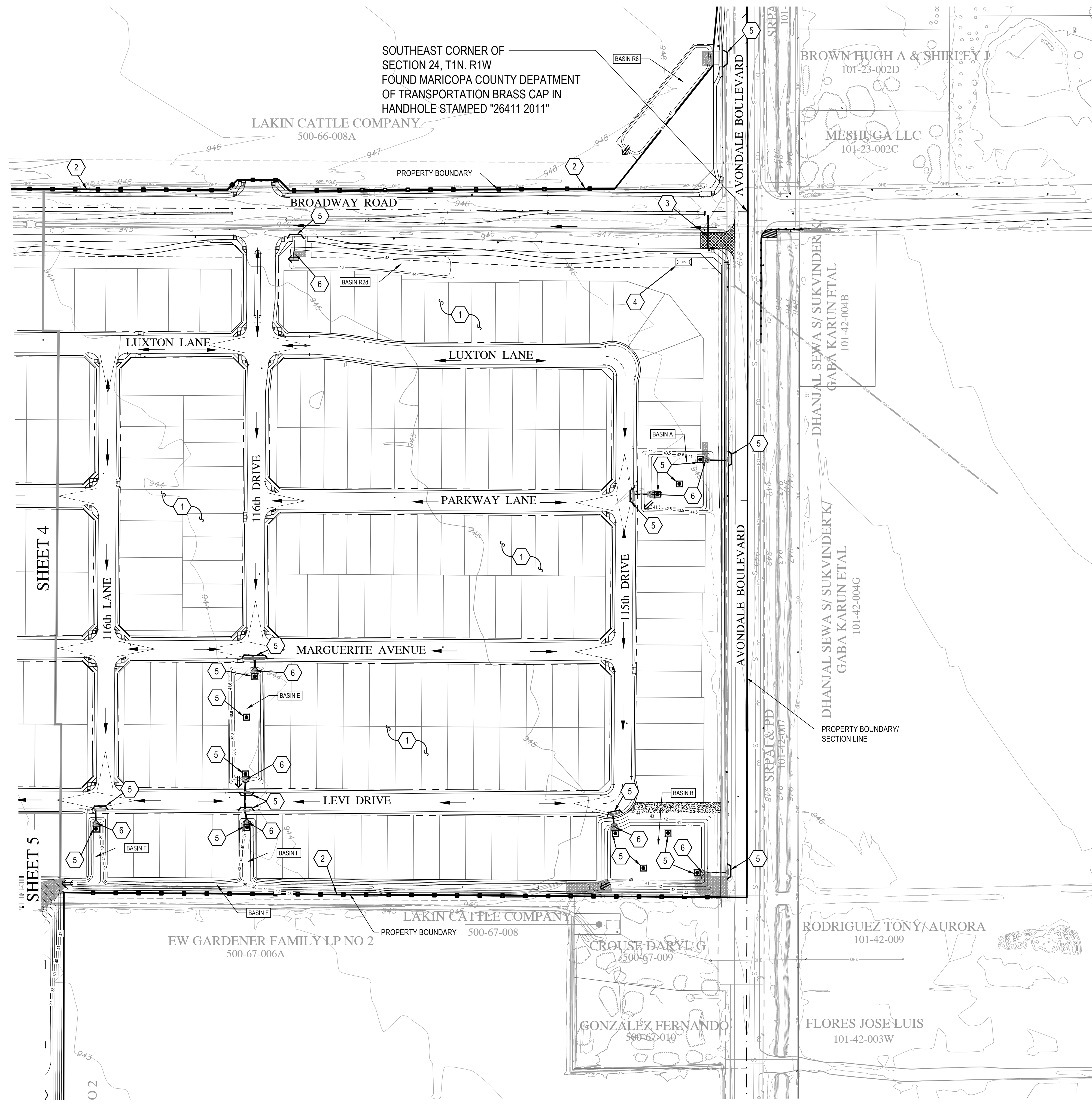
SOUTH 1/4 CORNER OF SECTION 24, T1N, R1W FOUND 2" I.P. WI NO I.D.

FOUND MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION BRASS CAP IN HANDHOLE STAMPED "26411 2011"

EAST 1/4 CORNER OF SECTION 25, T1N, R1W FOUND 3" M.C.D.O.T. B.C.H.H. STAMPED T1N R1W S25 S30 RLS 33310



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 800-782-5348
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- SWPPP CONSTRUCTION NOTES**
- 1 IMPLEMENT DUST CONTROL MEASURES PER SECTION EC-7: DUST CONTROL IN THE MARICOPA COUNTY EROSION CONTROL MANUAL.
 - 2 INSTALL SILT FENCE PER DETAIL SPC-5 ON SHEET 6.
 - 3 INSTALL STABILIZED CONSTRUCTION ENTRANCE PER DETAIL EC-5 ON SHEET 6.
 - 4 DESIGNATED WASH DOWN AREA PER DETAIL GH-4 ON SHEET 7.
 - 5 INLET PROTECTION PER SECTION SPC-7: STORM DRAIN INLET PROTECTION, SEE DETAIL ON SHEET 6.
 - 6 PIPE OUTLET PROTECTION PER DETAIL EC-11 ON SHEET 6. OR FOLLOW CONSTRUCTION ON PAVING AND GRADING PLAN.
 - 7 INSTALL COMPOST FILTER WATTLES (CFW) OR EQUIVALENT PER DETAIL SPC-1 ON SHEET 8

- LEGEND**
- PROJECT BOUNDARY
 - 1501 PROPOSED CONTOUR & ELEVATION
 - 1501 EXISTING CONTOUR & ELEVATION
 - ML= MONUMENT LINE
 - R/W= RIGHTS-OF-WAY LINES
 - DIRECTION OF FLOW (FINAL CONDITION)
 - ULTIMATE SITE OUTFALL
 - CONSTRUCTION ENTRANCE
 - WASH DOWN AREA
 - STORM DRAIN
 - INLET PROTECTION
 - SILT FENCE
 - COMPOST FILTER WATTLES

SCALE (HORIZ.)	1" = 100'
SCALE (VERT.)	N/A

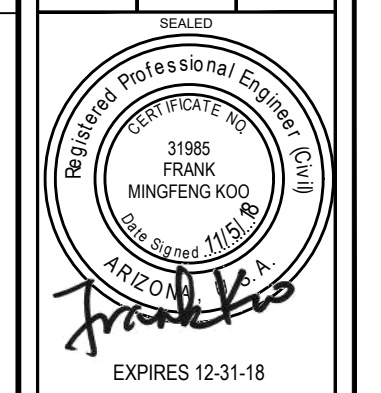
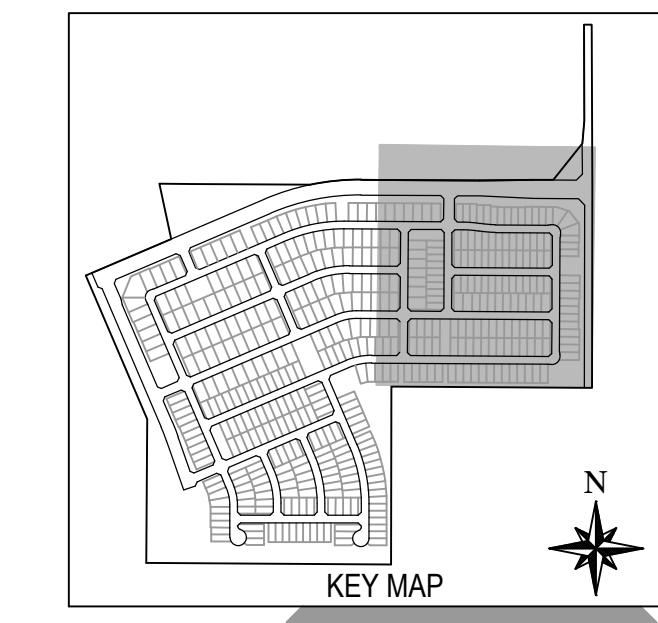
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DEVELOPER
BROOKFIELD LAKIN, LLC

PROJECT NAME
ALAMAR - PHASE 1

PLAN TYPE
EROSION CONTROL PLAN

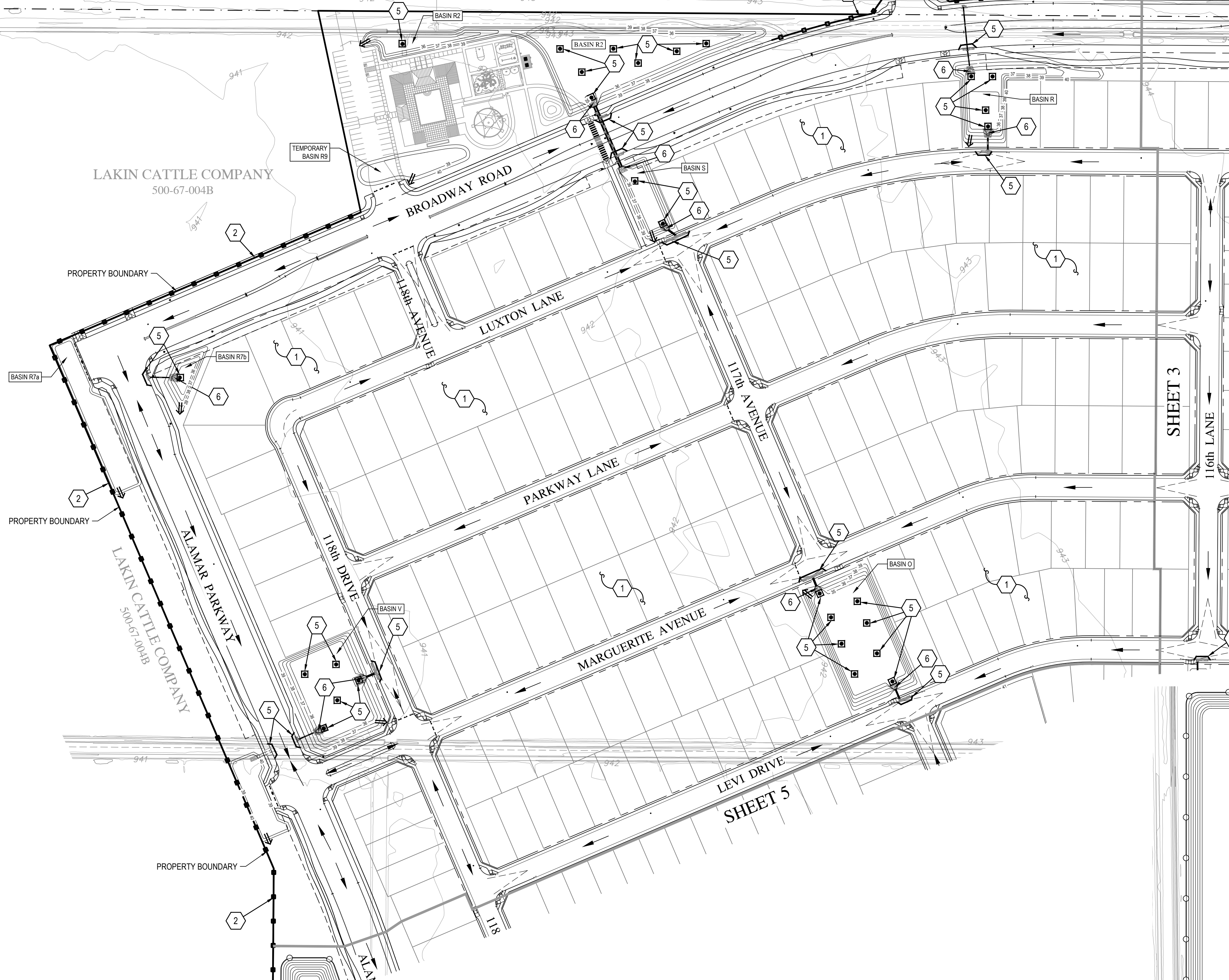
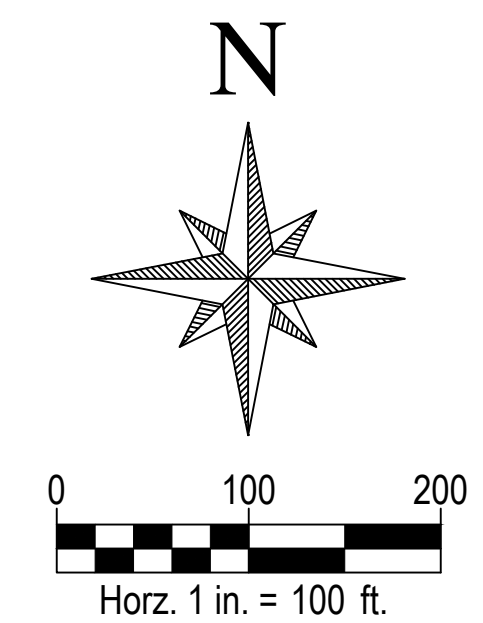


PLAN DATE	11/5/2018
LATEST REVISION DATE	
SHEET NUMBER	3 OF 8
PROJECT NUMBER	174612.04

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LAKIN CATTLE COMPANY
500-66-008A

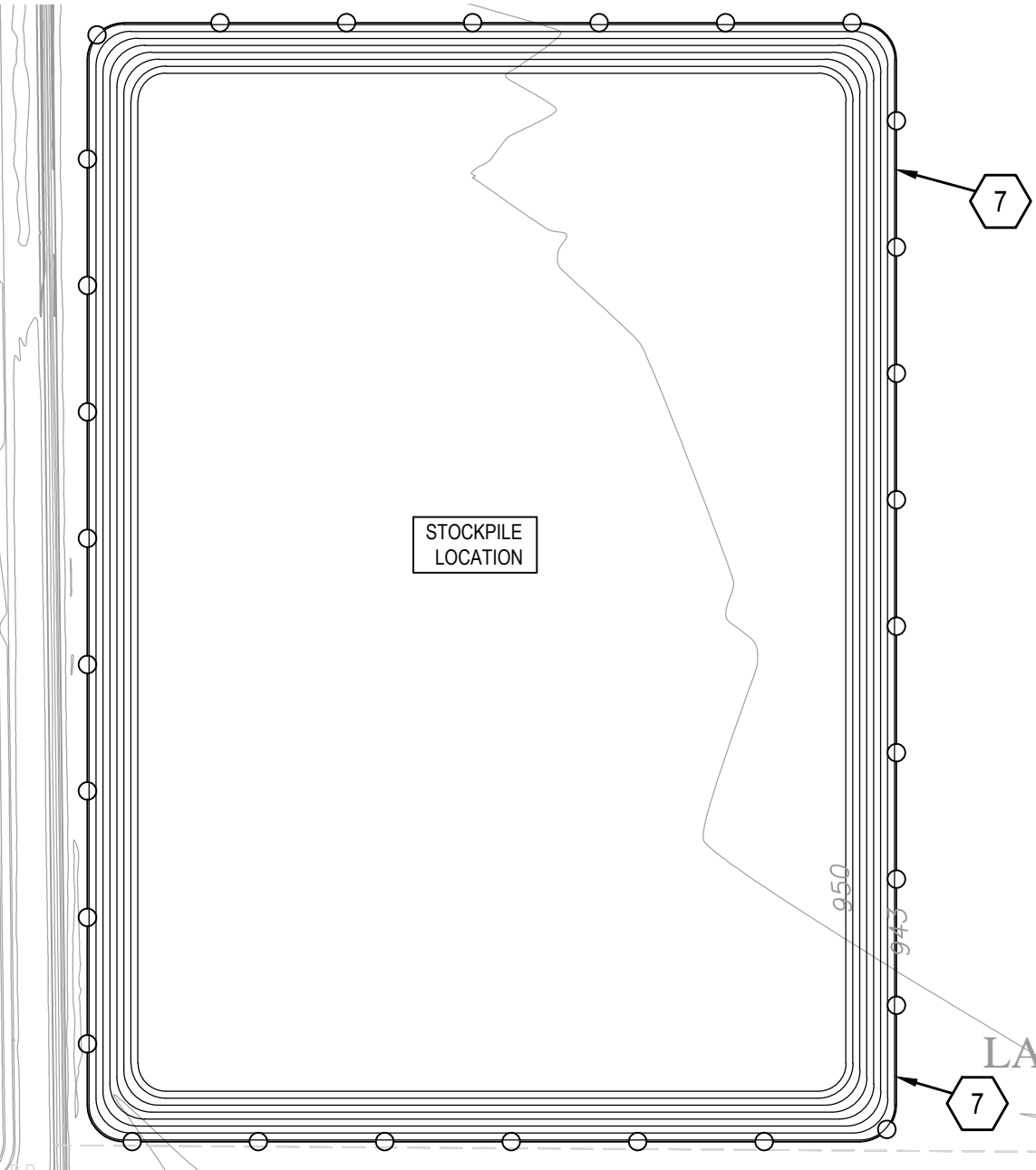


SWPPP CONSTRUCTION NOTES

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LEGEND

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- STORM DRAIN
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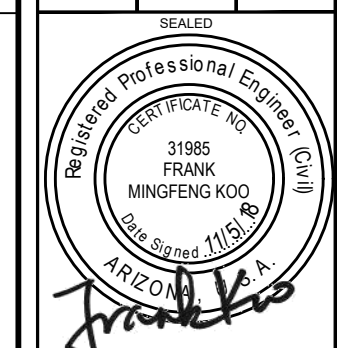
MATCH UPPER LEFT

SCALE (HORIZ.)	1" = 100'
SCALE (VERT.)	N/A

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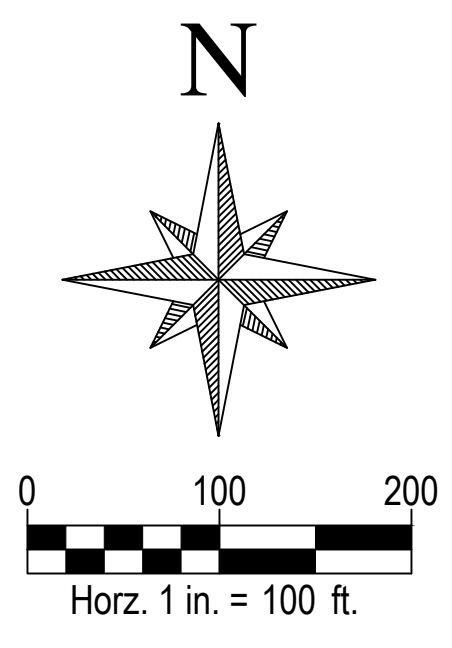
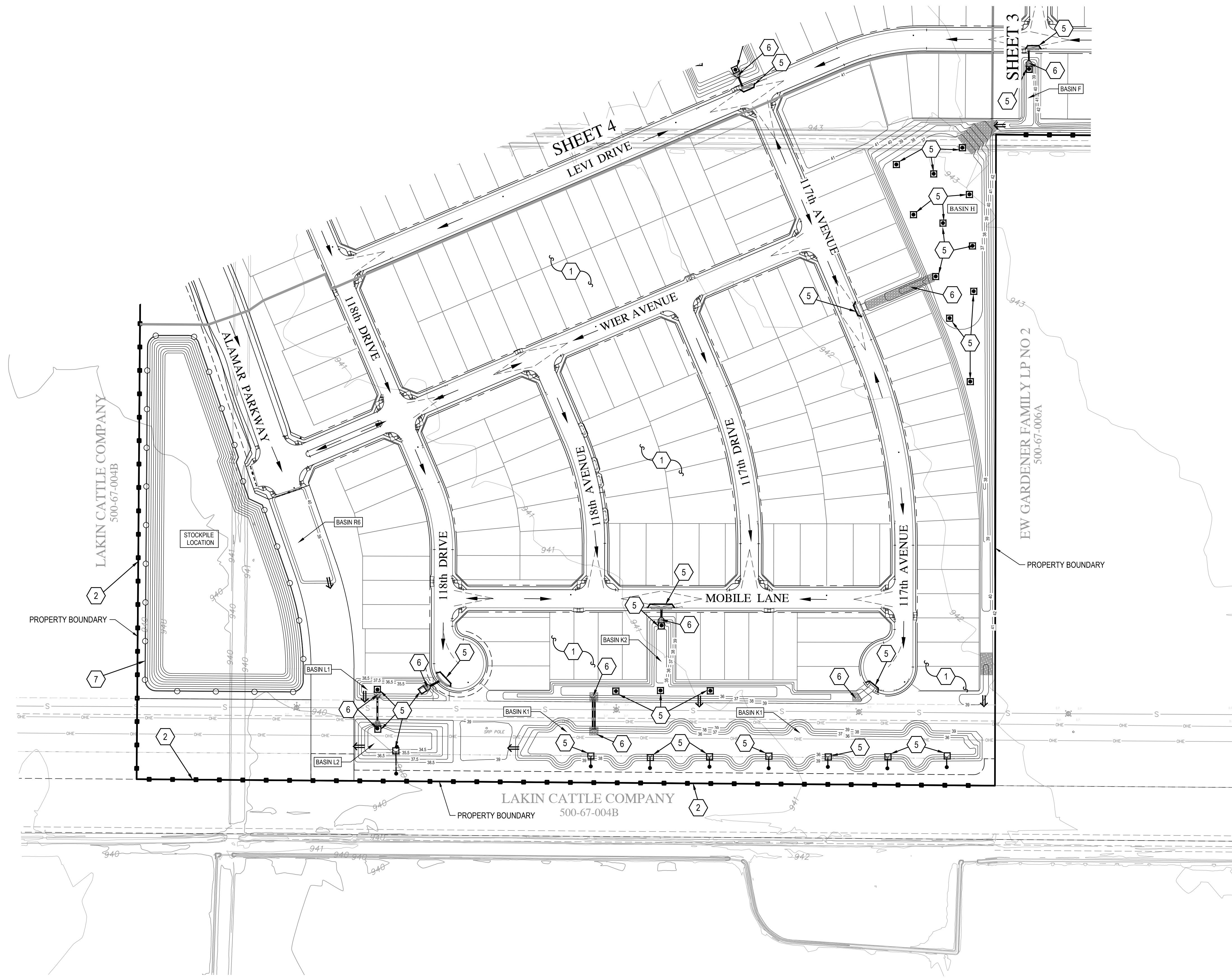


DEVELOPER
BROOKFIELD LAKIN, LLC
PROJECT NAME
ALAMAR - PHASE 1
PLAN TYPE
EROSION CONTROL PLAN



EXPIRES 12-31-18
PLAN DATE
11/5/2018
LATEST REVISION DATE
SHEET NUMBER
4 OF 8
PROJECT NUMBER
174612.04

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SWPPP CONSTRUCTION NOTES

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LEGEND

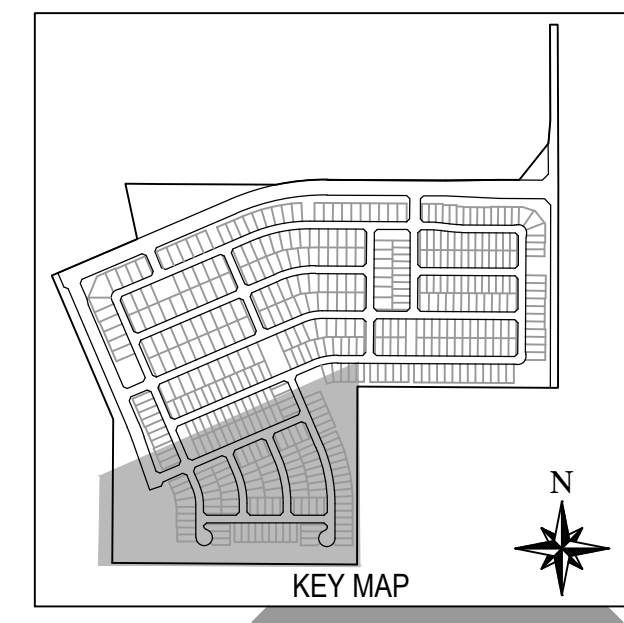
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SCALE (HORIZ.)	1" = 100'
SCALE (VERT.)	N/A

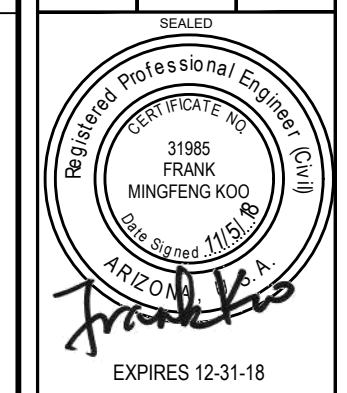
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DEVELOPER
BROOKFIELD LAKIN, LLC
PROJECT NAME
ALAMAR - PHASE 1
PLAN TYPE
EROSION CONTROL PLAN

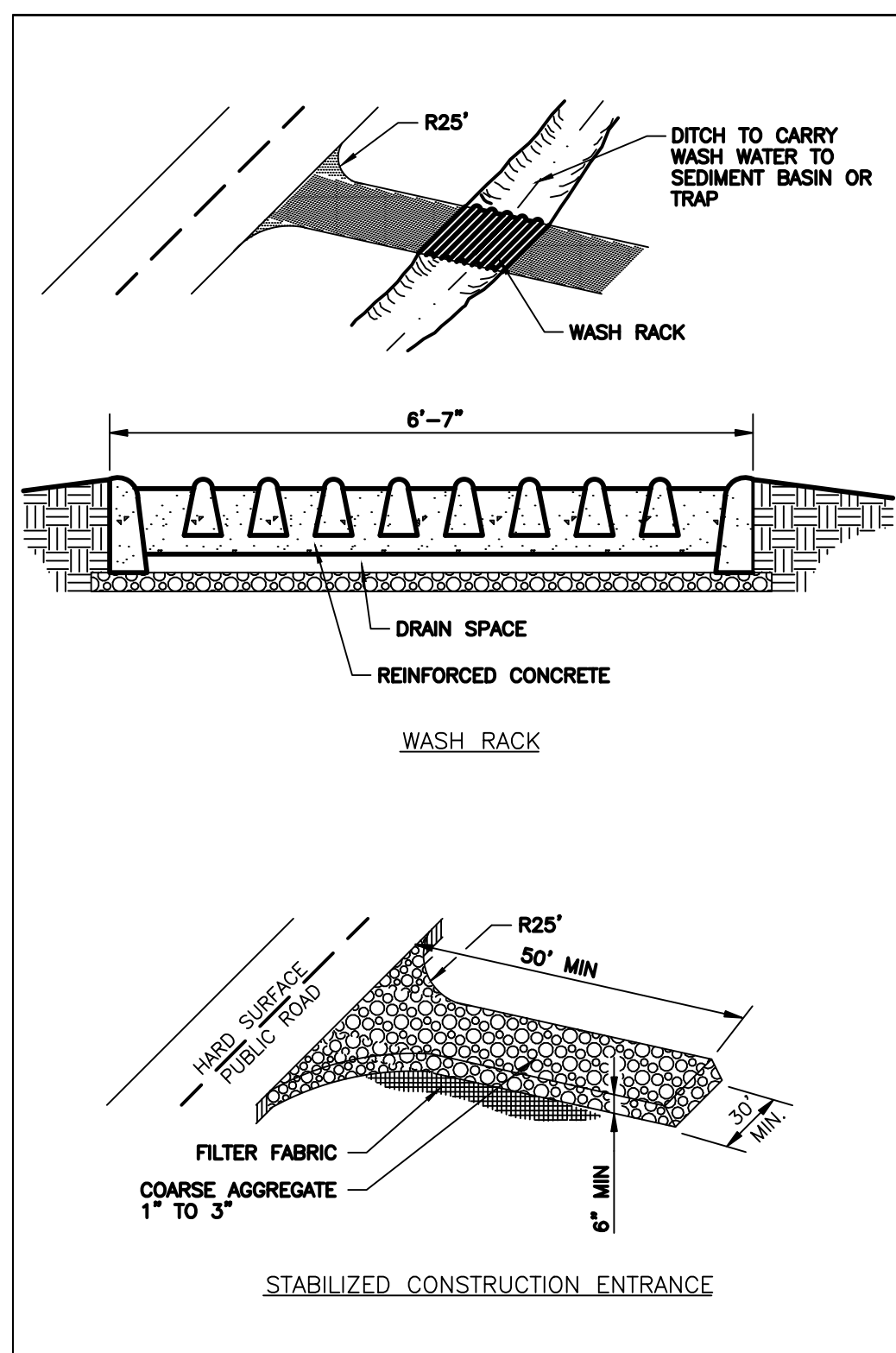


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FRANK
MINGFENG KOO
EXPIRES 12/31/18
PLAN DATE
11/5/2018
LATEST REVISION DATE
SHEET NUMBER
5 OF 8
PROJECT NUMBER
174612.04

ENG-18-0206



DEFINITION **EC-5**

A STABILIZED PAD OF AGGREGATE UNDERLAIN WITH FILTER CLOTH LOCATED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE TO OR FROM A PUBLIC RIGHT-OF-WAY, STREET, ALLEY, SIDEWALK OR PARKING AREA.

PURPOSE

THE PURPOSE OF A STABILIZED CONSTRUCTION ENTRANCE IS TO REDUCE OR ELIMINATE THE TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY OR STREETS. REDUCING TRACKOUT OF SEDIMENTS AND OTHER POLLUTANTS ONTO PAVED ROADS HELPS PREVENT DEPOSITION OF SEDIMENTS INTO LOCAL STORM DRAINS AND PRODUCTION OF AIRBORNE DUST.

APPROPRIATE APPLICATIONS

A STABILIZED CONSTRUCTION ENTRANCE SHOULD BE USED AT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS. NPDES PERMITS REQUIRE THAT APPROPRIATE MEASURES BE IMPLEMENTED TO PREVENT TRACKOUT OF SEDIMENTS ONTO PAVED ROADWAYS.

LIMITATIONS

THE STABILIZED CONSTRUCTION ENTRANCE PLAN SHOULD BE REVIEWED AS PART OF THE PROJECT TRAFFIC CONTROL PLAN.

- CONSTRUCT ON LEVEL GROUND.
- STABILIZED CONSTRUCTION ENTRANCES ARE RATHER EXPENSIVE TO CONSTRUCT AND WHEN A WASH RACK IS INCLUDED, A SEDIMENT TRAP OF SOME KIND MUST ALSO BE PROVIDED TO COLLECT WASH WATER RUNOFF.

PLANNING CONSIDERATIONS

STABILIZED CONSTRUCTION ENTRANCES ARE NOT VERY EFFECTIVE IN REMOVING SEDIMENT FROM EQUIPMENT LEAVING A CONSTRUCTION SITE. EFFICIENCY IS GREATLY INCREASED, THOUGH WHEN A WASHING RACK IS INCLUDED AS PART OF A STABILIZED CONSTRUCTION ENTRANCE. BUILD ON LEVEL GROUND

+ ADVANTAGES:

- DOES REMOVE SOME SEDIMENT FROM EQUIPMENT AND SERVES TO CHANNEL CONSTRUCTION TRAFFIC IN AND OUT OF THE SITE.

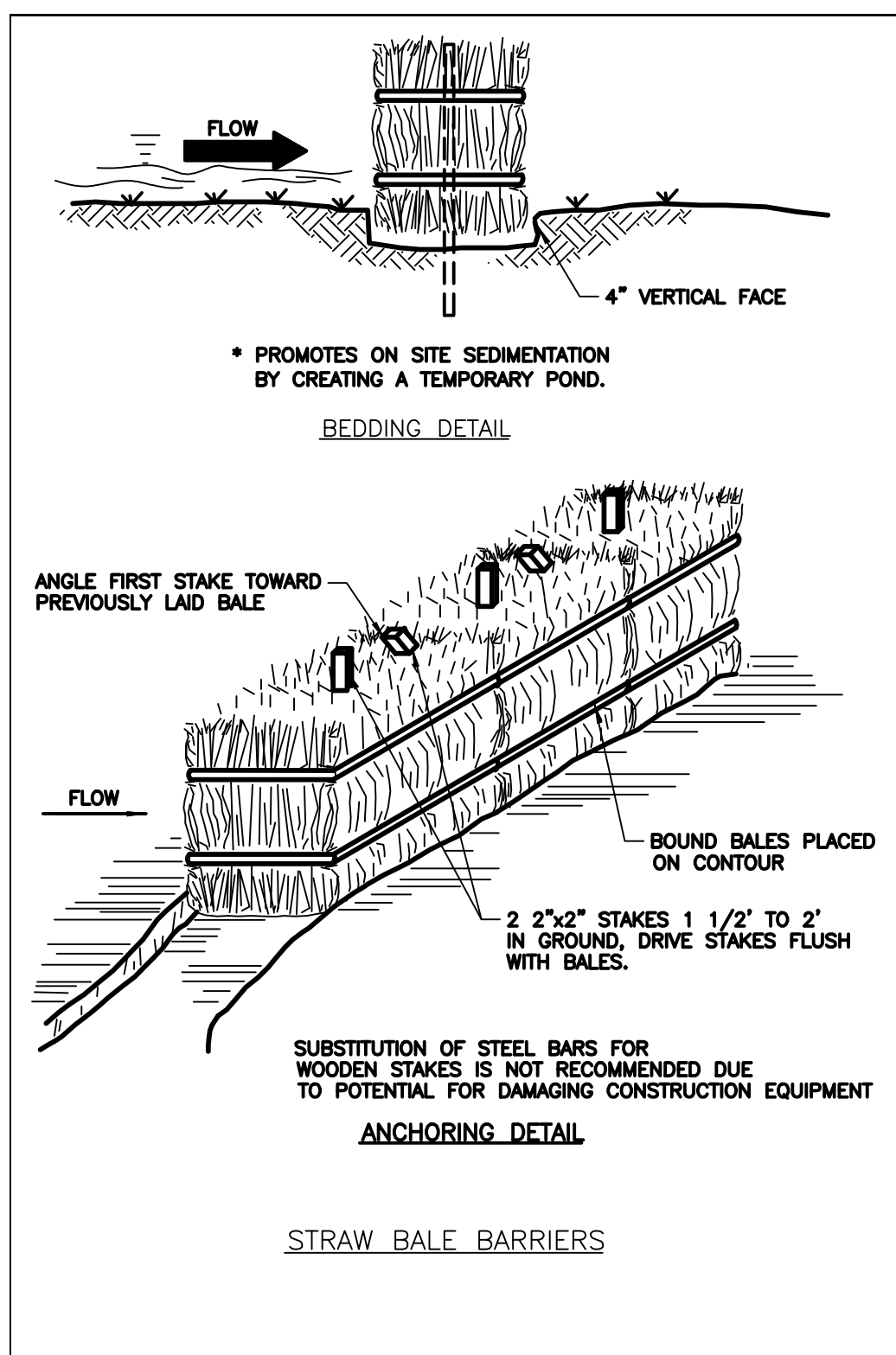
DESIGN & SIZING CONSIDERATIONS

THE AGGREGATE FOR STABILIZED CONSTRUCTION ENTRANCE APRONS SHALL BE 1 TO 3 INCHES IN SIZE, WASHED, WELL-GRADED GRAVEL OR CRUSHED ROCK. THE APRON DIMENSIONS RECOMMENDED ARE 30 FT. X 50 FT. AND 6 INCHES DEEP.

- ENTRANCE MUST BE PROPERLY GRADED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
- WHEN WASH AREAS ARE PROVIDED, WASHING SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO A PROPERLY CONSTRUCTED SEDIMENT TRAP OR BASIN (POND).

MAINTENANCE REQUIREMENTS

- INSPECT MONTHLY AND AFTER EACH RAINFALL.
- REPLACE GRAVEL MAT WHEN SURFACE VOIDS ARE NO LONGER VISIBLE. PERIODIC TOP DRESSING WITH ADDITIONAL STONE WILL BE REQUIRED.
- ALL SEDIMENTS DEPOSITED ON PAVED ROADWAYS MUST BE REMOVED WITHIN 24 HOURS.
- REMOVE GRAVEL AND FILTER FABRIC UPON COMPLETION OF CONSTRUCTION.



DEFINITION **SPC-1**

A TEMPORARY BARRIER OF STRAW BALES OR SIMILAR MATERIAL USED TO INTERCEPT SEDIMENT LADEN RUNOFF FROM SMALL DRAINAGE AREAS OF DISTURBED SOIL. PURPOSE OF A STRAW BALE DIKE IS TO REDUCE RUNOFF VELOCITY AND CAUSE POSITION OF THE TRANSPORTED SEDIMENT LOAD.

APPROPRIATE APPLICATIONS

THE STRAW BALE DIKE IS USED WHERE THERE ARE NO CONCENTRATIONS OF WATER IN A CHANNEL OR DRAINAGE WAY, AND WHERE EROSION WOULD OCCUR FROM SHEET FLOW. THESE BARRIERS ARE TYPICALLY CONSTRUCTED, BELOW DISTURBED AREAS SUBJECT TO SHEET FLOW OF RUNOFF TO INTERCEPT AND DETAIN SEDIMENT.

LIMITATIONS

- STRAW BALE DIKES ARE NOT TO BE USED FOR EXTENDED PERIODS OF TIME BECAUSE THEY TEND TO ROT AND FALL APART.
- SUITABLE ONLY FOR SHEET FLOW ON SLOPES OF 2% OR FLATTER.
- NOT APPROPRIATE FOR LARGE DRAINAGE AREAS, LIMIT TO ONE ACRE OR LESS.
- STRAW BALES LOSE THEIR EFFECTIVENESS RAPIDLY DUE TO ROTTING, THIS CONSTANT MAINTENANCE IS REQUIRED.
- NOT RECOMMENDED FOR CONCENTRATED FLOW, CHANNEL FLOW, AND LIVE STREAMS.
- BALE BINDINGS OF JUTE OR COTTON NOT RECOMMENDED.

PLANNING CONSIDERATIONS

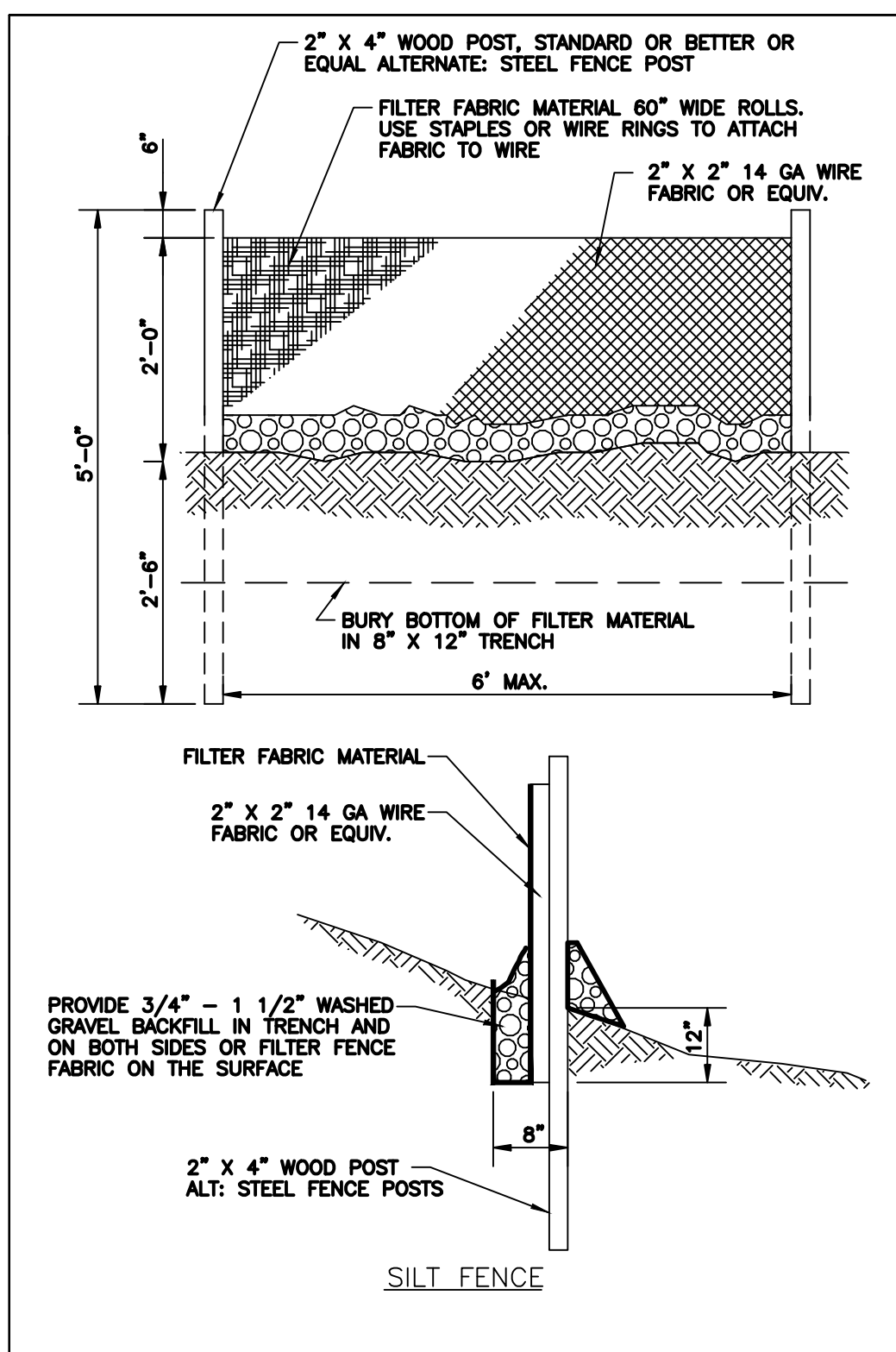
WHEN INSTALLED AND MAINTAINED PROPERLY, STRAW BALE DIKES REMOVE APPROXIMATELY 67% OF THE SEDIMENT TRANSPORTED IN CONSTRUCTION SITE RUNOFF. THIS OPTIMUM EFFICIENCY CAN ONLY BE ACHIEVED THROUGH CAREFUL MAINTENANCE WITH SPECIAL ATTENTION TO REPLACING ROTTED OR BROKEN BALES. BARRIER SHOULD BE CONSTRUCTED ON A LEVEL CONTOUR TO PREVENT CONCENTRATION OF FLOW AGAINST A SMALL PORTION OF THE BARRIER.

DESIGN & SIZING CRITERIA

- BALES SHALL BE PLACED ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
- MAXIMIZE PENDING BY LOCATING BARRIER AWAY FROM THE TOE-OF-SLOPES. THIS ALSO PROVIDES ACCESS FOR MAINTENANCE.
- EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF FOUR INCHES AND PLACED SO THE BINDINGS ARE HORIZONTAL. BINDINGS PLACED ON SOIL WILL SOON DISINTEGRATE AND CAUSE THE BARRIER TO FAIL.
- BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
- BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

MAINTENANCE REQUIREMENTS

INSPECT MONTHLY AND AFTER EACH RAIN EVENT. REMOVE AND PROPERLY DISPOSE OF DETAINED SEDIMENTS WHEN SILT DEPTH REACHES 6".



DEFINITION **SPC-5**

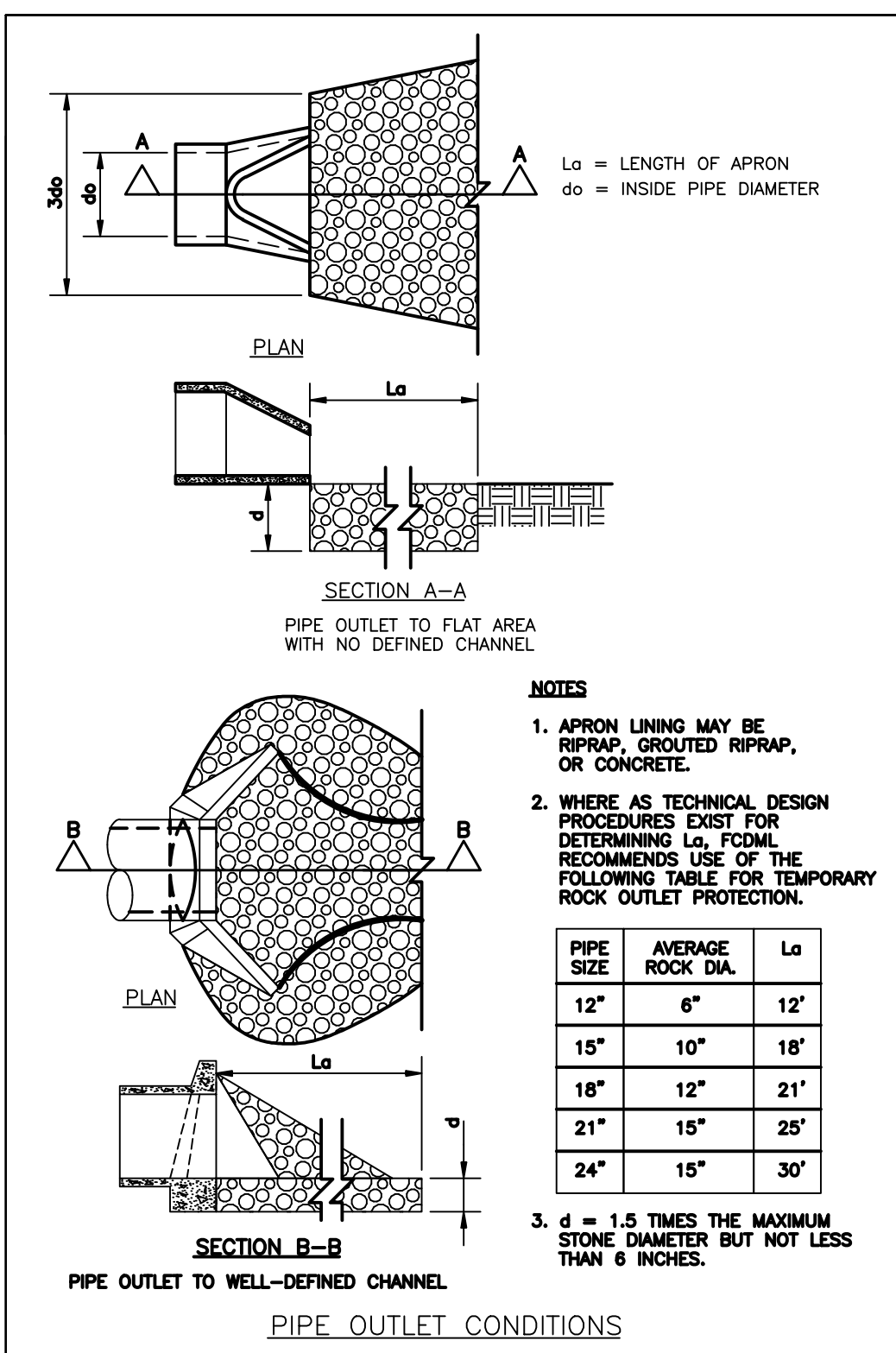
SELECTION OF FABRIC TENSILE STRENGTH AND BURSTING STRENGTH CHARACTERISTICS SHALL BE SUPPORTED WITH WIRE MESH IN AND AS RECOMMENDED BY THE FABRIC MANUFACTURER. FILTER FABRIC MATERIAL SHALL CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF SIX MONTHS OF EXPECTED USABLE LIFE AT A TEMPERATURE RANGE OF 0° F. TO 120° F.

TYPICAL INSTALLATION:

FILTER FENCES ARE TO BE CONSTRUCTED ON A LEVEL CONTOUR TO MAXIMIZE THE AVAILABLE PONDING AREA AND PREVENT CONCENTRATION OF FLOW AGAINST THE FENCE.

- POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 30 INCHES.
- A TRENCH SHALL BE EXCAVATED APPROXIMATELY 8 INCHES WIDE AND 12 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER.
- WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 4 INCHES.
- THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 20 INCHES OF THE FABRIC SHALL EXTEND INTO THE TRENCH. WHEN EXTRA-STRENGTH FILTER FABRIC AND CLOSER POST SPACING ARE USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED AND THE FILTER FABRIC STAPLED OR WIRED DIRECTLY TO THE POSTS.
- THE USE OF JOINTS SHOULD BE AVOIDED WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6 INCH OVERLAP AND BOTH ENDS SECURELY FASTENED TO THE POST.
- THE TRENCH SHALL BE BACKFILLED WITH 3/4-INCH MINIMUM DIAMETER WASHED GRAVEL OR COMPACTED-NATIVE MATERIAL.

MAINTENANCE REQUIREMENTS INSPECT MONTHLY DURING DRY PERIODS AND IMMEDIATELY AFTER EACH RAINFALL. REPAIR AS NECESSARY. SEDIMENT MUST BE REMOVED WHEN IT REACHES APPROXIMATELY ONE THIRD THE HEIGHT OF THE FENCE, ESPECIALLY IF HEAVY RAINS ARE EXPECTED. FILTER FENCES SHOULD NOT BE REMOVED UNTIL THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED



DEFINITION **SPC-11**

A SECTION OF ROCK PROTECTION PLACED AT THE OUTLET END OF CULVERTS, CONDUITS OR CHANNELS. GROUTED RIPRAP AND CONCRETE RUBBLE ARE ALSO USED FOR PIPE OUTLET STABILIZATION.

PURPOSE

THE PURPOSE OF THE ROCK OUTLET PROTECTION IS TO REDUCE THE VELOCITY, AND ENERGY OF WATER, SUCH THAT THE FLOW WILL NOT ERODE THE RECEIVING DOWNSTREAM REACH.

APPROPRIATE APPLICATIONS

THIS PRACTICE APPLIES WHERE DISCHARGE VELOCITIES AND ENERGIES AT THE OUTLETS OF CULVERTS, CONDUITS OR CHANNELS ARE SUFFICIENT TO ERODE THE NEXT DOWNSTREAM REACH.

ROCK OUTLET PROTECTION IS USUALLY LESS EXPENSIVE AND EASIER TO INSTALL THAN CONCRETE APRONS OR ENERGY DISSIPATORS; IT ALSO SERVES TO TRAP SEDIMENT AND REDUCE FLOW VELOCITIES. ROCK SIZE SHOULD BE INCREASED FOR HIGH VELOCITY FLOWS.

LIMITATIONS

ROCK OUTLET PROTECTION MAY NEED CONTINUAL MAINTENANCE BECAUSE LARGE STORMS OFTEN WASH AWAY THE STONE AND LEAVE THE AREA SUSCEPTIBLE TO EROSION. GROUTED OR WIRE-TIED ROCK RIPRAP CAN MINIMIZE MAINTENANCE REQUIREMENTS.

PLANNING CONSIDERATIONS

ROCK OUTLET PROTECTION IS EFFECTIVE WHEN THE ROCK IS SIZED AND PLACED PROPERLY. WHEN THIS IS ACCOMPLISHED, ROCK OUTLETS DO MUCH TO LIMIT EROSION AT PIPE OUTLETS. IF RUNOFF IS SEDIMENT-LADEN, A SEDIMENT TRAP BELOW THE PIPE OUTLET IS RECOMMENDED.

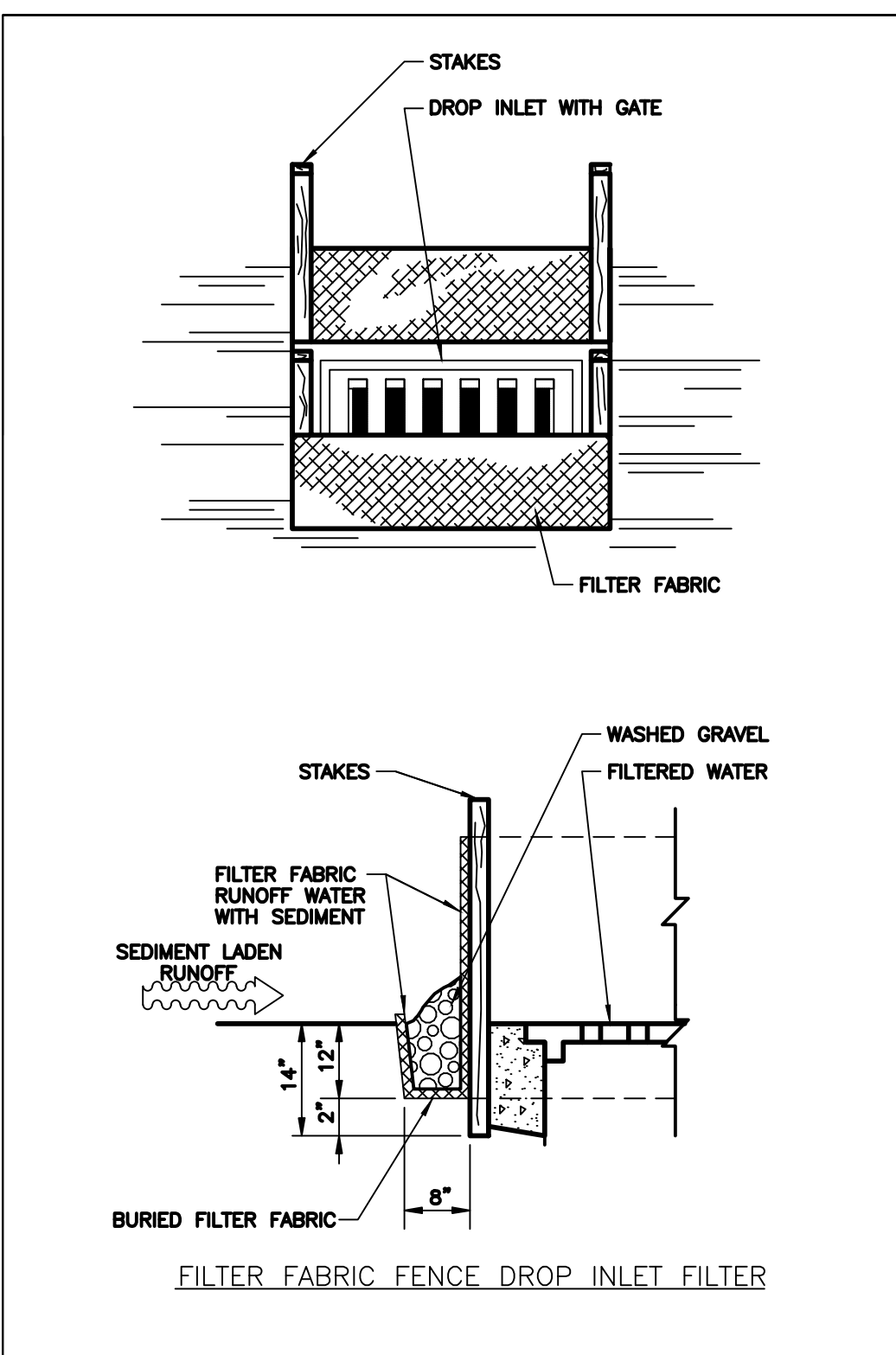
PERMANENT ROCK RIPRAP PROTECTION SHOULD BE DESIGNED AND SIZED BY THE ENGINEER AS PART OF THE CULVERT, CONDUIT OR CHANNEL DESIGN.

DESIGN AND SIZING CRITERIA

GENERAL RECOMMENDATIONS FOR ROCK SIZE AND LENGTH OF OUTLET PROTECTION MAT SHOWN IN THE ROCK OUTLET PROTECTION FIGURE. BEST RESULTS ARE OBTAINED WHEN SOUND, DURABLE, ANGULAR ROCK IS USED.

MAINTENANCE

INSPECT MONTHLY AND AFTER EACH RAINFALL. REPLACE ROCKS AS NEEDED.



DEFINITION **SPC-7**

A SEDIMENT FILTER OR AN EXCAVATED IMPOUNDING AREA AROUND A STORM DRAIN, DROP INLET, OR CURB INLET.

PURPOSE

TO PREVENT SEDIMENT FROM ENTERING STORM DRAINAGE SYSTEMS PRIOR TO PERMANENT STABILIZATION OF THE DISTURBED AREA.

APPROPRIATE APPLICATIONS

WHERE STORM DRAIN INLETS ARE TO BE MADE OPERATIONAL BEFORE PERMANENT STABILIZATION OF THE DISTURBED DRAINAGE AREA. DIFFERENT TYPES OF STRUCTURES ARE APPLICABLE TO DIFFERENT CONDITIONS:

- FILTER FABRIC FENCE - APPLICABLE WHERE THE INLET DRAINS A RELATIVELY SMALL (LESS THAN 1 ACRE) FLAT AREA (LESS THAN 5 PERCENT SLOPE). DO NOT PLACE FABRIC UNDER GRADE AS THE COLLECTED SEDIMENT MAY FALL INTO THE DRAIN WHEN THE FABRIC IS RETRIEVED.
- EXCAVATED DROP INLET SEDIMENT TRAP - PROTECTION AGAINST SEDIMENT ENTERING A STORM DRAIN INLET CAN BE PROVIDED BY EXCAVATING AN AREA IN THE APPROACH TO THE DRAIN. THE DRAINAGE AREA FOR A DRAIN PROTECTED IN THIS MANNER IS ONE ACRE. PROVIDE WEEP HOLES TO DRAIN THE SHALLOW POOL.

+ ADVANTAGES:

- INLET PROTECTION PREVENTS SEDIMENT FROM ENTERING THE STORM DRAIN SYSTEM AND CLOGGING IT.

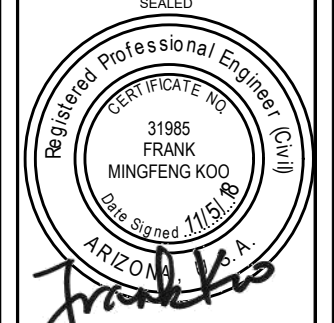
LIMITATIONS

- PONDING WILL OCCUR AT THE INLET WITH POSSIBLE SHORT TERM FLOODING.
- CURB INLETS ON SLOPES CANNOT BE EFFECTIVELY PROTECTED BECAUSE THE STORMWATER WILL BYPASS THE INLET AND CONTINUE DOWNGRADE.
- FILTER FABRIC FENCES ARE LIMITED TO STORM DRAIN INLETS FOR SMALL DRAINAGE AREAS OF FIVE ACRE OR LESS. FOR LARGER DRAINAGE AREAS, SMALLER SEDIMENT CATCHMENT AREAS ARE RECOMMENDED.

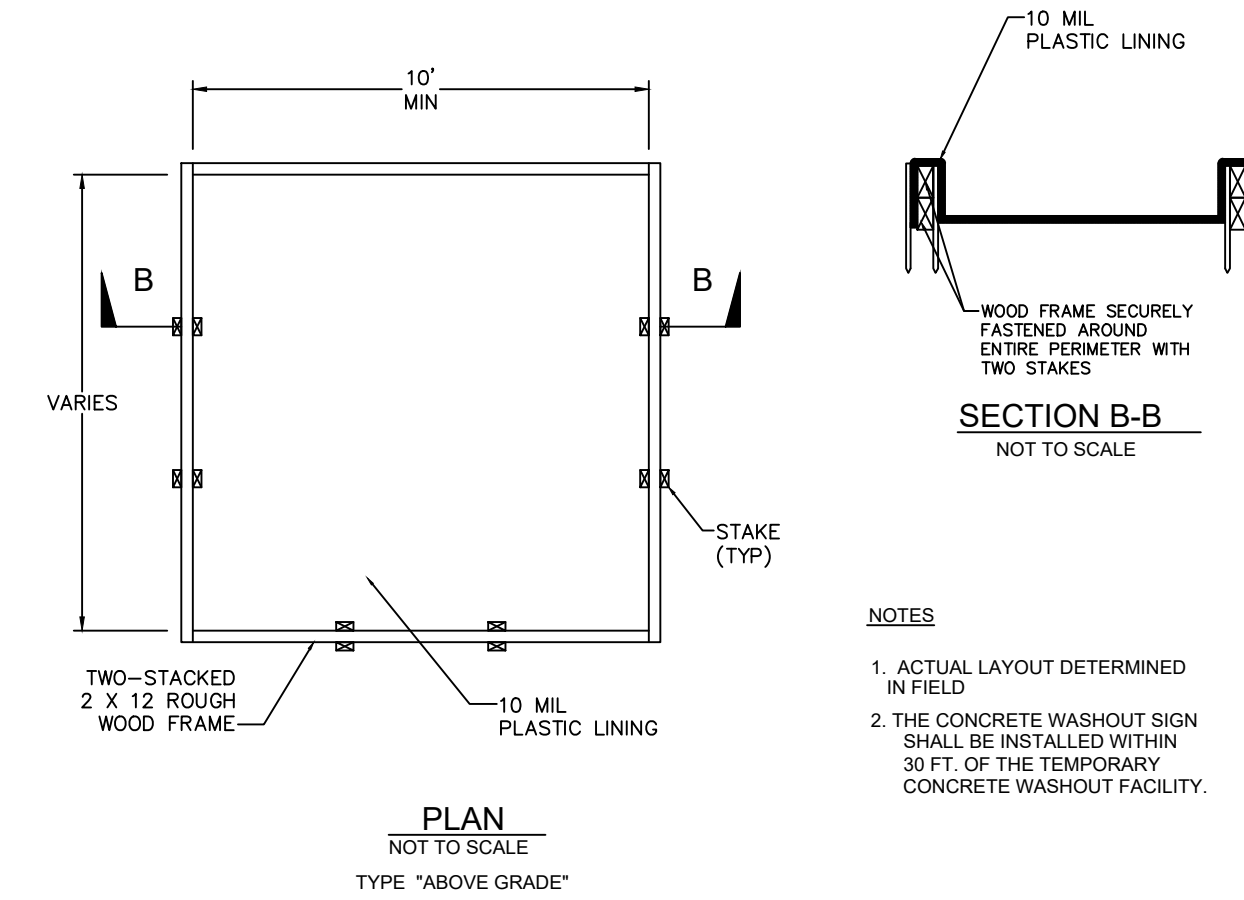
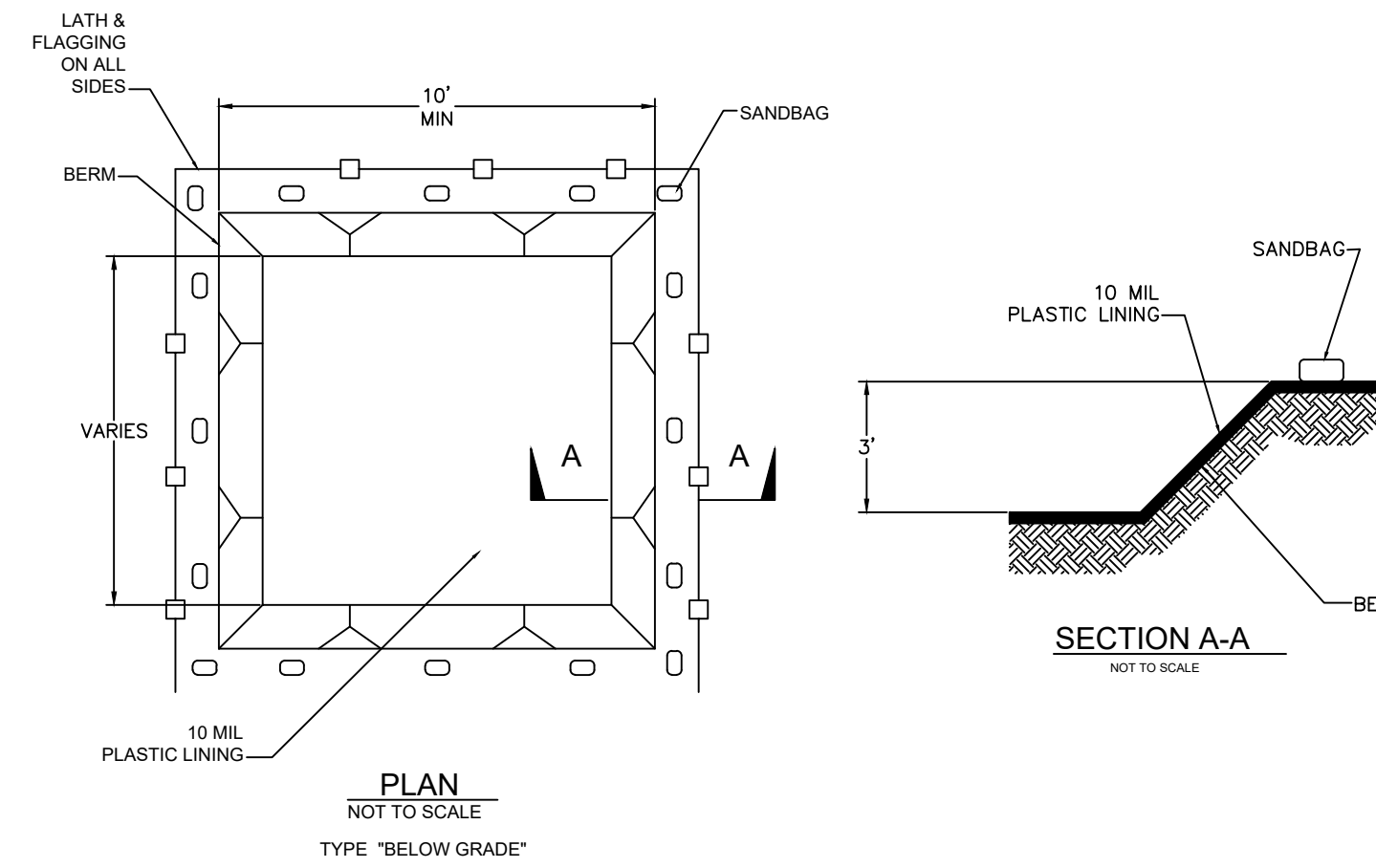
PLANNING CONSIDERATIONS

WHERE STORM SEWERS ARE MADE OPERATIONAL BEFORE THEIR DRAINAGE AREA IS STABILIZED, OR WHERE CONSTRUCTION IS ADJACENT TO AN EXISTING STORM SEWER, LARGE AMOUNTS OF SEDIMENT MAY ENTER THE STORM SEWER SYSTEM. IN CASES OF EXTREME SEDIMENT LOADING, THE STORM SEWER ITSELF MAY CLOG AND LOSE A MAJOR PORTION OF ITS CAPACITY. TO AVOID THESE PROBLEMS, IT IS NECESSARY TO PREVENT SEDIMENT FROM ENTERING THE SYSTEM AT THE INLETS.

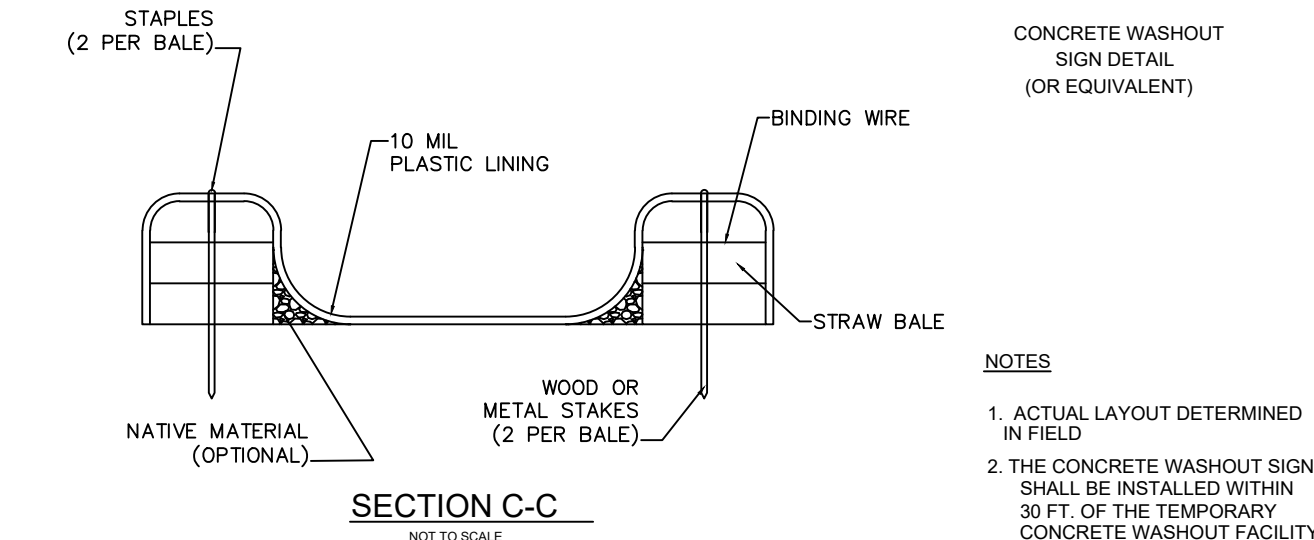
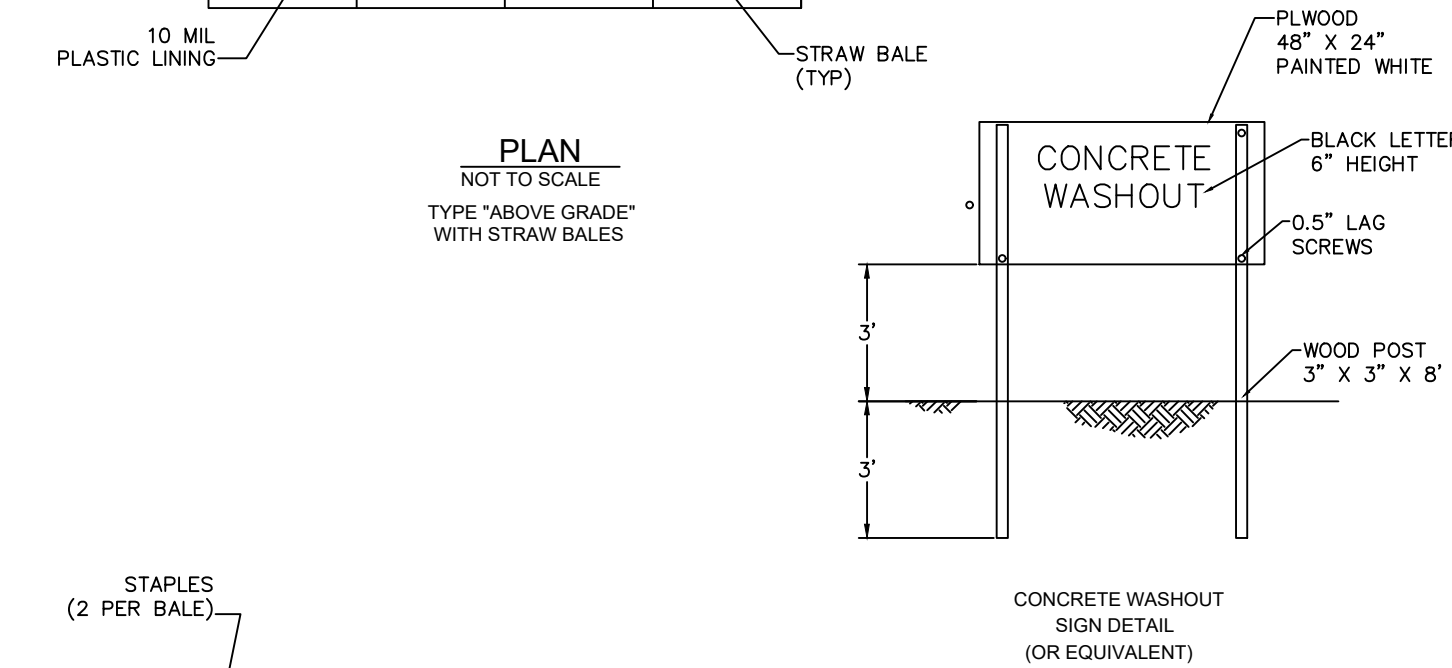
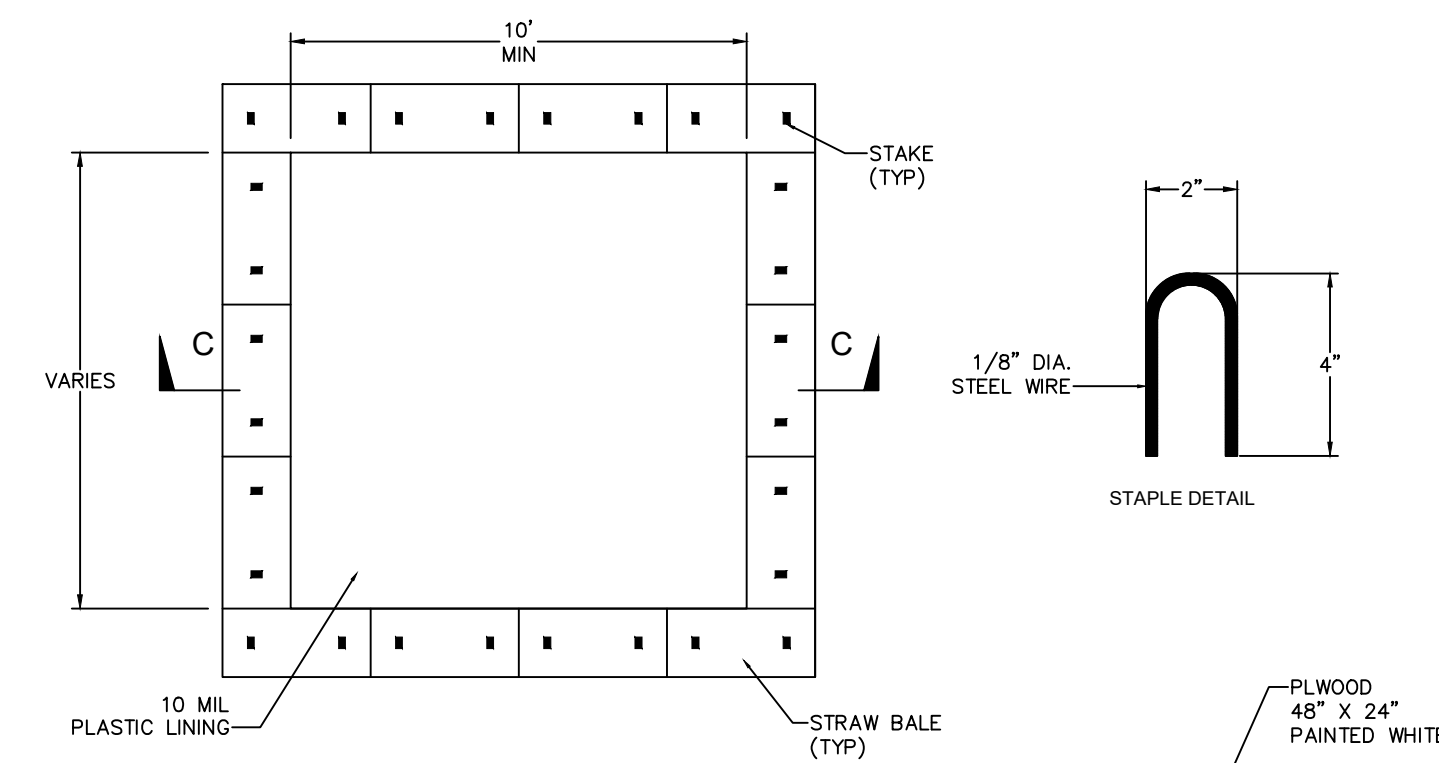
THIS PRACTICE CONTAINS SEVERAL TYPES OF INLET FILTERS AND TRAPS WHICH HAVE DIFFERENT APPLICATIONS DEPENDENT UPON SITE CONDITIONS AND TYPE OF INLET. OTHER INNOVATIVE TECHNIQUES FOR ACCOMPLISHING THE SAME PURPOSE ARE ENCOURAGED, BUT ONLY AFTER SPECIFIC PLANS AND DETAILS ARE SUBMITTED TO AND APPROVED BY THE LOCAL GOVERNMENT.



GH-4



- NOTES**
1. ACTUAL LAYOUT DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.



- NOTES**
1. ACTUAL LAYOUT DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

DEFINITION

A temporary pit or bermed area for washout of concrete trucks, tools, mortar mixers, etc. The concrete wash-out area must be located as far as possible away from the watercourse and other drainage ways. Unless the entire project site is located within the floodplain, the concrete wash-out area must also be located above the floodplain. The washout area must be contained by constructing a temporary sub-surface pit or by using impervious structural barriers to contain concrete waste while it hardens. The wash-out area must be lined with an impervious material to hold wash water while it evaporates. The wash-out area must be built with adequate capacity to hold concrete wastes and potential rainfall, and prevent overtopping and runoff.

PURPOSE

Improper washout of concrete trucks, tools, etc. may allow fresh concrete or cement laden mortar to enter a storm drainage system.

APPROPRIATE APPLICATIONS

Concrete transit mixers must be cleaned in the designated wash-out area only. Effective when vehicles, tools, and mixers can be moved to the pit location. Where this is not practical, temporary ponds may be constructed to allow for settling and hardening of cement and aggregates. Washout area/pits are appropriate for minor amounts of wash water which result from cleaning of aggregate materials or concrete trucks, tools, etc.

PLANNING CONSIDERATIONS

1. Wash out into a slurry pit which will later be backfilled. Do this only with the approval of the property owner.
2. Wash out into a temporary pit where the concrete wash can harden, be broken up, and then properly disposed of off-site.

DESIGN & SIZING CRITERIA

1. Locate wash out pits away from storm drains, open ditches, or stormwater receiving waters.
2. DO NOT wash out concrete trucks into storm drains, sanitary sewers, street gutters, or stormwater channels.
3. Washout cannot be connected to any storm water facilities, or retention basins.

MAINTENANCE REQUIREMENTS

Properly dispose of hardened concrete products on a routine basis to prevent the buildup of waste materials to an unmanageable size and to maintain percolation of water. All materials used to construct the temporary wash-out area must be removed from the construction site following construction. Ground disturbance at the wash-out area must be permanently stabilized at the end of construction.

SCALE (HORIZ.)	N/A
SCALE (VERT.)	N/A

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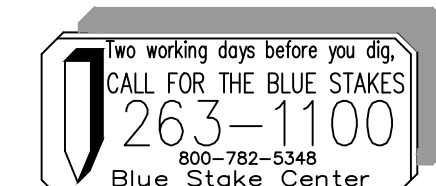
DEVELOPER
BROOKFIELD LAKIN, LLC
PROJECT NAME
ALAMAR - PHASE 1
PLAN TYPE
EROSION CONTROL PLAN

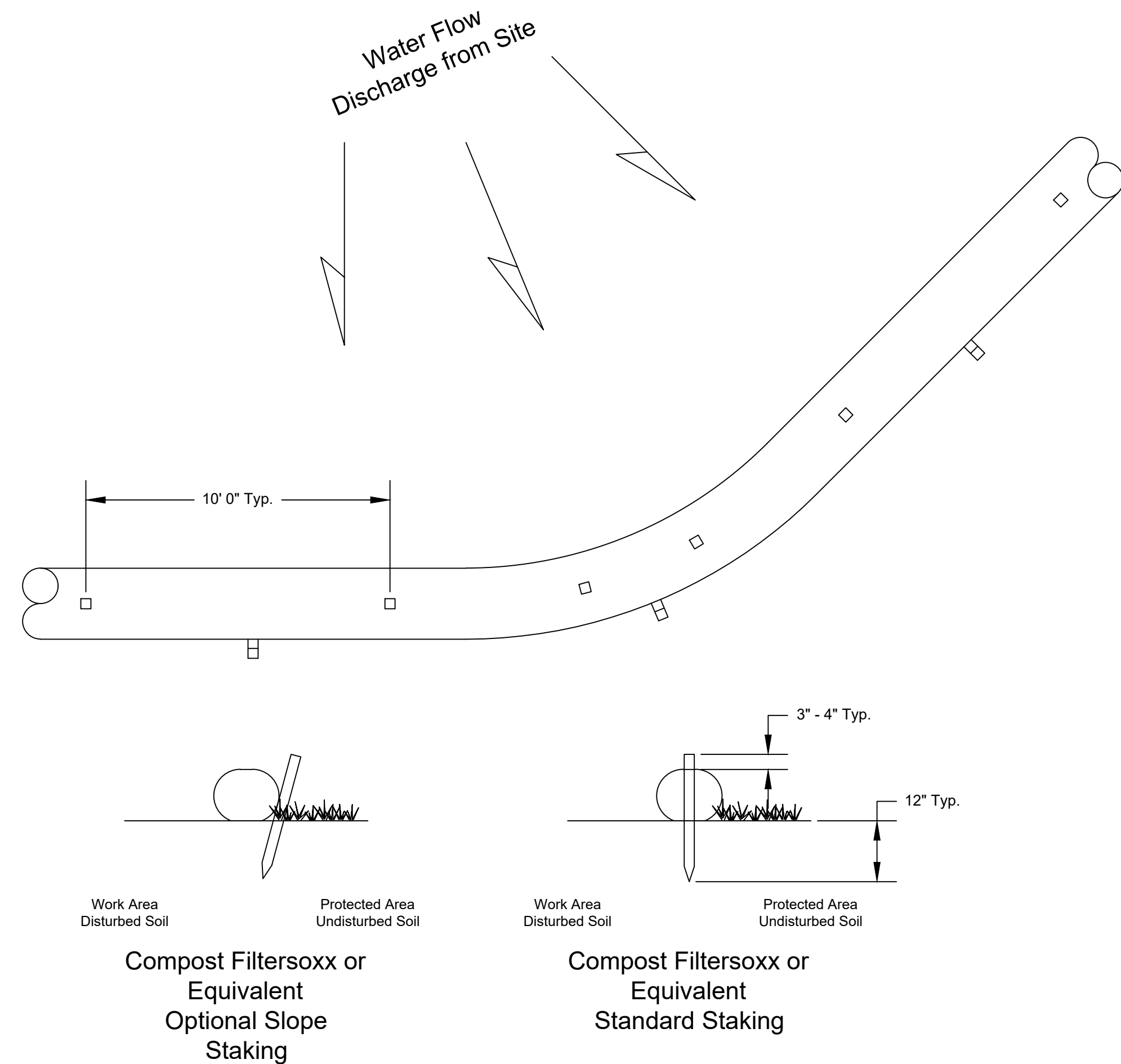


PLAN DATE
11/5/2018
LATEST REVISION DATE

SHEET NUMBER
7 OF 8

PROJECT NUMBER
174612.04





CONDITIONS OF USE: COMPOST FILTER WATTLES (CFW) ARE TO BE USED IN ANY AREA REQUIRING SEDIMENT OR EROSION CONTROL WHERE RUNOFF IS IN THE FORM OF SHEET FLOW OR IN AREAS WHERE SILT FENCE IS NORMALLY CONSIDERED ACCEPTABLE. THE USE OF CFS OR PERIMETER PROTECTION APPLIES TO AREAS OF HIGH SHEET EROSION, ON STEEP SLOPES UP TO AND EXCEEDING 2:1, AROUND INLETS, OUTFALLS AND IN OTHER DISTURBED AREAS OF CONSTRUCTION SITES REQUIRING SEDIMENT CONTROL.

MAINTENANCE: CFW SHOULD BE INSPECTED DAILY TO MAKE SURE THEY HOLD THEIR SHAPE AND ARE PRODUCING ADEQUATE PERMEABLE FLOW. IF PONDING BECOMES EXCESSIVE, AND SEDIMENT REACHES MORE THAN 50% OF THE HEIGHT OF THE CFW; EITHER ADDITIONAL CFW SHOULD BE ADDED TO THE TOP OF THE EXISTING CFW OR THE SEDIMENT ON THE UPSIDE PORTION OF THE CFW SHOULD BE REMOVED TO THE ORIGINAL GRADE. WHEN CONSTRUCTION IS COMPLETE, THE CFW MAY BE CUT OPEN AND THE FILTER MEDIA DISPERSED WITH A LOADER, RAKE, SKID STEER OR OTHER DEVICE TO BE INCORPORATED IN THE SOIL OR LEFT ON TOP OF THE SOIL FOR FINAL SEEDING TO OCCUR. THE CFW MESH NETTING MATERIAL WILL BE COLLECTED AND DISPOSED OF IN NORMAL TRASH CONTAINER OR REMOVED BY THE CONTRACTOR.

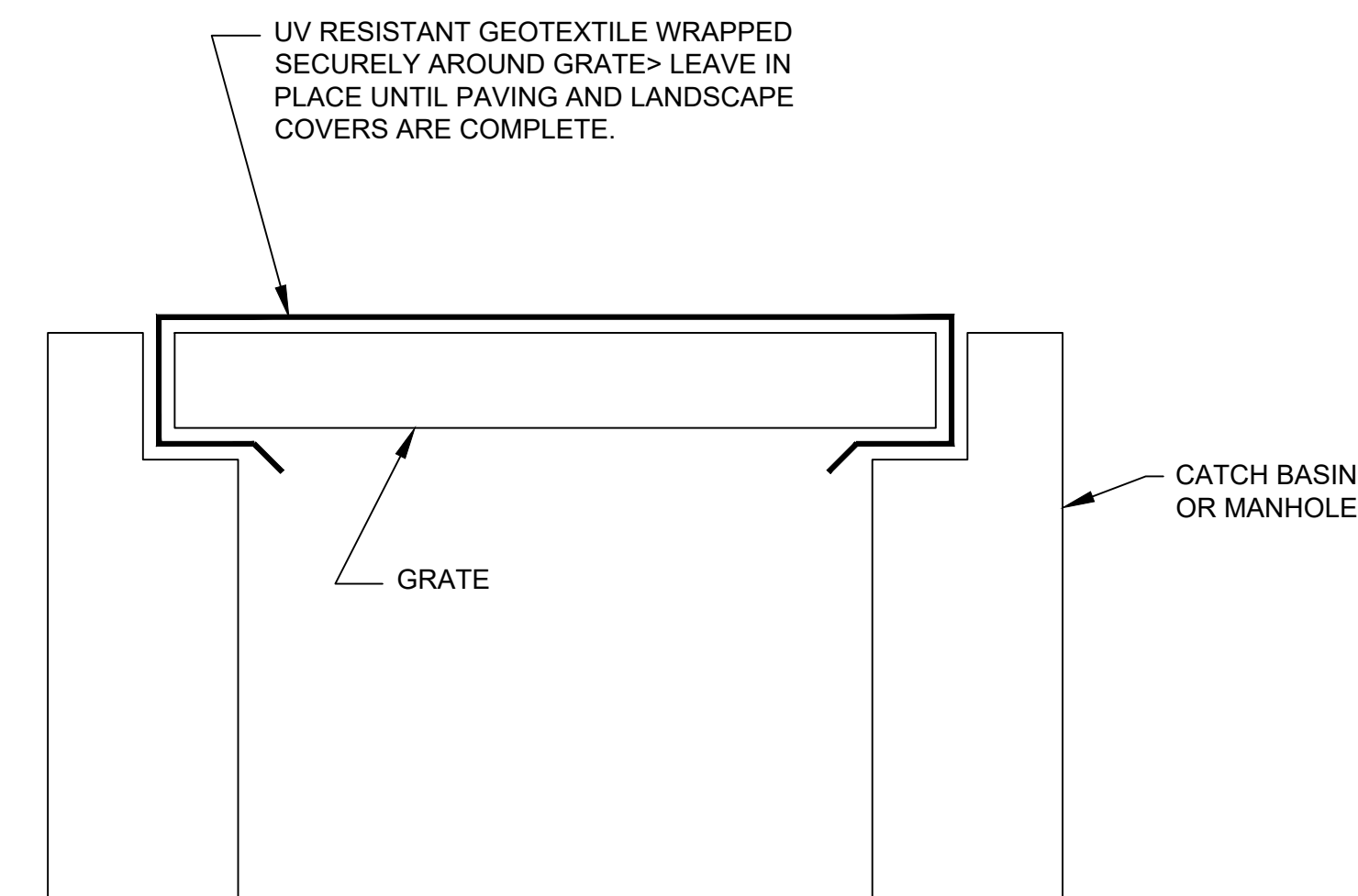
SPC-1

Notes:

1. Use Filtrexx Filtersox or equivalent with compost that is weed free and derived from well decomposed source of organic material. The compost shall be produced using an aerobic composting process meeting CFR 503 regulations, including time and temperature data indicating effective weed seed, pathogen and insect larvae kill. The compost shall be free of any refuse, contaminants or other materials toxic to plant growth. Test methods shall follow USCC TMECC guidelines for laboratories procedures:
 - 1.1. PH - 5.0 to 8.0 in accordance with TMECC 04.11-A, "ELECTRONMETRIC PH DETERMINATIONS FOR COMPOST".
 - 1.2. Particle size - 99% passing a 2" sieve and a minimum of 60% greater than the 3/8" sieve, in accordance with TMECC 02.02-B, "SAMPLE SIEVING FOR AGGREGATE SIZE CLASSIFICATION".
 - 1.3. Moisture content of less than 60% in accordance with standardized test methods for moisture determination.
 - 1.4. Material shall be relatively free (<1% by dry weight) of inert or foreign man made materials.
 - 1.5. Compost product shall be an approved as determined by testing procedures. A copy of an approved report shall be kept on file.
2. Use 2" x 2" wood stakes to secure CFW to grade spaced at 10' 0" intervals for most installations. Where installed on slopes stake spacing may be reduced and the optional slope staking may be used to secure Filtersox in place.
3. CFW may be used in direct flow areas within runoff channels, typically 18" or 24" diameter is used in channel applications.

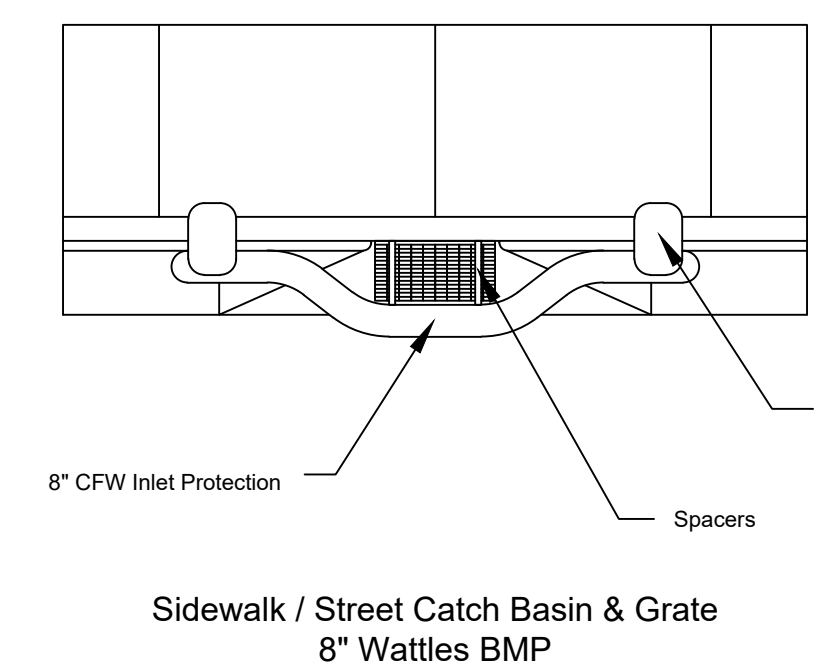
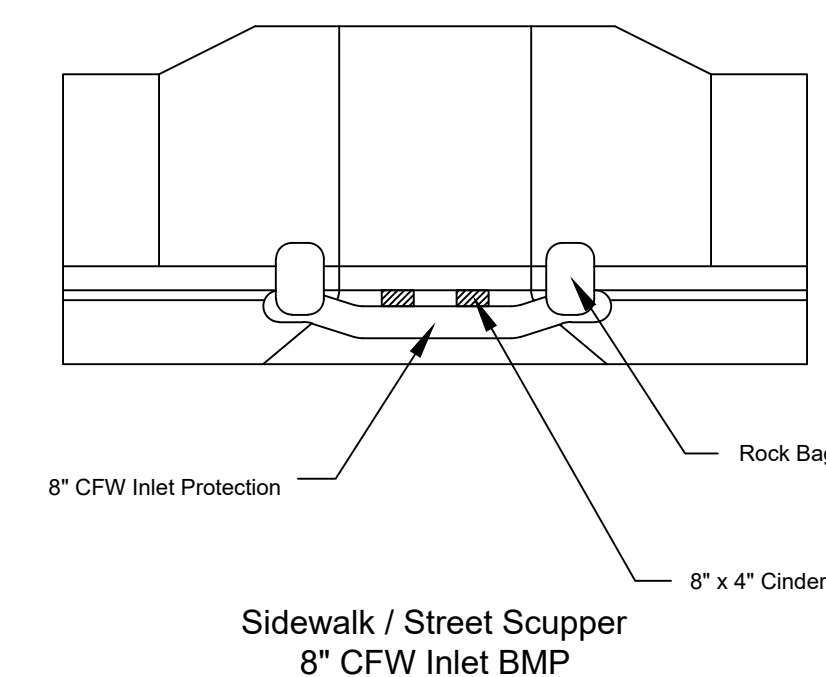
INSPECTIONS: CFS SHOULD BE INSPECTED DURING THE NORMAL COURSE OF SWPPP INSPECTION AS OUTLINED IN THE GENERAL CONSTRUCTION PERMIT. INSPECTORS SHOULD NOTE ANY UV DEGRADATION OF THE CFW MESH AND ANY TEARS WHICH WOULD PROVIDE A CHANNEL FOR TO WATER FLOW THROUGH THE FILTER MEDIA. THE CFW SHOULD BE RELATIVELY UNIFORM IN APPEARANCE WITH EVEN DISTRIBUTION OF THE FILTER MEDIA INSIDE THE MESH. EXCESSIVE STRETCHING OR PULLING WHICH REDUCES THE OUTSIDE DIAMETER OF THE CFW BY MORE THAN 30% SHOULD NOT BE ALLOWED. STAKING SHOULD BE SPACED SUFFICIENTLY TO KEEP THE CFW IN PLACE WITHOUT SIGNIFICANT MOVEMENT WHEN FLOWS ARE PRESENT.

CONSTRUCTION (INSTALLATION): CFW SHALL BE PLACED AT LOCATIONS INDICATED ON THE PLANS AS DIRECTED BY THE ENGINEER. CFW SHOULD BE INSTALLED PARALLEL TO THE BASE OF THE SLOPE OR OTHER AFFECTED AREA, PERPENDICULAR TO THE WATER FLOW. CFW MAY BE USED IN DIRECT FLOW SITUATIONS WITHIN RUNOFF CHANNELS OR WASHES. NORMALLY WHEN USED IN CHANNELS OR WASHES, 18" OR 20" CFW WILL BE USED. NORMALLY CFW DOES NOT NEED TO BE TRENCHED, THE MESH TUBE ALLOWS THE CFW TO DEFORM AND MAKE INTIMATE CONTACT WITH THE SOIL. THUS PROVIDING SUFFICIENT CONTACT WITH THE GRADE TO PREVENT LOCALIZED CHANNEL FLOW OR UNDER CUTTING OF THE BMP.



FABRIC GRATE COVER

EC-1



Notes:

1. Inlet protection shall consist of wattle such as Filtrexx SiltSox or equivalent with compost that is weed free and derived from well decomposed source of organic material. The compost shall be produced using an aerobic composting process meeting CFR 503 regulations, including time and temperature data indicating effective weed seed, pathogen and insect larvae kill. The compost shall be free of any refuse, contaminants or other materials toxic to plant growth. Test methods shall follow USCC TMECC guidelines for laboratories procedures:
 - 1.1. PH - 5.0 to 8.0 in accordance with TMECC 04.11-A, "ELECTRONMETRIC PH DETERMINATIONS FOR COMPOST".
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 - 1.3. Moisture content of less than 60% in accordance with standardized test methods for moisture determination.
 - 1.4. Material shall be relatively free (<1% by dry weight) of inert or foreign man made materials.
 - 1.5. Compost product shall be an approved as determined by testing procedures. A copy of an approved report shall be kept on file.
2. Use of 8" x 4" cinder blocks should be spaced to support CFW away from inlet, as not to block an overflow situation.
3. Use of rock bags as anchoring devices instead of steel stakes shall be acceptable to preserve the curbing, street asphalt, concrete sidewalk, or other structures.
4. During Monsoons replaces approximately every 4 to 8 weeks. Otherwise replace approximately every 4 to 6 months.

SPC-3

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SCALE (VERT.)	N/A
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ALAMAR	
DEVELOPER BROOKFIELD LAKIN, LLC	PROJECT NAME ALAMAR - PHASE 1
EROSION CONTROL PLAN	
EXP. DATE	11/5/2018
LATEST REVISION DATE	
SHEET NUMBER	8 OF 8
PROJECT NUMBER	174612.04

EXHIBIT 7

**GEOTECHNICAL EVALUATION
ALAMAR PHASE I
SWC OF WEST BROADWAY ROAD AND
SOUTH AVONDALE BOULEVARD
AVONDALE, ARIZONA**

GTR PROJECT No. 1626.1-PHR



GEOTEK

GEOTECHNICAL | ENVIRONMENTAL | MATERIALS

GEOTECHNICAL EVALUATION

FOR

ALAMAR PHASE I

SOUTHWEST CORNER OF WEST BROADWAY ROAD
AND SOUTH AVONDALE BOULEVARD
AVONDALE, ARIZONA

PROJECT NO. 1626.1-PHR

PREPARED FOR:

BROOKFIELD RESIDENTIAL (ARIZONA), LLC
14646 NORTH KIERLAND BOULEVARD, SUITE 165
SCOTTSDALE, ARIZONA 85254

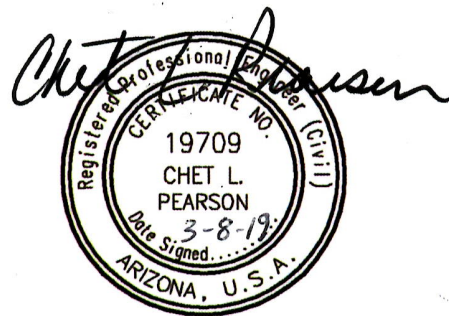
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4050 EAST COTTON CENTER BLVD, SUITE #49
PHOENIX, ARIZONA 85040

MARCH 8, 2019

BY: _____

ANDREW WALTON, E.I.
GEOTECHNICAL SPECIALIST



AND BY: _____

CHET L. PEARSON, P.E.
PRINCIPAL

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1.0 INTENT

It is the intent of this report to assist in the design and construction of the proposed development. The advice presented in this report is intended to reduce risks associated with the design and construction of the project. The professional opinions and geotechnical advice contained in this report are not intended to imply total performance of the project or guarantee that unusual or variable conditions will not be discovered during or after construction.

2.0 PURPOSE AND SCOPE OF SERVICES

The purpose of the evaluation is to assess the general subsurface conditions at the Site and to present geotechnical recommendations with regard to earthwork and other soil-supported components of the project.

The scope of this evaluation includes the following:

- Review of select geologic maps, aerial photographs, and previous reports,
- Field exploration consisting of 10 test borings,
- Laboratory testing on selected soil samples,
- Compilation, review, and analysis of data,
- Report preparation with our findings, conclusions and recommendations for the site development and construction.

3.0 SITE AND PROJECT INFORMATION

3.1 Site Description

The Site consists of approximately 135 acres of agricultural farm land located at the southwest corner of West Broadway Road and South Avondale Boulevard in Avondale, Arizona as shown on Figure 1: Site Location Map. It is our understanding that the Site will be developed into Phase I of the Alamar residential master-planned community and will include a total of 461 lots. The Site is identified as part of Maricopa County Assessor's Parcel Number (APN) 500-67-004C. The approximate center of the Site was located at a latitude of approximately 33.4031° North and a longitude of approximately -112.3128° West. The Site is located in the northeast quarter of Section 25 of Township 1 North and Range 1 West of the Gila and Salt River Baseline and Meridian System.

Based on our review of aerial photographs and previous reports, the Site appeared to be vacant desert land in 1937. In 1949, the northern half of the Site was developed and contained an agricultural farm field with an apparent farm structure and several small ancillary structures in the northeast corner (“Northeast Developed Area”). The southern half of the Site remained vacant desert. In 1953, the remaining southern half of the Site was developed into agricultural farm land, and the farm structure in the Northeast Developed Area was no longer present. The Northeast Developed Area was a graded lot. In 1959, another farm structure was present in the Northeast Developed Area, and the southeastern portion of the Site was developed with an apparent shade canopy and ancillary structures in the western portion and a livestock pen on the eastern portion (“Southeast Developed Area”). In 1970 and 1971, the structures in the Northeast Developed Area were no longer observed, and the previously developed area became part of the agricultural crop fields in the 1970s. The livestock pens were no longer observed in the graded area within the Southeast Developed Area. Multiple storage boxes or trailers were stored along the western portion of the graded area. By 1979, the graded area in the Southeast Developed Area was developed into agricultural crop fields. High voltage power lines crossed the southern portion of the Site by 1986. The Site remained relatively unchanged until 2004, when the sanitary sewer line and manholes were installed parallel to the powerlines in the southern portion of the Site. No apparent changes were noted to the Site through present day photographs.

The Site is bounded by South Avondale Road to the east and an unpaved West Broadway Road, currently used as a farm access road, to the north. Concrete-lined irrigation ditches run along the northern and eastern borders and also run east-west through the center of the Site. A previous feed store and an existing residence area are located east of the Site.

3.2 Proposed Development

It is our understanding that site development would consist of performing typical cut and fill earthwork to attain the desired graded configuration for the construction of one- to two-story detached single-family residential structures. Dead and live foundation loading conditions are expected to be less than 40 kips for column loads and up to 3 kips per lineal foot for wall loads for the residential structures, typical of the wood and/or metal frame and stucco nature of the construction. It is further assumed that final site grades will be within 2 feet of existing site grade and that no basements or below grade structures are proposed.

3.3 Review of Previous Data

GeoTek Residential, LLC (GTR) was provided with a previously prepared geotechnical evaluation report performed by ProTex, The PT Xperts LLC (ProTex). The report is titled *Geotechnical Investigation, Lakin Ranch – Phase I, Avondale Boulevard and Broadway Road, Avondale, Arizona ProTex*

Job No. 7649, dated April 16, 2018. The ProTex report included 30 test borings within the 135 acres of land in the subdivision, plus 10 test borings along perimeter roads. Therefore, ProTex drilled about 1 test boring per 4.5 acres, which is within the typical industry standard for this type of project. The text indicated that all of the test borings were terminated at a depth of 15 feet, but the attached boring logs indicated that B1 was drilled to 31 feet and B-19 was drilled to 33 feet, where possible groundwater was encountered. We did not find boring logs for the 10 borings along the perimeter roads. We were also provided with a Geotechnical Pavement Section Design report by ProTex, and we did not find boring logs for the pavement borings in this report.

The soils encountered in the borings consisted of Lean Clay (CL), Sandy Silt (ML), and Lean Clay-Lean Silt (CL-ML). The report included numerous Percent Passing No. 200 Sieve results ranging from 52 to 98 percent passing for the near surface soil samples, and plasticity index test results ranging from non-plastic (NP) to 26 for the upper soil samples. The text included some partial hydrometer test results, but we did not find any hydrometer laboratory test results attached to the report. No swell potentials of the soils were performed, but ProTex did conduct Expansion Index testing, and the Expansion Index results ranged from 30 to 81. ProTex indicated that the expansion potential of the native soils is considered very low to medium. The laboratory testing indicated low to no collapse potentials, but ProTex indicated that these soils are susceptible to hydro-collapse due to the low blow counts. One of the samples actually swelled when inundated with water.

ProTex recommended that after clearing the site of vegetation, debris and remnants of previous development, the soils should be over excavated to a depth of 1.0 foot below existing grade or 1.0 foot below finished pad grade elevation, whichever is deeper. The exposed surface should be scarified and compacted to a minimum depth of 8 inches. This should provide a 20-inch fill blanket beneath post-tensioned slabs. ProTex recommended that the post-tensioned slabs should be designed with an edge lift of 1.3 inches and a center lift 0.7 inches. Based on our experience, both these values are high, especially considering ProTex indicated that the expansion potential is very low to medium. Based on our review, it appears that ProTex used the highest plasticity index sample or the most conservative sample data for the post-tensioned slab design. We normally find that the typical site grading and earthwork blend the surficial soils resulting in pad soils with plasticity indexes less than the highest sample.

GTR also reviewed a previously performed geotechnical evaluation report prepared by Construction Inspection and Testing Co. (CIT) on land containing the Site. The ProTex report did not reference the previous CIT report. CIT conducted a preliminary geotechnical evaluation on 900 acres including most of the Site. CIT drilled 25 test borings across the 900 acres. Test Borings B-16, B-17, B-19, and B-20 were drilled on or near the current Site. The report indicated that the subsoil profile to depths of significant foundation stress influence for the majority of the

property consisted of a mix of sandy clays/clayey sands/silty sands of low to high plasticity distributed in no discernable manner. Boring B-16 contained Sandy Clay of medium to high plasticity, and Borings B-17, B-19, and B-20 contained Sandy Clay of medium plasticity. The surface soils at B-19 had a plasticity index of 24 with 93 percent passing the No. 200 sieve, and this sample exhibited a 5.6 percent swell potential. Deeper samples from Borings B-20 and B-17 also exhibited swell potentials of 5.4 and 5.6 percent. CIT performed numerous standard Proctor tests on the soils to conduct the swell testing at the appropriate density.

Two previously prepared Phase I and II Environmental Site Assessment (ESA) reports were prepared by Allwyn Consultants (Allwyn) and GTR. The Allwyn reports were performed on land containing most of the Site and are titled *Phase I Environmental Site Assessment, Lakin Ranch, NE of South Dysart Road and West Southern Avenue, Avondale, Arizona* (Allwyn Project No. 0163-002) dated April 21, 2018 and *Phase II Environmental Site Assessment, Lakin Ranch, NE of South Dysart Road and West Southern Avenue, Avondale, Arizona* (Allwyn Project No. 0163-003) dated April 27, 2018. The Phase I ESA report identified the Southeast Developed Area as a recognized environmental condition (REC). The Northeast Developed Area was excluded from the property assessed by the Allwyn report. The Phase II report addressed the identified REC and included excavating 5 trenches within Southeast Developed Area. An APS water/wastewater utility line crossed east-west through the southern portion of the Southeast Developed Area, so the trenches were excavated just north of the line. The trenches were excavated to a depth of 4 to 5 feet bgs and were excavated north to south. Allwyn indicated that no debris, foreign objects, staining or discolored soils were observed within the trenches. Allwyn reviewed some previous Phase II ESA data, and the previous data did not identify any issues in this area. Allwyn concluded that REC does not represent a current or controlled REC. Although no remnants of the previous development were found by Allwyn or the previous consultant, this area should be closely monitored during the earthwork to look for any remnants in this area.

The GTR report is titled *Phase I and II, Environmental Site Assessment, Lakin Ranch Phase I, SWC of West Broadway Road and South Avondale Boulevard* (GTR Project No. 1626-PHR) dated April 9, 2019. The report indicated that the Allwyn report did not include the Northeast Developed Area, and this area was considered a REC based on the unknown historical activities and usages. GTR confirmed that the Southeast Developed Area is not considered a REC based on the Allwyn findings and conclusions. Seven trenches were excavated to depths between 3 and 5 feet bgs with lengths between 10 to 18 feet within the Northeast Developed Area. No debris, spills, leaks or stained soils were identified in the trenches. GTR concluded that the Northeast Developed Area is not considered a REC.

Copies of the boring and laboratory data from the previous geotechnical reports are attached in Appendix A.

4.0 FIELD AND LABORATORY TESTING PROCEDURES

4.1 Field Exploration

A representative of GTR contacted Arizona 811 to clear public utilities at the Site prior to our field exploration. An APS water/wastewater line crossed east-west within the southern portion of the Site. No other utility lines were identified.

The field work was completed on February 19, 2019 by our field personnel who conducted field mapping, logging of test borings, and obtained samples of representative material for laboratory testing. GTR advanced 10 test borings with the use of a hand tools and a hand auger to a depth of 2 feet below the ground surface (bgs) at the approximate locations shown on Figure 2. The materials in the test borings were visually classified in the field by GTR personnel. Samples were obtained for laboratory testing, and the Unified Soil Classification System (USCS) was used to visually classify the fill and native soils during the field evaluation. The test borings were backfilled upon completion. Photographs of the field work are presented in the Photographic Log in Appendix B, and the test boring logs are attached in Appendix C.

4.2 Artificial Fill

Due to agricultural operations, there was approximately 12 inches of disturbed natural soils from the agricultural dicing and plowing operations. The artificial fill soils were noted to be similar to the native soils and consisted of silty clay (CL) with varying amounts of sand.

The Southeast and Northeast Developed Areas also contained approximately 12 inches of disturbed natural soils associated with the agricultural crop farming. There may be deeper areas of existing fill materials in these areas shown in Figure 2. During the previous Allwyn and GTR Phase II ESA field work, no debris, spills, leaks or stained soils were identified. However, based on the limited trenches within these areas, special attention should be given to identifying and removing surface and subsurface remnants including spread fill materials, underground utility lines, septic tank systems, etc. that may have not been previously identified. Therefore, a representative of the geotechnical engineer should be present during the excavation work in the previously developed areas. Any found remnants should be handled in accordance with the recommendations of this report and the geotechnical engineer. If the artificial fills are properly cleaned of debris and organics, the remaining soil could be used as structural fill.

4.3 Native Alluvial Soils

Native alluvial material typically consists of Silty Clay (CL) with varying amounts of sand. The moisture condition of the native alluvium ranged from slightly damp to damp, and the consistency of the alluvial materials ranged from stiff to very stiff. No groundwater was encountered in the borings. The test boring logs presented in Appendix C should be referred to for more detailed information.

4.4 Laboratory Testing

Laboratory tests were performed on selected samples to provide a reasonable representation of the engineering properties of the soils. Testing was performed in general accordance with applicable ASTM, AASHTO, or ADOT procedures.

4.5 Collapse and Expansion Potential

In arid regions, shallow natural soils can "collapse" (settle a significant amount quickly) when wetted. This condition is intensified when the soils are supporting building foundations and/or fill surcharges. The previous CIT and ProTex data indicate that the natural soils do not exhibit significant collapse potentials. ProTex expressed concern about the low blow counts, but these fine-grained soils will have low blow counts especially when at higher moisture contents due to farming. These soils should stiffen as the moisture content decreases after farming ceases. Based on our review, we believe that the existing surface and near surface soils at the Site are expected to exhibit variable low compression and collapse potentials when wetted under foundation loads. Therefore, the foundation, site grading, and drainage recommendations presented herein are intended to reduce the potential for structural movements due to the apparent compression and collapse potentials.

Based on our evaluation, the near surface soil samples from the Site contained between about 77 and 90 percent fines (passing the No. 200 sieve) and exhibited Plasticity Indices of 9 to 21. The surface soils exhibited swell potentials of 1.0 to 2.7 percent, considered low to moderate. The surface soils exhibited Expansion Indexes of 17 to 40, considered low to moderate. A swell potential test was performed on the Expansion Index of 40) and indicated a swell potential of 2.7 percent. The Expansion Index of 40 was prepared by compacting the soil sample at a degree of saturation of approximately 50 percent (12.7 percent moisture content). The swell potential sample was prepared with a moisture content of 16.7 percent; therefore, moisture contents near optimum will likely reduce the swell potential of the native soils.

The previous CIT and ProTex data indicated similar high variability of the plasticity index and expansion potential of the near surface soils. We compiled the GeoTek and ProTex plasticity index data on a site plan shown on Figure 3. As shown on the figure, there are samples with plasticity indexes of 23 and 5, 21 and 5, and NP and 21 in close proximity to each other. We found no discernable pattern to the plasticity index variation across the Site. Both ProTex and GeoTek samples exhibited a large range of plasticity indexes (ProTex NP to 26 and GeoTek 9 to 21), but the average plasticity index for both sets of data was about 14.6, borderline low to medium plasticity. CIT indicated that the soils had low to high plasticity distributed in no discernable manner across the larger property containing the Site. The subsequent ProTex and GeoTek data agree with this data. Based on our experience, the surface soils at the Site will be blended and mixed as part of the grading effort to develop house pads, so we used a blended soil approach to our expansion potential analysis as discussed in subsequent sections of this report. We recommend conducting post-grading geotechnical evaluations of the finished pads to evaluate the final soils in the pads for final post-tensioned slab parameters.

We believe that the existing surface and near surface soils may be used as structural fill below the building floor slabs and other areas of the proposed development, provided that the fill is placed at moisture contents at or above optimum and maintained in a moist condition or re-conditioned prior to slab construction as recommended in this report.

In arid regions, the expansion potential of compacted soils can be increased by lower moisture contents and over-compaction of these soils. Therefore, the foundation, site grading, and drainage recommendations presented herein are intended to reduce the potential for structural movements due to expansion potentials.

5.0 GENERAL SITE CONDITIONS

5.1 Regional Geologic Setting

The Site is located north of the intersection of the Gila and Salt Rivers on relatively flat land in the Salt River Valley basin. The Salt River Valley is located in the Basin and Range Province located in the southern and western portions of Arizona. The Basin and Range Province is characterized by elongated mountain ranges trending northwest-southeast that are separated by broad alluvial valleys. The mountains in this Province consist of tilted blocks of Precambrian, Paleozoic, Mesozoic, and Cenozoic rocks that are bounded by faults and are usually severely eroded.

The Salt River Valley is an extensive basin containing alluvial soils often over 1,500 feet thick, as well as numerous small mountains. The alluvial soils between the mountains are highly variable and

range from dense sand, gravel, and cobbles to silts and clays. Deposits of heavily cemented soils ("caliche") are encountered in some areas. The alluvial soils are typically divided into three units based on lithographic changes. The Upper Alluvial Unit generally consists of coarse-grained deposits of sand, gravel, and cobbles extending as deep as 1,200 feet in some areas. This unit is underlain by the Middle Fine-Grained Unit composed primarily of silts and clays. The deepest unit is called the Lower Conglomerate Unit. The bedrock that lies underneath the basin-fill sediments is composed of various metamorphic and igneous rocks. Bedrock has little groundwater storage or production capacity and therefore is not considered to be an aquifer

5.2 Tectonic Faulting and Regional Seismicity

The Site is located in an area of fairly low seismic activity. The possibility of ground acceleration or shaking at the Site may be considered approximately similar to the central Arizona region as a whole. It is reasonable to assume that structures built in this area will be subject to at least one seismic event during their life; therefore, it is recommended that all structures be designed and constructed in accordance with the International Building Code (IBC).

The Site is located at approximately 33.4031° North Latitude and -112.3128° West Longitude in Avondale, Arizona. We understand that the City of Avondale is using the 2012 IBC. Based on our review, the soils at the Site would be classified as a Site Class D (stiff soil profile). The spectral response accelerations were determined from the USGS Website, Earthquake Hazards Program, Interpolated Probabilistic Ground Motion for the Conterminous 48 States by Latitude/Longitude, 2012 International Building Code Data Edition. The USGS Website with the 2012 IBC was used to obtain the seismic design parameters. The mapped spectral acceleration parameters for short periods (S_s) would be 0.16g, and the spectral acceleration for a one-second period (S_1) would be 0.054g; and the site coefficient for a short period (F_a) would be 1.6, and the site coefficient for a one-second period (F_v) would be 2.4. The design spectral response acceleration parameters are shown in the following table:

Design Spectral Response Acceleration Parameters	% of g
0.2 sec period (S_{DS}) - Site Class D	17.0
1.0 sec period (S_{D1}) - Site Class D	8.7

5.3 Secondary Seismic Constraints

The following list includes other potential seismic related hazards that have been evaluated with respect to the Site, but in our opinion, the potential for these seismically related constraints to affect the Site is considered negligible.

- * Liquefaction
- * Dynamic Settlements
- * Surface Fault Rupture
- * Ground Lurching or Shallow Ground Rupture

It is important to keep in perspective that if a seismic event were to occur on any major fault, intense ground shaking could be induced to this general area. Potential damage to any settlement sensitive structures would likely be greatest from the vibrations and impelling force caused by the inertia of the structures mass than that created from secondary seismic constraints.

Considering the subsurface soil conditions and local seismicity, it is estimated that the Site has a very low risk associated with the potential for these phenomena to occur and adversely affect surface improvements. These potential risks are no greater at this Site than they are for other structures and improvements developed on the alluvial materials in this vicinity.

5.4 Vicinity Surface Drainage

The natural elevation of the Site was approximately 937 to 950 feet above mean sea level (MSL) with an overall slope down towards the southwest according to elevations on Google Earth. The Site was previously graded during farming activities for irrigation, and it was relatively flat.

Surface water was not encountered during our evaluation and existing topography directs surface runoff towards the western and southern boundary. The project's design civil engineer should evaluate the potential for flooding.

5.5 Groundwater

Seeps, springs, or other indications of high groundwater levels were not noted during our field exploration at the subject Site. Groundwater was not encountered in our test borings at the Site. These observations reflect conditions at the time of this exploration and do not preclude changes in local groundwater conditions in the future from natural causes, damaged structures (lines, pipes etc.), or heavy irrigation.

Based on the 2004 ADWR map titled *Maps Showing Groundwater Conditions in the Phoenix Active Management Area, Maricopa, Pinal, and Yavapai Counties, Arizona – Nov. 2002 – Feb. 2003*, (ADWR Hydrologic Map Series Report No. 35, Depth to Water and Water-Level Altitude, Sheet 1 of 3), groundwater was identified at a depth of about 27 to 65 feet bgs. According to the ADWR website, domestic wells (ADWR 55-605568, 55-605567, 55-516759) were identified close to the Site. A review of available documents of the wells indicated that the wells were installed from

1969 to 1987, and groundwater during drilling was observed at depths of about 12 to 24 feet bgs. ProTex indicated that two borings were extended to depths of about 31 and 33 feet bgs, and groundwater was encountered at these depths.

5.6 Land Subsidence and Earth Fissures

The Site is not located in any mapped area of significant groundwater withdrawal by the Arizona Geologic Survey (AZGS). A review of the AZGS data indicates that the Site is located about 6 miles south from the Luke Study Area for Earth Fissure Map Areas. The closest earth fissure to the Site was 9 miles northwest of the Site, and it was a confirmed and continuous earth fissure. We did not observe indications of earth fissures near the Site during our aerial photograph review or our field exploration. Based on our review, we did not find information indicating the presence of earth fissures at or near the Site.

Because current groundwater withdrawal is significantly less than historic pumping, it is unlikely that new fissures or significant additional subsidence will adversely affect the project Site. However, in the future if groundwater withdrawal was to increase in the Phoenix metropolitan area, additional subsidence could occur.

6.0 CONCLUSIONS

Based on our field exploration, laboratory testing, engineering and geologic analyses, it is our opinion that the subject Site is suited for development from a geotechnical engineering and geologic viewpoint. Based on field surface evaluations and review of published maps concerning ground fissures in the surrounding area, the potential risks are no greater at this Site than they are for other structures and improvements developed on the alluvial materials in this vicinity.

The recommendations presented herein should be incorporated into the final design, grading, and construction phases of development. The engineering analyses performed concerning site preparation and the recommendations presented below, have been completed using the information provided to us regarding site development. In the event that the information concerning proposed development is not correct, the conclusion and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and conclusions of this report are modified or approved in writing by this office.

7.0 FOUNDATION RECOMMENDATIONS

7.1 General

Geotechnical engineering recommendations for the support of residential building elements associated with the development are presented in the following sections. These recommendations are based upon our present understanding of the project, review of previous data, and the results of the field and laboratory testing presented in Appendices A, C, and D of this report. Alternative recommendations may be possible and will be considered upon request. The proposed foundation systems should be designed and constructed in accordance with the guidelines contained herein and in the IBC.

Based on the soil conditions, structures at the Site should be founded on post-tensioned slab foundations founded on engineered fill materials.

7.2 Post-Tensioned Slabs

The information and recommendations presented below are not meant to supersede design by a registered structural engineer or civil engineer familiar with post-tensioned slab design. Upon request, GTR could provide additional input/consultation regarding soil parameters as related to post-tensioned slab design. All footings should maintain a minimum horizontal distance of five (5) feet from the outside bottom edge of the footing to the face of an adjacent descending slope.

Post-tensioned slabs founded at shallow levels below expected finished grades were evaluated for support of the residential structures at the Site. Recommendations for post-tensioned slabs are provided for relatively light foundation loading conditions, such as those anticipated for the proposed structures. Foundation loading conditions are expected to be less than 40 kips for column loads and less than 3 kips per lineal foot for wall loads for the structures. Based on the Post-Tensioning Institute's (PTI's) Manual titled "Design of Post-Tensioned Slabs-on-Ground" (third edition manual), the on-site soils are considered expansive based on the Plasticity Indices and expansion potential. Post-tensioned slabs should be designed using sound engineering practice and be in conformance with local and/or national code requirements, including PTI's "Design of Post-Tensioned Slabs-on-Ground" (third edition) and the International Building Code (IBC). All reinforcing (steel or post-tensioning) should be properly designed and specified by the structural engineer.

The soils at the Site exhibited variable low to moderate expansion potentials. Some soils found at the Site meet the PTI's non-active conditions, but some soils were also moderately expansive. Due to the high variability of the plasticity indexes of the surface soils at the Site, a Post-Grading

Geotechnical Evaluation should be performed by the project Geotechnical Engineer to determine the expansive classification of the surface soils in the final finished lots. As previously discussed, we anticipate some blending and mixing of the surface soils during grading, so we have provided post-tensioned slab recommendations for a blended mix of the higher and lower plasticity index soils.

7.2.1 Expansive Soils

The maximum allowable bearing pressure applicable beneath perimeter thickened edges and/or stiffening beams is 1,500 psf provided they are founded entirely on properly compacted fill and embedded a minimum of 12 inches. The maximum allowable bearing pressure applicable beneath perimeter thickened edges and/or stiffening beams is 1,250 psf provided they are founded entirely on properly compacted fill and embedded a minimum of 6 inches. In order to achieve the embedment depth, the adjacent fill can be placed during fine grading of the Site and post construction of the perimeter thickened edges. The maximum allowable bearing pressure beneath the inner portions of the post-tensioned slabs is 1,250 psf provided the post-tensioned slab is bordered by thickened edges embedded a minimum of 6 inches. These bearing pressures are applicable to the post-tensioned slabs bearing on 4 inches of aggregate base course (ABC), sand, or properly compacted fill. The bearing value may be increased by one-third for seismic or other temporary loads.

Local standard-of-care has historically not incorporated a vapor retarder in to design or construction. Final determination on the use of a vapor retarder should be left to the slab designer or architect. If a vapor retarder is used it should conform to the specifications presented in ASTM E1745 and should be placed as described in ASTM E1643 and the Guide for Concrete Floor and Slab Construction, published by the American Concrete Institute (ACI 302.1R).

Post-tensioned concrete slab design parameters for low to moderate expansive soil conditions are provided below:

Allowable bearing value (at 12 inches).....	1,500 psf
Allowable bearing value (at 6 inches).....	1,250 psf
Modulus of subgrade reaction.....	150 pci
Passive Pressure	335 psf/ft.
Coefficient of friction (select sand/type II).....	1.0
Coefficient of friction (onsite soil)	0.36
Edge Lift (Y _m)	0.97 inches
Center Lift (Y _m).....	0.10 inches
Edge Moisture Variation Distance (E _m).....	4.6 feet
Center Moisture Variation Distance (E _m)	9.0 feet

The post-tensioned slab enclosed within the perimeter thickened edges should be underlain with a minimum of 4 inches of sand or ABC material. Care should be taken to ensure that slabs are not potentially undermined through erosion.

7.3 Foundation Settlement

Provided that the recommendations contained in this report are incorporated into final design and construction phase of project, total settlement for the recommended post-tensioned slab foundations is estimated to be less than ½ inch with differential settlement producing angular distortions of less than ¼ inch for stable subgrade soil moisture content over the life of the foundation.

7.4 Retaining and Block Walls

The design parameters provided below are applicable provided that low expansive soils are used to backfill any retaining walls. If expansive soils are used to backfill the walls, increased active and at-rest earth pressures will need to be utilized for design. Building walls, below grade, should be waterproofed or damp-proofed, depending on the degree of moisture protection desired.

1. An allowable bearing value of 1,500 pounds per square foot may be used for design of wall footings which maintain a minimum width of 12 inches and a minimum depth of at least 18 inches into undisturbed soils or properly compacted fill soils. An allowable bearing value of 1,250 pounds per square foot may be used for design of wall footings which maintain a minimum width of 12 inches and a minimum depth of at least 12 inches into undisturbed or properly compacted fill soils. The bearing value may be increased by one-third for seismic or other temporary loads.
2. For lateral sliding resistance, a 0.37 coefficient of friction may be utilized for a concrete to soil contact when multiplied by the dead load.
3. Passive earth pressure may be computed as an equivalent fluid having a density of 335 pounds per square foot per foot of depth with a maximum earth pressure of 2,500 pounds per square foot. However, for block and retaining walls within 5 feet of descending slopes, passive earth pressures should be considered negligible without further review by GTR.
4. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one-third.
5. Active earth pressure may be used for retaining wall design, provided the top of the wall is not restrained from minor deflections. Active earth pressure may be computed as an equivalent fluid having a density of 40 pounds per square foot per foot of depth.

6. Any retaining walls that will be restrained prior to placing and compacting backfill material or that have reentrant or male corners, should be designed for an at-rest equivalent fluid pressure of 60 pcf, plus any applicable surcharge loading. For areas of male or re-entrant corners, the restrained wall design should extend a minimum distance of twice the height of the wall laterally from the corner.
7. The equivalent fluid pressures are provided for vertical walls and horizontal backfill less than 10 feet tall. Pressures do not include pressures imposed during compaction of backfill, swelling pressures of clay backfill, hydrostatic pressures from inundation of the backfill or free water behind the walls, traffic above the wall, surcharge loads, sloping fill above the top of the wall, seismic events, or adverse geologic conditions. Walls must be braced during backfilling to prevent damage and excessive movements

All walls should be reinforced to reduce the potential for distress caused by differential foundation movement in accordance with the Structural Engineer's recommendations. In the upper bond beam, "U" blocks should be used. The walls should use both vertical and horizontal reinforcement and be designed to resist the effects a two-way 1/400 angular distortion would impart on a wall. Prior to placing concrete, the subgrade soils should be lightly moisture conditioned to prevent loss of water during pouring and curing of the concrete.

7.5 Wall Backfill and Drainage

All retaining walls should be provided with an adequate back drain system to reduce the buildup of hydrostatic pressure and to minimize potential buildup of effervescence along the front of the wall. We recommend the use of gravel, a free draining layer of soil or a manufactured synthetic material to be utilized as a back-drain system. A filter may be required between the soil backfill and a drainage layer. Proper surface drainage should also be provided.

8.0 PAVEMENT RECOMMENDATIONS

8.1 Flexible Pavements

Traffic information was not provided for the planned residential subdivision and the surrounding streets. We anticipate that traffic will consist of passenger vehicles and periodically small to medium sized trucks. The soils at the Site should provide suitable support for pavements, provided that they are prepared as recommended in this report. We assumed that the pavements would be supported by a compacted subgrade of the on-site soil or imported soils with comparable properties.

Based upon the soil conditions encountered and the City of Avondale standards, (City of Avondale Standard Details No. A1100 and A1102), the City of Avondale minimum pavement sections are recommended as shown in the following table:

PAVEMENT AREA	MINIMUM AC (inches)	MINIMUM ABC (inches)
Local Residential Streets	3.0	8.0
Minor Collectors Streets	3.5	10.0

The recommended pavement sections are considered minimal sections based on the anticipated traffic and the subgrade soil conditions encountered. However, they are expected to function with periodic maintenance and overlays if positive drainage is provided and maintained over the life of the pavement. Some pavement damage may occur in localized areas during periods of abnormally heavy traffic loads, such as from repeated passage of construction equipment. Therefore, consideration should be given to a staged construction program or alternative access routes during construction to limit damage to the pavement sections.

8.2 Asphalt Pavement Construction

All pavement section changes should be properly transitioned. If adverse conditions are encountered during the preparation of subgrade materials, special construction methods may be needed. All subgrade materials should be compacted to a minimum relative compaction of 95 percent of AASHTO T-99, Standard Proctor. All aggregate bases should be compacted to a minimum relative compaction of 100 percent of AASHTO T-99, Standard Proctor. Positive site drainage away from pavement areas should be maintained at all times. Water should not be allowed to pond or seep into the ground in or adjacent to pavement areas. If planters or landscaping are adjacent to paved areas, measures should be taken to minimize the potential for water to enter the pavement section. Pavement installation should be carried out under applicable portions of MAG Section 321 and any City of Avondale requirements. The City of Avondale requires two lifts for the 3.5 inches of AC on collector streets.

9.0 CONSTRUCTION RECOMMENDATIONS

9.1 General

All grading should conform to the International Building Code (IBC) and the Maricopa Association of Governments (MAG) with City of Avondale requirements, except where specifically superseded

in the text of this report. During earthwork construction, all removals, drain systems, slopes, and the general grading procedures of the contractor should be observed and the fill selectively tested by a representative of GTR. If unusual or unexpected conditions are exposed in the field, they should be reviewed by this office and if warranted, modified and/or additional recommendations offered. It is recommended that the earthwork contractor(s) perform their own independent reconnaissance of the Site to observe field conditions first hand.

If the contractor(s) should have any questions regarding site conditions, site preparation, or the remedial recommendations provided, they should contact an engineer at GTR for any necessary clarifications prior to submitting earthwork bids. All applicable requirements of local and national construction and general industry safety orders, the Occupational Safety and Health Act, and the Construction Safety Act should be met.

9.2 Removals/Processing - General

Debris, vegetation, and other deleterious material should be stripped/removed from areas proposed for structural fill placement and disposed off-site prior to the start of construction. Artificial fill was noted in several locations of the Site as described in Section 4.2 – Artificial Fill, and the location of these fills are indicated on Figure 2: Boring Location Map. Although no debris, spills, leaks or stained soils were identified within the Northeast and Southeast Developed Areas during the Allwyn and GTR Phase II ESA field work, special attention should be given to identifying and removing surface and subsurface remnants (i.e. artificial fill materials, underground utility lines, septic tanks, seepage pits, wells, etc.) that may have not been discovered during the limited amount of trenches excavated in these areas.

Any found remnants should be removed in accordance with the recommendations of the project geotechnical engineer and/or any applicable regulatory requirements. All artificial fill should be removed and cleaned of debris, trash, and organics prior to using as structural fill material. A representative of the geotechnical engineer would need to approve the cleaned material for it to be considered suitable for use as structural fill. A representative of GTR should observe the removal and verify that the bottom and sides of excavations are founded in medium dense to dense or firm to stiff native soil prior to backfilling the excavations.

For more uniform support of the intended structures, the building pad should consist of 20 inches of structural fill. In cut situation or when the proposed building pad elevation is equal to the existing native elevation, the soils should be over-excavated 12 inches below proposed finished pad grade and then 8 inches of material below should be moisture conditioned, processed and compacted in place. In a fill situation, the soils should be over-excavated 12 inches below existing grade and 8 inches should be processed, moisture conditioned, and compacted in place prior to

placing additional structural fill. The 8 inches of processed and compacted in place soil in both a cut and fill situation can be used toward the total of 20 inches of structural fill required within the building pads. In all cases, a minimum of 20 inches of fill is required within the building pads. The streets should also be provided with a minimum of 12 inches of processed and compacted soil.

Locally deeper removals/processing may be necessary based on the conditions exposed (e.g., areas near natural drainages, removal of underground structures, etc.). Processing should extend at least five (5) feet laterally beyond proposed structures and improvements (e.g., flatwork, block walls, etc.). The depth of the moisture conditioning and compaction should be verified by a representative of GTR.

9.3 Excavation Difficulty

We present the following general comments regarding excavation conditions for the owner's and designers' information with the understanding that they are approximations based on widely spaced test borings. More accurate information regarding the excavation conditions should be evaluated by contractors or other interested parties from test excavations using the intended equipment and extending to the required depths.

We anticipate that shallow excavations and utility trenches for the proposed construction can be accomplished with conventional excavating equipment. Cobbles, dense and/or cemented soils were not encountered during GTR's and ProTex's field evaluations; however, based on our review of ADWR groundwater well drilling logs, cobbles may be encountered at depths over 15 feet bgs due to the close proximity to the Salt and Gila Rivers. Deeper excavations may require the use of heavy-duty, specialized equipment to facilitate removal. The speed and ease of excavation is dependent on the nature of the soils, the type of equipment used, and the skill and experience of the equipment operator.

Instability in the form of slope raveling, caving, and sloughing should be expected in the excavations and trenches at the Site due to the granular and dry nature of the natural soils at the Site. Excavations and trenches at the Site should be braced, sloped, and/or designed as required to provide personnel safety and satisfy safety code regulations. Construction site safety is generally the sole responsibility of the contractor. GTR is providing information in this report solely as a service to our client and the design professionals on the project. Under no circumstances should the information in this report be interpreted to mean that GTR is assuming responsibility for construction site safety or the contractor's activities.

9.4 Fill Placement

Fill placement within the roadways and utility trenches should be performed in accordance with the MAG and City of Avondale requirements. However, for general site grading including the building pads and associated improvements other than utility trenches and roadways, excavated on-site soils or import material may be placed in relatively thin lifts, cleaned of vegetation and debris, brought to at or above optimum moisture content, and compacted to a minimum relative compaction of 95 percent of the laboratory standard ASTM D698 maximum dry density. A sufficient number of field density tests shall be performed to provide an opinion to the degree of compaction achieved. Field density tests should be performed at a minimum rate of one (1) test for every 1,000 cubic yards of material placed, one for every two vertical feet of material placed, or where there is a change in material, whichever is greater. If needed, when testing the fill for dry density and moisture content, a pothole/test pit should be excavated to a minimum depth to remove any loose surficial material. The area should then be leveled prior to performing a density test. A failing soil density test is based on either a dry density of less than 95 percent compaction or moisture content less than optimum moisture content of the laboratory standard ASTM D698.

9.5 Materials

The following sub-sections present our recommendations for materials to be used for the planned development. Since materials characteristics are dependent upon a variety of parameters, and some characteristics can be mitigated by other procedures, the final decision on acceptance of a construction material should be the GTR geotechnical engineer in consultation with the owner/developer and other design professionals.

9.5.1 On-Site Soil:

Based on the laboratory testing performed and previous reports, the on-site soils that are cleaned of debris may be used as structural fill beneath post-tensioned slabs.

9.5.2 Imported Fill Material:

It is possible that additional soils will be imported to the Site for earthwork construction purposes and for fill on the retention basins. A sample of any intended import material should first be submitted to GTR, so that laboratory and/or chemical testing can be performed to verify that the intended import material is compatible with on-site soils. Fill materials should be inorganic soils free of vegetation, debris, and organics, subject to standard local construction practices approved by the geotechnical engineer. Any imported fill materials to the Site should meet the following requirements:

Characteristic	Specification	Comments
Maximum Particle Size	4 inches	Size may be reduced or increased at the owner's or developer's discretion to satisfy project requirements.
Maximum Percent Passing the No. 200 Sieve	80 percent	General requirement.
Maximum Plasticity Index (PI)	15	None
Maximum Percent Expansion	1.5 percent	Measured on a sample compacted to about 95 percent of the ASTM D698 maximum dry density at about 2 percent below optimum moisture content, confined under a 100 psf surcharge and submerged.
Maximum Expansion Index	20	None

The intent of these specifications is to allow for using the on-site soils encountered at the Site as fill materials for the planned development and to provide general requirements for imported materials. Since soil characteristics are dependent upon a variety of parameters, and some characteristics can be mitigated by other procedures, the final decision on acceptance of the soil for use as fill materials should be geotechnical engineer in consultation with the owner/developer and other design professionals.

9.5.3 Aggregate Base Course

Base course materials for use beneath post-tensioned floor slabs should be well-graded sand or gravel materials meeting the MAG Specifications for Aggregate Base Course (ABC) materials, Section 702 and City of Avondale specification.

9.5.4 Asphalt Pavement

Pavement materials for residential streets should be in accordance with the requirements of the MAG Standard Specifications for Asphalt Concrete (MAG Section 710) and City of Avondale requirements. Placement requirements for the asphaltic concrete pavement should be in accordance with the requirements presented in the MAG Standard Specifications for Asphalt Concrete Pavement (MAG Section 321) and City of Avondale requirements. Engineering observation and testing should be performed as necessary to verify conformance with these recommended specifications, especially compaction requirements for asphaltic concrete surfacing. The subgrade should be prepared by

removing undesirable materials, scarified, moistened, and compacted for a minimum depth of 12 inches prior to placement of pavement materials. Material and compaction requirements should conform to recommendations presented in Section 9 of this report and MAG specifications

9.6 Engineered Fill Placement

The site clearing operations and the exposed subgrade beneath site clearing and fill removal areas should be approved by the geotechnical engineer prior to engineered fill placement. The subgrade preparation should be completed to the previously recommended depths depending upon the area and the compaction requirements presented below. Engineered fill placement should be conducted under observation and materials testing directed by the geotechnical engineer.

Excavation areas should be widened to accommodate the earth moving and compaction equipment, and to provide a level base for placing engineered fill materials. Slopes should be benched to provide a level area for placing fill. Fill materials should be placed and compacted in horizontal lifts of thicknesses compatible with the compaction equipment used. Compaction of subgrade soil, backfill, subgrade fill, trench backfill, and base course materials should be completed to the following density criteria using the maximum dry density determined by ASTM D698 and optimum moisture content (opt.) for each fill soil type.

Material	Area of Placement	Percent Compaction	Moisture Content (percent)
Exposed natural subgrade soils, Natural and fill soils, and Imported soils used as fill materials	Below post-tensioned foundations	95 min.	Opt. to Opt. +3
	Below asphalt pavement: 0 to 2 feet below finished grade Over 2 feet below finished grade	95 min. 95 min.	Opt. -3 to Opt. +1 Opt. ±3
Base Course	Below concrete slabs	95 min.	Opt. ±3
	Below pavement	100 min.	Opt. -3 to Opt. +2
Miscellaneous non-structural backfill	Areas not used for support of structures or pavement.	90 min.	Opt. ±3

The on-site soils are susceptible to pumping at elevated moisture contents above optimum moisture content. In pad areas, the soils should be maintained at moisture contents above optimum moisture content, and some construction equipment stability problems may be encountered. We would not consider some minor pumping of the subgrade to be detrimental beneath future building or house areas. If the pumping becomes severe at these moisture contents,

lighter compaction equipment may be required. In asphalt pavement areas, the soils should be kept at moisture contents below optimum to limit pumping of the subgrade soils. If pumping occurs, some drying of the subgrade soils or drying additives (lime or cement) may be needed to limit pumping.

Engineered fill soils subsequently removed or disturbed should be replaced with compacted engineered fill materials placed under observation and testing by the geotechnical engineer. In the arid environment at the Site, compacted engineered fill materials will lose moisture over time. Engineered fill materials in structure areas should be maintained in a moist condition until placement of base course and concrete slabs, or the upper portion of the engineered fill materials should be re-worked and re-certified within 30 days prior to placement of the floor slab.

9.7 Construction Observations

We recommend that site preparation and foundation construction activities be observed and/or tested by a GTR representative working under the direction of the project geotechnical engineer. This representative would have at least the following duties:

- Observe and document adequate removal of existing surficial vegetation, artificial fill, and other deleterious materials. Observe the over-excavation in the previously developed areas for subsurface remnants of the previous development.
- Observe and approve the exposed subgrade soils under the building areas.
- Approve any material used as engineered fill in building areas to document that it meets the requirements.
- Monitor the progress of earthwork and compaction operations.
- Monitor footing excavation operations to document that the recommended soils and compaction requirements in engineered fill are fulfilled.
- Provide a final report documenting on-site activities, site progress, and whether the above requirements have been fulfilled.

9.8 Utility Construction

9.8.1 Trench Excavations

We anticipate that shallow excavations and utility trenches for the proposed construction can be accomplished with conventional excavation equipment. Cobbles, dense and/or cemented soils were not encountered during GTR's and ProTex's field evaluations; however, based on our review of ADWR groundwater well drilling logs, cobbles may be

encountered at depths greater than 15 feet bgs due to the close proximity to the Salt and Gila Rivers. Deeper excavations may require the use of heavy-duty, specialized equipment to facilitate removal. The speed and ease of excavation is dependent on the nature of the soils, the type of equipment used, and the skill and experience of the equipment operator. Instability in the form of slope raveling, caving, and sloughing should be expected in the majority of the excavations and trenches at the Site due to the granular nature of the natural soils at the Site.

If utility trenches extend to a depth of five (5) feet or more below construction grade, the contractor or others should develop a trench safety plan to protect personnel entering the excavation. Trench safety should conform to OSHA safety guidelines and other applicable industry standards. Backfill of trenches, excluding pipe bedding and pipe zone material, should utilize processed and compacted on-site soils in order to provide more uniform improvement support conditions and reduce potential differential settlement and expansion problems.

9.8.2 Utility Trench Backfill

Considering the overall nature of the soil observed on the Site, it should be anticipated that materials would need to be imported to the Site for use as pipe bedding and pipe zone material. Utility trench backfill should be placed in accordance with the appropriate MAG standards and City of Avondale requirements. The on-site soils will not meet specifications for selected and granular trench backfill. Compaction testing and observation, along with probing, should be performed to verify the desired results. Sand backfill, unless excavated from the trench, should not be used adjacent to perimeter footings or in trenches on slopes.

9.9 Soil Corrosion and Cement Type

Soils within the area vary in corrosive potential to concrete and metal; therefore, materials selected for construction purposes should be resistant to corrosion. Testing of on-site soils within the previous ProTex report indicated sulfate contents of 34 to 113 ppm, which may be characterized as negligible sulfate content (ACI 318– less than 1,000 ppm). Type II cement or equivalent for negligible sulfate exposure conditions is acceptable for concrete mixtures. Previous Testing of on-site soils within the previous ProTex report indicated chloride contents of 26 to 117 ppm, which are below the typical limits of 500 to 600 ppm for protection of steel tendons in concrete slabs-on-grade. All concrete should be designed, mixed, placed, finished, and cured in accordance with guidelines presented by the Portland Cement Association (PCA), the ACI, and the IBC.

The pH and minimum resistivity were not analyzed in the previous ProTex report. Based on experience, the natural soils in the vicinity, especially when of elevated moisture content, are highly corrosive to buried ferrous metals. Therefore, special protection may be warranted for buried metal piping, underground retention tanks, or other conduits that would be in direct contact with the natural soils. In addition, special protection may be necessary where dissimilar metals are placed in close proximity or are joined. Consideration should be given to the use of approved non-metallic or coated conduits.

9.10 Slope Stability

No significantly high (greater than ten feet) slopes are anticipated to be constructed on the Site. All slopes should be designed at gradients of 2 to 1 (Horizontal to Vertical) or flatter. All slopes should be constructed in accordance with the minimum requirements of MAG and 2015 IBC. Cut and fill slopes are anticipated to perform adequately in the future with respect to gross and surficial stability if the soil materials are maintained in a solid to semi-solid state (as defined by the soil's Atterberg Limits) and are limited to the heights prescribed herein. The slopes should be adequately protected from erosion. GTR should be contacted for recommendations on higher or steeper slopes.

9.11 Earthwork Balance

The volume change of excavated materials upon compaction as engineered fill is anticipated to vary with material type and location. The overall earthwork shrinkage may be approximated by using the following parameters:

Alluvium	5% to 20% shrinkage
Artificial Fill	5% to 20% shrinkage

It should be noted that the above factors are estimates only, based on experience and limited data. Final earthwork balance factors could vary. In this regard, it is recommended that balance areas be reserved where grades could be adjusted up or down near the completion of grading in order to accommodate yardage imbalance for the project. We point out that deeper excavations extending into granular cemented soils will likely have lower shrinkage values, and in some cases, these soils may increase in volume during handling and processing.

10.0 DEVELOPMENT CRITERIA

10.1 Site Improvements

As is commonly known, soil movement is problematic with respect to the design, construction, and long-term performance of concrete flatwork. Due to the nature of concrete flatwork, it is essentially impossible to totally mitigate the effects of soil movement. Recommendations for exterior concrete flatwork design and construction can be provided upon request.

If, in the future, any additional improvements are planned for the Site, additional recommendations concerning the geological or geotechnical aspects of design and construction of said improvements could be provided upon request. This office should be notified in advance of any fill placement, grading, or trench backfilling after rough grading has been completed. This includes any grading, utility trench and retaining wall backfills.

10.2 Landscaping Maintenance and Planting

Water has been shown to weaken the inherent strength of all earth materials. Graded slopes constructed within and utilizing on-site materials may be erosive. Eroded debris may be reduced, and surficial slope stability enhanced by establishing and maintaining a suitable vegetation cover as soon as possible after construction. Compaction to the face of fill slopes would help to reduce short-term erosion until vegetation is established.

Plants selected for landscaping should be lightweight, deep-rooted types, which require little water and are capable of surviving the prevailing climate. From a geotechnical standpoint, leaching is not recommended for establishing landscaping. If the surface soils are processed for the purpose of adding amendments, they should be recompact to 95 percent compaction (based on ASTM D698). Only the minimum amount of irrigation necessary to sustain plant life should be provided. Over watering landscape areas could adversely affect proposed site improvements. We recommend that any proposed open bottom planter areas adjacent to the structure be eliminated or set back a minimum distance of five (5) feet and suggest that desert landscape using xeriscape technology is used outside of this buffer zone.

As an alternative, closed bottom type planters could be utilized. An outlet, placed in the bottom of the planter, could be installed to direct drainage away from structures or any exterior concrete flatwork. Irrigation timers should be adjusted on a monthly basis to match seasonal weather conditions and landscape requirements, in accordance to jurisdiction recommendations.

10.3 Drainage

Water has been shown to weaken the inherent strength of all soil materials, and the soils at the Site are moisture sensitive based on our review. Positive drainage is a key to the successful performance of any foundation or slab scheme. Therefore, providing positive drainage away from structures, concrete slabs, and driveways and preventing the ponding of water near the structures, slabs, and driveways must be completed during the design, construction, and over the life of the structures at the Site. The usual source of increasing moisture in soils is from infiltrating surface water.

In keeping with local building practices, the Site should be graded to keep surface water away from structures and foundation areas. In areas where sidewalks, slabs, or driveways, do not immediately adjoin the residential structures; the finished soil surfaces adjacent to structures should be constructed with positive slopes (minimum of 5 percent) so that surface waters cannot pond adjacent to foundations or penetrate any backfilled wall or foundation zones.

All surface water should be directed at least 10 feet away from the structures. Special attention should also be given to the collection and drainage of roof and surface runoff, and to the location and design of all planters, irrigation systems, drainage swales, and water retention basins. Backfill adjoining perimeter building walls and exterior footings should be well compacted to reduce possible moisture infiltration through loose soil intervals. Care should be taken in design and construction to provide adequate control of domestic and storm water in order to prevent seepage into the underlying soils. These recommendations will help reduce the potential for soil movements from water infiltration, but they may not eliminate soil movements or structural distress.

11.0 PLAN REVIEW

Final grading, foundation, and improvement plans should be submitted to this office for review and comment as they become available, to reduce the potential for any misunderstandings between the plans and the intent of the recommendations presented herein. In addition, foundation excavations and earthwork construction performed on the site should be observed and tested by this office. If conditions are found to differ substantially from those stated, appropriate recommendations would be offered at that time.

12.0 LIMITATIONS

The soil conditions presented in this report are an interpolation of the subsurface conditions based on the data obtained from the limited test borings at the subject Site. Regardless of the thoroughness of a geotechnical exploration, there is always a possibility that conditions between the test borings will be different from those at the specific test boring locations. In addition, it is possible that the conditions discovered in the field will be different from those anticipated by the designer or contractor, or that construction activities may alter the soil or rock conditions at the Site. The nature and extent of variations across the Site may not become evident until construction commences. Therefore, the geotechnical engineer should be made aware of any variations or differences from the results presented in this report.

The analyses and recommendations submitted in this report are based on our understanding of the above described project information and on our interpretation of the data collected from the Site and laboratory tests performed during this subsurface exploration. Our recommendations are based on our previous experience with similar subsurface conditions encountered at other sites under similar loading conditions. The recommendations apply only to the specific project discussed in this report.

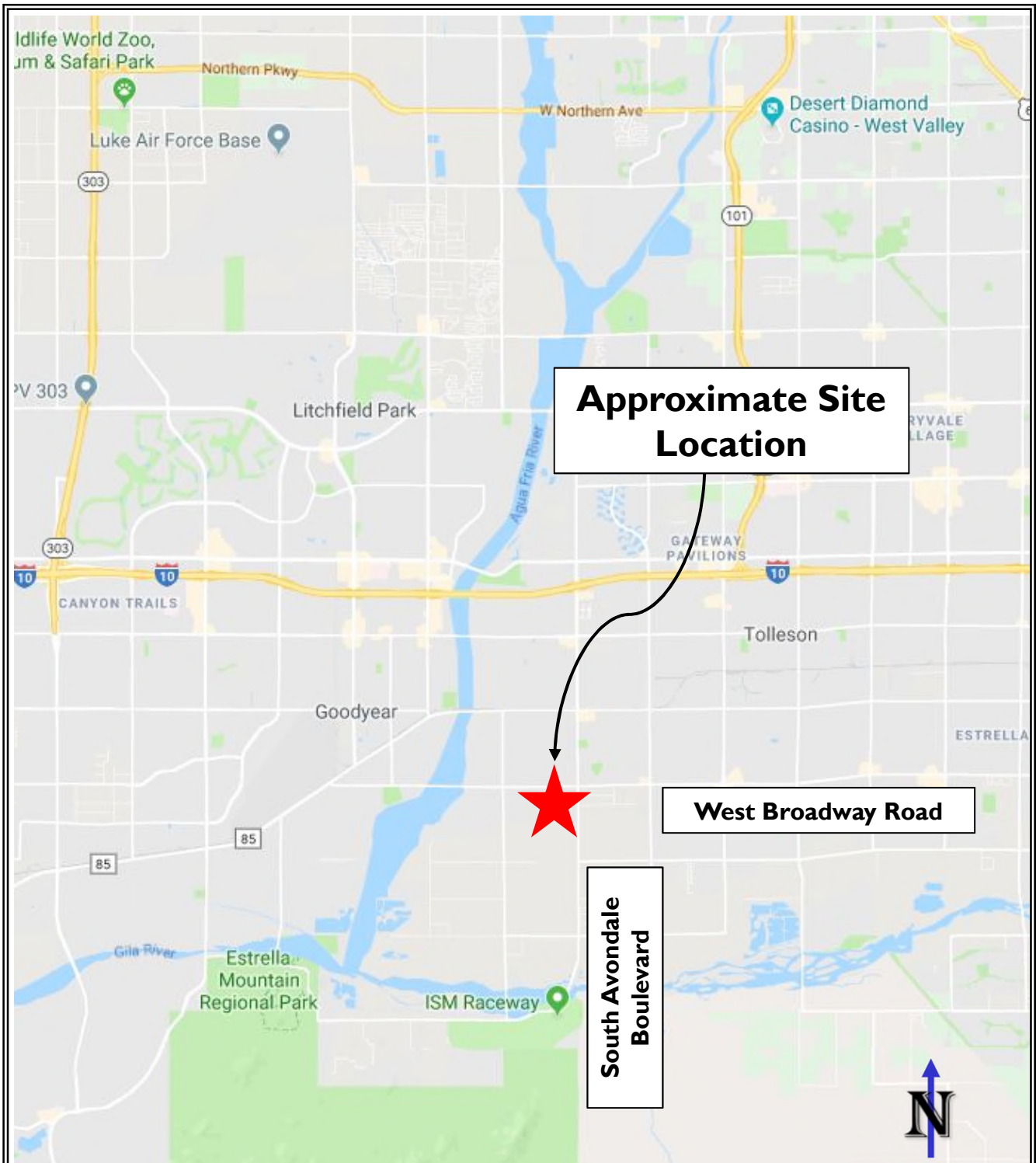
If information in this report is incorrect or if additional information becomes available, we should be contacted immediately so that we can review our recommendations. The materials encountered on the project Site and utilized in our laboratory study are believed representative of the area; however, soil and bedrock materials vary in character between excavations and natural outcrops or conditions exposed during mass grading. Site conditions may vary due to seasonal changes or other factors.

GTR assumes no responsibility or liability for work, testing, or recommendations performed or provided by others. Because our study is based upon the site materials observed, selective laboratory testing and engineering analysis, the conclusions and recommendations are professional opinions. These opinions have been derived in accordance with current standards of practice and no warranty is expressed or implied. Standards of practice are subject to change with time.

This document and the information contained herein have been prepared solely for the use of Brookfield Residential (Arizona), LLC and their authorized representatives. Any entity's receipt, review, and/or use of this report constitutes its acknowledgment to be bound the same as Brookfield Residential (Arizona), LLC by the terms and conditions in our contract and this report. Any reliance on this report by other parties shall be at such party's sole risk. Third party reliance letters may be issued upon request and upon the payment of the fee for such letters. All third parties relying on this report, by such reliance, agree to be bound by the terms, conditions, and

limitations agreed to by Brookfield Residential (Arizona), LLC. No reliance by any party is permitted without such agreement, regardless of the content of the reliance letter.

FIGURES



Approximate Site Location

West Broadway Road

South Avondale Boulevard



GeoTek Residential, LLC
 4050 E. Cotton Center Blvd.,
 Suite 49
 Phoenix, AZ 85040
 (480) 505-9422 Office
 (480) 505-9431 Fax

GEOTECHNICAL ENVIRONMENTAL MATERIALS

FIGURE I: SITE LOCATION MAP

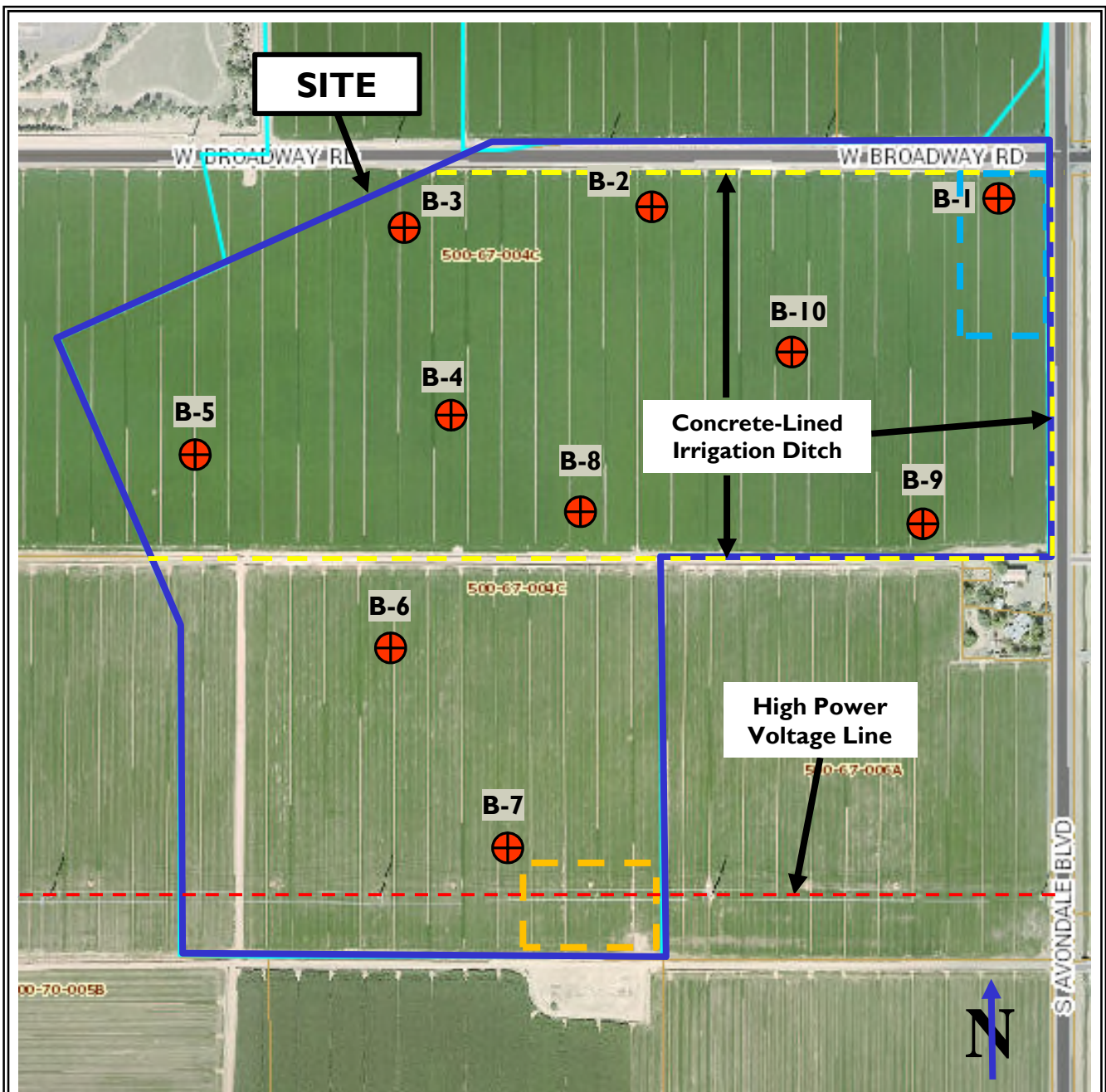
Alamar Phase I
 SWC of West Broadway Rd. and South Avondale Blvd.
 Avondale, AZ

Prepared for: Brookfield Residential (Arizona), LLC

Project No.:
1626.I-PHR

Report Date:
March 2019

Drawn By:
ACW



⊕ - Test Boring Location & Number

⊔ - Northeast Developed Area

⊔ - Southeast Developed Area



GeoTek Residential, LLC
 4050 E. Cotton Center Blvd.,
 Suite 49
 Phoenix, AZ 85040
 (480) 505-9422 Office
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GEOTECHNICAL ENVIRONMENTAL MATERIALS

FIGURE 2: BORING LOCATION MAP

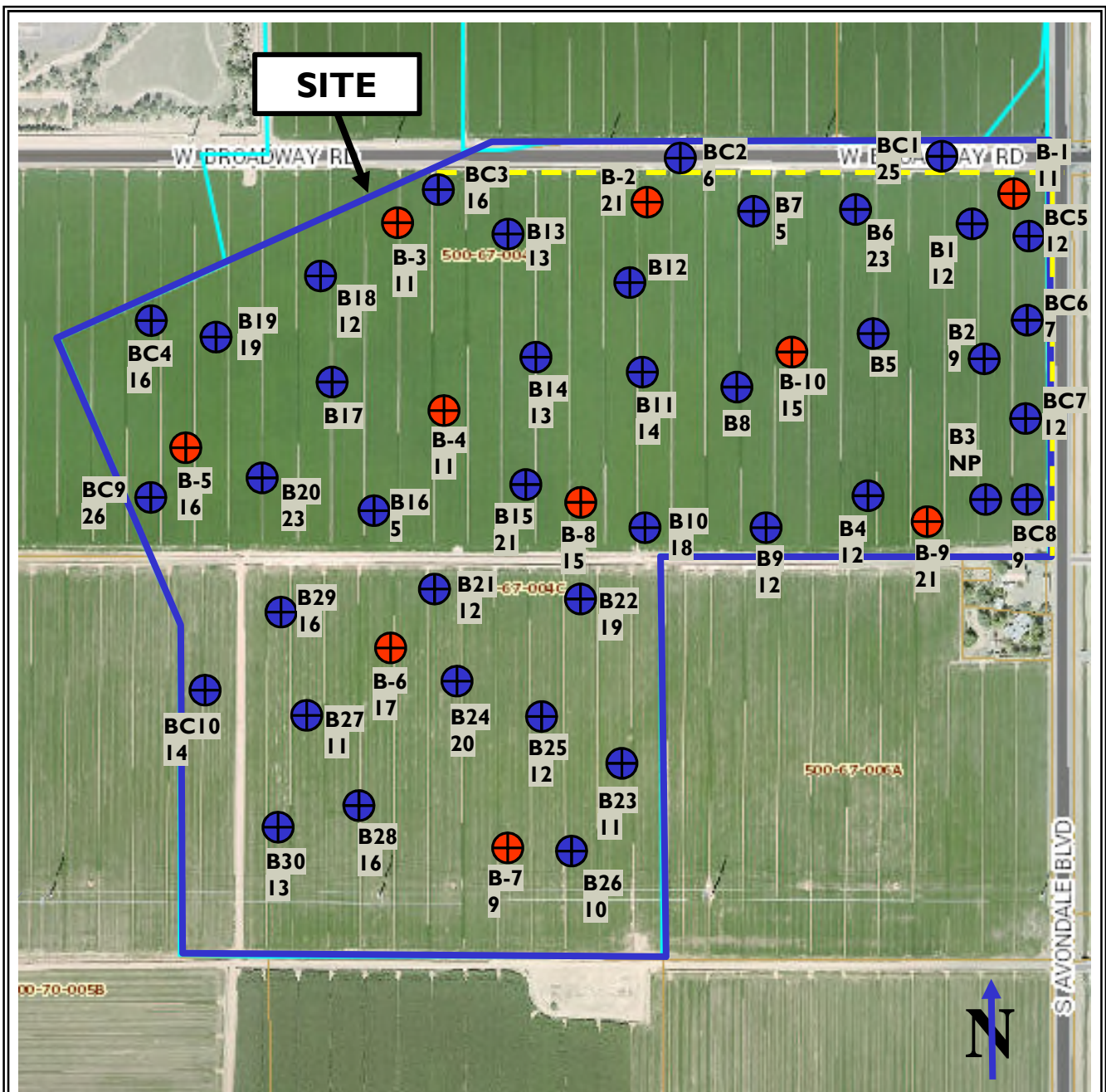
Alamar Phase I
 SWC of West Broadway Rd. and South Avondale Blvd.
 Avondale, AZ

Prepared for: Brookfield Residential (Arizona), LLC

Project No.:
 1626.1-PHR

Report Date:
 March 2019

Drawn By:
 ACW



- GeoTek Test Boring Location, Number, and Plasticity Index
- ProTex Test Boring Location, Number, and Plasticity Index



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GEOTECHNICAL ENVIRONMENTAL MATERIALS

FIGURE 3: PLASTICITY INDEX LOCATION

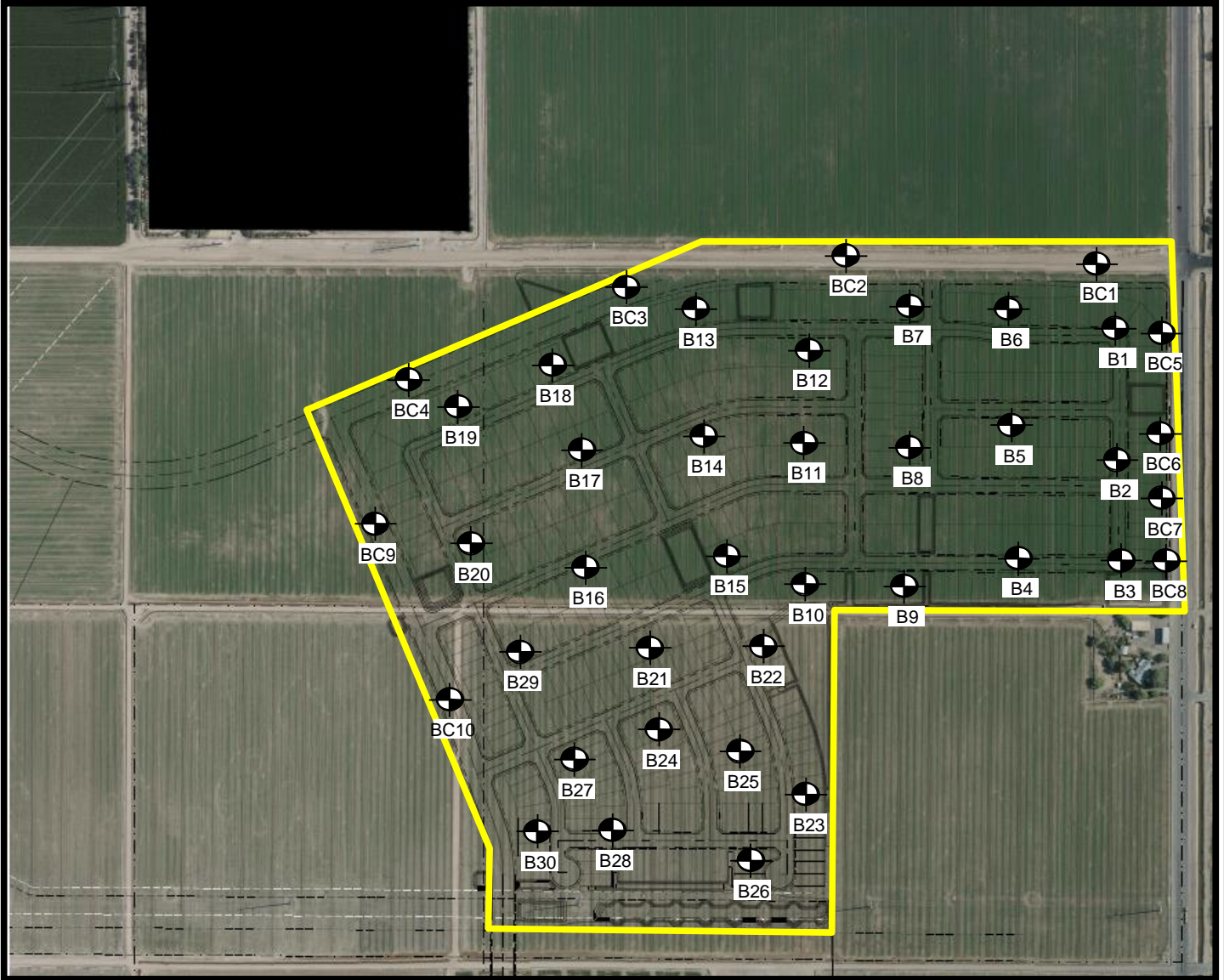
Alamar Phase I
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 Avondale, AZ

Prepared for: Brookfield Residential (Arizona), LLC

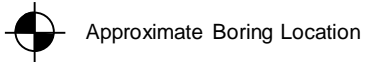
Project No.: 1626.1-PHR	Report Date: March 2019	Drawn By: ACW
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APPENDIX A

Previous Data



Legend:



Approximate Boring Location

Site Plan

Scale: N.T.S.

Drawn by: KR

Date: 3/13/18

Lakin Ranch – Phase 1
Avondale Road and Boadway Road
Avondale, Arizona



ProTeX Job No: 7649

Key To Soil Symbols and Classifications

Common Strata Symbols

	High plasticity clay (CH -- C)		Well graded gravel with clay (GW-GC -- 830)
	Inorganic silts and clays (CH-MH -- MC)		Well graded gravel with silt (GW-GM -- 83Z)
	Low plasticity clay (CL -- O)		Well graded gravel/clayey gravel (GW-GP -- 83G)
	Low-high plasticity clays (CL-CH -- CO)		Well graded gravel and sand (GW-SW -- 83D)
	Silty low plasticity clay (CL-ML -- CZ)		Elastic silt (MH -- M)
	Fill (FILL -- F)		Silt (ML -- Z)
	Clayey gravel (GC -- O8)		High plasticity organic clays (OH -- 5)
	Clayey sand and gravel (GC-SC -- DO8)		Low plasticity organic silts (OL -- 4)
	Silty gravel (GM -- Z8)		Basalt (or generic rock) (ROCK --)
	Silty clayey gravel (GM-GC -- ZO8)		Clayey sand (SC -- DO)
	Silty sand and gravel (GM-SM -- O8)		Silty sand (SM -- O)
	Poorly graded gravel (GP -- G)		Poorly graded clayey silty sand (SC-SM -- :ZO)
	Poorly graded gravel with clay (GP-GC -- DGO3)		Poorly graded silty fine sand (SM-ML -- :Z)
	Poorly graded gravel with silt (GP-GM -- DGZ3)		Poorly graded sand (SP -- :)
	Poorly graded gravel and sand (GP-SP -- :G)		Poorly graded sand with clay (SP-SC -- :R)
	Well graded gravel (GW -- 83)		Poorly graded sand with silt (SP-SM -- :=)
	Well graded sand (SW -- D)		Well graded sand with gravel (SW -- D9)
	Well graded sand with clay (SW-SC -- DR)		Silty sand with gravel (SM -- O9)
	Well graded sand with silt (SW-SM -- D=)		Clayey sand with gravel (SC -- DO9)

Relative Density of Cohesionless Soils (blows/ft)

Very Loose	0 to 4
Loose	5 to 10
Medium	11 to 30
Dense	31 to 50
Very Dense	over 50

Relative Degree of Plasticity (PI)

Non-Plastic	0
Low	1 to 7
Low-Medium	8 to 14
Medium	15 to 21
Medium-High	22 to 28
High	29 to 35
Very High	Over 35

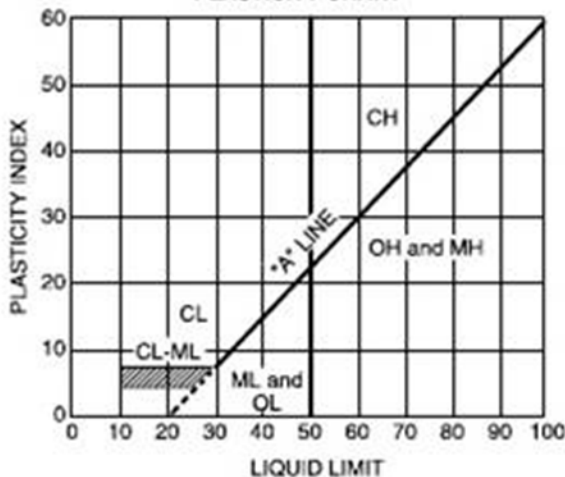
Relative Proportions (%)

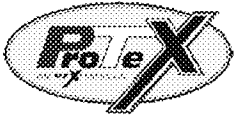
Trace	1 to 10
Little	11 to 20
Some	21 to 35
With	36 to 50

Particle Size Identification (Diameter)

Boulder	8.0" or Larger
Cobbles	3.0" to 8.0"
Coarse Gravel	0.75" to 3.0"
Fine Gravel	5.0 mm to 3.0"
Coarse Sand	2.0 mm to 5.0 mm
Medium Sand	0.4 mm to 2.0 mm
Fine Sand	0.07 mm to 0.4 mm
Silt	0.002 mm to 0.07 mm
Clay	Less Than 0.002

PLASTICITY CHART



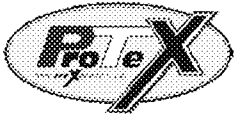


LOG OF BORING No. B1

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	Lean Clay, low-medium plasticity, brown, moist				78	Water Content - ●	Penetration -
3	Increase in plasticity to medium						
6							
9							
12							
15							
18	Silty Sand, non-plastic, brown, moist						
21							

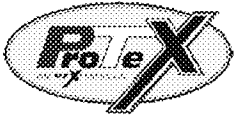


LOG OF BORING No. B1

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS					
						Plastic Limit	Water Content - ●			Liquid Limit	
						Penetration -	10	20	30	40	50
24											
27											
30											
33	Boring terminated at 31 ft. Possible groundwater table										
36											
39											
42											



LOG OF BORING No. B2

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts % < #200	TEST RESULTS		
					Plastic Limit	Water Content - ●	Liquid Limit
0	Lean Clay, low-medium plasticity, brown, damp			R 38			
3							
6				R 51			
9							
12							
15	Boring terminated at 15 ft.						
18							
21							

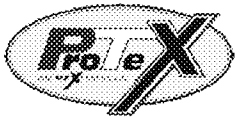


LOG OF BORING No. B3

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS				
						Plastic Limit	Liquid Limit			
0	Sandy Silt, non-plastic, brown, damp					Water Content - ●	Penetration -			
3						10	20	30	40	50
6	Lean Clay, medium-high plasticity, brown, damp					5-7'				
9										
12										
15	Boring terminated at 15 ft.									
18										
21										

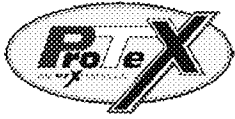


LOG OF BORING No. B4

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit ----- Liquid Limit	Water Content - ●
0	Lean Clay, low-medium plasticity, brown, damp					Penetration -	
3							
6	Lean Silt, low-medium plasticity, brown, damp						
6-8'							
9							
12	Boring terminated at 15 ft.						
15							
18							
21							

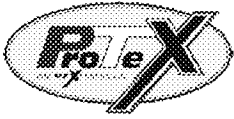


LOG OF BORING No. B5

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	Lean Clay, medium plasticity, brown, damp					Plastic Limit	Liquid Limit
						Water Content - ●	
						Penetration -	
						10 20 30 40 50	
3							
6							
9							
12						Increase in moisture to moist	
15						Boring terminated at 15 ft.	
18							
21							

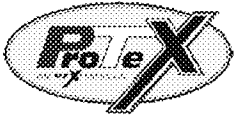


LOG OF BORING No. B6

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts % < #200	TEST RESULTS	
					Plastic Limit _____ Liquid Limit	Water Content - ●
0	Lean Clay, medium-high plasticity, brown, damp			R 5 4	Penetration -	
3						
6					R 7 39	
9						
12						
15	Boring terminated at 15 ft.					
18						
21						

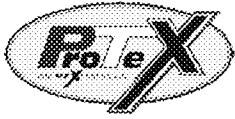


LOG OF BORING No. B7

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS						
						Plastic Limit	Liquid Limit					
0	Silty Clay, low plasticity, brown, damp					Plastic Limit	Liquid Limit					
						Water Content - ●						
						Penetration -						
						10	20	30	40	50		
3												
6												
9												
12												
15						Boring terminated at 15 ft.						
18												
21												

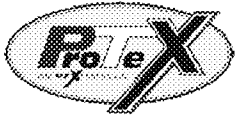


LOG OF BORING No. B8

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS						
						Plastic Limit	Liquid Limit					
0	Lean Clay, low-medium plasticity, brown, damp					Plastic Limit	Liquid Limit					
						Water Content - ●						
						Penetration -						
						10	20	30	40	50		
3												
6												
9												
12												
15						Boring terminated at 15 ft.						
18												
21												

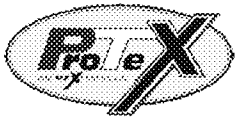


LOG OF BORING No. B9

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS		
						Plastic Limit	Water Content - ●	Liquid Limit
0	Lean Clay, low-medium plasticity, brown, damp							
3								
6	Sandy Silt, non-plastic, brown, damp							
9								
11								
12	Lean Clay, low-medium plasticity, brown, damp							
15	Boring terminated at 15 ft.							
18								
21								



LOG OF BORING No. B10

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	Lean Clay, medium plasticity, brown, damp					Plastic Limit	Liquid Limit
3						Water Content - ●	
5.7	Sandy Silt, non-plastic, brown, damp					Penetration -	
6							
9	Lean Clay, low-medium plasticity, brown, damp						
12							
15	Boring terminated at 15 ft.						
18							
21							

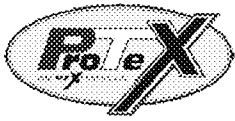


LOG OF BORING No. B11

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts % < #200	TEST RESULTS	
					Plastic Limit	Liquid Limit
0	Lean Clay, medium plasticity, brown, damp			R 8 14	Plastic Limit	Liquid Limit
3					Water Content - ●	Penetration -
6	Sandy Silt, non-plastic, brown, damp			R 12 23	10	20
9					30	40
12	Boring terminated at 15 ft.				50	
15						
18						
21						

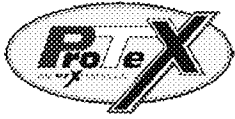


LOG OF BORING No. B12

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS				
						Plastic Limit	Water Content - ●	Liquid Limit		
0	Lean Clay, low-medium plasticity, brown, damp					Penetration -				
3						10	20	30	40	50
6										
9										
12										
15						Boring terminated at 15 ft.				
18										
21										

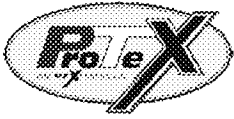


LOG OF BORING No. B13

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS		
						Plastic Limit	Water Content - ●	Liquid Limit
0	Lean Clay, medium plasticity, brown, damp							
3								
6	Decrease in plasticity to low-medium							
9								
12								
15	Boring terminated at 15 ft.							
18								
21								

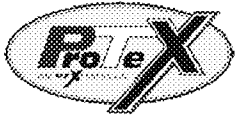


LOG OF BORING No. B14

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit ----- Liquid Limit	Water Content - ●
0	Lean Clay, low-medium plasticity, brown, damp					Penetration -	
3						10 20 30 40 50	
6	Lean Silt, low-medium plasticity, brown, damp					-----	
9						10 20 30 40 50	
12	Boring terminated at 15 ft.						
15							
18							
21							

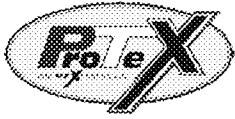


LOG OF BORING No. B15

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS				
						Plastic Limit ----- Liquid Limit	Water Content - ●			
0	Lean Clay, medium plasticity, brown, damp					Penetration -				
3						10	20	30	40	50
6										
9										
12										
15						Boring terminated at 15 ft.				
18										
21										

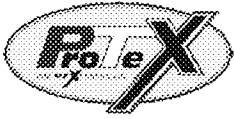


LOG OF BORING No. B16

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts % < #200	TEST RESULTS		
					Plastic Limit	Water Content - ●	Liquid Limit
0	Silty Clay, low plasticity, brown, damp			R 8 19	Penetration -		
3					10	20	30
6	Lean Cla7, low-medium plasticity, brown, damp			R 5 10	Penetration -		
9					10	20	30
12	Boring terminated at 15 ft.						
15							
18							
21							



LOG OF BORING No. B17

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS					
						Plastic Limit ----- Liquid Limit	Water Content - ●				
0	Lean Clay, low-medium plasticity, brown, damp					Penetration -					
3						10	20	30	40	50	
6											
9											
12											
14											
15						Sandy Silt, non-plastic, brown, damp					
18						Boring terminated at 15 ft.					
21											

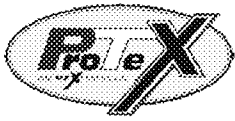


LOG OF BORING No. B18

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS									
						Plastic Limit	Water Content - ●	Liquid Limit							
0	Lean Clay, low-medium plasticity, brown, slightly damp					Penetration -									
3															
6															
9															
12						Sandy Silt, non-plastic, brown, damp									
15															
18															
21						Boring terminated at 15 ft.									



LOG OF BORING No. B19

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS					
						Plastic Limit	Liquid Limit				
0	Lean Clay, medium plasticity, brown, damp					Plastic Limit	Liquid Limit				
3						Water Content - ●					
6						Penetration -					
9						10	20	30	40	50	
12											
15						Sandy Silt, non-plastic, brown, damp					
18						Silty Clay, low plasticity, brown, damp					
21											

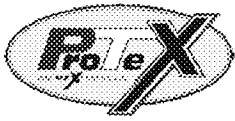


LOG OF BORING No. B19

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit ----- Liquid Limit	Water Content - ●
24							
27							
30							
33	Boring terminated at 33 ft. Possible Ground Water						
36							
39							
42							

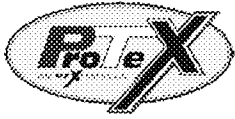


LOG OF BORING No. B20

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS			
						Plastic Limit	Water Content - ●	Liquid Limit	
0	Lean Clay, medium-high plasticity, brown, damp								
3									
6									
9									
12									
15			Boring terminated at 15 ft.						
18									
21									

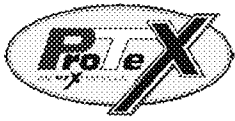


LOG OF BORING No. B21

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C _____

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit ----- Liquid Limit	Water Content - ●
0	Lean Clay, low-medium plasticity, brown, damp						
3							
6	Silty Clay, low plasticity brown, slightly damp						
9							
12							
15	Lean Clay, low-medium plasticity, brown, damp						
18	Boring terminated at 15 ft.						
21							

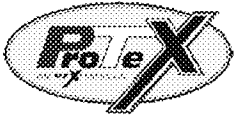


LOG OF BORING No. B22

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS	
						Plastic Limit	Liquid Limit
0	Lean Clay, medium plasticity, brown, damp						
3	Decrease in plasticity to low-medium						
6							
9							
12							
15	Boring terminated at 15 ft.						
18							
21							

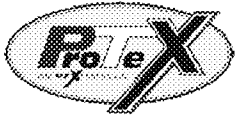


LOG OF BORING No. B23

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts % < #200	TEST RESULTS		
					Plastic Limit	Water Content - ●	Liquid Limit
0	Lean Clay, low-medium plasticity, brown, damp			R 29			
3							
6	Sandy Silt, non-plastic, brown, damp			R 27 31			
8-10							
9							
12							
15	Boring terminated at 15 ft.						
18							
21							



LOG OF BORING No. B24

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS		
						Plastic Limit	Liquid Limit	
0	Lean Clay, medium plasticity, brown, damp					Plastic Limit	Liquid Limit	
						Water Content - ●		
						Penetration -		
						10 20 30 40 50		
3								
6								
9								
12								
15						Boring terminated at 15 ft.		
18								
21								

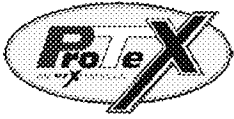


LOG OF BORING No. B25

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS		
						Plastic Limit	Liquid Limit	
0	Lean Clay, low-medium plasticity, brown, damp					Water Content - ●	Penetration -	
3						10	20	30
6	Lean Clay, medium plasticity, brown, damp							
9								
12								
15	Boring terminated at 15 ft.							
18								
21								

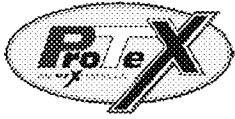


LOG OF BORING No. B26

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS				
						Plastic Limit	Water Content - ●	Liquid Limit		
0	Lean Clay, low-medium plasticity, brown, damp					Plastic Limit	Water Content - ●	Liquid Limit		
3						10	20	30	40	50
6	Sandy Silt, non-plastic, brown, damp					Penetration -				
9										
12										
15	Boring terminated at 15 ft.									
18										
21										

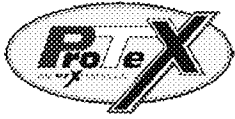


LOG OF BORING No. B27

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS							
						Plastic Limit ----- Liquid Limit	Water Content - ●						
0	Lean Clay, low-medium plasticity, brown, damp					Penetration -							
3													
6													
9													
12													
15						Increase in plasticity to medium							
18						Boring terminated at 15 ft.							
21													

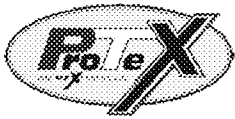


LOG OF BORING No. B28

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:**
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ **AFTER 24 HOURS:** ∇ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS		
						Plastic Limit	Water Content - ●	Liquid Limit
0	Lean Clay, medium plasticity, brown,damp					Penetration -		
3								
6	Sandy Silt, non-plastic, brown, damp							
7-9'								
9								
12	Boring terminated at 15 ft.							
15								
18								
21								

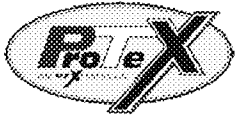


LOG OF BORING No. B29

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts % < #200	TEST RESULTS	
					Plastic Limit _____ Liquid Limit	Water Content - ●
0	Lean Clay, medium plasticity, brown, damp			R 4 6		
3						
6	Silty Clay, low plasticity, brown, damp			R 6 8		H
8-10						
9	Boring terminated at 15 ft.					
12						
15						
18						
21						



LOG OF BORING No. B30

PROJECT: Lakin Ranch - Phase 1 **PROJECT NO.:** 7649
CLIENT: Brookfield Residential (Arizona)
PROJECT LOCATION: Avondale Boulevard and Broadway Road
LOCATION: See site map **ELEVATION:** _____
DRILLER: D&S Driling **LOGGED BY:** SD
DRILLING METHOD: 8" power auger **DATE:** 3/14/18
DEPTH TO - WATER> INITIAL: ∇ _____ **AFTER 24 HOURS:** ∇ _____ **CAVING>** C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Description	Graphic	Sample No.	Blow Counts	% < #200	TEST RESULTS				
						Plastic Limit	Water Content - ●	Liquid Limit		
0	Lean Clay, medium-high plasticity, brown, damp									
3										
6										
9										
12										
15										
15			Boring terminated at 15 ft.							
18										
21										



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182039

Job ID #: 7649

Received: 3/19/2018 Sampled: 3/14/2018

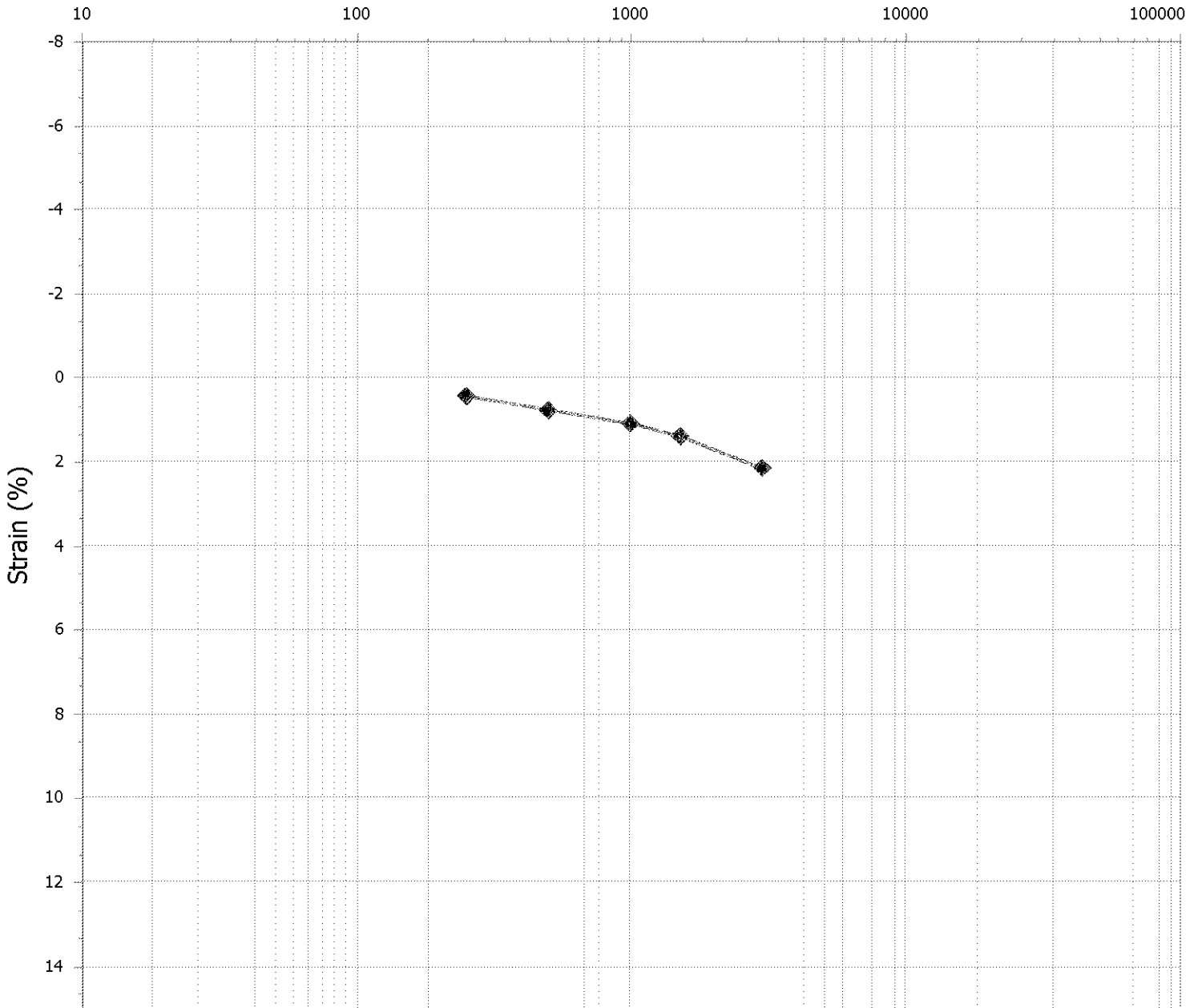
Material: Geo Samples

Sampled By: Thomas M Perkins

Material Source: Native - Onsite

Submitted By: _____

Load (PSF)



Source: B2 - Ring 1.5'

Moisture Content: 20.0 %

Sample Type: Undisturbed

Dry Unit Weight: 104.3 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: kgrossarth



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182040

Job ID #: 7649

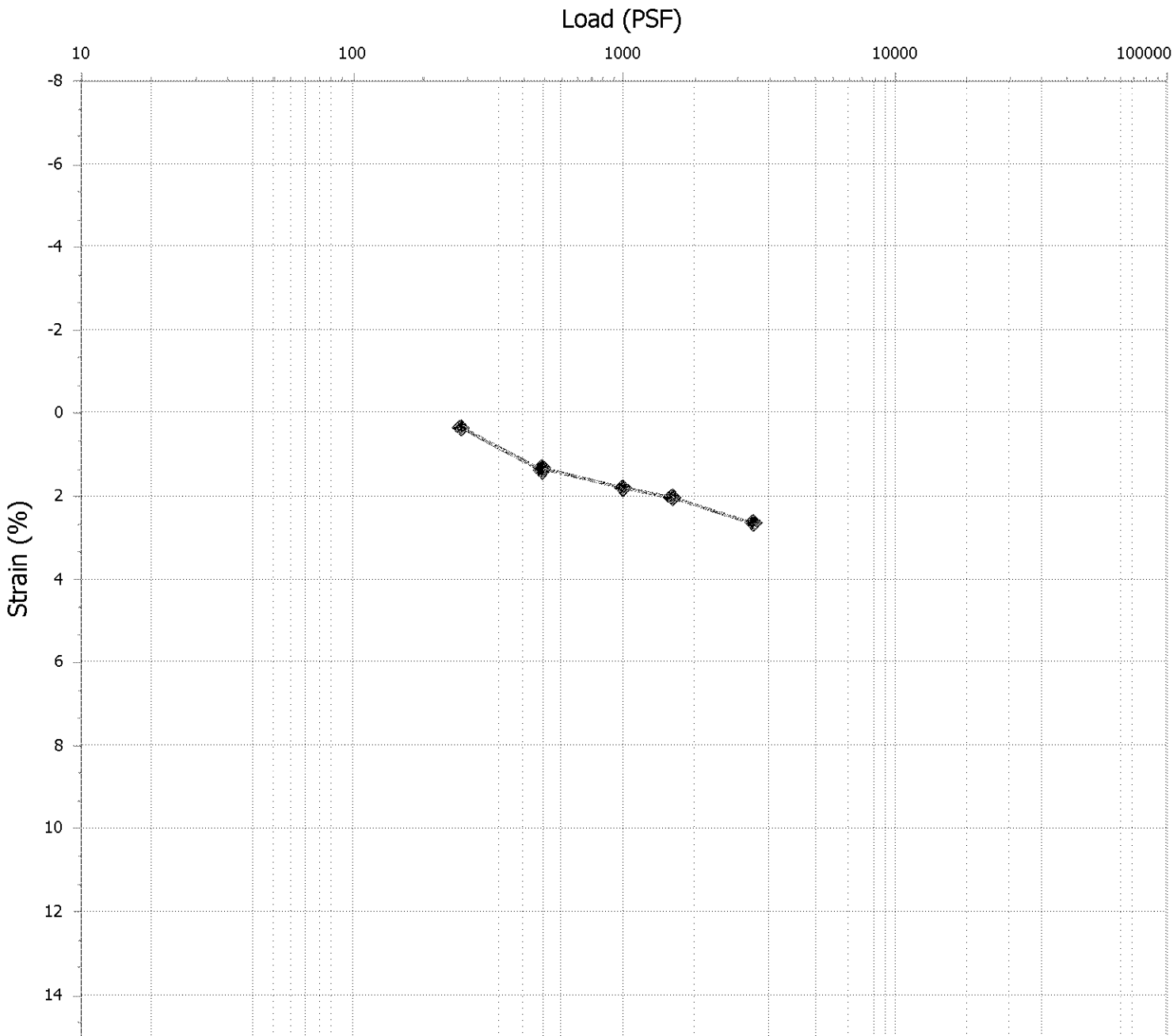
Received: 3/19/2018 Sampled: 3/14/2018

Material: Geo Samples

Sampled By: Thomas M Perkins

Material Source: Native - Onsite

Submitted By: _____



Source: B2 - Ring 5'

Moisture Content: 25.3 %

Sample Type: Undisturbed

Dry Unit Weight: 90.8 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: kgrossarth



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182041

Job ID #: 7649

Received: 3/19/2018 Sampled: 3/14/2018

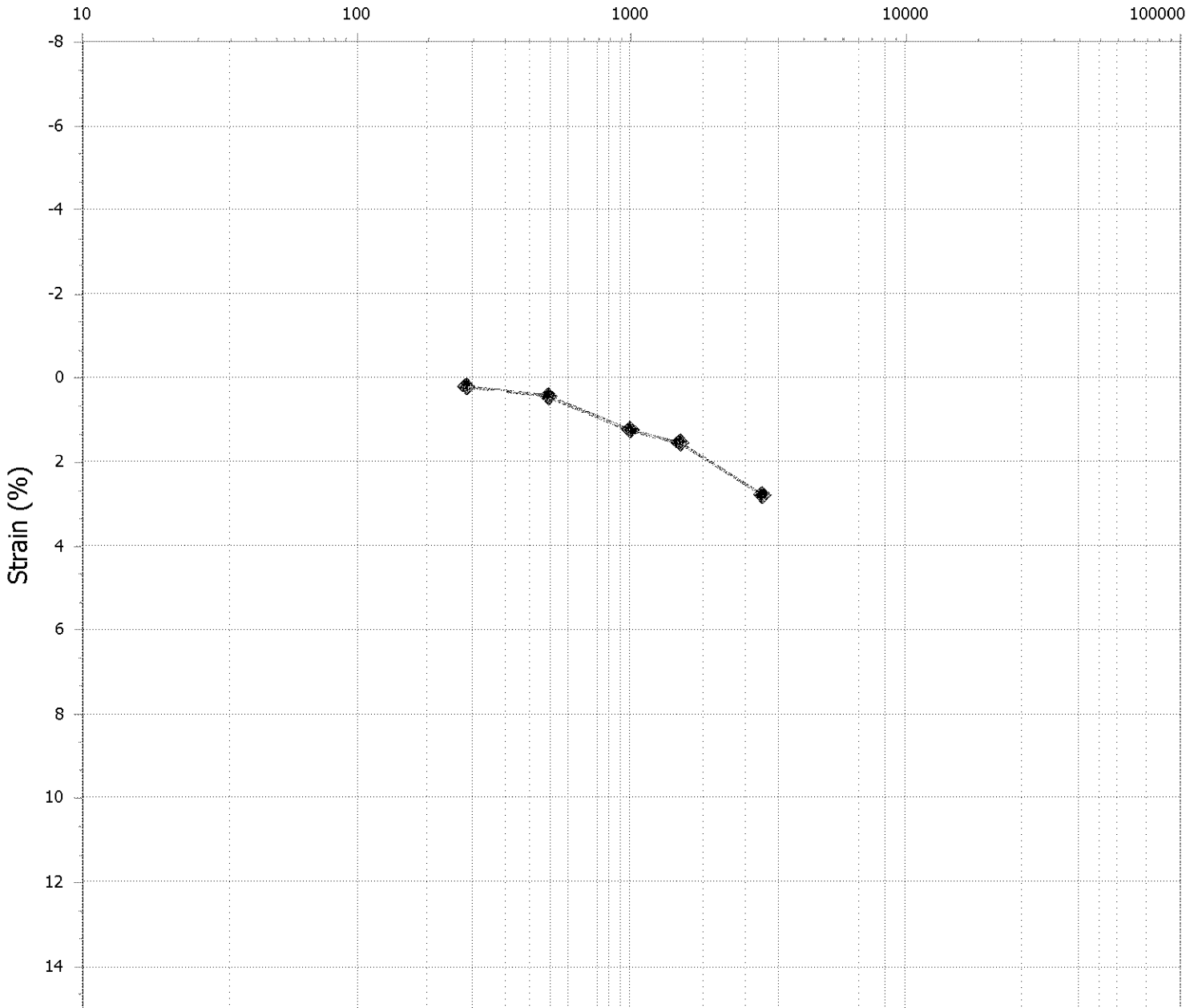
Material: Geo Samples

Sampled By: Thomas M Perkins

Material Source: Native - Onsite

Submitted By: _____

Load (PSF)



Source: B6 - Ring 1.5'

Moisture Content: 16.2 %

Sample Type: Undisturbed

Dry Unit Weight: 102.0 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: kgrossarth



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182042

Job ID #: 7649

Received: 3/19/2018 Sampled: 3/14/2018

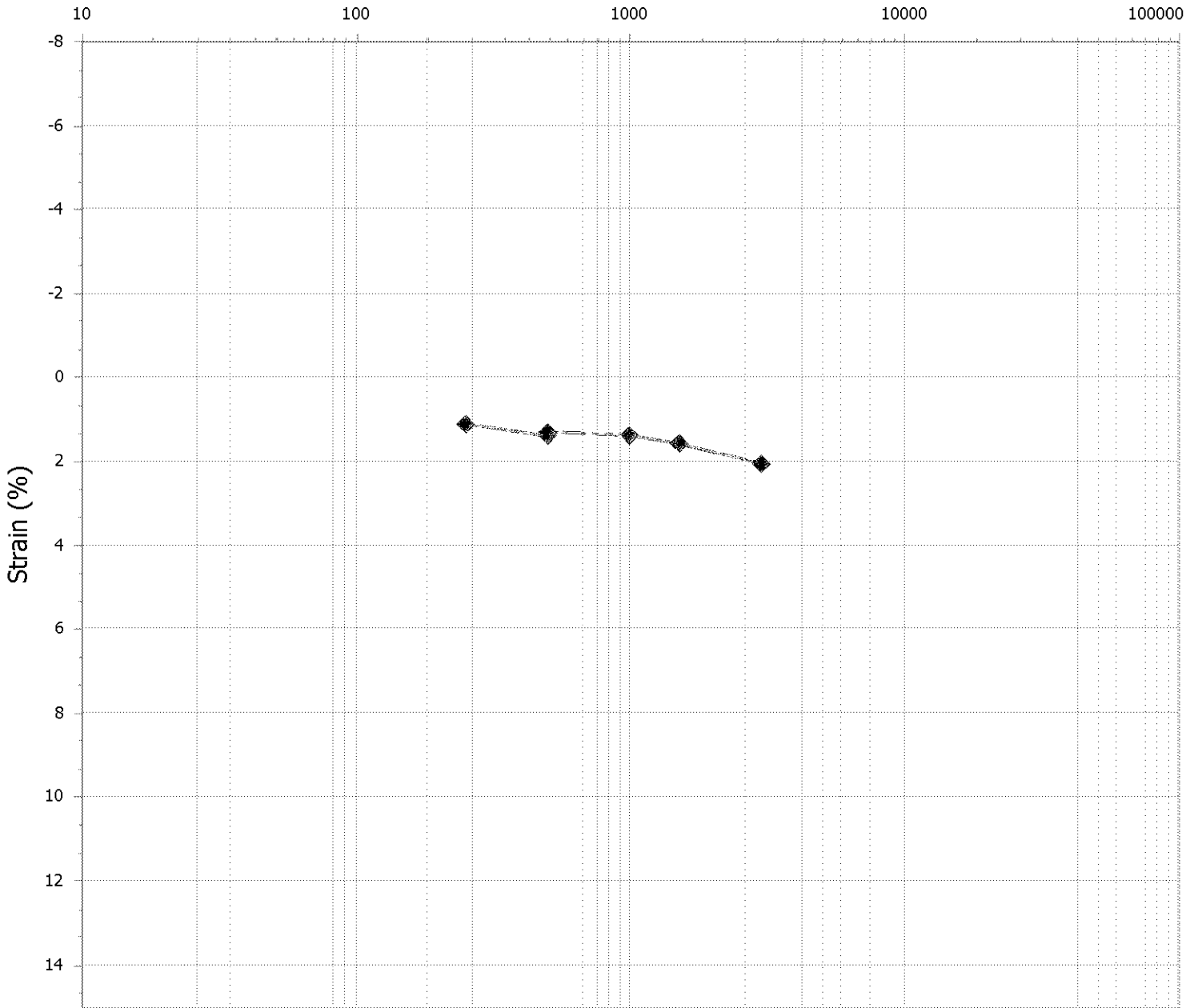
Material: Geo Samples

Sampled By: Thomas M Perkins

Material Source: Native - Onsite

Submitted By: _____

Load (PSF)



Source: B6 - Ring 5'

Moisture Content: 28.3 %

Sample Type: Undisturbed

Dry Unit Weight: 89.5 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: kgrossarth



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182043

Job ID #: 7649

Received: 3/19/2018 Sampled: 3/14/2018

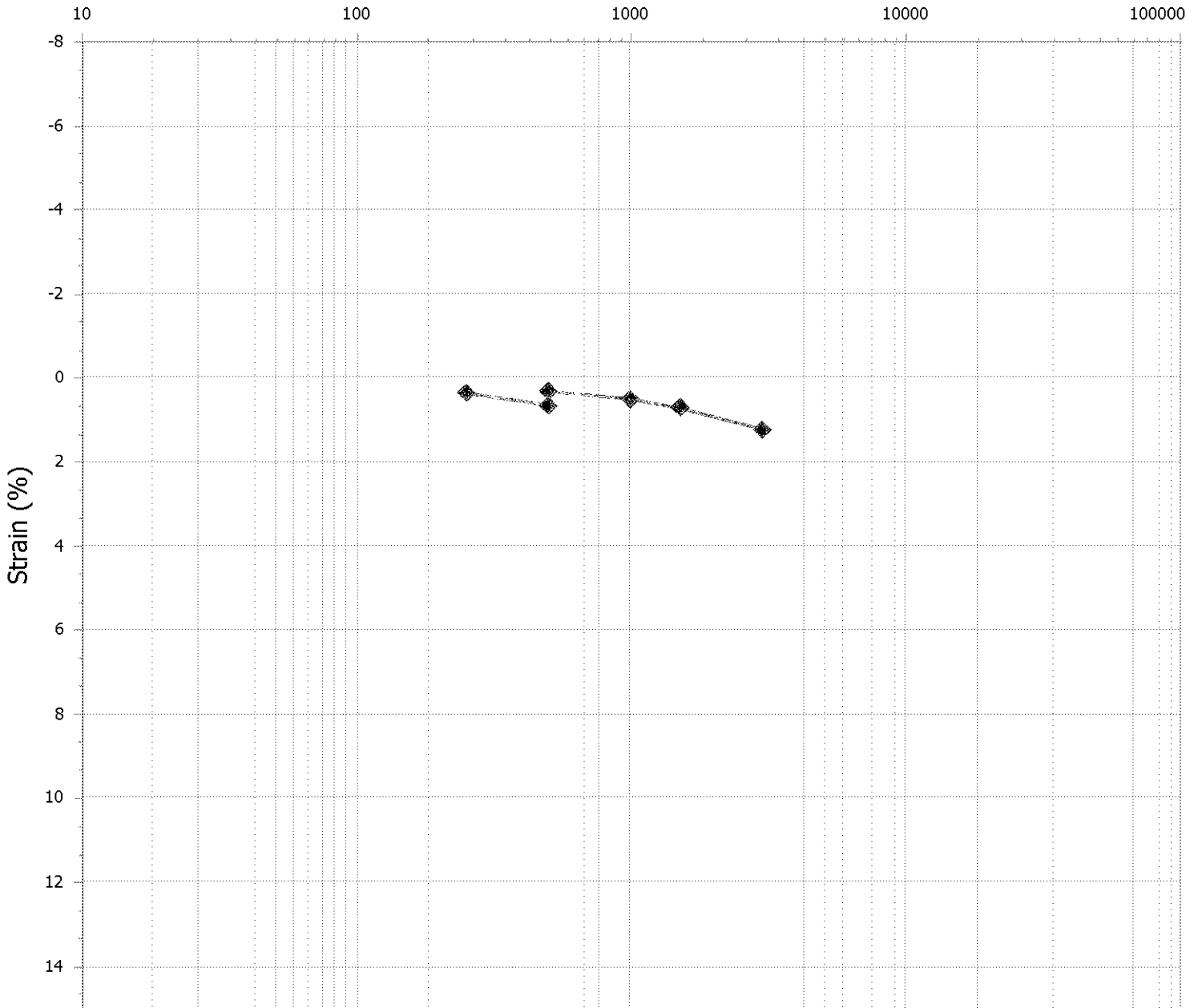
Material: Geo Samples

Sampled By: Thomas M Perkins

Material Source: Native - Onsite

Submitted By: _____

Load (PSF)



Source: B11 - Ring 1.5'

Moisture Content: 21.3 %

Sample Type: Undisturbed

Dry Unit Weight: 103.0 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: jgrossarth



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182044

Job ID #: 7649

Received: 3/19/2018 Sampled: 3/14/2018

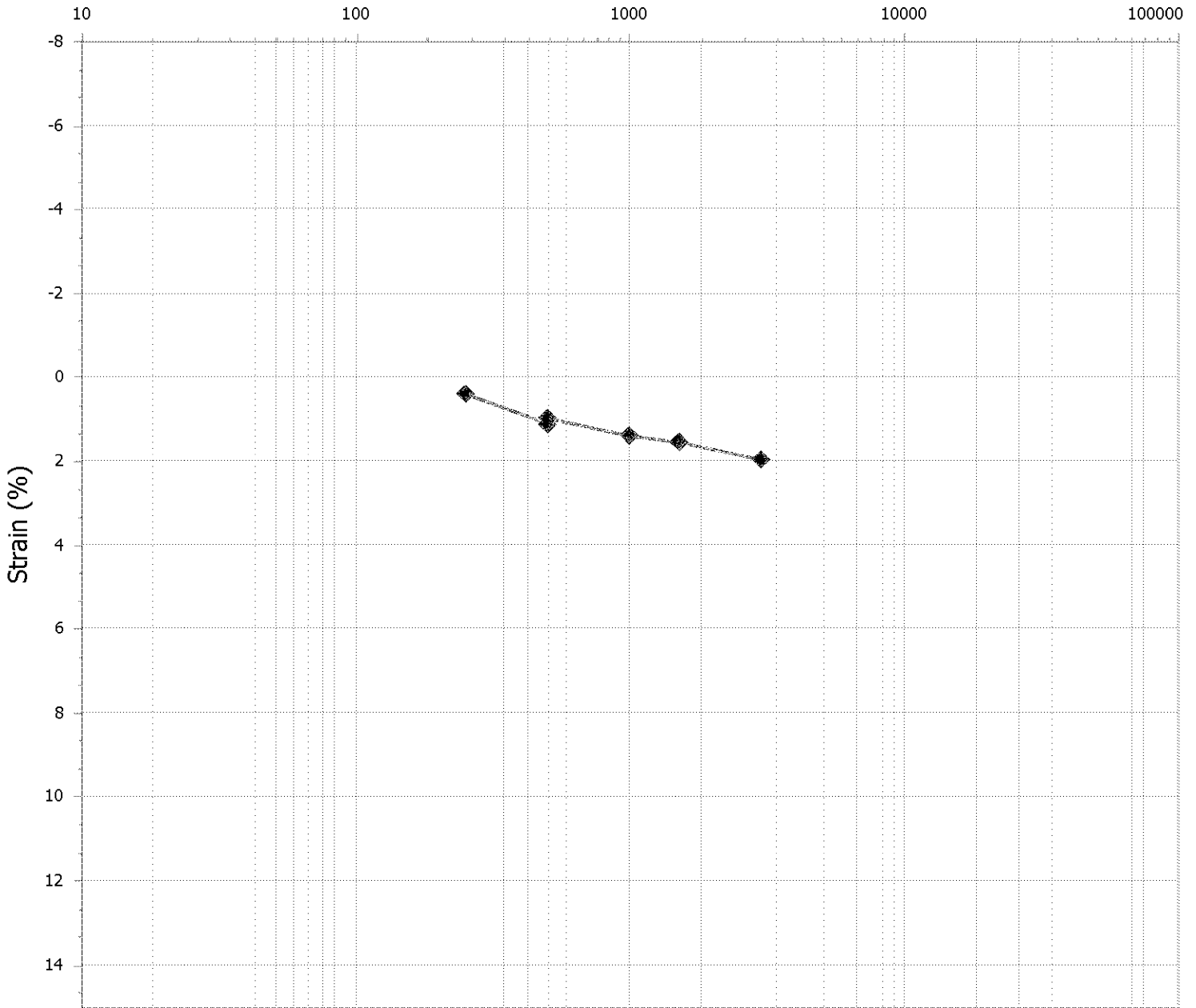
Material: Geo Samples

Sampled By: Thomas M Perkins

Material Source: Native - Onsite

Submitted By: _____

Load (PSF)



Source: B11 - Ring 5'

Moisture Content: 19.7 %

Sample Type: Undisturbed

Dry Unit Weight: 94.7 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: jgrossarth



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182045

Job ID #: 7649

Received: 3/19/2018 Sampled: 3/14/2018

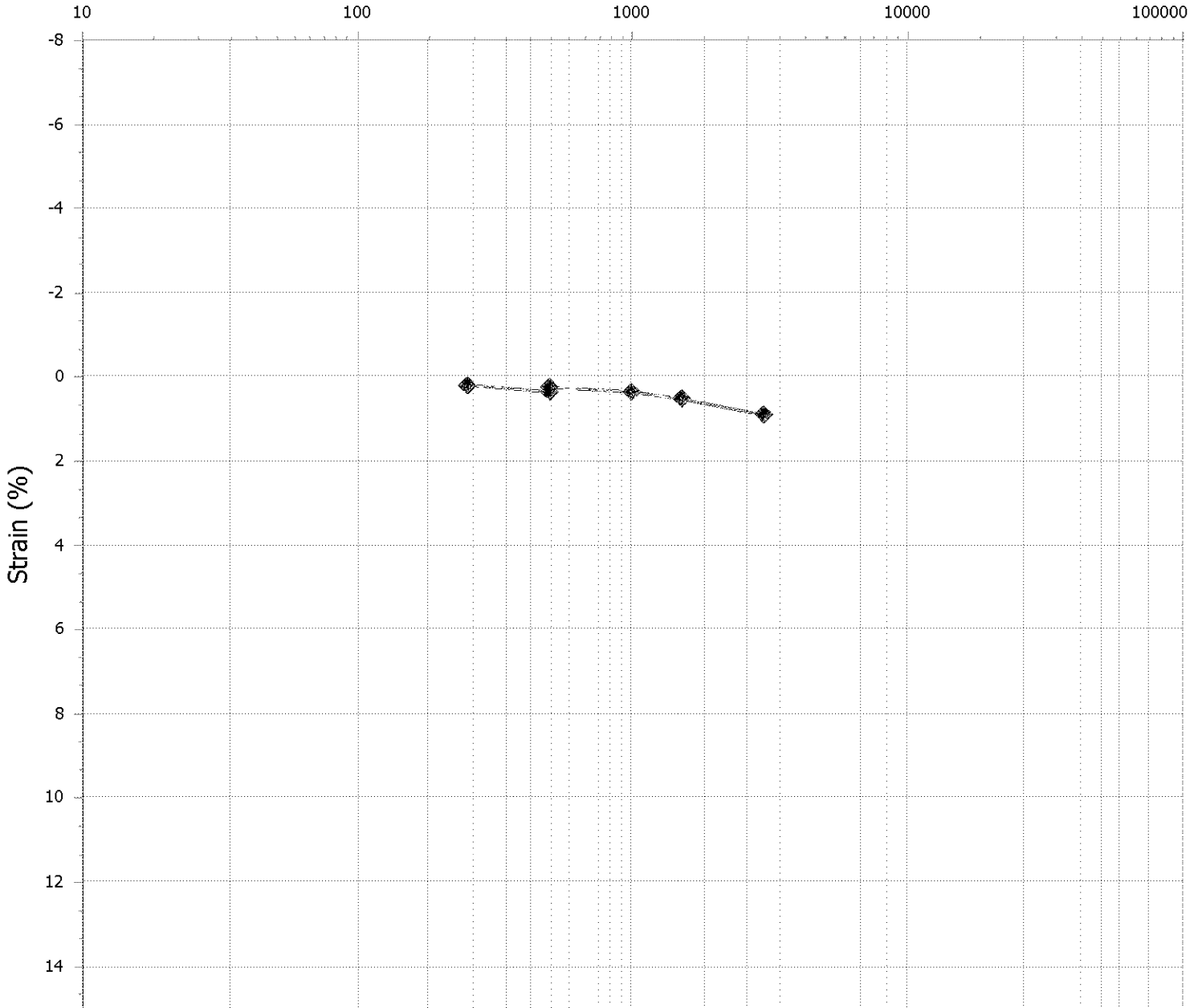
Material: Geo Samples

Sampled By: Thomas M Perkins

Material Source: Native - Onsite

Submitted By: _____

Load (PSF)



Source: B16 - Ring 1.5'

Moisture Content: 28.3 %

Sample Type: Undisturbed

Dry Unit Weight: 93.0 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: jgrossarth



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182046

Job ID #: 7649

Received: 3/19/2018 Sampled: 3/14/2018

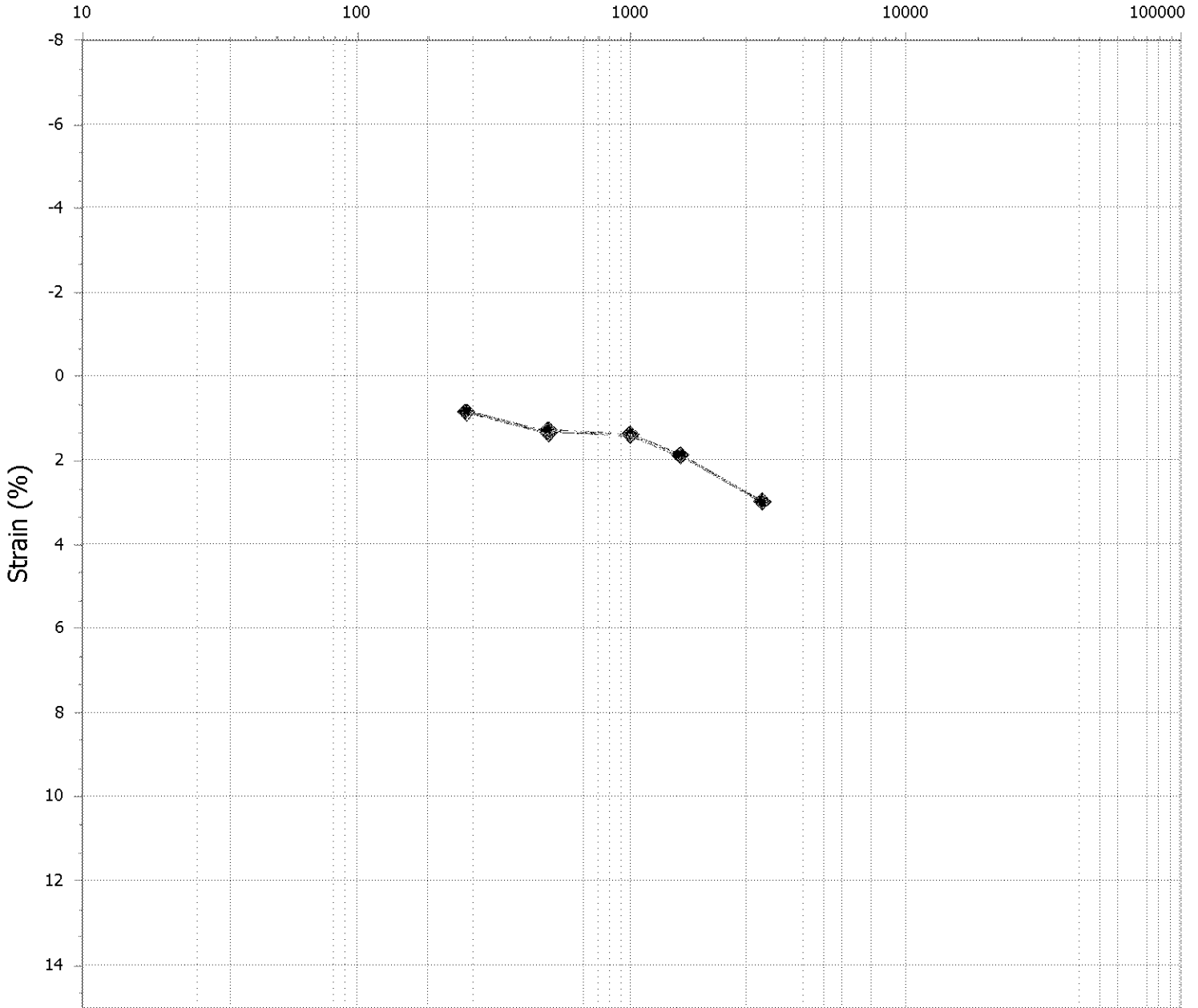
Material: Geo Samples

Sampled By: Thomas M Perkins

Material Source: Native - Onsite

Submitted By: _____

Load (PSF)



Source: B16 - Ring 5'

Moisture Content: 21.5 %

Sample Type: Undisturbed

Dry Unit Weight: 102.9 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: jgrossarth



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182245

Job ID #: 7649

Received: 3/26/2018 Sampled: 3/23/2018

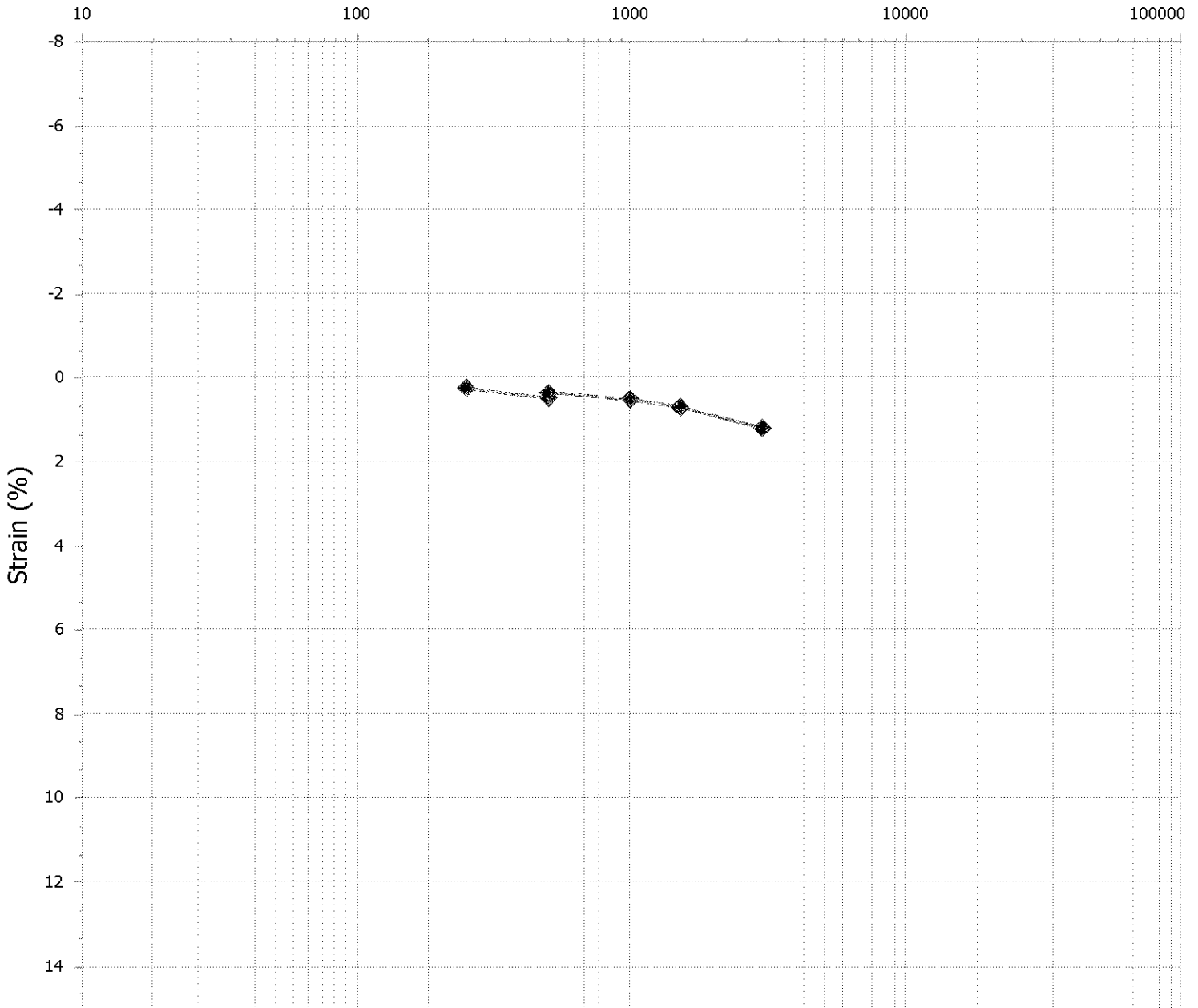
Material: Geo Samples - Native

Sampled By: Spencer Drenth

Material Source: On-site

Submitted By: _____

Load (PSF)



Source: B23 - Rings 1.5'

Moisture Content: 17.8 %

Sample Type: Undisturbed

Dry Unit Weight: 107.7 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: kgrossarth



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182246

Job ID #: 7649

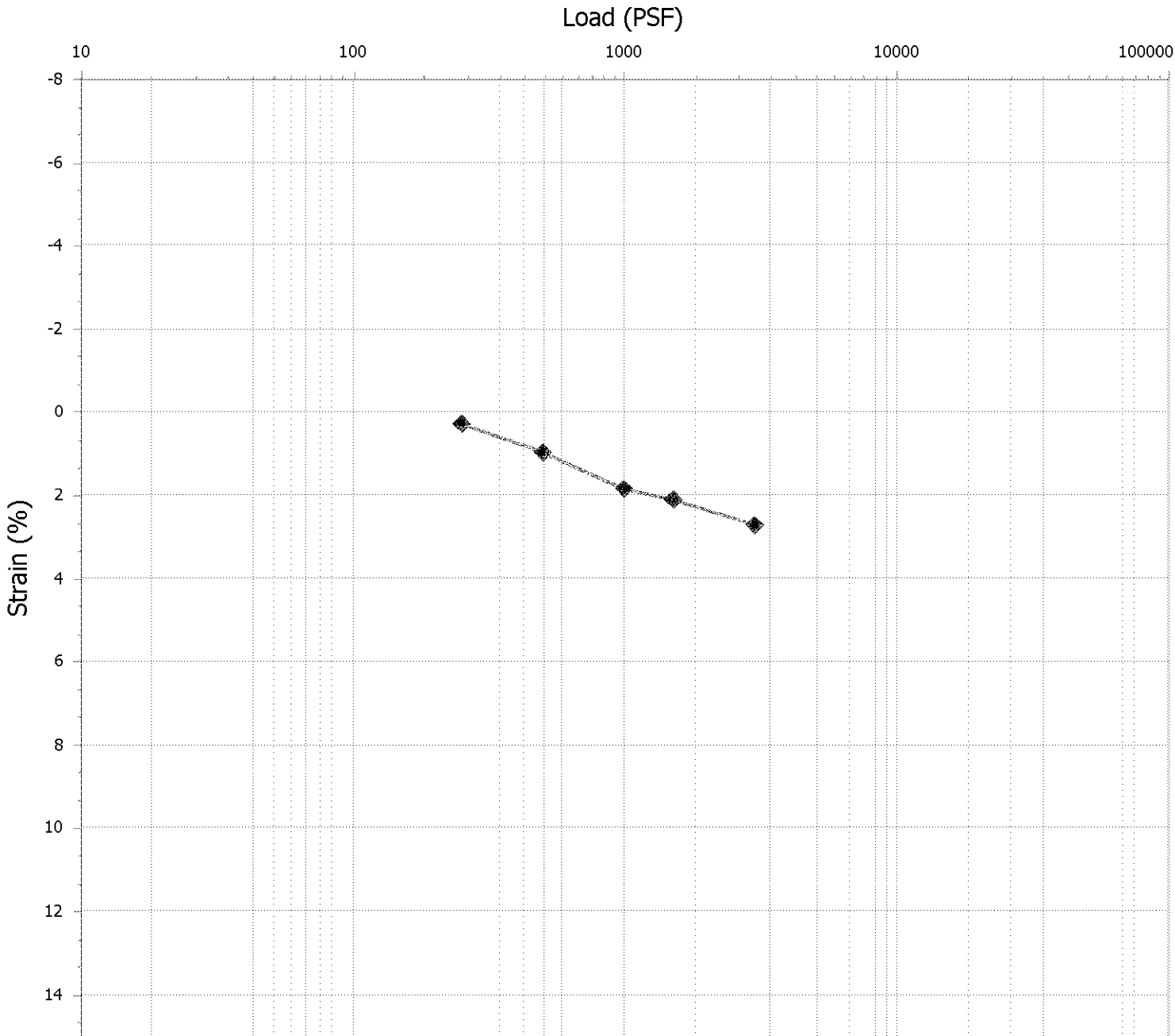
Received: 3/26/2018 Sampled: 3/23/2018

Material: Geo Samples - Native

Sampled By: Spencer Drenth

Material Source: On-site

Submitted By: _____



Source: B23 - Rings 5'

Moisture Content: 16.5 %

Sample Type: Undisturbed

Dry Unit Weight: 103.3 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: kgrossarth



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182247

Job ID #: 7649

Received: 3/26/2018 Sampled: 3/23/2018

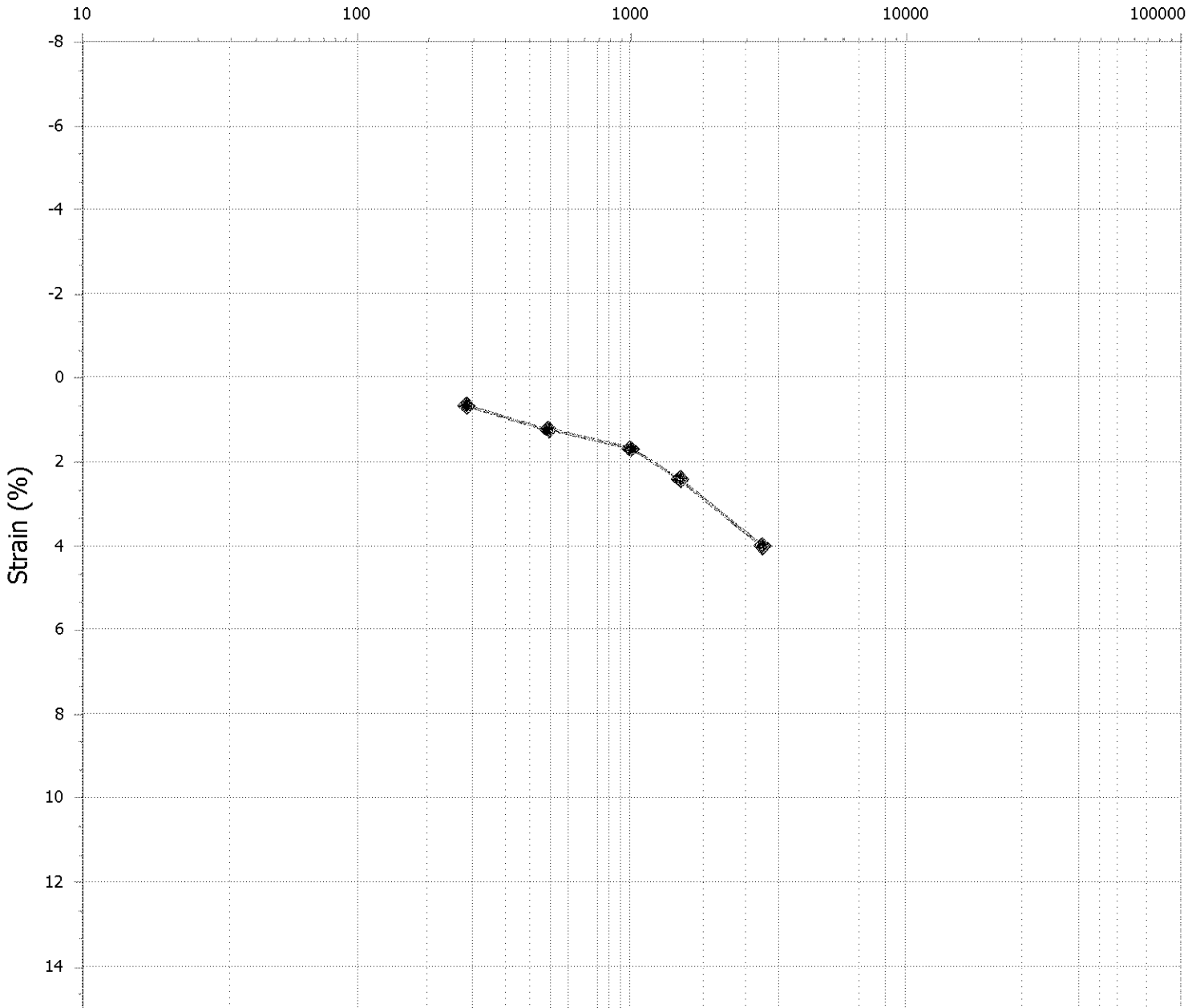
Material: Geo Samples - Native

Sampled By: Spencer Drenth

Material Source: On-site

Submitted By: _____

Load (PSF)



Source: B29 - Rings 1.5'

Moisture Content: 26.7 %

Sample Type: Undisturbed

Dry Unit Weight: 94.4 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: kgrossarth



Consolidation

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Lab Number: 182248

Job ID #: 7649

Received: 3/26/2018 Sampled: 3/23/2018

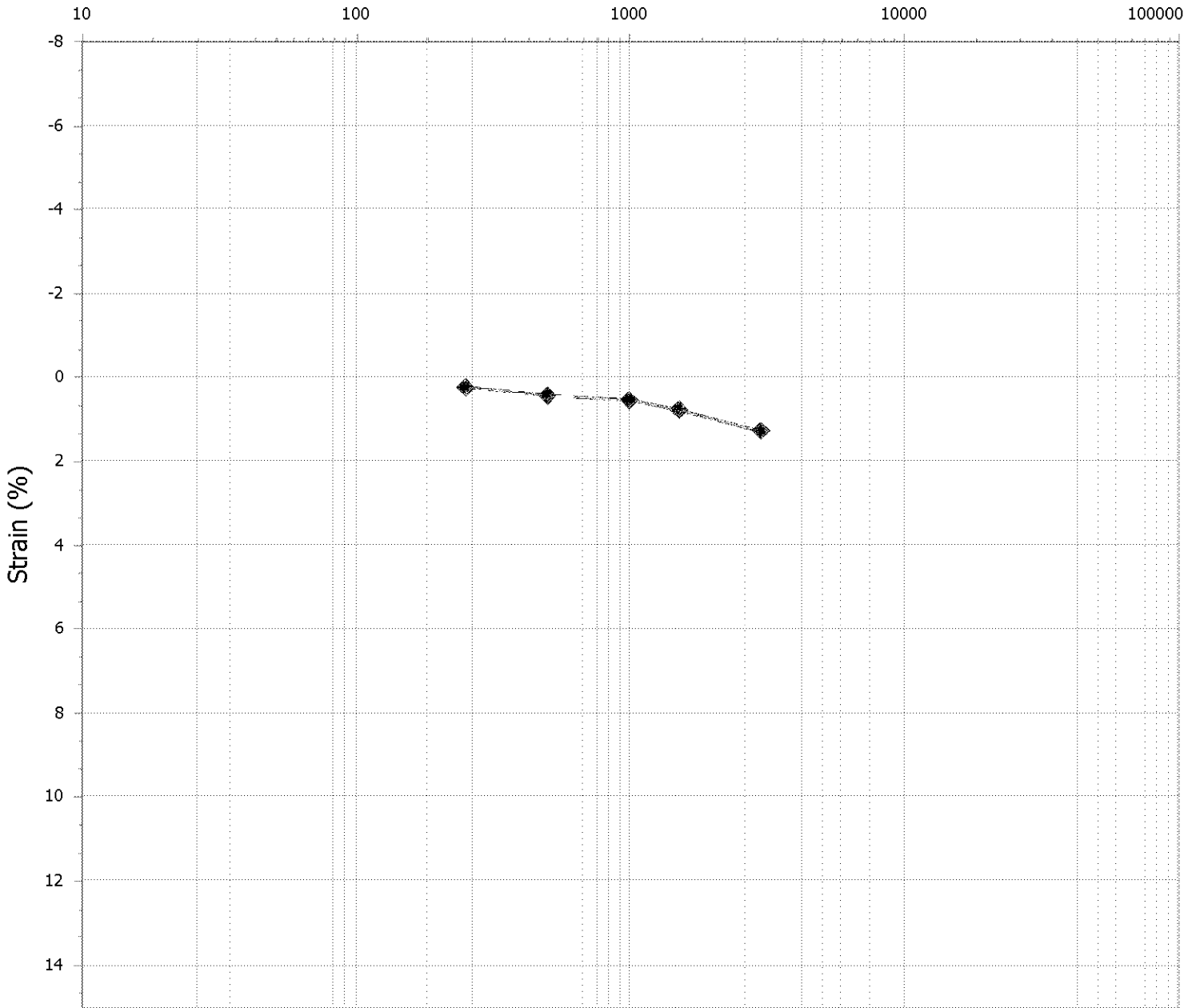
Material: Geo Samples - Native

Sampled By: Spencer Drenth

Material Source: On-site

Submitted By: _____

Load (PSF)



Source: B29 - Rings 5'

Moisture Content: 17.0 %

Sample Type: Undisturbed

Dry Unit Weight: 102.5 lb/ft³

Load at Saturation: 500 PSF

Remarks:

Reviewed By: kgrossarth



ProTeX the PT Xperts LLC
 1102 W. Southern Ave., Ste. 4 Office: (602)-272-7891
 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B1 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182015 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	28
Plastic Limit	16
Plasticity Index	12

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	94		
#100	87		
#200	78		

Remarks:

Reviewed By:
 Kip Grossarth



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 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B1 (5-7')

ProTeX Job No: 7649
 ProTeX Lab No: 182016 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	40
Plastic Limit	22
Plasticity Index	18

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	9

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	99		
#4	91		
#10	85		
#40	81		
#100	76		
#200	71		

Remarks:

Reviewed By:
 Kip Grossarth



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 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B1 (10-12')

ProTeX Job No: 7649
 ProTeX Lab No: 182017 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	39
Plastic Limit	18
Plasticity Index	21

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	4

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	96		
#10	94		
#40	92		
#100	88		
#200	81		

Remarks:

Reviewed By:
 Kip Grossarth



ProTeX the PT Xperts LLC
 1102 W. Southern Ave., Ste. 4 Office: (602)-272-7891
 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B2 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182018 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	16
Plasticity Index	9

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 39
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

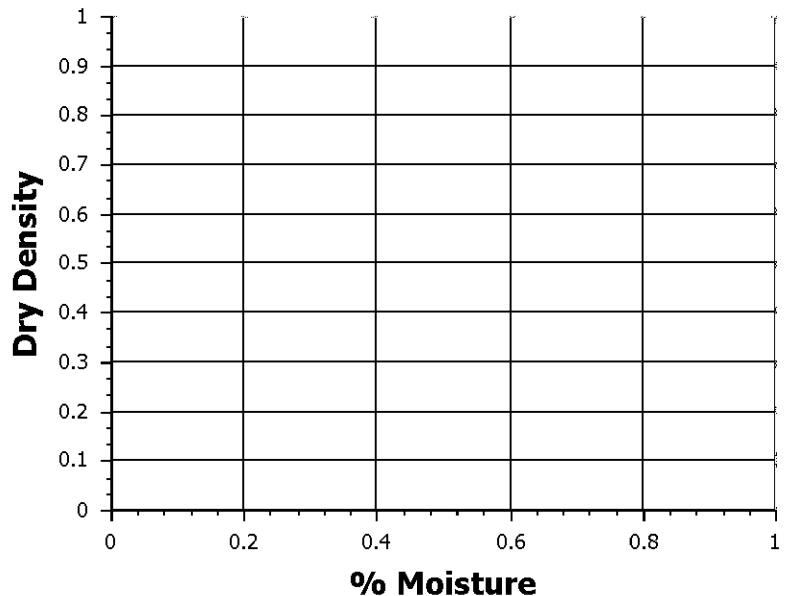
AASHTO T272	
Moisture Density (Proctor)	
Max. Dry Density	108.9
Opt. Moisture %	17.2
Corr. Max. Dry Density	109.3
Corr. Opt. Moisture %	17.0
% Rock	1

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	99		
#10	99		
#40	97		
#100	92		
#200	80		

Moisture Vs. Density



Remarks:

Reviewed By:

Jerald W Grossarth



ProTeX the PT Xperts LLC
 1102 W. Southern Ave., Ste. 4 Office: (602)-272-7891
 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B3 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182019 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	NV
Plastic Limit	NP
Plasticity Index	NP

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

Class: Silt with sand
 Symbol: ML

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	99		
#100	93		
#200	79		

Remarks:

Reviewed By:


 Jerald W Grossarth



ProTeX the PT Xperts LLC
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 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B3 (5-7')

ProTeX Job No: 7649
 ProTeX Lab No: 182020 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	40
Plastic Limit	18
Plasticity Index	22

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 75
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	13

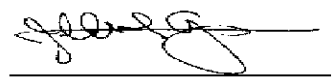
Class: Lean clay with gravel
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	98		
#4	87		
#10	83		
#40	81		
#100	79		
#200	77		

Remarks:

Reviewed By:


 Jerald W Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B4 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182021 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	28
Plastic Limit	16
Plasticity Index	12

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	100		
#100	99		
#200	90		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B4 (6-8')

ProTeX Job No: 7649
 ProTeX Lab No: 182022 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	37
Plastic Limit	26
Plasticity Index	11

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	4

Class: Silt with sand
 Symbol: ML

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	96		
#10	90		
#40	82		
#100	78		
#200	75		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B6 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182023 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	42
Plastic Limit	19
Plasticity Index	23

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	3

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	97		
#10	96		
#40	94		
#100	88		
#200	79		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B7 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182024 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	18
Plasticity Index	5

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

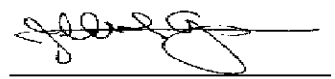
Class: Silty clay with sand
 Symbol: CL-ML

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	99		
#100	97		
#200	82		

Remarks:

Reviewed By:



 Jerald W Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B9 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182025 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	27
Plastic Limit	15
Plasticity Index	12

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	99		
#100	91		
#200	78		

Remarks:

Reviewed By: *Kip Grossarth*
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B10 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182026 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	37
Plastic Limit	19
Plasticity Index	18

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 70
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

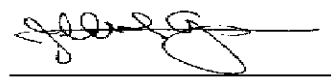
Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	99		
#10	99		
#40	99		
#100	97		
#200	90		

Remarks:

Reviewed By:


 Jerald W Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B10 (5-7)

ProTeX Job No: 7649
 ProTeX Lab No: 182027 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	NV
Plastic Limit	NP
Plasticity Index	NP

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

Class: Silt
 Symbol: ML

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	99		
#4	98		
#10	97		
#40	96		
#100	95		
#200	91		

Remarks:

Reviewed By:

Jerald W Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B11 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182028 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	31
Plastic Limit	17
Plasticity Index	14

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	99		
#100	96		
#200	88		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B11 (5-7)

ProTeX Job No: 7649
 ProTeX Lab No: 182029 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	28
Plastic Limit	23
Plasticity Index	5

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	5

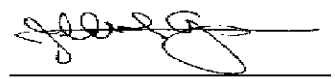
Class: Silt
 Symbol: ML

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	98		
#4	95		
#10	94		
#40	92		
#100	91		
#200	89		

Remarks:

Reviewed By:



 Jerald W Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B13 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182030 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	28
Plastic Limit	15
Plasticity Index	13

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	100		
#100	99		
#200	95		

Remarks:

Reviewed By:
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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B14 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182031 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	30
Plastic Limit	17
Plasticity Index	13

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

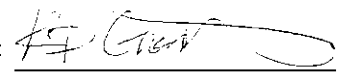
Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	100		
#100	99		
#200	93		

Remarks:

Reviewed By: 
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B14 (6-8')

ProTeX Job No: 7649
 ProTeX Lab No: 182032 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	36
Plastic Limit	25
Plasticity Index	11

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	21

Class: Gravelly silt with sand
 Symbol: ML

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	87		
#4	79		
#10	75		
#40	72		
#100	67		
#200	63		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B15 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182033 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	41
Plastic Limit	20
Plasticity Index	21

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	99		
#100	99		
#200	98		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B16 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182034 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	22
Plastic Limit	17
Plasticity Index	5

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 30
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

Class: Silty clay with sand
 Symbol: CL-ML

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	97		
#100	91		
#200	75		

Remarks:

Reviewed By:
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 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B16 (5-7)

ProTeX Job No: 7649
 ProTeX Lab No: 182035 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	28
Plastic Limit	19
Plasticity Index	9

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	5

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	98		
#4	95		
#10	94		
#40	93		
#100	90		
#200	79		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B18 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182036 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	37
Plastic Limit	25
Plasticity Index	12

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	11

Class: Silt with gravel
 Symbol: ML

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	94		
#4	89		
#10	86		
#40	84		
#100	81		
#200	78		

Remarks:

Reviewed By:

Jerald W Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B19 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182037 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	39
Plastic Limit	20
Plasticity Index	19

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

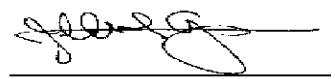
Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	99		
#100	98		
#200	94		

Remarks:

Reviewed By:



 Jerald W Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples (Native - Onsite)
 Material Supplier: -
 Sample Location: B20 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182038 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	43
Plastic Limit	20
Plasticity Index	23

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Lean clay
 Symbol: CL

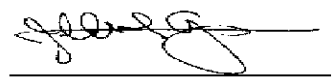
Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	3

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	99		
#4	97		
#10	96		
#40	96		
#100	95		
#200	93		

Remarks:

Reviewed By:



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B21 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182223 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	29
Plastic Limit	17
Plasticity Index	12

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

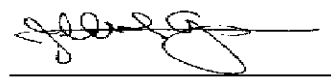
Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	99		
#100	98		
#200	90		

Remarks:

Reviewed By:



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B21 (6-8')

ProTeX Job No: 7649
 ProTeX Lab No: 182224 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	28
Plastic Limit	21
Plasticity Index	7

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	8

Class: Silty clay with sand
 Symbol: CL-ML

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	99		
#4	92		
#10	89		
#40	84		
#100	83		
#200	80		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B21 (13-15')

ProTeX Job No: 7649
 ProTeX Lab No: 182225 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	29
Plastic Limit	18
Plasticity Index	11

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	4

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	96		
#10	93		
#40	88		
#100	87		
#200	71		

Remarks:

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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B21 (23-25')

ProTeX Job No: 7649
 ProTeX Lab No: 182226 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	NV
Plastic Limit	NP
Plasticity Index	NP

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

Class: Silty sand
 Symbol: SM

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	98		
#100	73		
#200	47		

Remarks:

Reviewed By: *Kip Grossarth*
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B22 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182227 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	38
Plastic Limit	19
Plasticity Index	19

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	99		
#100	99		
#200	97		

Remarks:

Reviewed By:
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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B22 (5-7')

ProTeX Job No: 7649
 ProTeX Lab No: 182228 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	31
Plastic Limit	21
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	98		
#10	96		
#40	94		
#100	92		
#200	87		

Remarks:

Reviewed By:
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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B23 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182229 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	28
Plastic Limit	17
Plasticity Index	11

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	6

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	99		
#4	94		
#10	91		
#40	86		
#100	79		
#200	72		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B23 (8-10')

ProTeX Job No: 7649
 ProTeX Lab No: 182230 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	NV
Plastic Limit	NP
Plasticity Index	NP

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	14

Class: Silt with gravel
 Symbol: ML

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	94		
#4	86		
#10	84		
#40	81		
#100	80		
#200	75		

Remarks:

Reviewed By: *[Signature]*
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B24 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182231 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	41
Plastic Limit	21
Plasticity Index	20

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 81
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	98		
#10	97		
#40	97		
#100	96		
#200	95		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B24 (3-5')

ProTeX Job No: 7649
 ProTeX Lab No: 182232 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	36
Plastic Limit	19
Plasticity Index	17

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	98		
#10	98		
#40	98		
#100	98		
#200	97		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B25 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182233 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	31
Plastic Limit	19
Plasticity Index	12

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 68
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	3

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	97		
#10	96		
#40	96		
#100	96		
#200	92		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B25 (13-15')

ProTeX Job No: 7649
 ProTeX Lab No: 182234 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	36
Plastic Limit	18
Plasticity Index	18

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	99		
#10	99		
#40	97		
#100	91		
#200	86		

Remarks:

Reviewed By:
 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B26 (0-3)

ProTeX Job No: 7649
 ProTeX Lab No: 182235 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	15
Plasticity Index	10

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	4

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	98		
#4	96		
#10	95		
#40	92		
#100	81		
#200	75		

Remarks:

Reviewed By: *Kip Grossarth*
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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B26 (6-8')

ProTeX Job No: 7649
 ProTeX Lab No: 182236 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	NV
Plastic Limit	NP
Plasticity Index	NP

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Silt with sand
 Symbol: ML

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	10

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	99		
#4	90		
#10	87		
#40	82		
#100	80		
#200	72		

Remarks:

Reviewed By:
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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B27 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182237 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	29
Plastic Limit	18
Plasticity Index	11

ASTM D4829		
Expansion Index, (EI)	Potential Expansion	Expansion Index EI = 45
0 - 20	Very Low	
21 - 51	Low	
52 - 90	Medium	
91 - 130	High	
> 130	Very High	

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	99		
#10	99		
#40	99		
#100	98		
#200	93		

Remarks:

Reviewed By:
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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B27 (4-6')

ProTeX Job No: 7649
 ProTeX Lab No: 182238 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	30
Plastic Limit	19
Plasticity Index	11

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	99		
#100	99		
#200	98		

Remarks:

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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B27 (13-15')

ProTeX Job No: 7649
 ProTeX Lab No: 182239 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	38
Plastic Limit	19
Plasticity Index	19

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	99		
#10	98		
#40	97		
#100	96		
#200	92		

Remarks:

Reviewed By:
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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B28 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182240 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	36
Plastic Limit	20
Plasticity Index	16

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

Class: Lean clay
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	99		
#10	99		
#40	98		
#100	96		
#200	93		

Remarks:

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 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B28 (7-9')

ProTeX Job No: 7649
 ProTeX Lab No: 182241 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	NV
Plastic Limit	NP
Plasticity Index	NP

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	6

Class: Silt with sand
 Symbol: ML

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	97		
#4	94		
#10	91		
#40	89		
#100	88		
#200	79		

Remarks:

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 Kip Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B29 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182242 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	36
Plastic Limit	20
Plasticity Index	16

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	99		
#40	99		
#100	99		
#200	95		

Remarks:

Reviewed By:
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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B29 (8-10')

ProTeX Job No: 7649
 ProTeX Lab No: 182243 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	20
Plasticity Index	3

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Silt with sand
 Symbol: ML

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	3

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	97		
#10	96		
#40	96		
#100	90		
#200	71		

Remarks:

Reviewed By:
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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Geo Samples - Native (On-site)
 Material Supplier: -
 Sample Location: B30 (0-3')

ProTeX Job No: 7649
 ProTeX Lab No: 182244 - Phoenix
 Date Received: 3/26/2018
 Sampled By: Spencer Drenth
 Date Sampled: 3/23/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	33
Plastic Limit	20
Plasticity Index	13

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Lean clay
 Symbol: CL

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	1

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	99		
#10	99		
#40	99		
#100	98		
#200	95		

Remarks:

Reviewed By:
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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Pavement Verification - Native (On-site)
 Material Supplier: -
 Sample Location: BC1 (0-5')

ProTeX Job No: 7649
 ProTeX Lab No: 182056 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	47
Plastic Limit	22
Plasticity Index	25

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	3.2
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

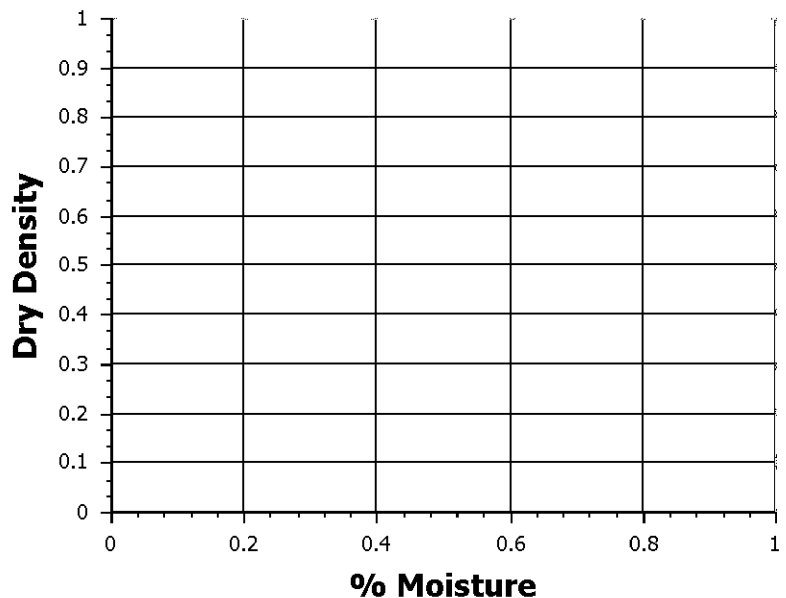
Class: Lean clay
 Symbol: CL

AASHTO T272	
Moisture Density (Proctor)	
Max. Dry Density	94.7
Opt. Moisture %	24.4
Corr. Max. Dry Density	94.8
Corr. Opt. Moisture %	24.3
% Rock	0

* = out of specification

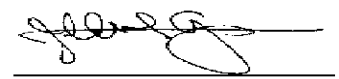
AASHTO T11/T27			
Sieve	% Pass	Specs	*
3"	100		
2-1/2"	100		
2"	100		
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	100		
3/8"	100		
1/4"	100		
#4	100		
#8	99		
#10	99		
#16	99		
#30	99		
#40	98		
#50	97		
#100	94		
#200	91		

Moisture Vs. Density



Remarks:

Reviewed By:


 Jerald W Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Pavement Verification - Native (On-site)
 Material Supplier: -
 Sample Location: BC2 (0-5')

ProTeX Job No: 7649
 ProTeX Lab No: 182055 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	21
Plastic Limit	15
Plasticity Index	6

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Sandy silty clay
 Symbol: CL-ML

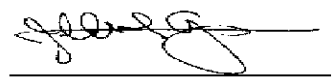
Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	4

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
3"	100		
2-1/2"	100		
2"	100		
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	98		
3/8"	98		
1/4"	97		
#4	96		
#8	92		
#10	91		
#16	89		
#30	85		
#40	82		
#50	78		
#100	63		
#200	52		

Remarks:

Reviewed By:



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Pavement Verification - Native (On-site)
 Material Supplier: -
 Sample Location: BC3 (0-5')

ProTeX Job No: 7649
 ProTeX Lab No: 182054 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	33
Plastic Limit	17
Plasticity Index	16

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Lean clay
 Symbol: CL

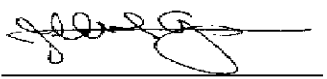
Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	NV

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
3"	100		
2-1/2"	100		
2"	100		
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	100		
3/8"	100		
1/4"	100		
#4	100		
#8	100		
#10	100		
#16	100		
#30	99		
#40	99		
#50	99		
#100	97		
#200	93		

Remarks:

Reviewed By:



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Pavement Verification - Native (On-site)
 Material Supplier: -
 Sample Location: BC4 (0-5')

ProTeX Job No: 7649
 ProTeX Lab No: 182053 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	40
Plastic Limit	24
Plasticity Index	16

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	5

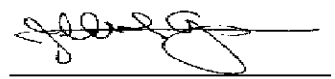
Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
3"	100		
2-1/2"	100		
2"	100		
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	98		
3/8"	98		
1/4"	96		
#4	95		
#8	87		
#10	87		
#16	86		
#30	84		
#40	84		
#50	83		
#100	81		
#200	79		

Remarks:

Reviewed By:


 Jerald W Grossarth



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Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Pavement Verification - Native (On-site)
 Material Supplier: -
 Sample Location: BC5 (0-5')

ProTeX Job No: 7649
 ProTeX Lab No: 182052 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	28
Plastic Limit	16
Plasticity Index	12

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	3.8
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

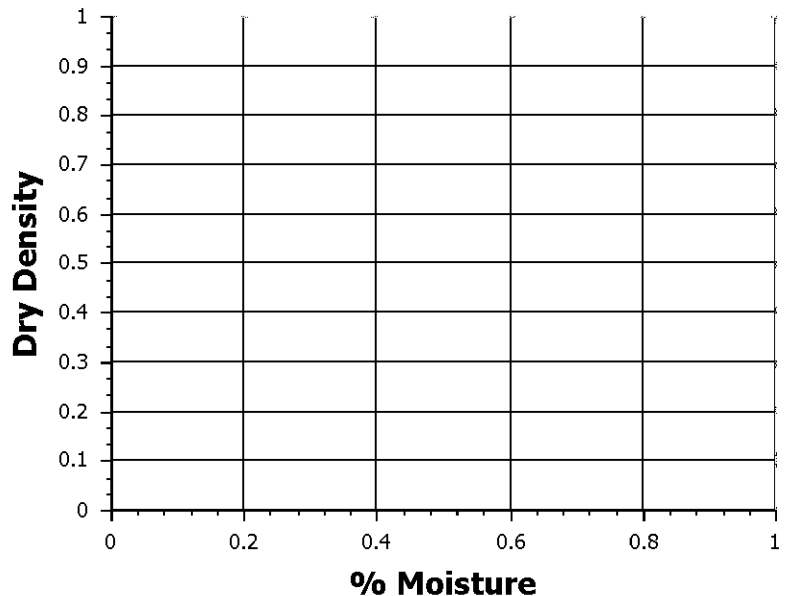
AASHTO T272	
Moisture Density (Proctor)	
Max. Dry Density	100.8
Opt. Moisture %	21.1
Corr. Max. Dry Density	101.4
Corr. Opt. Moisture %	20.8
% Rock	1

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
3"	100		
2-1/2"	100		
2"	100		
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	100		
3/8"	100		
1/4"	99		
#4	99		
#8	96		
#10	96		
#16	96		
#30	95		
#40	95		
#50	94		
#100	90		
#200	82		

Moisture Vs. Density



Remarks:

Reviewed By:

Jerald W Grossarth



ProTeX the PT Xperts LLC
 1102 W. Southern Ave., Ste. 4 Office: (602)-272-7891
 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Pavement Verification - Native (On-site)
 Material Supplier: -
 Sample Location: BC6 (0-5')

ProTeX Job No: 7649
 ProTeX Lab No: 182051 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	23
Plastic Limit	16
Plasticity Index	7

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Class: Silty clay with sand
 Symbol: CL-ML

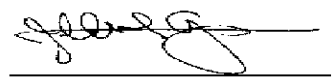
Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	2

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
3"	100		
2-1/2"	100		
2"	100		
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	100		
3/8"	99		
1/4"	99		
#4	98		
#8	96		
#10	96		
#16	96		
#30	95		
#40	95		
#50	93		
#100	88		
#200	76		

Remarks:

Reviewed By:



 Jerald W Grossarth



ProTeX the PT Xperts LLC
 1102 W. Southern Ave., Ste. 4 Office: (602)-272-7891
 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Pavement Verification - Native (On-site)
 Material Supplier: -
 Sample Location: BC7 (0-5')

ProTeX Job No: 7649
 ProTeX Lab No: 182050 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	33
Plastic Limit	21
Plasticity Index	12

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	8

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
3"	100		
2-1/2"	100		
2"	100		
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	99		
3/8"	97		
1/4"	94		
#4	92		
#8	90		
#10	90		
#16	89		
#30	88		
#40	88		
#50	87		
#100	83		
#200	74		

Remarks:

Reviewed By:

Jerald W Grossarth



ProTeX the PT Xperts LLC
 1102 W. Southern Ave., Ste. 4 Office: (602)-272-7891
 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Pavement Verification - Native (On-site)
 Material Supplier: -
 Sample Location: BC8 (0-5')

ProTeX Job No: 7649
 ProTeX Lab No: 182049 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	25
Plastic Limit	16
Plasticity Index	9

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	0

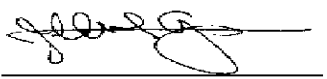
Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
3"	100		
2-1/2"	100		
2"	100		
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	100		
3/8"	100		
1/4"	100		
#4	100		
#8	98		
#10	98		
#16	98		
#30	98		
#40	98		
#50	97		
#100	93		
#200	77		

Remarks:

Reviewed By:



 Jerald W Grossarth



ProTeX the PT Xperts LLC
 1102 W. Southern Ave., Ste. 4 Office: (602)-272-7891
 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Pavement Verification - Native (On-site)
 Material Supplier: -
 Sample Location: BC9 (0-5')

ProTeX Job No: 7649
 ProTeX Lab No: 182048 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	45
Plastic Limit	19
Plasticity Index	26

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	3.6
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

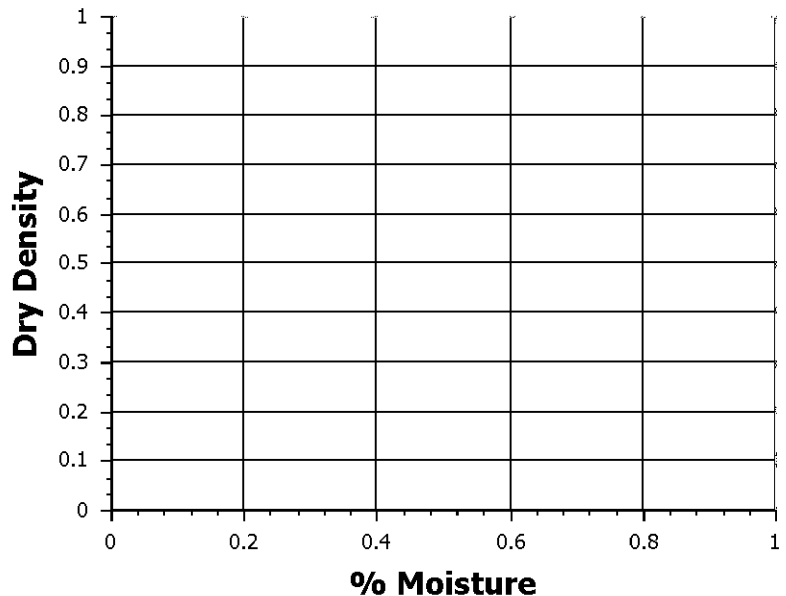
AASHTO T272-A	
Moisture Density (Proctor)	
Max. Dry Density	97.7
Opt. Moisture %	22.6
Corr. Max. Dry Density	97.8
Corr. Opt. Moisture %	22.5
% Rock	NV

Class: Fat clay
 Symbol: CH

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
1"	100		
1/2"	100		
#4	100		
#10	100		
#40	99		
#100	99		
#200	96		

Moisture Vs. Density



Remarks:

Reviewed By:

Jerald W Grossarth



ProTeX the PT Xperts LLC
 1102 W. Southern Ave., Ste. 4 Office: (602)-272-7891
 Tempe, AZ 85282 Fax: (602) 272-7892

Soils Summary

Client: Brookfield Residential (Arizona)
 Project Name: Lakin Ranch
 Job Name: Phase 1
 Material: Pavement Verification - Native (On-site)
 Material Supplier: -
 Sample Location: BC10 (0-5')

ProTeX Job No: 7649
 ProTeX Lab No: 182047 - Phoenix
 Date Received: 3/19/2018
 Sampled By: Thomas M Perkins
 Date Sampled: 3/14/2018
 Submitted By: _____

AASHTO T89/T90	
Plasticity Index	
Liquid Limit	36
Plastic Limit	22
Plasticity Index	14

Expansion Index, (EI)	Potential Expansion
0 - 20	Very Low
21 - 51	Low
52 - 90	Medium
91 - 130	High
> 130	Very High

Expansion Index	
EI =	NA

Percent Swell of Soil	
% Swell	NV
Notes:	

pH and Resistivity	
pH Reading:	NA
Resistivity (ohms-cm)	NA

Moisture Density (Proctor)	
Max. Dry Density	NV
Opt. Moisture %	NV
Corr. Max. Dry Density	NV
Corr. Opt. Moisture %	NV
% Rock	8

Class: Lean clay with sand
 Symbol: CL

* = out of specification

AASHTO T11/T27			
Sieve	% Pass	Specs	*
3"	100		
2-1/2"	100		
2"	100		
1-1/2"	100		
1"	100		
3/4"	100		
1/2"	98		
3/8"	96		
1/4"	93		
#4	92		
#8	82		
#10	82		
#16	81		
#30	81		
#40	81		
#50	81		
#100	80		
#200	77		

Remarks:

Reviewed By:

Jerald W Grossarth



Summary of Laboratory Test Results Potential for Corrosion

Client: Brookfield Residential (Ar Builder: Brookfield Residential (Ar Project Name: Lakin Ranch

Job Name: Phase 1

Job ID #: 7649

ProTeX Lab#	Location	Depth	Material Type	Sample Date	Sulfate (SO4) (ppm)	Chloride (CL) (ppm)	Soluble Salts (ppm)	Minimum Resistivity (ohms-cm)	pH	Oxidation- Reduction Potential of Water (mV)
182015	B1	0-3'	Geo Samples	3/14/2018	113	40				
182023	B6	0-3'	Geo Samples	3/14/2018	105	26				
182029	B11	5-7'	Geo Samples	3/14/2018	34	45				
182035	B16	5-7'	Geo Samples	3/14/2018	84	117				
182223	B21	0-3'	Geo Samples - Native	3/23/2018	64	29				
182235	B26	0-3'	Geo Samples - Native	3/23/2018	90	31				

LABORATORY SERVICES REPORT



Report Number: 65151173.0025
Service Date: 03/19/18
Report Date: 03/19/18
Task:

4685 S Ash Ave Ste H-4
Tempe, AZ 85282-6767
480-897-8200

Client

ProTeX
Attn: Jeff Ritter
1102 W. Southern Ave, Ste. 4
Tempe, AZ 85282

Project

ProTeX
In House - Terracon Tempe Lab
Tempe, AZ

Project No. 65151173

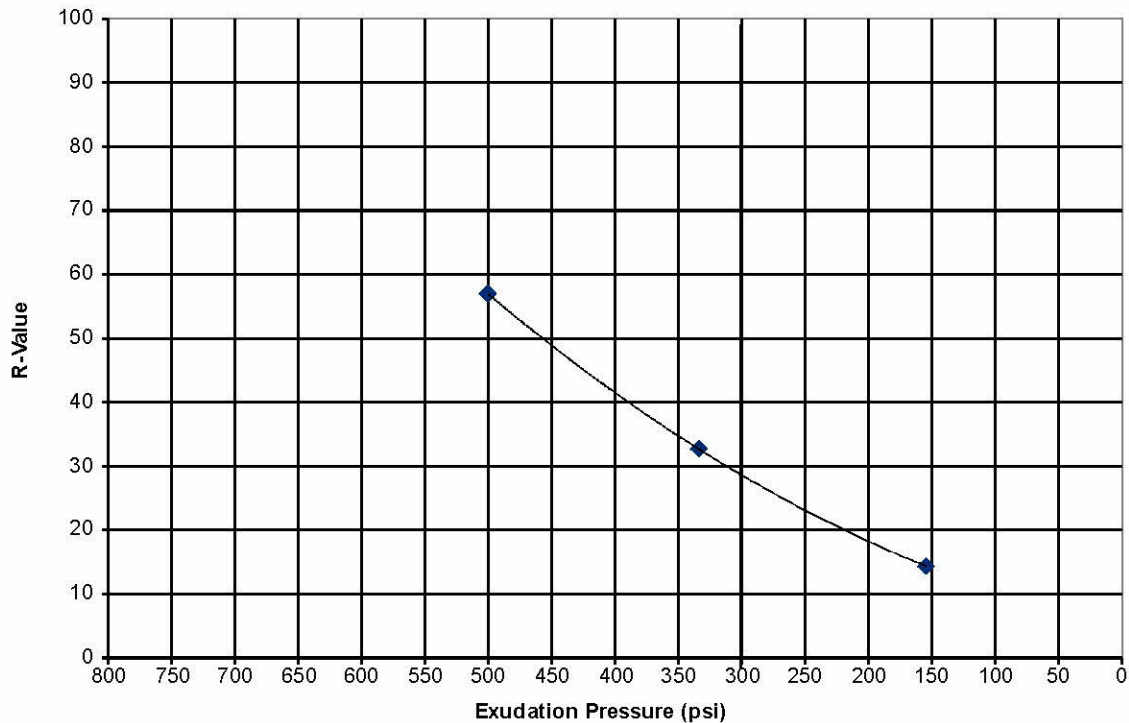
Material Description: Sandy Silty Clay
Sample Location: BC-2
Lab Number: 1403

Sample Source: #BC2468

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	14.5%	12.7%	11.8%
Compaction Pressure (psi)	75	150	350
Specimen Height (inches)	2.48	2.44	2.47
Dry Density (pcf)	121.8	125.1	126.4
Horiz. Pres. @ 1000lbs (psi)	51.0	24.0	22.0
Horiz. Pres. @ 2000lbs (psi)	117.0	80.0	49.0
Displacement	5.44	4.83	4.26
Expansion Pressure (psi)	0.0	0.0	0.0
Exudation Pressure (psi)	155	334	501
R Value	14	33	57

R-Value:
29



Services:

Terracon Rep:

Reported To:

Contractor:

Report Distribution

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(1) ProTeX, Engineering Department

Reviewed By:

Clifford Metz

Laboratory Manager

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

LABORATORY SERVICES REPORT

Report Number: 65151173.0025
Service Date: 03/19/18
Report Date: 03/19/18
Task:



4685 S Ash Ave Ste H-4
Tempe, AZ 85282-6767
480-897-8200

Client

ProTeX
Attn: Jeff Ritter
1102 W. Southern Ave, Ste. 4
Tempe, AZ 85282

Project

ProTeX
In House - Terracon Tempe Lab
Tempe, AZ

Project No. 65151173

Material Description: Silty Fat Clay

Sample Location: BC-4

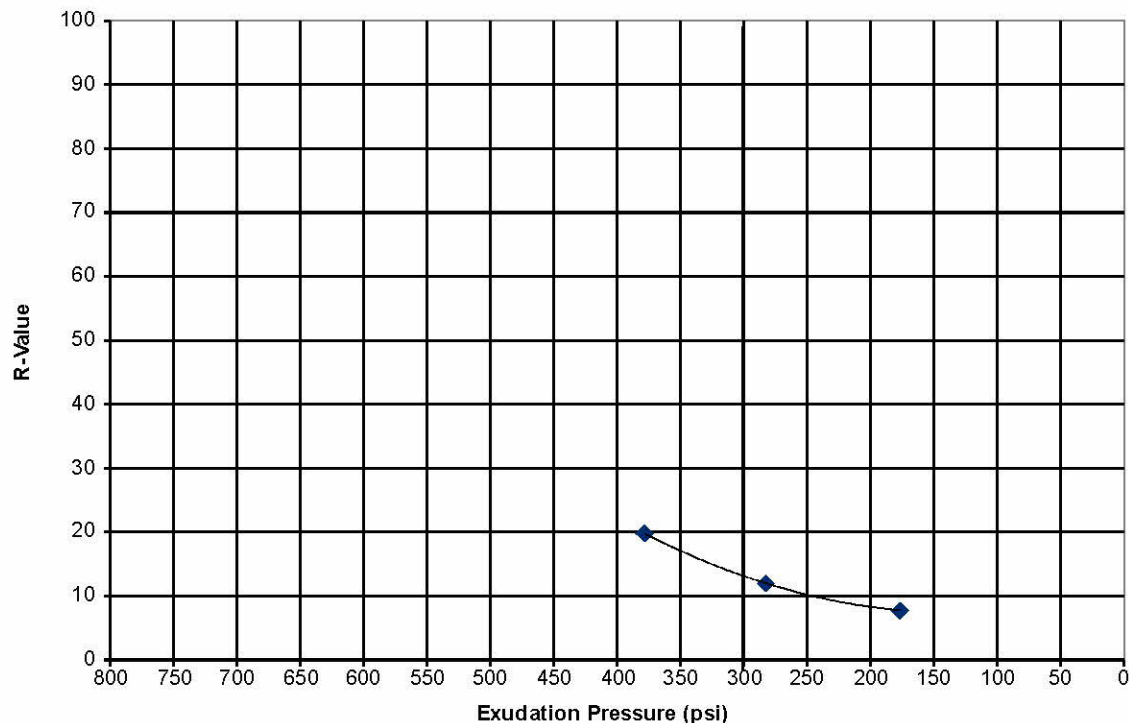
Lab Number: 1403

Sample Source: #BC2468

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	31.0%	27.9%	25.8%
Compaction Pressure (psi)	*	75	125
Specimen Height (inches)	2.66	2.47	2.48
Dry Density (pcf)	92.9	97.2	101.0
Horiz. Pres. @ 1000lbs (psi)	65.0	46.0	43.0
Horiz. Pres. @ 2000lbs (psi)	140.0	130.0	116.0
Displacement	4.92	4.21	3.83
Expansion Pressure (psi)	0.0	0.0	0.8
Exudation Pressure (psi)	177	283	379
R Value	8	12	20

R-Value:
13



Services:

Terracon Rep:

Reported To:

Contractor:

Report Distribution

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(1) ProTeX, Engineering Department

Reviewed By:

Clifford Metz

Laboratory Manager

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LABORATORY SERVICES REPORT



Report Number: 65151173.0025
Service Date: 03/19/18
Report Date: 03/19/18
Task:

4685 S Ash Ave Ste H-4
Tempe, AZ 85282-6767
480-897-8200

Client
ProTeX
Attn: Jeff Ritter
1102 W. Southern Ave, Ste. 4
Tempe, AZ 85282

Project
ProTeX
In House - Terracon Tempe Lab
Tempe, AZ

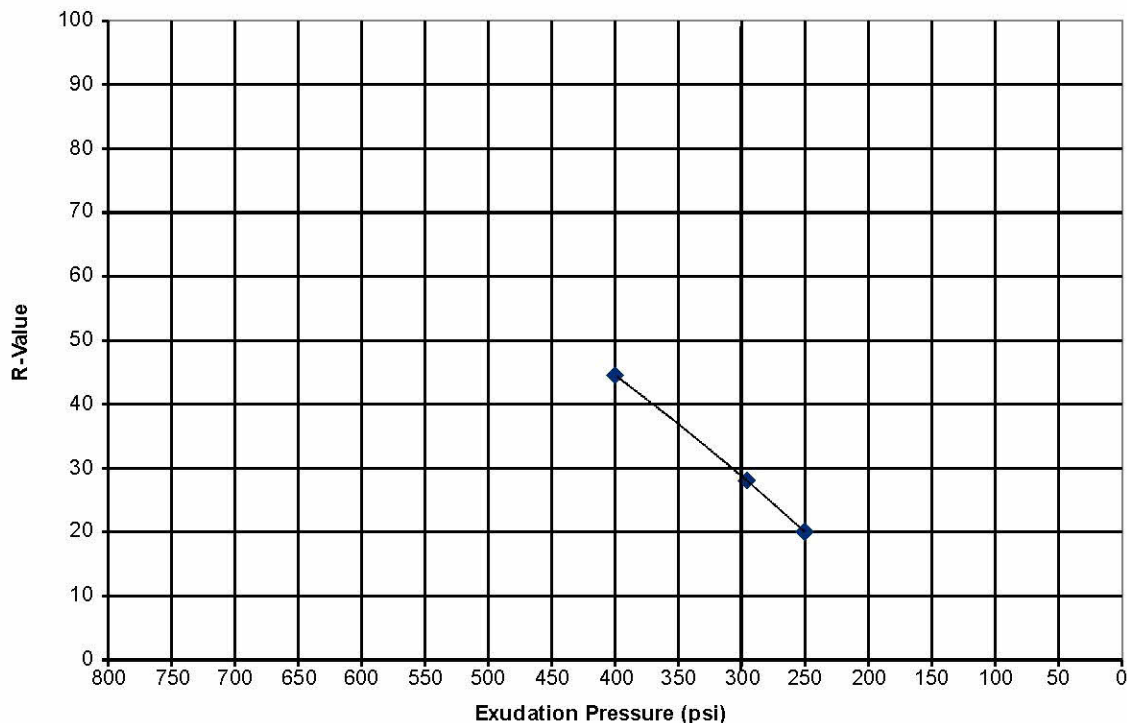
Project No. 65151173

Material Description: Sandy Clayey Silt
Sample Location: BC-6
Lab Number: 1403 Sample Source: #BC2468

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	16.3%	15.4%	14.5%
Compaction Pressure (psi)	75	125	200
Specimen Height (inches)	2.59	2.53	2.49
Dry Density (pcf)	115.2	118.1	120.4
Horiz. Pres. @ 1000lbs (psi)	46.0	39.0	33.0
Horiz. Pres. @ 2000lbs (psi)	112.0	96.0	67.0
Displacement	4.64	4.26	4.30
Expansion Pressure (psi)	0.0	0.0	0.3
Exudation Pressure (psi)	251	296	401
R Value	20	28	45

**R-Value:
29**



Services:
Terracon Rep:
Reported To:
Contractor:

Report Distribution

- (1) ProTeX, Emailed
- (1) ProTeX, Engineering Department

Reviewed By:

Clifford, Metz
Laboratory Manager

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LABORATORY SERVICES REPORT



Report Number: 65151173.0025
Service Date: 03/19/18
Report Date: 03/19/18
Task:

4685 S Ash Ave Ste H-4
Tempe, AZ 85282-6767
480-897-8200

Client

ProTeX
Attn: Jeff Ritter
1102 W. Southern Ave, Ste. 4
Tempe, AZ 85282

Project

ProTeX
In House - Terracon Tempe Lab
Tempe, AZ

Project No. 65151173

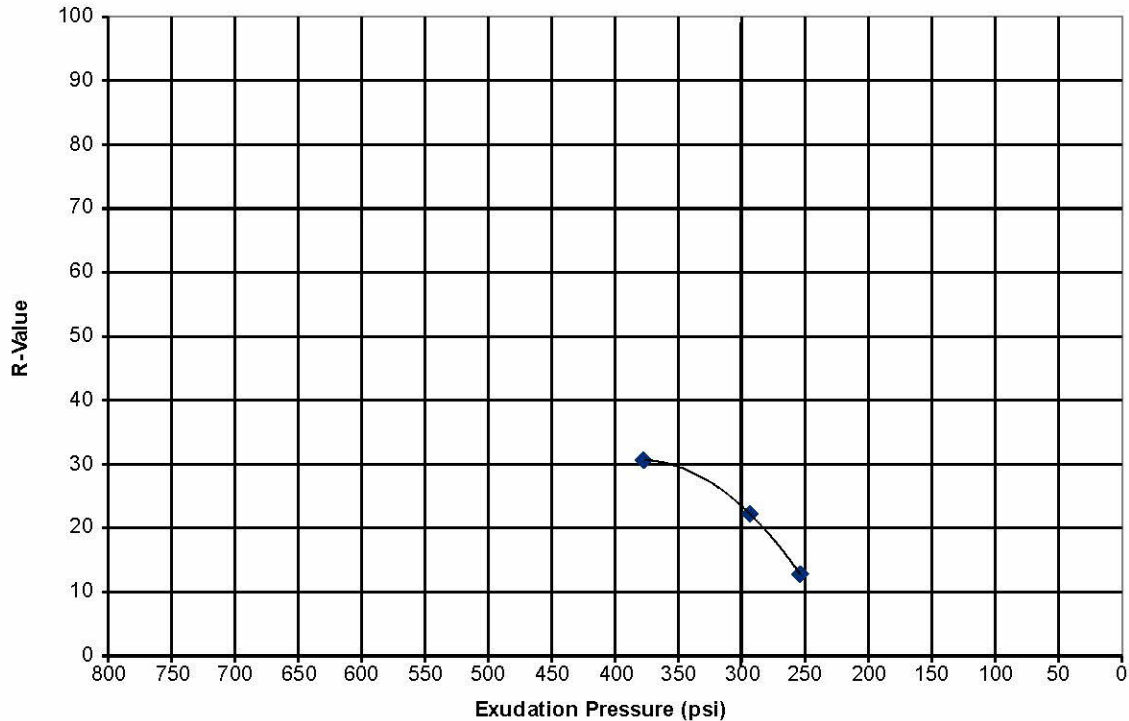
Material Description: Sandy Clayey Silt
Sample Location: BC-8
Lab Number: 1403

Sample Source: #BC2468

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN I. D.	A	B	C
Moisture Content	20.0%	18.1%	17.1%
Compaction Pressure (psi)	25	125	150
Specimen Height (inches)	2.61	2.57	2.51
Dry Density (pcf)	109.9	113.3	116.5
Horiz. Pres. @ 1000lbs (psi)	55.0	46.0	38.0
Horiz. Pres. @ 2000lbs (psi)	129.0	114.0	99.0
Displacement	4.53	3.76	3.48
Expansion Pressure (psi)	0.1	0.0	0.0
Exudation Pressure (psi)	254	294	378
R Value	13	22	31

R-Value:
23



Services:

Terracon Rep:

Reported To:

Contractor:

Report Distribution

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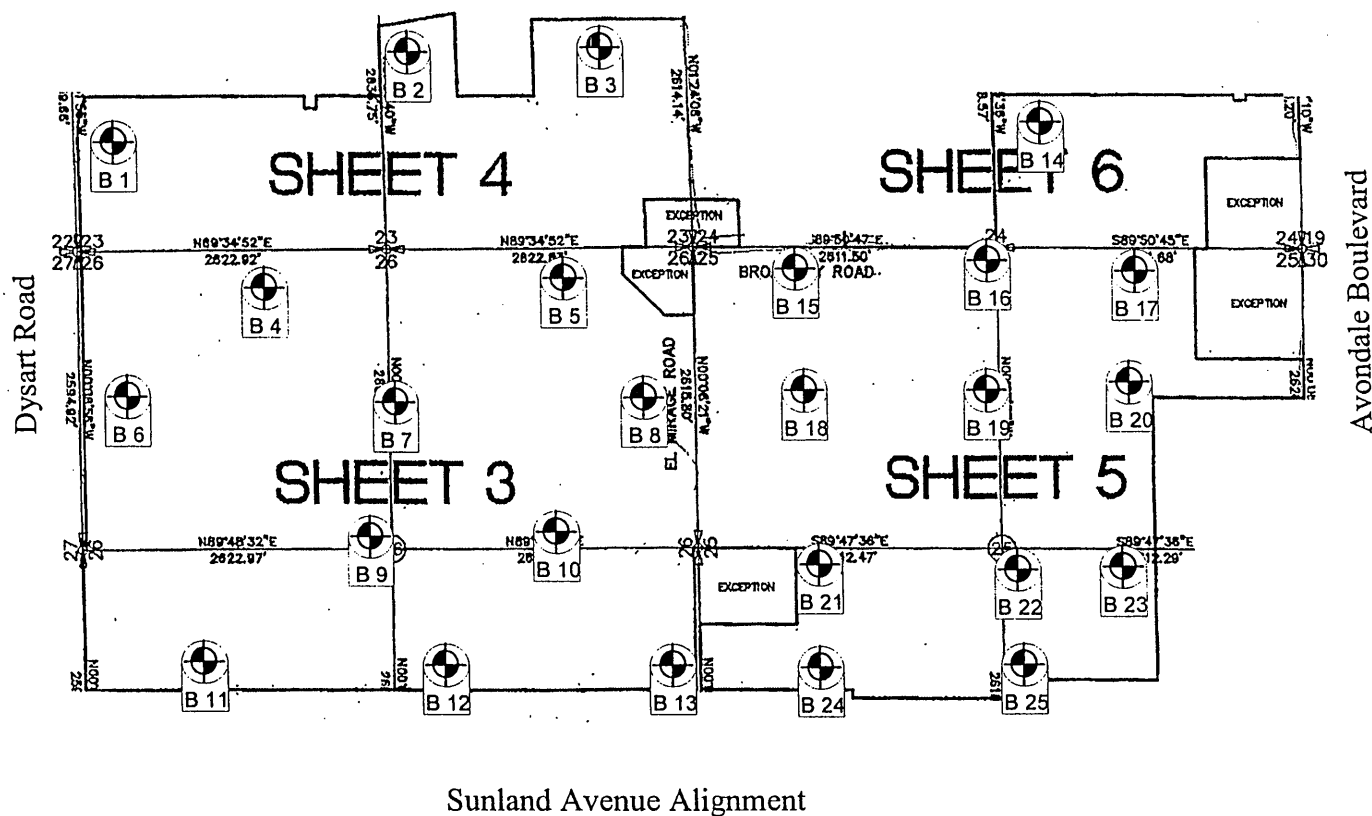
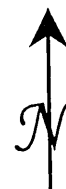
(1) ProTeX, Engineering Department

Reviewed By:

Clifford, Metz

Laboratory Manager

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Legend:



Approximate Test
Hole Location

Site Plan

Scale: N.T.S.

Drawn By: DD

Date: 09/28/2004

Lakin Ranch Property
NWC, Dysart Road and Sunland Avenue
Maricopa County, Arizona



CIT Project No.: 59993

Definition of Terminology

Allowable Soil Bearing Capacity	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
Aggregate Base Course (ABC)	A sand and gravel mixture of specified gradation, used for slab and pavement support.
Backfill	A specified material placed and compacted in a confined area.
Base Course	A layer of specified material placed on a subgrade.
Bench	A horizontal surface in a sloped deposit.
Caisson	A concrete foundation element cased in a circular excavation that may have an enlarged base. Sometimes referred to as a Cast-In-Place Pier.
Concrete Slabs-On-Grade	A concrete surface layer cast directly upon ABC, crushed gravel or subgrade.
Controlled Compacted Fill	Engineered fill. Specific material placed and compacted to specified density and/or moisture conditions under observation of a representative of a soil engineer.
Crushed Gravel	Relatively clean crushed gravel with a small amount of fines.
Differential Settlement	Unequal settlement between or within foundation elements of a structure.
Expansive Potential	The potential of a soil to increase in volume due to the absorption of moisture.
Fill	Materials deposited by the action of man.
Finish Grade	The final grade created as a part of the project.
Heave	Upward movement due to expansion.
Native Grade	The naturally occurring ground surface.
Native Soil	Naturally occurring on-site soil.
Over-Excavate	Vertical zone of soil removal and recompaction required for adequate foundation or slab support.
Rock	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting, or other methods of extraordinary force for excavation.
Scarify	To mechanically loosen soil or break down the existing soil structure.
Settlement	Downward movement of the soil mass and structure due to vertical loading.
Soil	Any unconsolidated material composed of disintegrated vegetable or mineral matter that can be separated by gently mechanical means, such as agitation in water.
Strip	To remove from present location.
Subgrade	Prepared native soil surface.

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No.: B1
Location: See Site Plan

Date: 09/23/2004 **Project No.:** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No.: B2
Location: See Site Plan

1-		Clayey Sand, low-medium PI, damp, tan
2-		Silty Sand, trace gravel, low PI, damp, tan weak cementation below 2.5'
3-	13 N	
4-		Clayey Gravelly Sand, weak cementation, low-medium PI, damp, tan
5-		
6-	63 N	
7-		
8-		
9-		
10-		
11-		
12-		Sandy Clay, weak cementation, thick strata of strong cementation, medium PI, damp, tan
13-		
14-		
15-		Bottom at 15'

1-		Gravelly Clayey Sand, low-medium PI, damp,
2-		
3-	6 N	Gravelly Silty Sand, non plastic-low PI, damp, tan
4-		
5-		
6-	72 N	Clayey Sand, weak cementation, low PI, damp, tan
7-		
8-		
9-		Clayey Sand, trace gravel, low-medium PI, damp, tan
10-		
11-		
12-		
13-		
14-		
15-		Bottom at 15'

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No.: B3
Location: See Site Plan

Date: 09/24/2004 **Project No.:** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No.: B4
Location: See Site Plan

		Gravelly Clayey Sand, low PI, damp, tan
1-		
2-		
3-	20 N	
4-		
5-		
6-	38 N	Sandy Fat Clay, moderate to strong cementation, very-high PI
7-		
8-		
9-		
10-		
11-		Silty Sand, low PI, damp, tan
12-		
13-		
14-		
15-		Bottom at 15'

		Sandy Clay, medium-high PI, moist, light
1-		
2-	22 R	
3-		
4-		
5-		medium PI below 5'
6-	16 N	
7-		
8-		
9-		
10-		
11-		Sandy Clay/Clayey Sand, low-medium PI, very moist, light brown
12-		
13-		
14-		
15-		Bottom at 15'

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No. B5
Location: See Site Plan

Date: 09/24/2004 **Project No.** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No. B6
Location: See Site Plan

1-		Sandy Clay, medium-high PI, moist, light brown
2-		
3-	31 R	Sandy Clay, weak cementation, high PI, moist, light brown
4-		
5-		
6-	26 N	
7-		no cementation below 7'
8-		
9-		very moist, below 9', medium PI
10-		
11-		
12-		
13-		
14-		Clayey Sand, low PI, moist, light brown
15-		Bottom at 15'

1-		Sandy Clay, medium PI, very moist, light brown
2-		
3-	8 N	
4-		
5-		
6-	9 N	Clayey Sand, low PI, moist, light brown
7-		Sandy Clay, low-medium PI, moist, light brown
8-		
9-		
10-		very moist below 10'
11-		
12-		
13-		
14-		
15-		Bottom at 15'

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No.: B7
Location: See Site Plan

Date: 09/24/2004 **Project No.:** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No.: B8
Location: See Site Plan

1-		Sandy Clay, medium PI, moist, light
2-		
3-	7 R	Sandy Clay, low-medium PI, moist, tan
4-		
5-		
6-		
7-	15 N	Sandy Clay, trace of cementation, medium PI, moist, light brown very moist below 7'
8-		
9-		
10-		
11-		Silty Sand, non plastic, moist, light brown
12-		
13-		
14-		
15-		Bottom at 15'

1-		Sandy Clay, medium PI, moist, light brown
2-		
3-		
4-		
5-	11 N	Sandy Clay, trace of cementation, medium PI, moist, light brown
6-		
7-	16 N	
8-		
9-		Silty Sand, low PI, moist, light brown
10-		
11-		Clayey Sand/Sandy Clay, low PI, very moist, light brown
12-		
13-		Silty Sand, non plastic-low PI, moist, tan
14-		
15-		Bottom at 15'

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No.: B9
Location: See Site Plan

Date: 09/24/2004 **Project No.:** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No.: B10
Location: See Site Plan

1-		Sandy Clay, medium PI, moist, light
2-		
3-	13 N	
4-		
5-		very moist below 5'
6-	9 N	
7-		
8-		
9-		
10-		
11-		Silty Sand, non plastic, moist, light brown
12-		
13-		
14-		
15-		Bottom at 15'

1-		Sandy Clay, medium PI, moist, light brown
2-		high PI below 2.5'
3-	18 R	
4-		
5-		
6-	17 N	Sandy Clay, trace of cementation, medium PI, moist, light brown
7-		
8-		Silty Sand, non plastic-low PI, moist, light brown
9-		
10-		
11-		
12-		
13-		
14-		
15-		Bottom at 15'

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No. B11
Location: See Site Plan

Date: 09/24/2004 **Project No.** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No. B12
Location: See Site Plan

1-		Sandy Clay, medium PI, moist, light brown
2-		low-medium PI, very moist below 2.5'
3-	8 R	
4-		
5-		
6-	14 N	Silty Sand, low PI, very moist, light brown
7-		
8-		
9-		
10-		wet below 10'
11-		
12-		
13-		moist below 13'
14-		
15-		Bottom at 15'

1-		Sandy Clay, medium PI, moist, light brown
2-		Silty Sand, non plastic, moist, tan
3-	11 N	
4-		
5-		
6-	17 N	
7-		
8-		
9-		
10-		very moist below 10'
11-		
12-		
13-		Silty Sand and Gravel with Cobbles, non plastic-low PI, moist, tan
14-		
15-		Bottom at 15'

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No.: B13
Location: See Site Plan

Date: 09/23/2004 **Project No.:** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No.: B14
Location: See Site Plan

1-		Sandy Clay, medium PI, moist, light brown
2-		
3-	18 R	
4-		
5-		
6-	14 N	medium-high PI below 6' Silty Sand, non plastic, moist, light brown
7-		
8-		
9-		
10-		
11-		
12-		
13-		
14-		
15-		Bottom at 15'

1-		Sandy Clay, medium PI, moist, tan
2-		
3-	18 N	-high PI below 2.5'
4-		
5-		
6-	29 N	
7-		very moist below 7'
8-		
9-		
10-		
11-		
12-		
13-		
14-		
15-		Bottom at 15'

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No. B15
Location: See Site Plan

Date: 09/24/2004 **Project No.** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No. B16
Location: See Site Plan

1-		Sandy Clay, medium-high PI, moist, light brown
2-	20 R	high PI below 3'
3-		
4-		
5-		weak cementation below 5.5'
6-	18 N	Silty Sand, low PI, moist, light brown
7-		
8-		Sandy Clay, very moist, brown
9-		
10-		
11-		Clayey Sand, low PI, moist, light brown
12-		
13-		
14-		
15-		Bottom at 15'

1-		Sandy Clay, medium-high PI, moist, tan
2-	14 R	medium PI below 2'
3-		weak cementation below 4', medium-high PI
4-		
5-		medium PI below 6'
6-	20 N	
7-		very moist below 7'
8-		increase in % silt below 10', wet, medium PI
9-		
10-		
11-		
12-		
13-		Bottom at 15'
14-		
15-		

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No. B17
Location: See Site Plan

Date: 09/23/2004 **Project No.** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No. B18
Location: See Site Plan

1-		Sandy Clay, medium PI, moist, tan
2-		
3-	11 N	very moist below 3'
4-		
5-		
6-	40 N	trace of cementation below 5.5', medium-high PI
7-		
8-		
9-		
10-		Clay, medium PI, wet, tan
11-		
12-		
13-		
14-		
15-		Bottom at 15'

1-		Sandy Clay, high PI, very moist, light brown
2-		
3-	12 N	Sandy Clay/Clayey Sand, low PI, moist, tan
4-		
5-		Clayey Sand, trace of cementation, low PI, moist, tan
6-	24 N	
7-		
8-		Sandy Clay/Clayey Sand, low PI, moist, tan
9-		
10-		Clayey Sand, low PI, moist, tan
11-		
12-		very moist below 12'
13-		
14-		
15-		Bottom at 15'

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No.: B19
Location: See Site Plan

Date: 09/23/2004 **Project No.:** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No.: B20
Location: See Site Plan

1-		Sandy Clay, medium PI, moist, light
2-		
3-	9 N	Sandy Clay, trace of cementation, low-medium PI, moist, light brown
4-		
5-		Silty Sand, non plastic-low PI, moist, tan
6-	17 N	
7-		Clayey Sand/Sandy Clay, low PI, very moist, light brown
8-		
9-		
10-		
11-		
12-		
13-		
14-		
15-		Bottom at 15'

1-		Sandy Clay, medium PI, moist, brown
2-		
3-	8 R	
4-		
5-		
6-		
7-	21 N	Silty Sand, low PI, moist, tan
8-		Sandy Clay, low-medium PI, very moist, light brown
9-		
10-		
11-		
12-		
13-		
14-		
15-		Bottom at 15'

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No.: B21
Location: See Site Plan

Date: 09/24/2004 **Project No.:** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No.: B22
Location: See Site Plan

1-		Clay with Sand, medium PI, moist, light brown
2-		
3-	12 R	
4-		
5-		
6-	20 R	Sandy Clay, medium-high PI, very moist, light brown
7-		
8-		
9-		
10-		
11-		Clayey Sand, low PI, very moist, light brown
12-		
13-		
14-		
15-		
		Bottom at 15'

1-		Clay with Sand, medium PI, very moist, light brown
2-		
3-	10 N	
4-		
5-		
6-	16 N	Sandy Clay, weak cementation, medium-high very moist, light brown
7-		
8-		
9-		
10-		
11-		Silty Sand, non plastic, very moist, light brown
12-		
13-		
14-		
15-		
		Bottom at 15'

Boring Log

For: Pulte Homes-Phoenix Division
Project: Lakin Ranch Property
Location of Project: NEC, Dysart Road and Sunland Avenue
Boring No.: B23
Location: See Site Plan

Date: 09/23/2004 **Project No.:** 59993
Type of Boring: 7" Auger
Field Party: JC/Heber
Boring No.: B24
Location: See Site Plan

1-		Gravelly Clayey Sand, low PI, damp, light brown
2-		
3-	9 N	Clay with Sand, high PI, damp, light brown
4-		
5-		
6-	20 N	Sandy Clay/Clayey Sand, low PI, moist, tan Sandy Clay, medium PI, moist, tan
7-		
8-		
9-		
10-		
11-		
12-		Silty Sand, non plastic-low PI, moist, tan
13-		
14-		
15-		Bottom at 15'

1-		Sandy Clay, medium PI, damp, light brown
2-		
3-	11 R	Sandy Clay/Clayey Sand, low-medium PI, very moist, light brown
4-		
5-		Silty Sand, low PI, moist, light brown
6-	15 N	Silty Sand, non plastic-moist, gray-tan
7-		
8-		
9-		gravelly below 9-11.5'
10-		
11-		
12-		
13-		
14-		
15-		Bottom at 15'



CONSOLIDATION TEST DATA SHEET

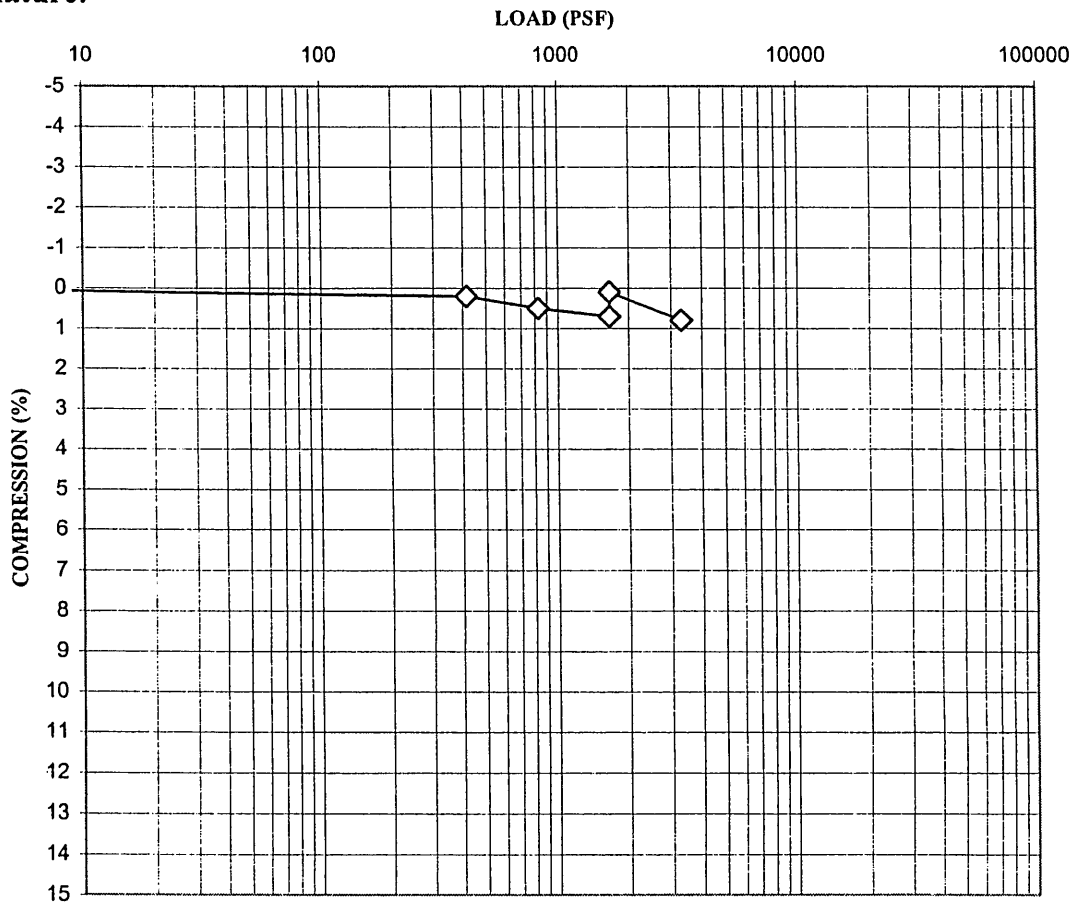
Date: 9/23/2004

Project No.: 59993

Project: Lakin Ranch Property

Location: NEC, Dysart Road and Sunland Avenue

Signature:



—◇— B4 @ 1.5-2.5'

Moisture Content: 17.2%

Dry Unit Wt.: 108.2 PCF

Sample Type: Undisturbed

Load @ Saturation: 1659 psf



CONSOLIDATION TEST DATA SHEET

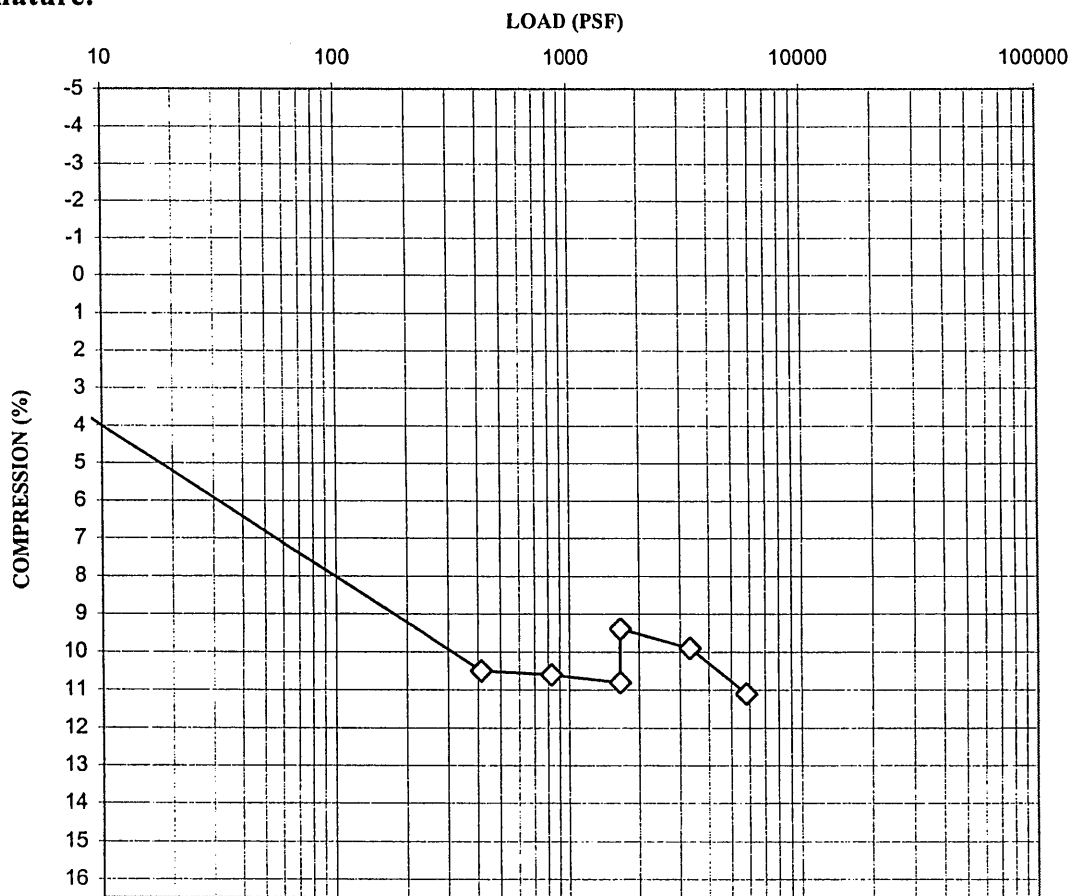
Date: 9/23/2004

Project No.: 59993

Project: Lakin Ranch Property

Location: NEC, Dysart Road and Sunland Avenue

Signature:



—◇— B5 @ 1.5-2.5'

Moisture Content: 19.2%

Dry Unit Wt.: 104.6 PCF

Sample Type: Undisturbed

Load @ Saturation: 1659 psf



CONSOLIDATION TEST DATA SHEET

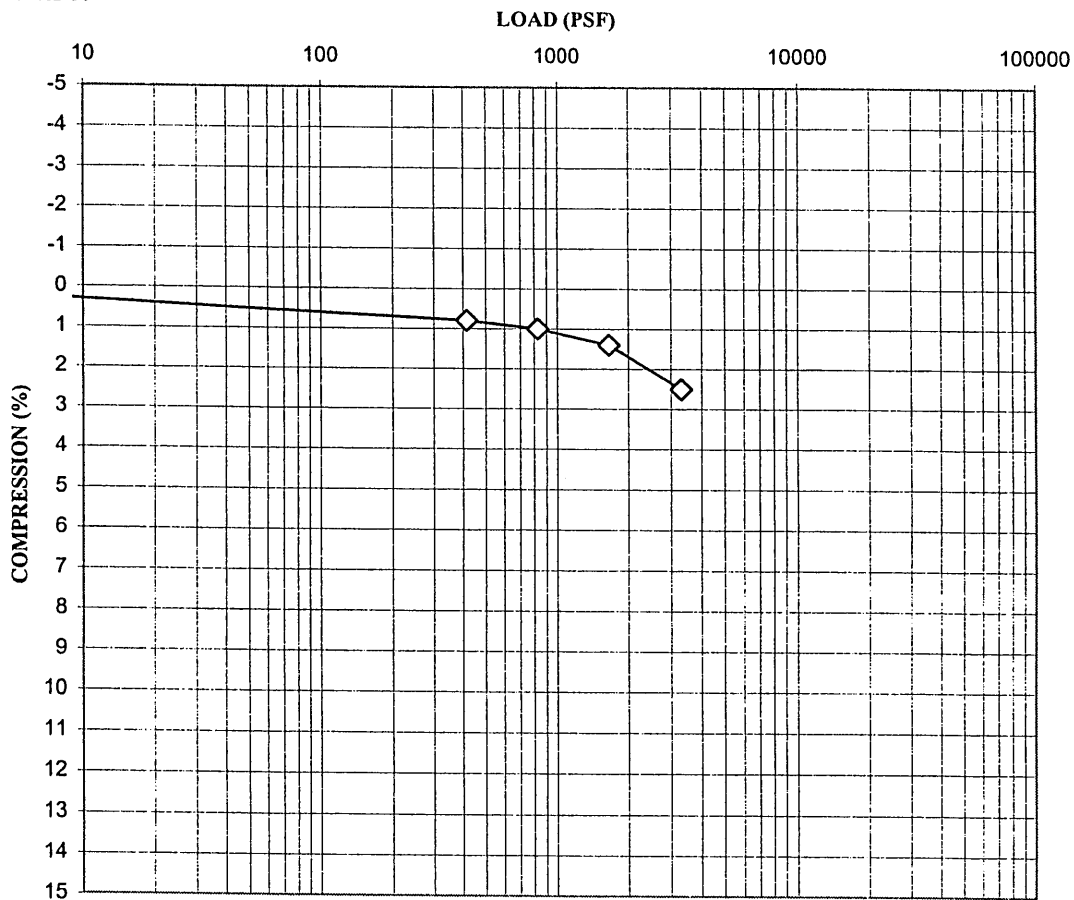
Date: 9/23/2004

Project No.: 59993

Project: Lakin Ranch Property

Location: NEC, Dysart Road and Sunland Avenue

Signature:



—◇— B7 @ 1.5-2.5'

Moisture Content: 14.3%

Dry Unit Wt.: 103.6 PCF

Sample Type: Undisturbed

Load @ Saturation: 1659 psf



CONSOLIDATION TEST DATA SHEET

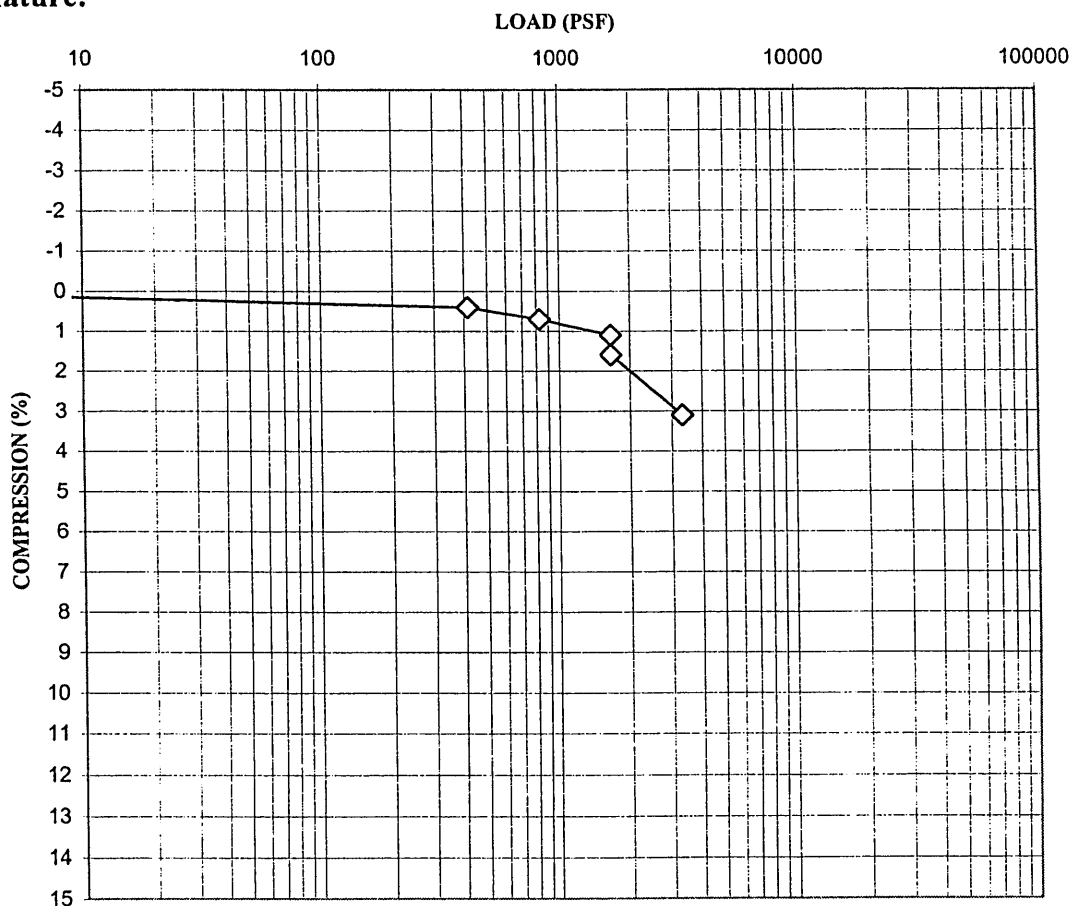
Date: 9/23/2004

Project No.: 59993

Project: Lakin Ranch Property

Location: NEC, Dysart Road and Sunland Avenue

Signature:



—◇— B10 @ 1.5-2.5'

Moisture Content: 11.6%

Dry Unit Wt.: 96.7 PCF

Sample Type: Undisturbed

Load @ Saturation: 1659 psf



CONSOLIDATION TEST DATA SHEET

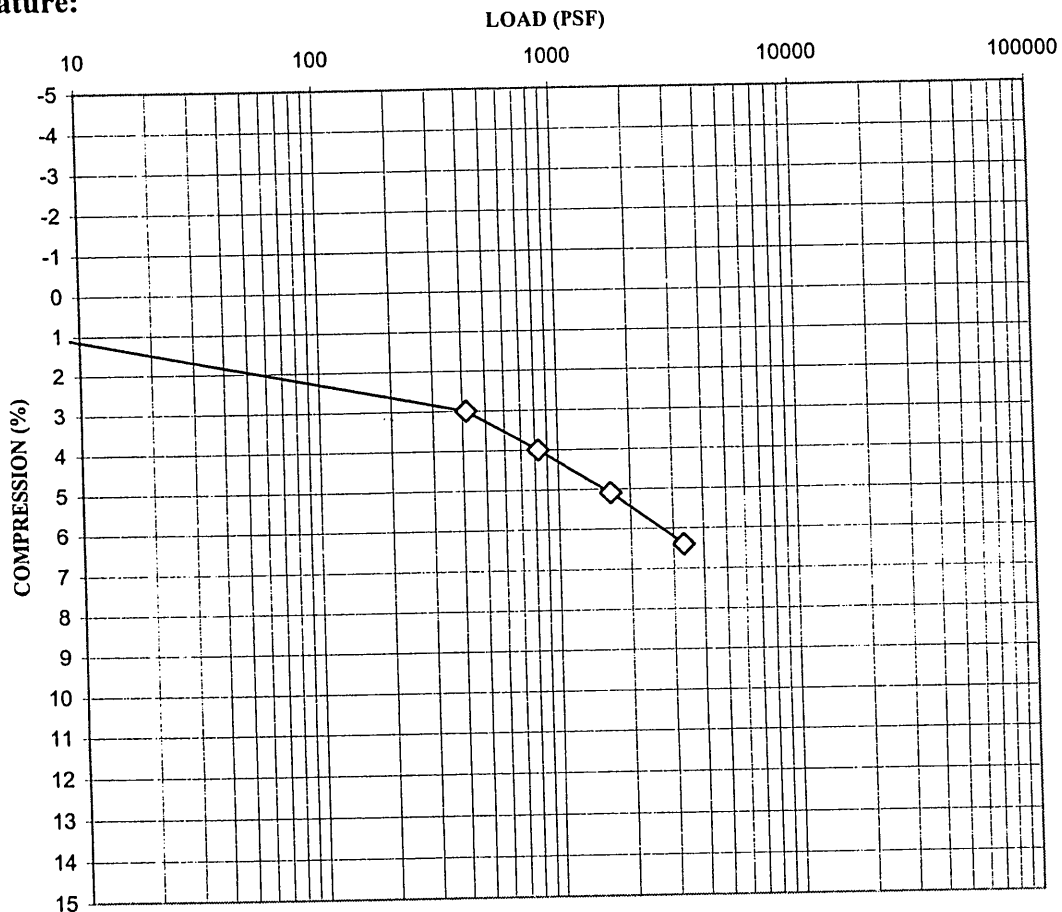
Date: 9/23/2004

Project No.: 59993

Project: Lakin Ranch Property

Location: NEC, Dysart Road and Sunland Avenue

Signature:



—◇— B11 @ 2-4'

Moisture Content: 23.8%

Dry Unit Wt.: 92.2 PCF

Sample Type: Undisturbed

Load @ Saturation: 1659 psf



CONSOLIDATION TEST DATA SHEET

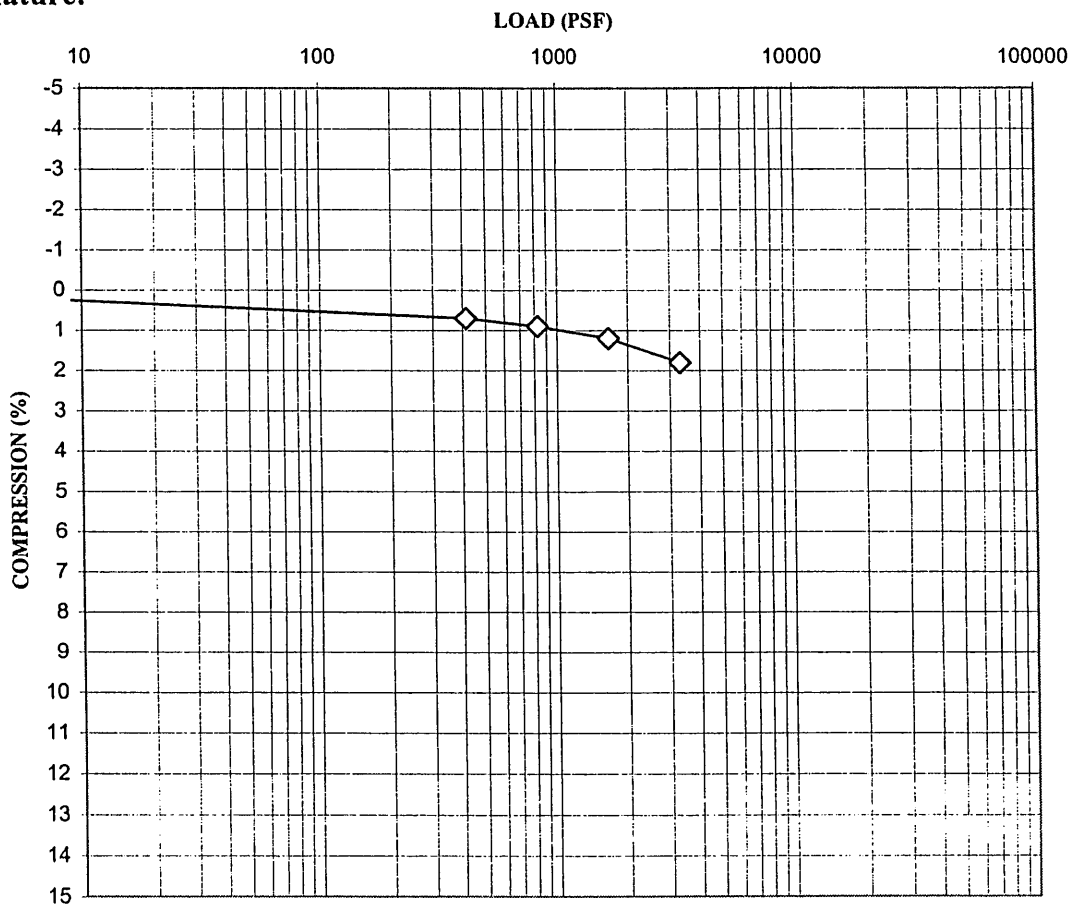
Date: 9/23/2004

Project No.: 59993

Project: Lakin Ranch Property

Location: NEC, Dysart Road and Sunland Avenue

Signature:



—◇— B15 @ 2-3'

Moisture Content: 17.5%

Dry Unit Wt.: 102.0 PCF

Sample Type: Undisturbed

Load @ Saturation: 1659 psf



CONSOLIDATION TEST DATA SHEET

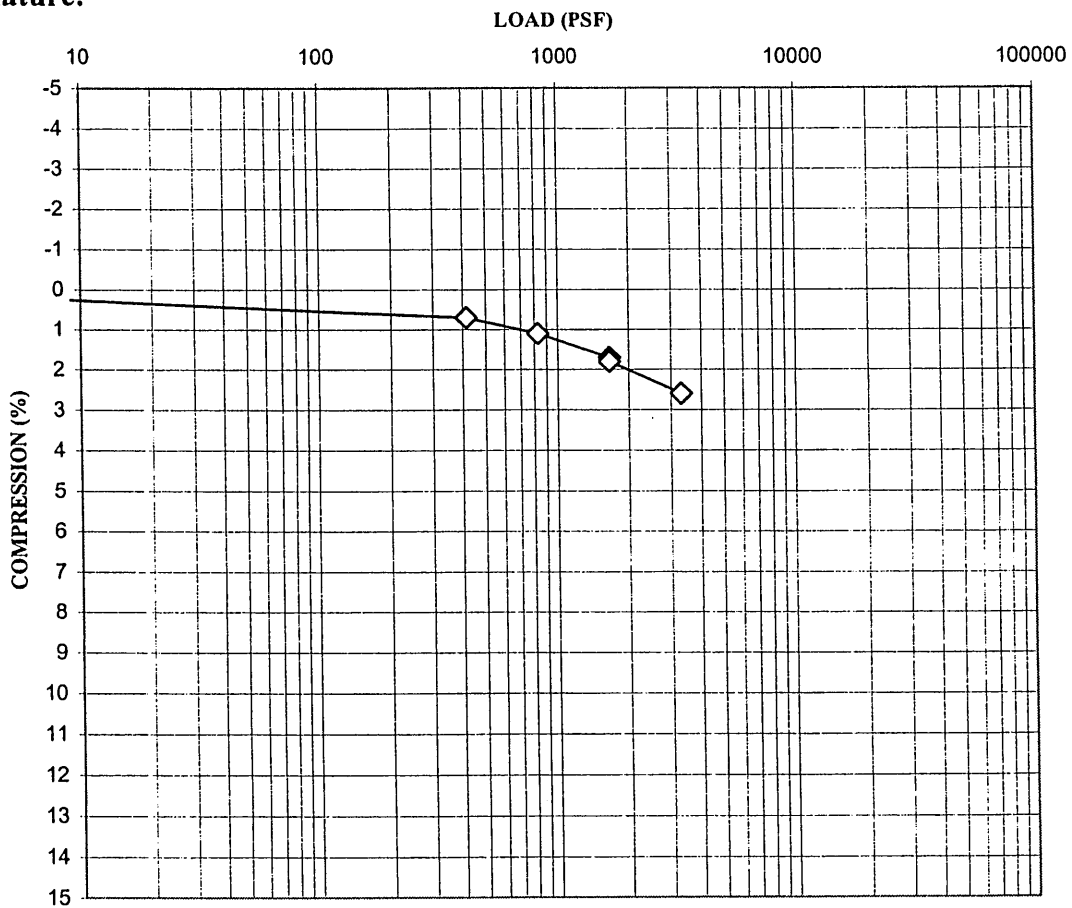
Date: 9/23/2004

Project No.: 59993

Project: Lakin Ranch Property

Location: NEC, Dysart Road and Sunland Avenue

Signature:



—◇— B21 @ 2-3'

Moisture Content: 21.3%

Dry Unit Wt.: 101.8 PCF

Sample Type: Undisturbed

Load @ Saturation: 1659 psf



CONSOLIDATION TEST DATA SHEET

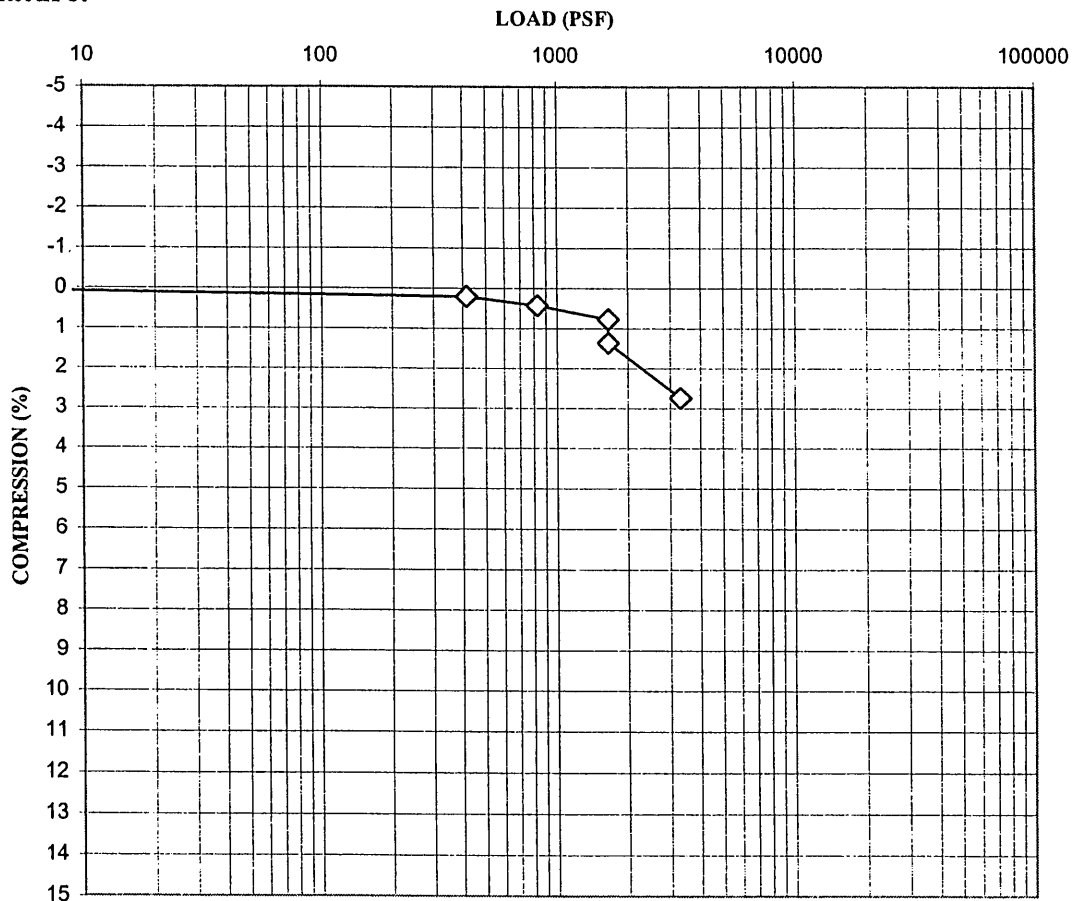
Date: 9/23/2004

Project No.: 59993

Project: Lakin Ranch Property

Location: NEC, Dysart Road and Sunland Avenue

Signature:



—◇— B16 @ 1.5-2.5'

Moisture Content: 18.1%

Dry Unit Wt.: 97.6 PCF

Sample Type: Undisturbed

Load @ Saturation: 1659 psf



CONSOLIDATION TEST DATA SHEET

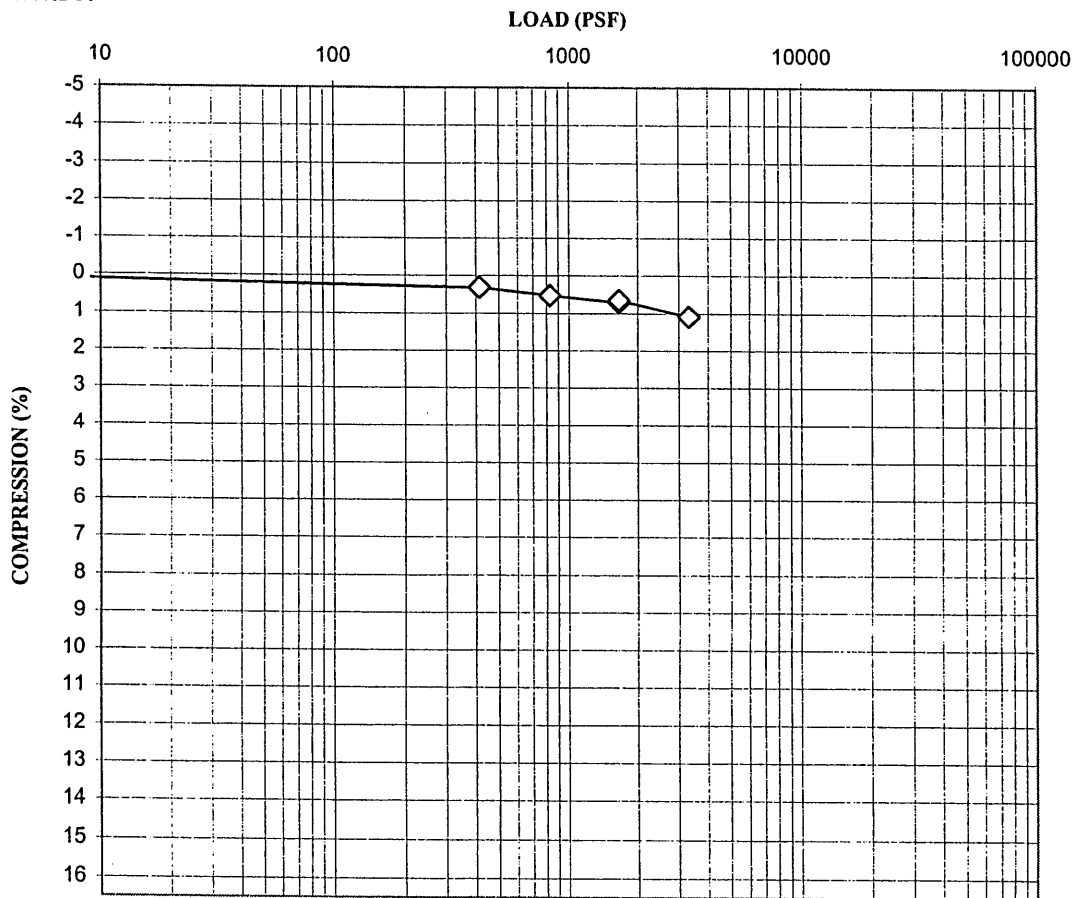
Date: 9/23/2004

Project No.: 59993

Project: Lakin Ranch Property

Location: NEC, Dysart Road and Sunland Avenue

Signature:



—◇— B20 @ 1.5-2.5'

Moisture Content: 16.2%

Dry Unit Wt.: 103.9 PCF

Sample Type: Undisturbed

Load @ Saturation: 1659 psf



CONSOLIDATION TEST DATA SHEET

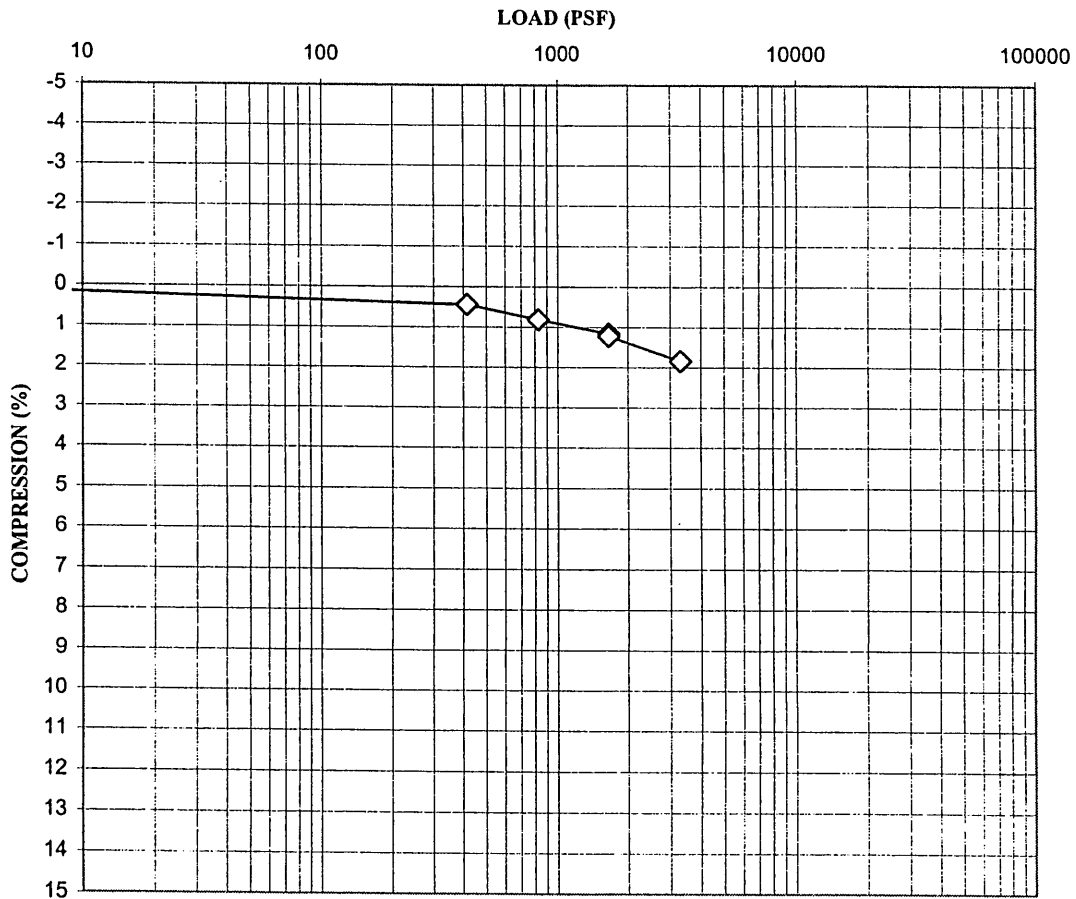
Date: 9/23/2004

Project No.: 59993

Project: Lakin Ranch Property

Location: NEC, Dysart Road and Sunland Avenue

Signature:



—◇— B24 @2-3'

Moisture Content: 21.6%

Dry Unit Wt.: 100.3 PCF

Sample Type: Undisturbed

Load @ Saturation: 1659 psf

EXISTING SOIL CHARACTERISTICS

Project: Lakin Ranch Property
 Location: NEC, Dysart Road and Sunland Avenue
 For: Pulte Homes – Phoenix Division

Date: 9/23/04
 Type Of Sample: Soil
 Source: Native

<u>Location</u>		<u>% Passing (Sieve Size)</u>						<u>Atterberg Limits</u>			
		<u>1</u>	<u>½</u>	<u>#4</u>	<u>#10</u>	<u>#40</u>	<u>#100</u>	<u>#200</u>	<u>LL</u>	<u>PL</u>	<u>PI</u>
B1	0-1.5'	97	92	86	82	68	44	32	23	17	6
B2	0-1.5'	100	94	90	87	65	45	39	29	22	7
B4	0-1.5'				100	97	86	78	40	20	20
B6	0-1.5'				100	99	93	76	32	19	13
B8	0-1.5'				100	98	92	87	41	20	21
B11	0-1.5'			100	99	93	80	69	31	17	14
B13	0-1.5'				100	98	96	87	33	18	15
B18	0-1.5'				100	98	92	84	41	17	24
B19	0-1.5'				100	99	97	93	42	18	24
B22	0-1.5'				100	99	97	90	34	16	18
B24	0-1.5'				100	97	88	75	28	17	11
B16	0-2'				100	97	91	85	36	17	19
B25	0-2'				100	98	92	84	39	17	22



Lakin Ranch Property
NEC, Dysart Road and Sunland Avenue
Maricopa County, Arizona
CIT Project No. 59993

**Swell Test on Disturbed
Recompacted Soil Sample**

<u>Location</u>	<u>Depth</u>	<u>Surcharge</u>	<u>Dry Density</u>	<u>% Swell</u>
B8	0-1.5'	100 PSF	115.6 PCF	1.2
B2	0-1.5'	100 PSF	111.2 PCF	0.6
B4	0-1.5'	100 PSF	99.9 PCF	7.5
B6	0-1.5'	100 PSF	105.6 PCF	3.1
B8	0-1.5'	100 PSF	97.8 PCF	6.2
B11	0-1.5'	100 PSF	110.8 PCF	3.1
B13	0-1.5'	100 PSF	102.0 PCF	4.5
B18	0-1.5'	100 PSF	104.7 PCF	5.0
B19	0-1.5'	100 PSF	104.6 PCF	5.6
B22	0-1.5'	100 PSF	110.7 PCF	5.1
B24	0-1.5'	100 PSF	110.0 PCF	2.8
B16	0-2'	100 PSF	100.8 PCF	4.3
B25	0-2'	100 PSF	103.7 PCF	6.8
B7	2-4'	100 PSF	97.5 PCF	0.1
B12	2-4'	100 PSF	114.2 PCF	0.6
B20	2-4'	100 PSF	104.1 PCF	5.6
B21	2-4'	100 PSF	108.2 PCF	3.2
B5	3-5'	100 PSF	95.5 PCF	6.5
B9	3-5'	100 PSF	101.2 PCF	7.1
B10	3-5'	100 PSF	95.0 PCF	5.9
B14	3-5'	100 PSF	97.3 PCF	9.7
B15	3-5'	100 PSF	87.0 PCF	6.3
B23	3-5'	100 PSF	99.0 PCF	6.9
B3	6-8'	100 PSF	107.6 PCF	13.2
B17	6-8'	100 PSF	88.6 PCF	5.4

CONSTRUCTION INSPECTION & TESTING Co.

Lakin Ranch Property
NEC, Dysart Road and Sunland Avenue
Maricopa County, Arizona
CIT Project No. 59993

Percent expansion upon soaking of remolded sample compacted to approximately 95% of the maximum ASTM D-698 density at approximately 2 to 3 percent below optimum.



Lakin Ranch Property
NEC, Dysart Road and Sunland Avenue
Maricopa County, Arizona
CIT Project No. 59993

Moisture Determination

<u>Location</u>	<u>0-1.5'</u>	<u>0-2'</u>	<u>2-4'</u>	<u>3-5'</u>	<u>6-8'</u>
B1	2.1%				
B2	3.2%				
B4	12.9%				
B6	18.8%				
B8	17.5%				
B11	12.2%				
B13	11.6%				
B18	13.9%				
B19	21.0%				
B22	14.3%				
B24	11.8%				
B16		13.0%			
B25		13.4%			
B7			14.4%		
B12			5.0%		
B20			18.9%		
B21			19.9%		
B10				20.5%	
B14				12.0%	
B15				23.0%	
B23				19.6%	
B5				17.1%	
B9				16.5%	16.5%
B3					12.9%
B17					27.0%



Lakin Ranch Property
NEC, Dysart Road and Sunland Avenue
Maricopa County, Arizona
CIT Project No. 59993

Standard Proctor Test

<u>Location</u>	<u>Dry Density</u>	<u>Optimum Moisture</u>
B1 @ 0-1.5'	121.7 PCF	11.9%
B2 @ 0-1.5'	117.0 PCF	13.3%
B4 @ 0-1.5'	105.3 PCF	18.9%
B6 @ 0-1.5'	110.8 PCF	16.4%
B8 @ 0-1.5'	103.0 PCF	20.0%
B11 @ 0-1.5'	117.0 PCF	13.5%
B13 @ 0-1.5'	106.5 PCF	18.4%
B18 @ 0-1.5'	110.2 PCF	16.6%
B19 @ 0-1.5'	110.2 PCF	16.6%
B22 @ 0-1.5'	117.0 PCF	13.5%
B24 @ 0-1.5'	115.8 PCF	14.1%
B16 @ 0-2'	105.9 PCF	18.7%
B25 @ 0-2'	109.0 PCF	17.2%
B7 @ 2-4'	102.4 PCF	20.3%
B12 @ 2-4'	119.9 PCF	12.5%
B20 @ 2-4'	109.6 PCF	16.9%
B21 @ 2-4'	114.0 PCF	14.9%
B5 @ 3-5'	100.5 PCF	21.2%
B9 @ 3-5'	106.5 PCF	18.4%
B10 @ 3-5'	99.9 PCF	21.5%
B14 @ 3-5'	102.4 PCF	20.3%
B15 @ 3-5'	91.6 PCF	26.2%
B23 @ 3-5'	104.1 PCF	19.5%
B3 @ 6-8'	113.3 PCF	15.2%
B17 @ 6-8'	93.4 PCF	25.1%



Lakin Ranch Property
NEC, Dysart Road and Sunland Avenue
Maricopa County, Arizona
CIT Project No. 59993

Expansion Index

<u>Location</u>	<u>Depth (Feet)</u>	<u>EI</u>
B4	0-1.5'	58
B14	3-5'	99

APPENDIX B
Photographic Log



PHOTOGRAPH NO. 1

View of concrete-lined irrigation ditch running east-west within northern portion of the Site, looking west.



PHOTOGRAPH NO. 2

Looking south across the agricultural field from the northeast portion of the Site.



PHOTOGRAPH NO. 3
View of boring at Test Boring B-7.



PHOTOGRAPH NO. 4
View of access road and irrigation ditch near the center of the Site,
looking east.



PHOTOGRAPH NO. 5
View from the center of the Site, looking west.



PHOTOGRAPH NO. 6
View of the northern portion of the Site, looking north.



PHOTOGRAPH NO. 7
View from the southern portion of the Site, looking east.



PHOTOGRAPH NO. 8
View of southern portion of Site, looking northwest.

APPENDIX C

Boring Logs

BORING LOG LEGEND

1. Unified Soil Classification System ASTM D-2487:

Coarse-Grained Soils Less Than 50% Fines		
Major Division	Group Symbol	Soil Description
GRAVEL - More than half the coarse fraction is larger than the No. 4 sieve	GW	Well-graded gravel or gravel-sand mixtures, less than 5% fines
	GP	Poorly graded gravel or gravel-sand mixtures, less than 5% fines
	GM	Silty gravel, gravel-sand-silt mixtures, more than 12% fines
	GC	Clayey gravel, gravel-sand-clay mixtures, more than 12% fines
SAND - More than half the coarse fraction is smaller than the No. 4 sieve	SW	Well-graded sands or gravelly sands, less than 5% fines
	SP	Poorly graded sands or gravelly sands, less than 5% fines
	SM	Silty sands, sand-silt mixtures, more than 12% fines
	SC	Clayey sands, sand-clay mixtures, more than 12% fines

Note: Coarse-grained soils receive dual symbols if the soil contains 5 to 12% fines (e.g., SW-SM, GP-GC, etc.).

Fine-Grained Soils More Than 50% Fines		
Major Division	Group Symbol	Soil Description
SILTS and CLAYS with a liquid limit less than 50	ML	Inorganic silts of low to medium plasticity, very fine sand-silt mixtures
	CL	Inorganic clays of low to medium plasticity, very fine sand-silt mixtures
	OL	Organic silts or organic silty-clays of low plasticity
SILTS and CLAYS with a liquid limit greater than 50	MH	Inorganic silts or clayey silts of high plasticity
	CH	Inorganic clays or silty clays of high plasticity
	OH	Organic clays or silty clays of high plasticity
HIGHLY ORGANIC SOILS	PT	Peat, muck, and other highly organic soils

Note: Fine-grained soils receive dual symbol if their plasticity index is between 4 and 7 and the liquid limit is less than 30.

2. Soil Grain Size:

U.S. Standard Sieve

		12"	3"	3/4"	#4	#10	#40	#200		
BOULDERS	COBBLES	GRAVEL			SAND			SILT	CLAY	
		COARSE	FINE	COARSE	MEDIUM	FINE				

3. Sample Types and Blow Counts (140-pound hammer):

G = Grab sample of drill cuttings

R = Ring-lined sampler – 3.0-in. outside diameter - Blow counts represent number of blows to drive 12 in.

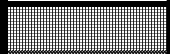










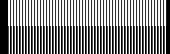
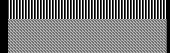
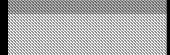



SS = Split Spoon sample – Standard Penetration Test, 2.0-in. outside diameter - Blow counts represent number of blows to drive last 12 in.






NR = No recovery

Relative Density Correlation for Gravels and Sands		Consistency Correlation for Silts and Clays	
Gravels and Sands	Blows per Foot	Silts and Clays	Blows per Foot
Very Loose	0 to 4	Very Soft	0 to 2
Loose	5 to 10	Soft	3 to 4
Medium Dense	11 to 30	Firm	5 to 8
Dense	31 to 50	Stiff	9 to 15
Very Dense	Over 51	Very Stiff	16 to 30
		Hard	Over 31



BORING LOG LEGEND

MATERIAL DESCRIPTION		
Soil Pattern	USCS Symbol	USCS Classification
	FILL	Artificial Fill
	GP or GW	Poorly/Well graded GRAVEL
	GM	Silty GRAVEL
	GC	Clayey GRAVEL
	GP-GM	Poorly graded GRAVEL with Silt
	GP-GC	Poorly graded GRAVEL with Clay
	SP or SW	Poorly/Well graded SAND
	SM	Silty SAND
	SC	Clayey SAND
	SP-SM	Poorly graded SAND with Silt
	SP-SC	Poorly graded SAND with Clay
	SC-SM	Silty Clayey SAND
	ML	SILT
	MH	Elastic SILT
	CL-ML	Silty CLAY
	CL	Lean CLAY
	CH	Fat CLAY

SAMPLING	
	SPT
	Ring Sample
	No Recovery
	Bulk Sample
	Water Table



BORING LOG

W.O. #: 1626.1-PHR
PROJECT: Alamar Phase 1
CLIENT: Brookfield Residential (Arizona)
LOCATION: Avondale, Arizona

LOGGED BY: A. Walton
METHOD: Hand Auger
OPERATOR: NA
DATE: 2/18/2019

Depth (ft)	SAMPLES			USCS Symbol	BORING NUMBER: B-1	Consistency	LABORATORY TESTING				
	Sample Type	Blows / 12 in.	Soil Pattern				Water Content (%)	Dry Density (pcf)	Plasticity Index	Swell (%)	Expansion Index
MATERIAL DESCRIPTION AND COMMENTS											
0.5				FILL	FILL: Silty Clay (CL), brown, with sand, low plasticity, slightly damp to damp, disturbed soils from farming				11		
1				CL	Silty CLAY, brown, with sand, low plasticity, stiff to very stiff, slightly damp to damp	S-VS					
1.5											
2											
2.5					BORING TERMINATED AT 2 FEET						
3					NO GROUNDWATER ENCOUNTERED						
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											
8											
8.5											
9											
9.5											
10											



BORING LOG

W.O. #: 1626.1-PHR
PROJECT: Alamar Phase 1
CLIENT: Brookfield Residential (Arizona)
LOCATION: Avondale, Arizona

LOGGED BY: A. Walton
METHOD: Hand Auger
OPERATOR: NA
DATE: 2/18/2019

Depth (ft)	SAMPLES			USCS Symbol	BORING NUMBER: B-2	Consistency	LABORATORY TESTING				
	Sample Type	Blows / 12 in.	Soil Pattern				Water Content (%)	Dry Density (pcf)	Plasticity Index	Swell (%)	Expansion Index
MATERIAL DESCRIPTION AND COMMENTS											
0.5				FILL	FILL: Silty Clay (CL), brown, with sand, medium plasticity, slightly damp to damp, disturbed soils from farming				21		17
1				CL	Silty CLAY, brown, with sand, medium plasticity, stiff to very stiff, slightly damp to damp	S-VS					
1.5											
2											
2.5					BORING TERMINATED AT 2 FEET						
3					NO GROUNDWATER ENCOUNTERED						
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											
8											
8.5											
9											
9.5											
10											



BORING LOG

W.O. #: 1626.1-PHR
PROJECT: Alamar Phase 1
CLIENT: Brookfield Residential (Arizona)
LOCATION: Avondale, Arizona

LOGGED BY: A. Walton
METHOD: Hand Auger
OPERATOR: NA
DATE: 2/18/2019

Depth (ft)	SAMPLES			USCS Symbol	BORING NUMBER: B-3	Consistency	LABORATORY TESTING				
	Sample Type	Blows / 12 in.	Soil Pattern				Water Content (%)	Dry Density (pcf)	Plasticity Index	Swell (%)	Expansion Index
MATERIAL DESCRIPTION AND COMMENTS											
0.5				FILL	FILL: Silty Clay (CL), brown, with sand, low plasticity, slightly damp to damp, disturbed soils from farming				11	1	
1				CL	Silty CLAY, brown, with sand, low plasticity, stiff to very stiff, slightly damp to damp	S-VS					
1.5											
2											
2.5					BORING TERMINATED AT 2 FEET						
3					NO GROUNDWATER ENCOUNTERED						
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											
8											
8.5											
9											
9.5											
10											



BORING LOG

W.O. #: 1626.1-PHR
PROJECT: Alamar Phase 1
CLIENT: Brookfield Residential (Arizona)
LOCATION: Avondale, Arizona

LOGGED BY: A. Walton
METHOD: Hand Auger
OPERATOR: NA
DATE: 2/18/2019

Depth (ft)	SAMPLES			USCS Symbol	BORING NUMBER: B-4	Consistency	LABORATORY TESTING				
	Sample Type	Blows / 12 in.	Soil Pattern				Water Content (%)	Dry Density (pcf)	Plasticity Index	Swell (%)	Expansion Index
MATERIAL DESCRIPTION AND COMMENTS											
0.5				FILL	FILL: Silty Clay (CL), brown, with sand, low plasticity, slightly damp to damp, disturbed soils from farming				11		
1				CL	Silty CLAY, brown, with sand, low plasticity, stiff to very stiff, slightly damp to damp	S-VS					
1.5											
2											
2.5					BORING TERMINATED AT 2 FEET						
3					NO GROUNDWATER ENCOUNTERED						
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											
8											
8.5											
9											
9.5											
10											



BORING LOG

W.O. #: 1626.1-PHR
PROJECT: Alamar Phase 1
CLIENT: Brookfield Residential (Arizona)
LOCATION: Avondale, Arizona

LOGGED BY: A. Walton
METHOD: Hand Auger
OPERATOR: NA
DATE: 2/18/2019

Depth (ft)	SAMPLES			USCS Symbol	BORING NUMBER: B-5	Consistency	LABORATORY TESTING				
	Sample Type	Blows / 12 in.	Soil Pattern				Water Content (%)	Dry Density (pcf)	Plasticity Index	Swell (%)	Expansion Index
MATERIAL DESCRIPTION AND COMMENTS											
0.5				FILL	FILL: Silty Clay (CL), brown, with sand, low to medium plasticity, slightly damp to damp, disturbed soils from farming				16		26
1				CL	Silty CLAY, brown, with sand, low to medium plasticity, stiff to very stiff, slightly damp to damp	S-VS					
1.5											
2											
2.5					BORING TERMINATED AT 2 FEET						
3					NO GROUNDWATER ENCOUNTERED						
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											
8											
8.5											
9											
9.5											
10											



BORING LOG

W.O. #: 1626.1-PHR
PROJECT: Alamar Phase 1
CLIENT: Brookfield Residential (Arizona)
LOCATION: Avondale, Arizona

LOGGED BY: A. Walton
METHOD: Hand Auger
OPERATOR: NA
DATE: 2/18/2019

Depth (ft)	SAMPLES			USCS Symbol	BORING NUMBER: B-6	Consistency	LABORATORY TESTING				
	Sample Type	Blows / 12 in.	Soil Pattern				Water Content (%)	Dry Density (pcf)	Plasticity Index	Swell (%)	Expansion Index
MATERIAL DESCRIPTION AND COMMENTS											
0.5				FILL	FILL: Silty Clay (CL), brown, with sand, trace gravel, low to medium plasticity, slightly damp to damp, disturbed soils from farming				17		
1				CL	Silty CLAY, brown, with sand, trace gravel, low to medium plasticity, stiff to very stiff, slightly damp to damp	S-VS					
1.5											
2											
2.5					BORING TERMINATED AT 2 FEET						
3					NO GROUNDWATER ENCOUNTERED						
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											
8											
8.5											
9											
9.5											
10											



BORING LOG

W.O. #: 1626.1-PHR
PROJECT: Alamar Phase 1
CLIENT: Brookfield Residential (Arizona)
LOCATION: Avondale, Arizona

LOGGED BY: A. Walton
METHOD: Hand Auger
OPERATOR: NA
DATE: 2/18/2019

Depth (ft)	SAMPLES			USCS Symbol	BORING NUMBER: B-7	Consistency	LABORATORY TESTING				
	Sample Type	Blows / 12 in.	Soil Pattern				Water Content (%)	Dry Density (pcf)	Plasticity Index	Swell (%)	Expansion Index
MATERIAL DESCRIPTION AND COMMENTS											
0.5				FILL	FILL: Silty Clay (CL), brown, some sand, low plasticity, slightly damp to damp, disturbed soils from farming				9	1.3	
1				CL	Silty CLAY, brown, some sand, low plasticity, stiff to very stiff, slightly damp to damp	S-VS					
1.5											
2											
2.5					BORING TERMINATED AT 2 FEET						
3					NO GROUNDWATER ENCOUNTERED						
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											
8											
8.5											
9											
9.5											
10											



BORING LOG

LOGGED BY: A. Walton
METHOD: Hand Auger
OPERATOR: NA
DATE: 2/18/2019

W.O. #: 1626.1-PHR
PROJECT: Alamar Phase 1
CLIENT: Brookfield Residential (Arizona)
LOCATION: Avondale, Arizona

Depth (ft)	SAMPLES			USCS Symbol	BORING NUMBER: B-8	Consistency	LABORATORY TESTING				
	Sample Type	Blows / 12 in.	Soil Pattern				Water Content (%)	Dry Density (pcf)	Plasticity Index	Swell (%)	Expansion Index
MATERIAL DESCRIPTION AND COMMENTS											
0.5				FILL	FILL: Silty Clay (CL), brown, with sand, low to medium plasticity, slightly damp to damp, disturbed soils from farming				15	1.3	
1				CL	Silty CLAY, brown, with sand, low to medium plasticity, stiff to very stiff, slightly damp to damp	S-VS					
1.5											
2											
2.5					BORING TERMINATED AT 2 FEET						
3					NO GROUNDWATER ENCOUNTERED						
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											
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8.5											
9											
9.5											
10											



BORING LOG

W.O. #: 1626.1-PHR
PROJECT: Alamar Phase 1
CLIENT: Brookfield Residential (Arizona)
LOCATION: Avondale, Arizona

LOGGED BY: A. Walton
METHOD: Hand Auger
OPERATOR: NA
DATE: 2/18/2019

Depth (ft)	SAMPLES			USCS Symbol	BORING NUMBER: B-9	Consistency	LABORATORY TESTING				
	Sample Type	Blows / 12 in.	Soil Pattern				Water Content (%)	Dry Density (pcf)	Plasticity Index	Swell (%)	Expansion Index
MATERIAL DESCRIPTION AND COMMENTS											
0.5				FILL	FILL: Silty Clay (CL), brown, with sand, medium plasticity, slightly damp to damp, disturbed soils from farming				21		
1				CL	Silty CLAY, brown, with sand, medium plasticity, stiff to very stiff, slightly damp to damp	S-VS					
1.5											
2											
2.5					BORING TERMINATED AT 2 FEET						
3					NO GROUNDWATER ENCOUNTERED						
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											
8											
8.5											
9											
9.5											
10											



BORING LOG

W.O. #: 1626.1-PHR
PROJECT: Alamar Phase 1
CLIENT: Brookfield Residential (Arizona)
LOCATION: Avondale, Arizona

LOGGED BY: A. Walton
METHOD: Hand Auger
OPERATOR: NA
DATE: 2/18/2019

Depth (ft)	SAMPLES			USCS Symbol	BORING NUMBER: B-10	Consistency	LABORATORY TESTING				
	Sample Type	Blows / 12 in.	Soil Pattern				Water Content (%)	Dry Density (pcf)	Plasticity Index	Swell (%)	Expansion Index
MATERIAL DESCRIPTION AND COMMENTS											
0.5				FILL	FILL: Silty Clay (CL), brown, with sand, low to medium plasticity, slightly damp to damp, disturbed soils from farming				15	2.7	40
1				CL	Silty CLAY, brown, with sand, low to medium plasticity, stiff to very stiff, slightly damp to damp	S-VS					
1.5											
2											
2.5					BORING TERMINATED AT 2 FEET						
3					NO GROUNDWATER ENCOUNTERED						
3.5											
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9.5											
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APPENDIX D

Laboratory Testing

LABORATORY TESTS RESULTS (1626.1-PHR)

ATTERBERG LIMITS

Atterberg limits were performed on representative samples in general accordance with ASTM D 4318. The results are shown in the following pages.

PARTICLE SIZE ANALYSIS

Sieve analyses were performed in general accordance with AASHTO Test Method T 27. Test results are presented in the following pages.

MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT

The maximum dry density and optimum moisture content of selected representative soil samples were evaluated using the Standard Proctor method in general accordance with ASTM D 698. Test results are presented in the following pages.

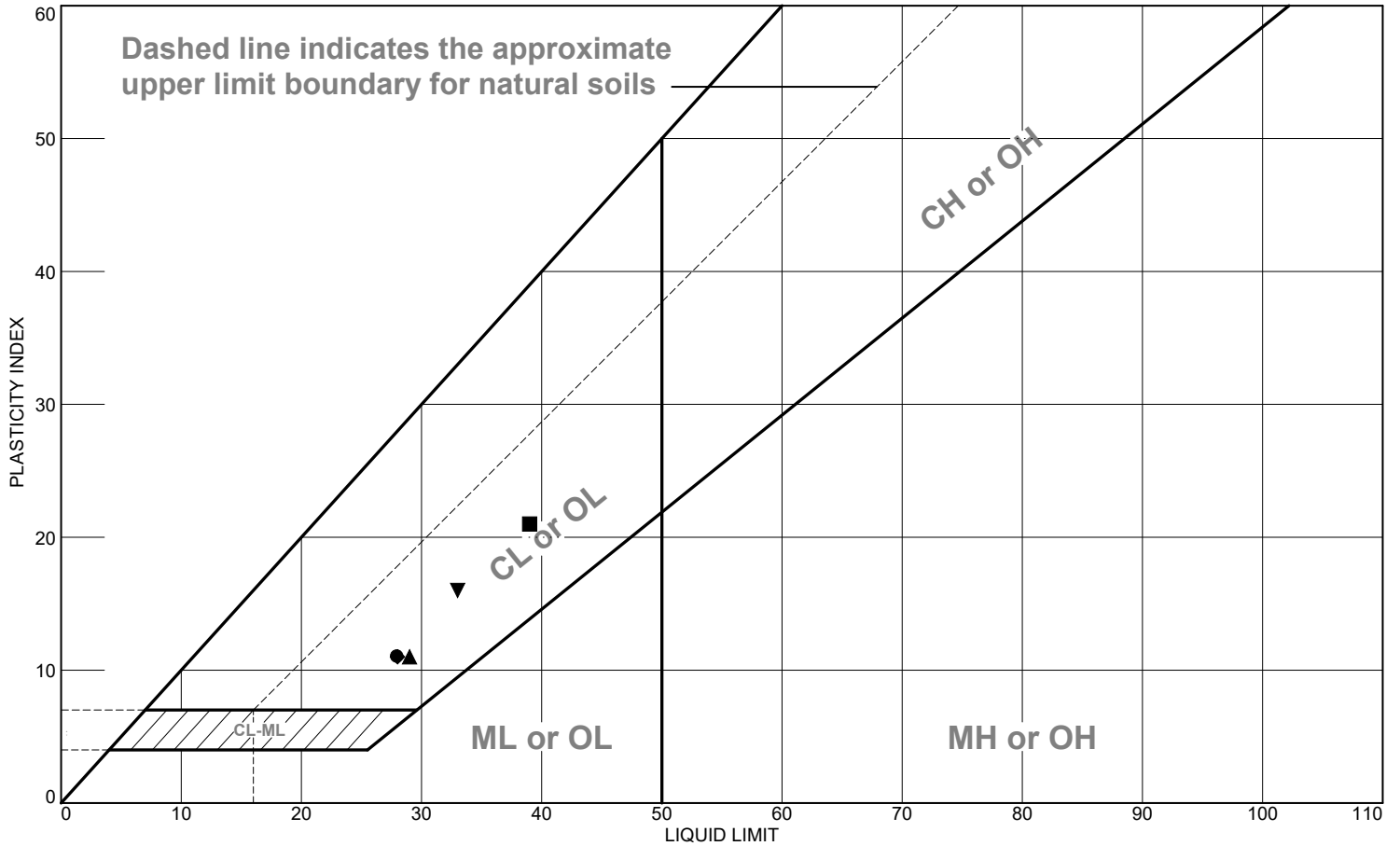
EXPANSION INDEX TESTS

Expansion Index (EI) tests were performed on remolded samples of soil. The samples were remolded at approximately 50 percent saturation in accordance with ASTM D 4829. All samples were then placed under a 5.5-kilogram weight and inundated with water for at least 24 hours. The percent expansion was then recorded as the amount of vertical rise compared to the original one-inch sample height. The results are shown in the following pages.

SWELL TESTS

Swell tests were performed in accordance with local standards. The swell potential of the compacted soil was measured on a sample compacted to about 95 percent of the ASTM D698 maximum dry density at a moisture content about 2 percent below optimum moisture content, confined under a 100 psf surcharge to simulate floor slab loading conditions, and submerged in water. The vertical rise of the sample was compared to the original one-inch sample height. The results are shown in the following pages.

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	28	17	11	91.5	79.5	CL
■	39	18	21	89.5	84.7	CL
▲	29	18	11	87.8	81.7	CL
◆	28	17	11	94.5	83.4	CL
▼	33	17	16	92.0	83.0	CL

Project No. 1626.1-PHR **Client:** Brookfield
Project: Alamar Phase 1

● Location: B-1 **Depth:** 0-2' **Sample Number:** 5475
■ Location: B-2 **Depth:** 0-2' **Sample Number:** 5476
▲ Location: B-3 **Depth:** 0-2' **Sample Number:** 5477
◆ Location: B-4 **Depth:** 0-2' **Sample Number:** 5478
▼ Location: B-5 **Depth:** 0-2' **Sample Number:** 5479

Remarks:

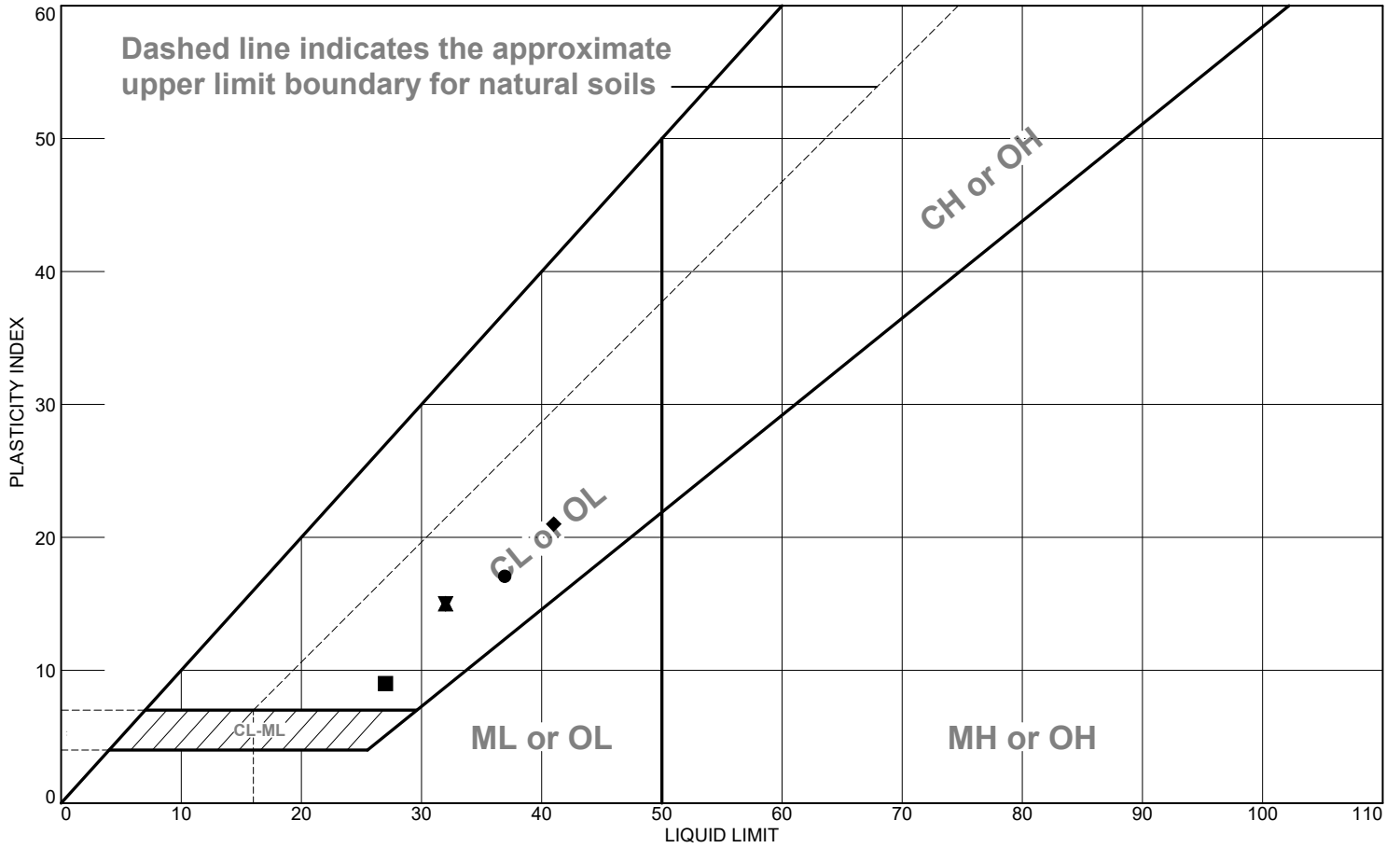


Phoenix Office
 4810 S 40th Street Suite 3 Phoenix, AZ 85040
 Phone (480) 505-9422 Fax (480) 505-9431
 www.geotekusa.com

Figure

Tested By: JJ _____

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	37	20	17	86.5	81.5	CL
■	27	18	9	98.3	89.6	CL
▲	32	17	15	93.7	81.9	CL
◆	41	20	21	82.6	76.8	CL
▼	32	17	15	90.5	82.2	CL

Project No. 1626.1-PHR **Client:** Brookfield
Project: Alamar Phase 1

● Location: B-6 **Depth:** 0-2' **Sample Number:** 5480
■ Location: B-7 **Depth:** 0-2' **Sample Number:** 5481
▲ Location: B-8 **Depth:** 0-2' **Sample Number:** 5482
◆ Location: B-9 **Depth:** 0-2' **Sample Number:** 5483
▼ Location: B-10 **Depth:** 0-2' **Sample Number:** 5484

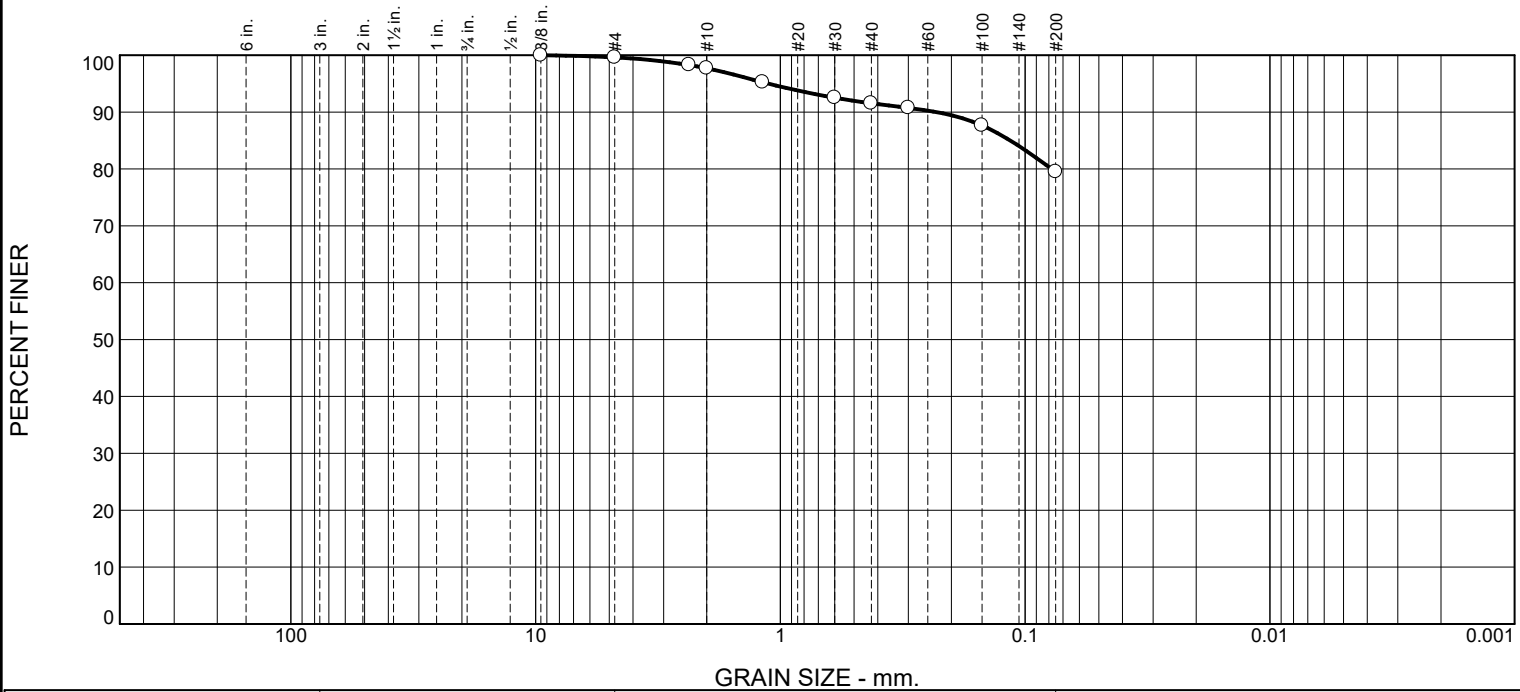
Remarks:



Figure

Tested By: JJ _____

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	1.9	6.2	12.0	79.5	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.6		
#8	98.3		
#10	97.7		
#16	95.3		
#30	92.5		
#40	91.5		
#50	90.7		
#100	87.6		
#200	79.5		

Material Description

Atterberg Limits (ASTM D 4318)
 PL= 17 LL= 28 PI= 11

Classification
 USCS (D 2487)= CL AASHTO (M 145)= A-6(7)

Coefficients
 D₉₀= 0.2305 D₈₅= 0.1151 D₆₀=
 D₅₀= D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Remarks

Date Received: 2/18/2019 Date Tested: 2/18/2019

Tested By: OE

Checked By: JJ

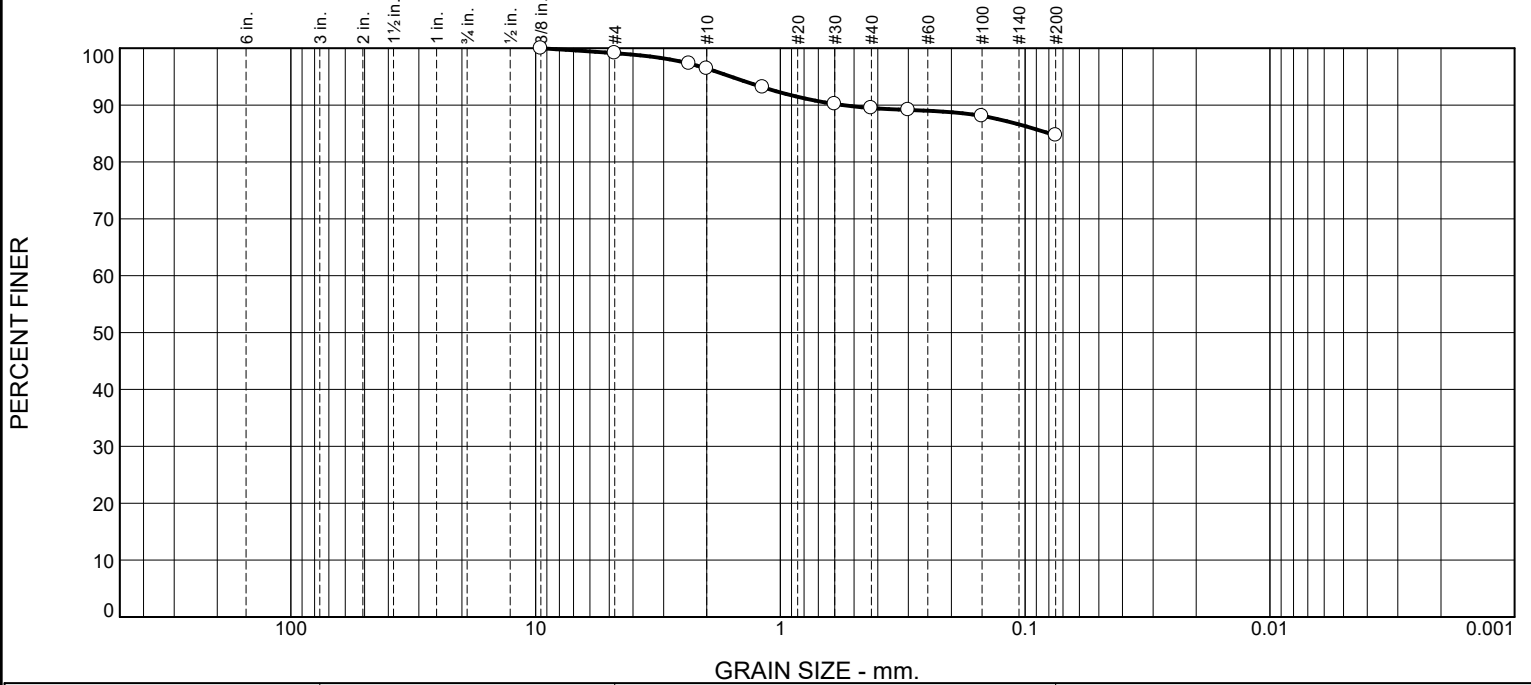
Title: Lab Manager

* (no specification provided)

Location: B-1 Depth: 0-2' Date Sampled: 2/18/2019

<p>Phoenix Office 4810 S 40th Street Suite 3 Phoenix, AZ 85040 Phone (480) 505-9422 Fax (480) 505-9431 www.geotekusa.com</p>	<p>Client: Brookfield Project: Alamar Phase 1</p>	<p>Project No: 1626.1-PHR</p>
--	--	--------------------------------------

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.9	2.7	6.9	4.8	84.7	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.1		
#8	97.3		
#10	96.4		
#16	93.1		
#30	90.2		
#40	89.5		
#50	89.1		
#100	88.1		
#200	84.7		

Material Description

Atterberg Limits (ASTM D 4318)

PL= 18 LL= 39 PI= 21

Classification

USCS (D 2487)= CL AASHTO (M 145)= A-6(17)

Coefficients

D₉₀= 0.5577 D₈₅= 0.0793 D₆₀=

D₅₀= D₃₀= D₁₅=

D₁₀= C_u= C_c=

Remarks

Date Received: 2/18/2019 Date Tested: 2/19/2019

Tested By: OE

Checked By: JJ

Title: Lab Manager

* (no specification provided)

Location: B-2 Depth: 0-2'

Date Sampled: 2/18/2019

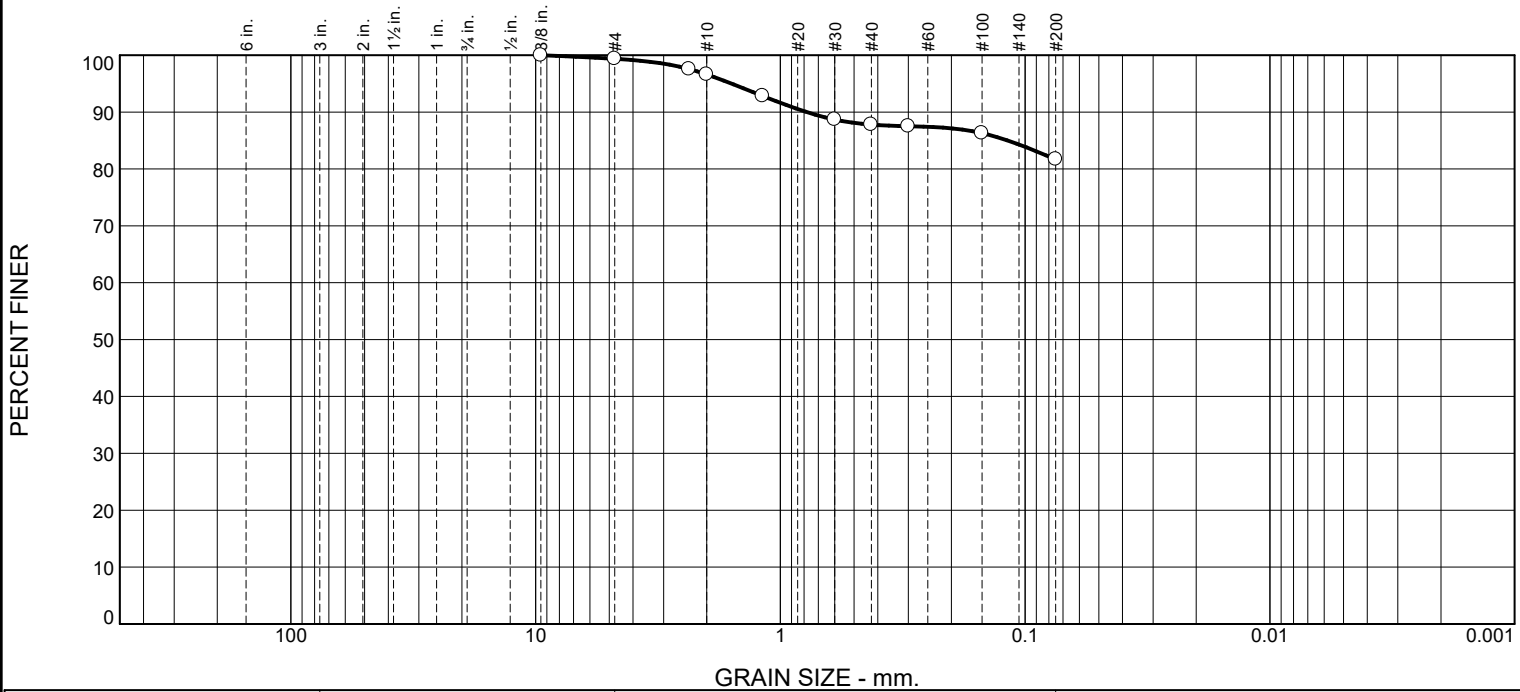
Phoenix Office
 4810 S 40th Street Suite 3
 Phoenix, AZ 85040
 Phone (480) 505-9422
 Fax (480) 505-9431
 www.geotekusa.com

Client: Brookfield
 Project: Alamar Phase 1

Project No: 1626.1-PHR

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	2.8	8.8	6.1	81.7	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.4		
#8	97.6		
#10	96.6		
#16	92.8		
#30	88.7		
#40	87.8		
#50	87.5		
#100	86.3		
#200	81.7		

Material Description

Atterberg Limits (ASTM D 4318)
 PL= 18 LL= 29 PI= 11

Classification
 USCS (D 2487)= CL AASHTO (M 145)= A-6(7)

Coefficients
 D₉₀= 0.7793 D₈₅= 0.1177 D₆₀=
 D₅₀= D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Remarks

Date Received: 2/18/2019 Date Tested: 2/19/2019

Tested By: OE

Checked By: JJ

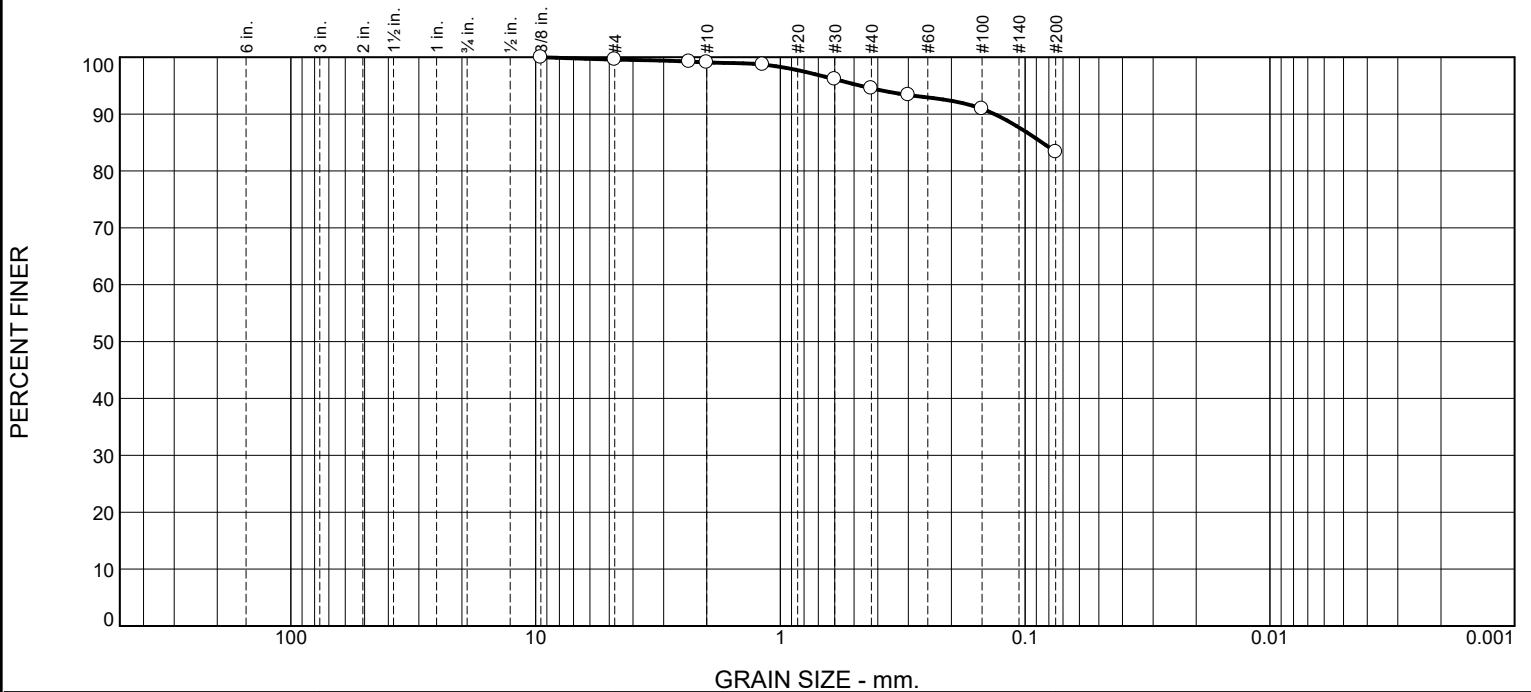
Title: Lab Manager

* (no specification provided)

Location: B-3 Depth: 0-2' Date Sampled: 2/18/2019

<p>Phoenix Office 4810 S 40th Street Suite 3 Phoenix, AZ 85040 Phone (480) 505-9422 Fax (480) 505-9431 www.geotekusa.com</p>	<p>Client: Brookfield Project: Alamar Phase 1</p>	<p>Project No: 1626.1-PHR</p>
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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.5	4.6	11.1	83.4	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.6		
#8	99.2		
#10	99.1		
#16	98.7		
#30	96.1		
#40	94.5		
#50	93.4		
#100	90.9		
#200	83.4		

Material Description

Atterberg Limits (ASTM D 4318)

PL= 17 LL= 28 PI= 11

Classification

USCS (D 2487)= CL AASHTO (M 145)= A-6(7)

Coefficients

D₉₀= 0.1334 D₈₅= 0.0853 D₆₀=

D₅₀= D₃₀= D₁₅=

D₁₀= C_u= C_c=

Remarks

Date Received: 2/18/2019 Date Tested: 2/19/2019

Tested By: OE

Checked By: JJ

Title: Lab Manager

* (no specification provided)

Location: B-4 Depth: 0-2'

Date Sampled: 2/18/2019

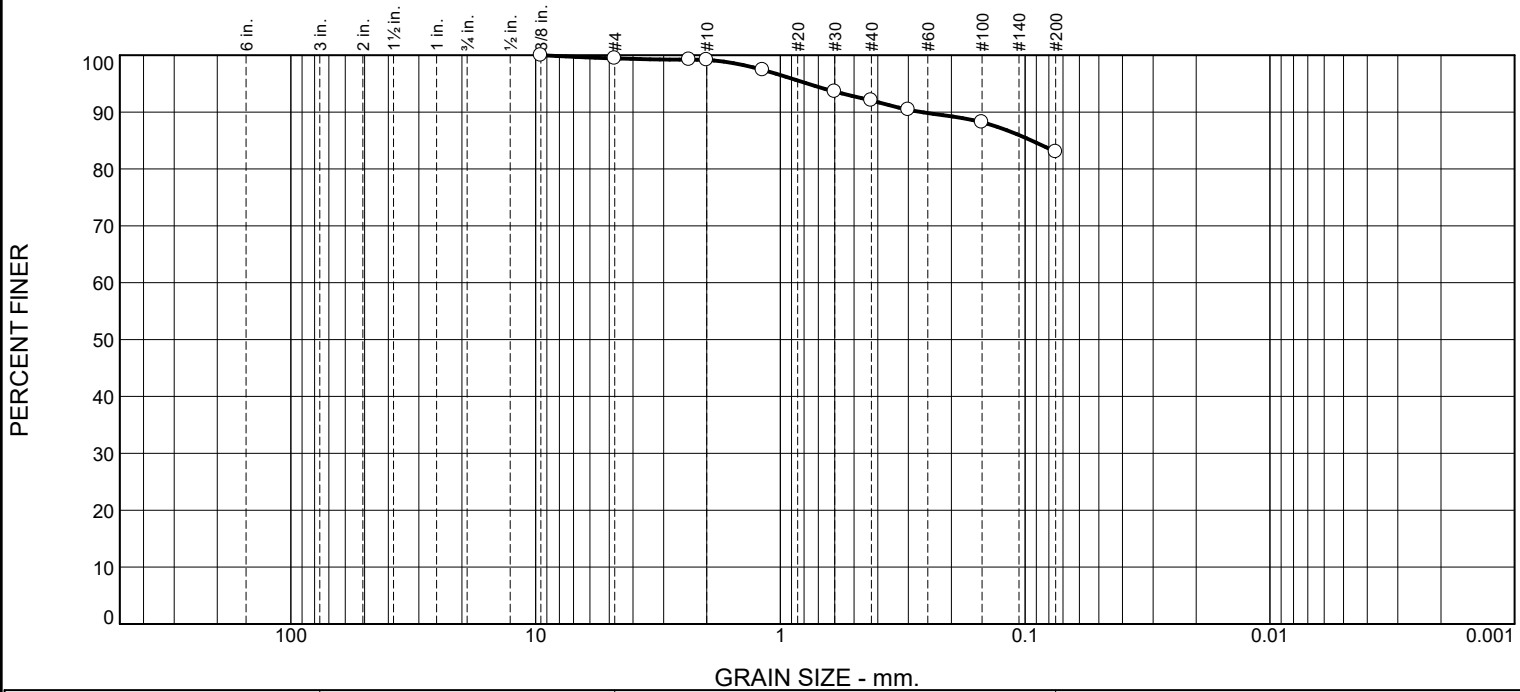
Phoenix Office
4810 S 40th Street Suite 3
Phoenix, AZ 85040
Phone (480) 505-9422
Fax (480) 505-9431
www.geotekusa.com

Client: Brookfield
Project: Alamar Phase 1

Project No: 1626.1-PHR

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	0.2	7.2	9.0	83.0	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.4		
#8	99.2		
#10	99.2		
#16	97.4		
#30	93.6		
#40	92.0		
#50	90.4		
#100	88.2		
#200	83.0		

Material Description

Atterberg Limits (ASTM D 4318)
 PL= 17 LL= 33 PI= 16

Classification
 USCS (D 2487)= CL AASHTO (M 145)= A-6(12)

Coefficients

D ₉₀ = 0.2660	D ₈₅ = 0.0942	D ₆₀ =
D ₅₀ =	D ₃₀ =	D ₁₅ =
D ₁₀ =	C _u =	C _c =

Remarks

Date Received: 2/18/2019 Date Tested: 2/19/2019

Tested By: OE

Checked By: JJ

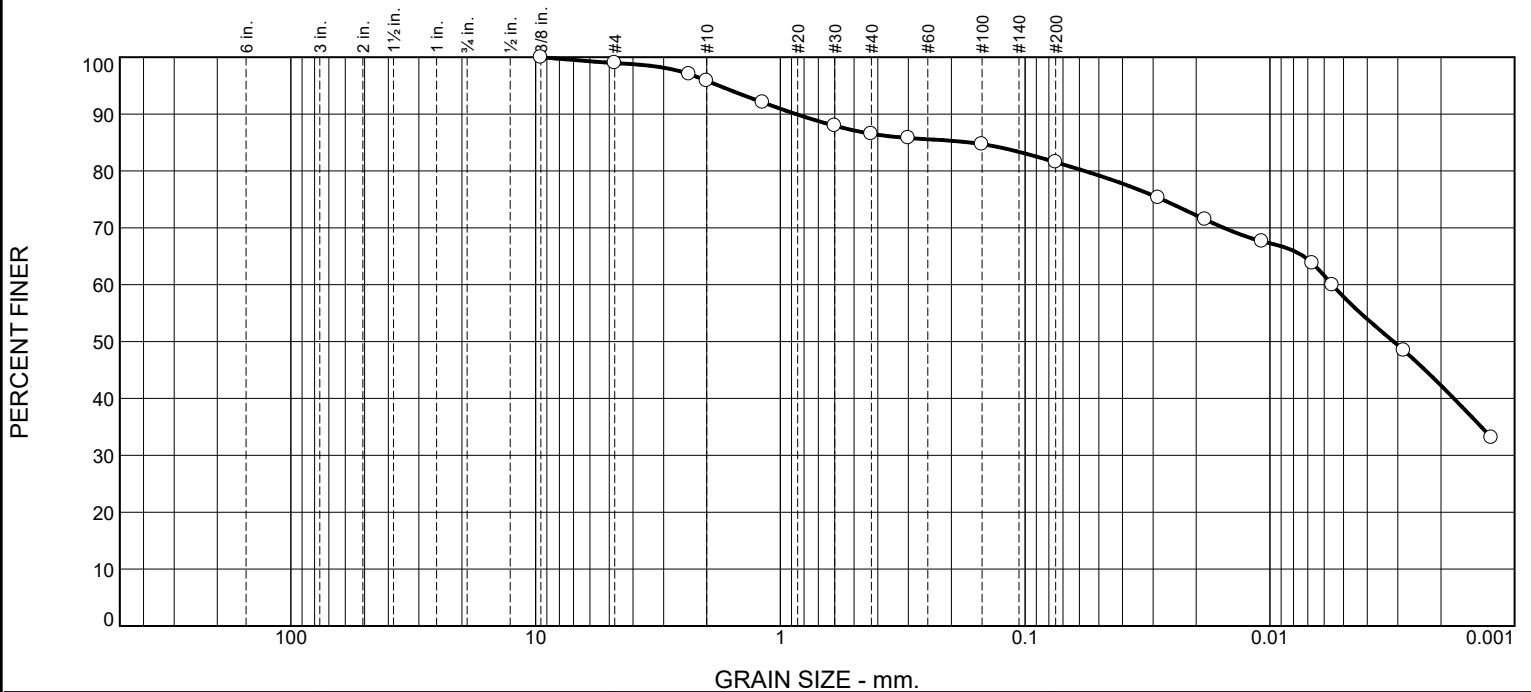
Title: Lab Manager

* (no specification provided)

Location: B-5 Date Sampled: 2/18/2019
 Sample Number: 5479 Depth: 0-2'

Phoenix Office 4810 S 40th Street Suite 3 Phoenix, AZ 85040 Phone (480) 505-9422 Fax (480) 505-9431 www.geotekusa.com	Client: Brookfield Project: Alamar Phase 1 Project No: 1626.1-PHR	Figure
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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.0	3.1	9.4	5.0	23.6	57.9

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.0		
#8	97.0		
#10	95.9		
#16	92.0		
#30	88.0		
#40	86.5		
#50	85.8		
#100	84.7		
#200	81.5		
0.0286 mm.	75.3		
0.0184 mm.	71.5		
0.0108 mm.	67.6		
0.0067 mm.	63.8		
0.0056 mm.	60.0		
0.0028 mm.	48.5		
0.0012 mm.	33.1		

* (no specification provided)

Material Description

Atterberg Limits (ASTM D 4318)

PL= 20 LL= 37 PI= 17

Classification

USCS (D 2487)= CL AASHTO (M 145)= A-6(13)

Coefficients

D₉₀= 0.8632 D₈₅= 0.1680 D₆₀= 0.0056
D₅₀= 0.0031 C_u= D₁₅=
D₁₀= C_c=

Remarks

Date Received: 2/18/2019 Date Tested: 2/19/2019

Tested By: OE

Checked By: JJ

Title: Lab Manager

Location: B-6
Sample Number: 5480 Depth: 0-2'

Date Sampled: 2/18/2019

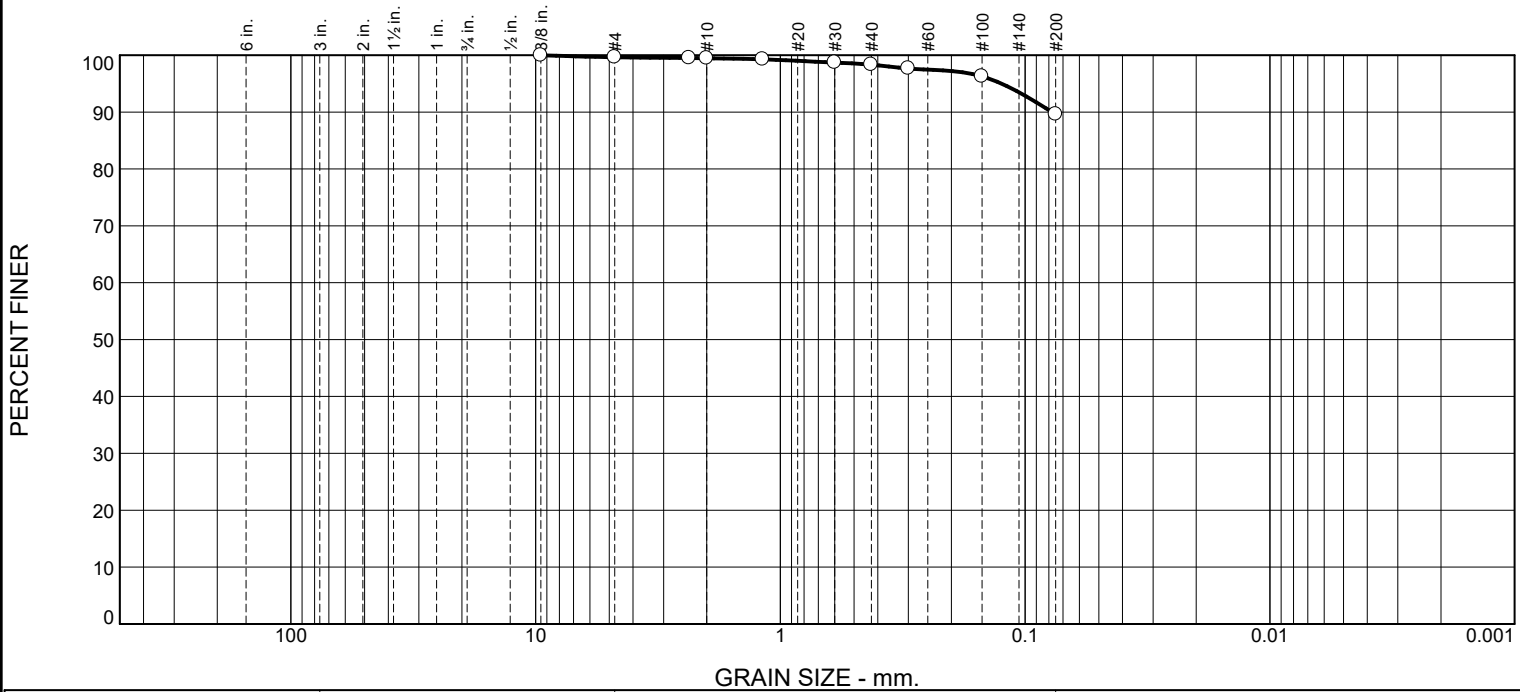
Phoenix Office
4810 S 40th Street Suite 3
Phoenix, AZ 85040
Phone (480) 505-9422
Fax (480) 505-9431
www.geotekusa.com

Client: Brookfield
Project: Alamar Phase 1

Project No: 1626.1-PHR

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.1	1.2	8.7	89.6	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	99.6		
#8	99.5		
#10	99.5		
#16	99.3		
#30	98.7		
#40	98.3		
#50	97.7		
#100	96.3		
#200	89.6		

Material Description

Atterberg Limits (ASTM D 4318)
 PL= 18 LL= 27 PI= 9

Classification
 USCS (D 2487)= CL AASHTO (M 145)= A-4(7)

Coefficients
 D₉₀= 0.0775 D₈₅= D₆₀=
 D₅₀= D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Remarks

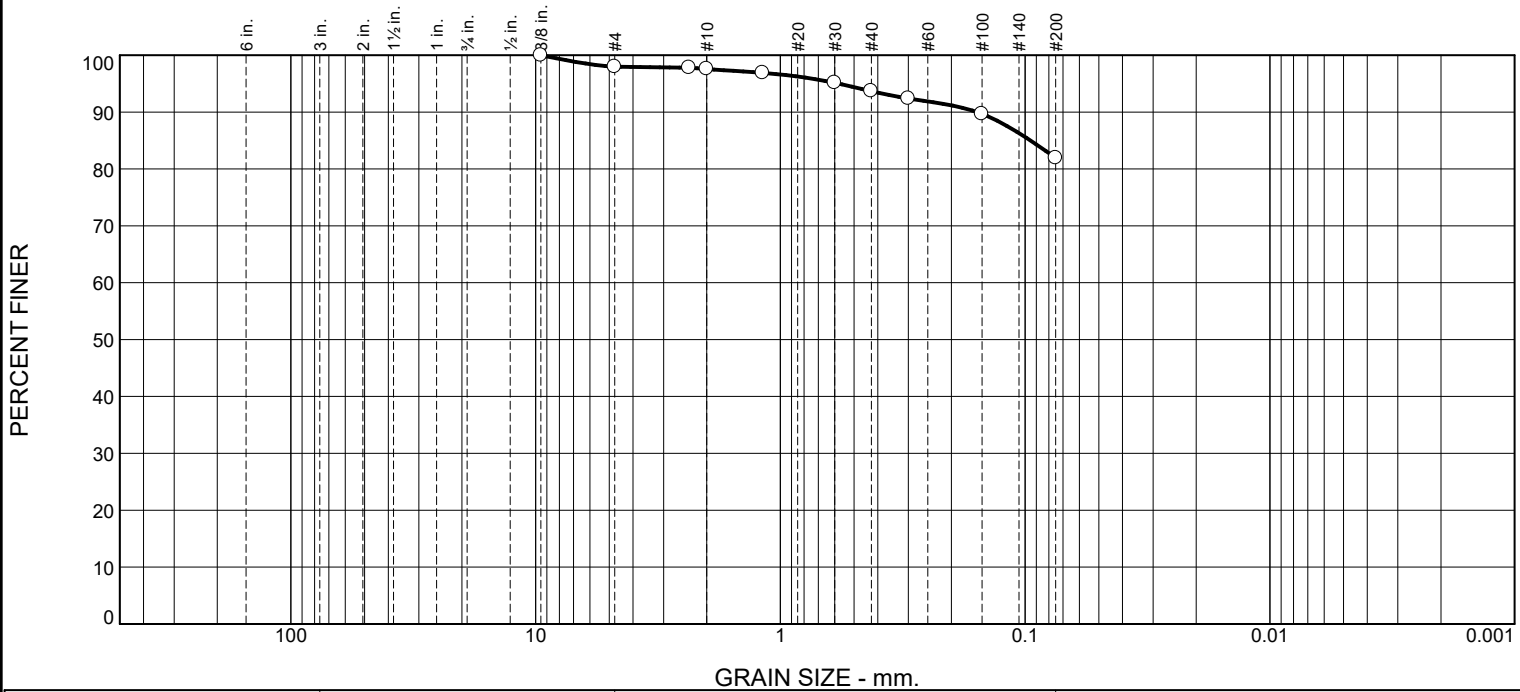
Date Received: 2/18/2019 Date Tested: 2/19/2019
 Tested By: OE
 Checked By: JJ
 Title: Lab Manager

* (no specification provided)

Location: B-7 Date Sampled: 2/18/2019
 Sample Number: 5481 Depth: 0-2'

Phoenix Office 4810 S 40th Street Suite 3 Phoenix, AZ 85040 Phone (480) 505-9422 Fax (480) 505-9431 www.geotekusa.com	Client: Brookfield Project: Alamar Phase 1 Project No: 1626.1-PHR	Figure
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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.0	0.4	3.9	11.8	81.9	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	98.0		
#8	97.8		
#10	97.6		
#16	96.9		
#30	95.1		
#40	93.7		
#50	92.4		
#100	89.7		
#200	81.9		

Material Description

Atterberg Limits (ASTM D 4318)
 PL= 17 LL= 32 PI= 15

Classification
 USCS (D 2487)= CL AASHTO (M 145)= A-6(11)

Coefficients
 D₉₀= 0.1573 D₈₅= 0.0951 D₆₀=
 D₅₀= D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Remarks

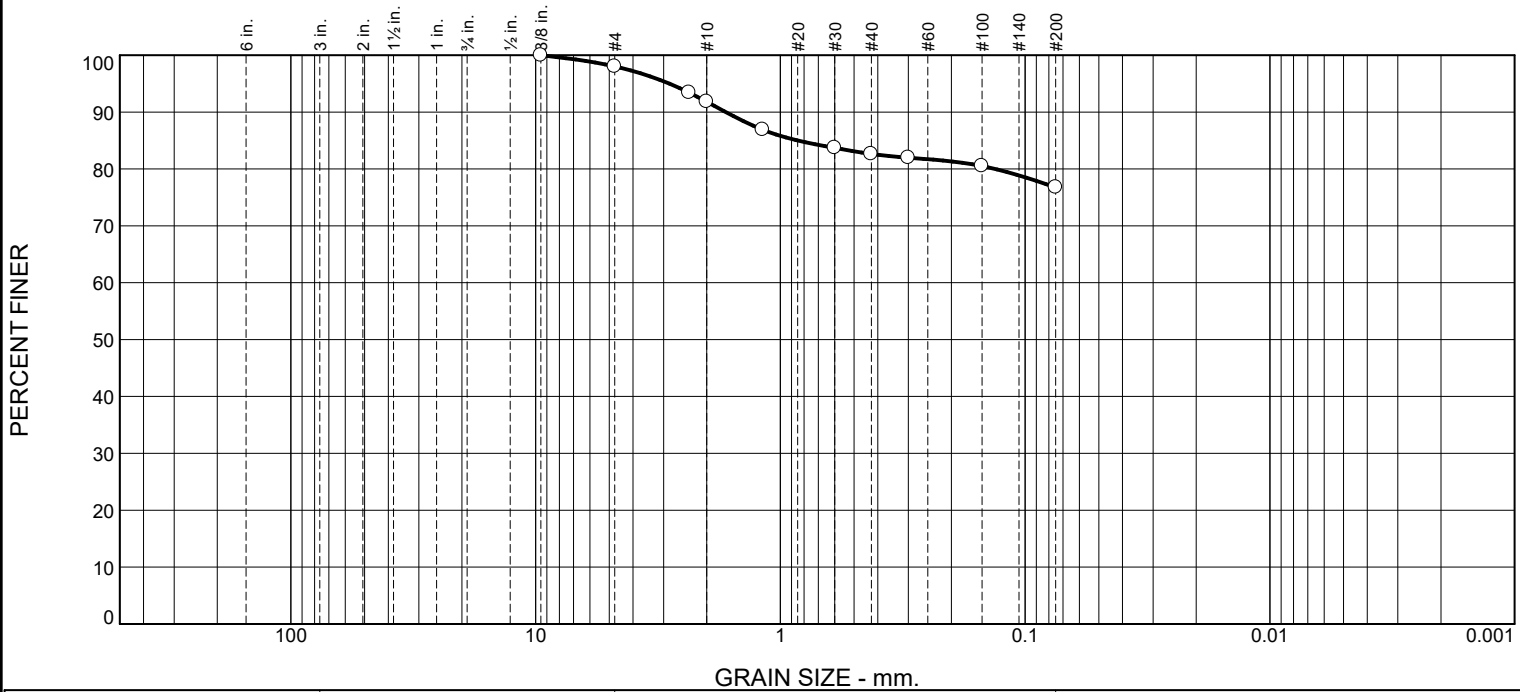
Date Received: 2/18/2019 Date Tested: 2/19/2019
 Tested By: OE
 Checked By: JJ
 Title: Lab Manager

* (no specification provided)

Location: B-8 Date Sampled: 2/18/2019
 Sample Number: 5482 Depth: 0-2'

Phoenix Office 4810 S 40th Street Suite 3 Phoenix, AZ 85040 Phone (480) 505-9422 Fax (480) 505-9431 www.geotekusa.com	Client: Brookfield Project: Alamar Phase 1 Project No: 1626.1-PHR	Figure
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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.0	6.2	9.2	5.8	76.8	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	98.0		
#8	93.4		
#10	91.8		
#16	86.9		
#30	83.7		
#40	82.6		
#50	82.0		
#100	80.5		
#200	76.8		

Material Description

Atterberg Limits (ASTM D 4318)
 PL= 20 LL= 41 PI= 21

Classification
 USCS (D 2487)= CL AASHTO (M 145)= A-7-6(15)

Coefficients
 D₉₀= 1.6728 D₈₅= 0.8488 D₆₀=
 D₅₀= D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Remarks

Date Received: 2/18/2019 Date Tested: 2/19/2019

Tested By: OE

Checked By: JJ

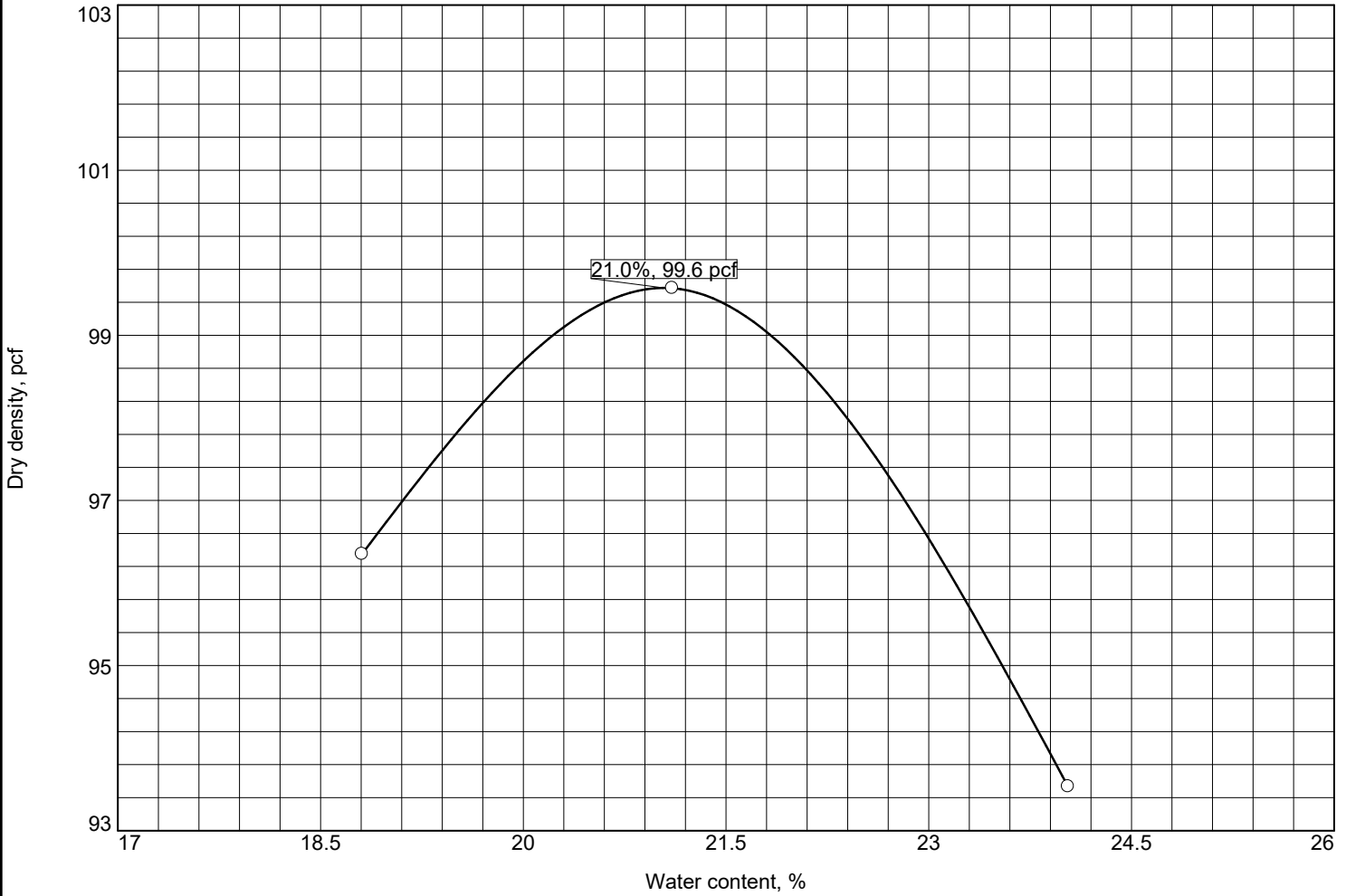
Title: Lab Manager

* (no specification provided)

Location: B-9 Sample Number: 5483 Depth: 0-2' Date Sampled: 2/18/2019


<p>Phoenix Office 4810 S 40th Street Suite 3 Phoenix, AZ 85040 Phone (480) 505-9422 Fax (480) 505-9431 www.geotekusa.com</p>	<p>Client: Brookfield Project: Alamar Phase 1</p>	<p>Project No: 1626.1-PHR</p>
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COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method A Standard

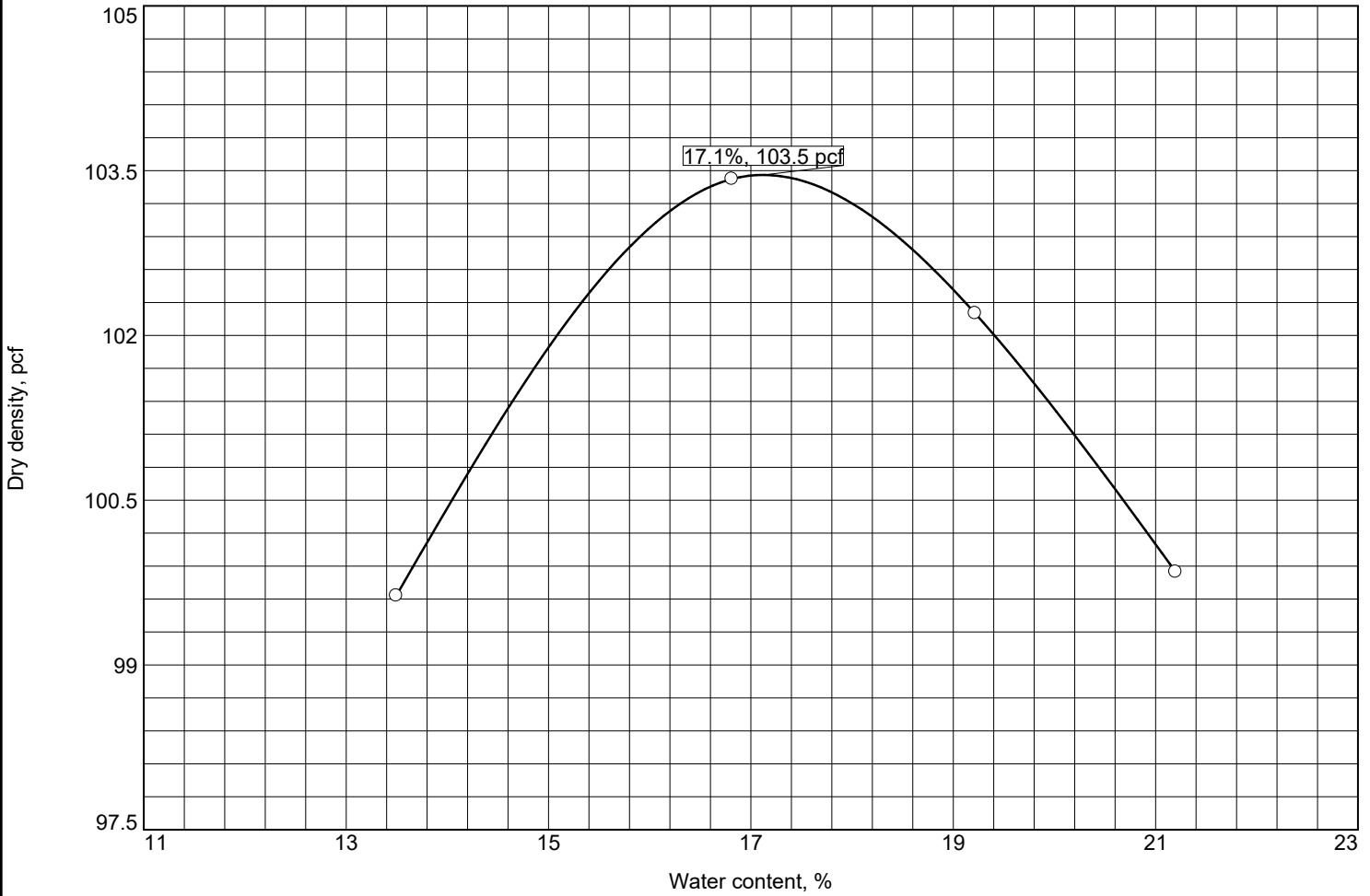
Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0-2'	CL	A-6(7)			29	11	0.6	81.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 99.6 pcf Optimum moisture = 21.0 %	
Project No. 1626.1-PHR Client: Brookfield Project: Alamar Phase 1 <input type="checkbox"/> Location: B-3 Sample Number: 5477	Remarks:
 Phoenix Office 4810 S 40th Street Suite 3 Phoenix, AZ 85040 Phone (480) 505-9422 Fax (480) 505-9431 www.geotekusa.com	

Figure

Tested By: JJ

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method A Standard

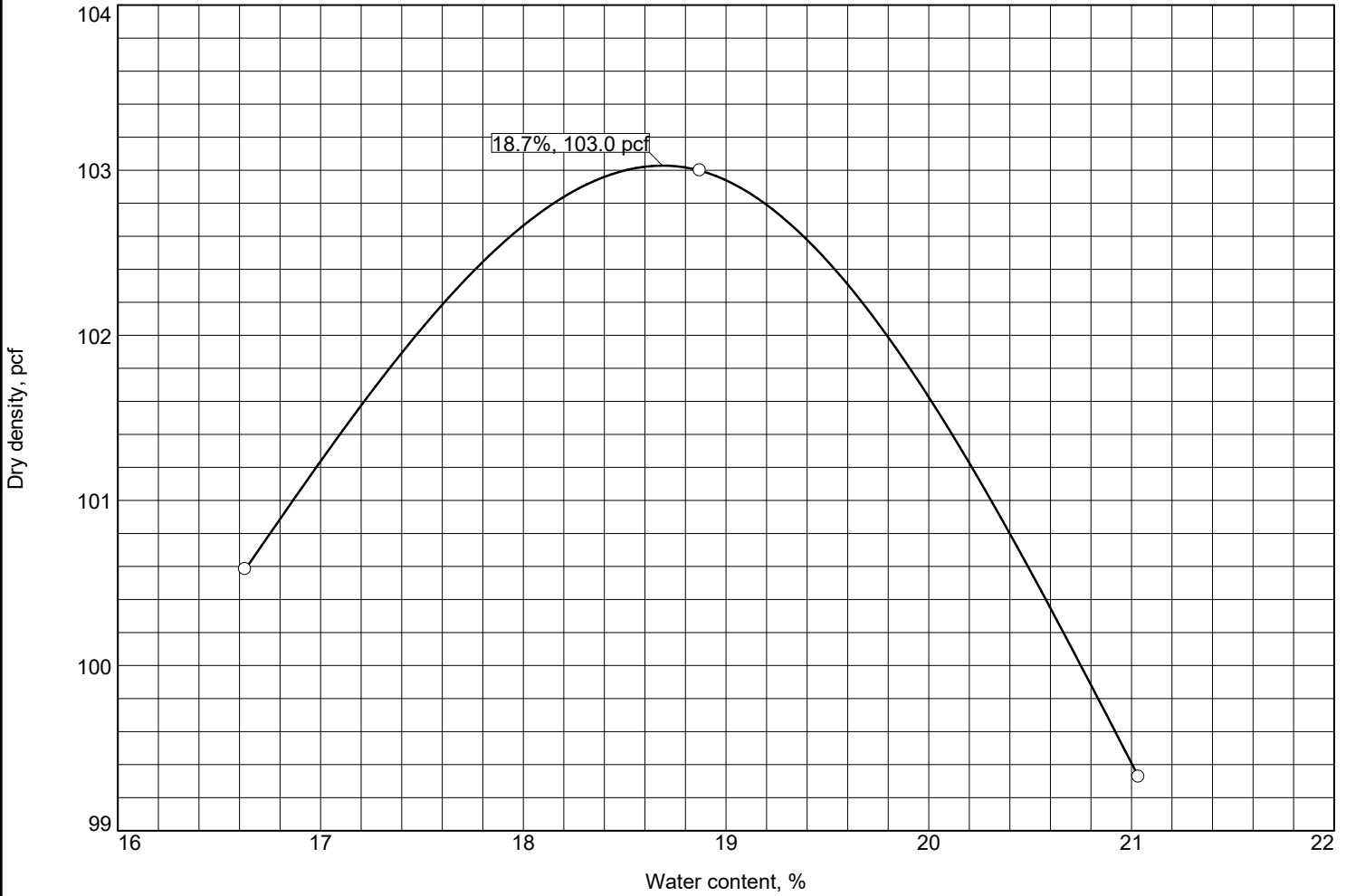
Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0-2'	CL	A-4(7)			27	9	0.4	89.6

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 103.5 pcf Optimum moisture = 17.1 %	
Project No. 1626.1-PHR Client: Brookfield Project: Alamar Phase I Location: B-7 Sample Number: 5481	Remarks:
Phoenix Office 4810 S 40th Street Suite 3 Phoenix, AZ 85040 Phone (480) 505-9422 Fax (480) 505-9431 www.geotekusa.com	

Figure

Tested By: JJ

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
0-2'	CL	A-6(11)			32	15	2.0	81.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 103.0 pcf Optimum moisture = 18.7 %	
Project No. 1626.1-PHR Client: Brookfield Project: Alamar Phase 1 Location: B-8 Sample Number: 5482	Remarks:
Phoenix Office 4810 S 40th Street Suite 3 Phoenix, AZ 85040 Phone (480) 505-9422 Fax (480) 505-9431 www.geotekusa.com	

Figure

Tested By: JJ



GeoTek Residential, LLC
4050 East Cotton Center Blvd., Suite 49 Phoenix, AZ 85040
(480) 505-9422 Office (480) 505-9431 Fax www.geotekusa.com

EXPANSION INDEX RESULTS

Sample Date 2/18/2019 Project No. 1626.I-PHR
Client Brookfield Residential (Arizona)
Project Name Alamar Phase I

LAB NO.	SAMPLE LOCATION	E.I.	MOISTURE (%)	DRY DENSITY (PCF)
5476	B-2 @ 0-3'	17	13.7	96.6
5479	B-5 @ 0-3'	26	13.7	96.6
5484	B-10 @ 0-3'	40	12.7	99.8

All Expansion Index Tests are compacted at a Degree of Saturation of 50 +/- 2%



GeoTek Residential, LLC

4050 East Cotton Center Blvd., Suite 49 Phoenix, AZ 85040
(480) 505-9422 Office (480) 505-9431 Fax www.geotekusa.com

SWELL TEST RESULTS

Sample Date 2/18/2019 Project No. 1626.I-PHR
Client Brookfield Residential (Arizona)
Project Name Alamar Phase I

LAB NO.	SAMPLE LOCATION	SWELL (%)	MOISTURE (%)	DRY DENSITY (PCF)
5477	B-3 @ 0-3'	1.0	19.0	94.6
5481	B-7 @ 0-3'	1.3	15.1	98.3
5482	B-8 @ 0-3'	1.3	16.7	97.8
5484	B-10 @ 0-3'	2.7	16.7	97.8

All Swell Tests are Compacted at 95% of the Maximum Dry Density (ASTM D698) at -2% below Optimum Moisture Content

EXHIBIT 8
DUAL OBLIGEE RIDER

This Rider is executed concurrently with and shall be attached to and form a part of Bond No. _____ (hereafter "Bond") issued by the _____ as Surety, on behalf of _____, hereafter referred to as the Principal, in favor of _____ hereafter referred to as the Owner for _____ (the "Contract") to include Project or

Solicitation No. EN 19-083

WHEREAS, the Owner requests that Surety and Principal _____ as an additional obligee under the Bond; and

WHEREAS, the Surety and Principal agree to the above referenced changes requested by the Owner which are set forth in this Rider which is executed concurrently with the execution of the Bond upon the conditions herein stated.

NOW, THEREFORE, the undersigned hereby agree as follows:

1. _____ is added to the Bond as an additional obligee ("Additional Obligee").
2. The Surety shall, in the event of any default by the Principal for which Surety is liable, have the option, in its sole discretion, to either make payment in satisfaction of its Bond obligation by a check issued jointly to the Owner and the Additional Obligee, or to complete or arrange for completion of the work on terms acceptable to the Owner and the Additional Obligee. In no event, however, shall Additional Obligee be liable for performance of the Contract unless it undertakes in a separate writing to be so bound. Unless Surety elects to make payment in satisfaction of its Bond obligation, Surety shall not be liable under the Bond to the Owner, the Additional Obligee, or either of them unless the Owner, the Additional Obligee or either of them shall make payments to the Principal (or in the case the Surety arranges for completion of the Contract, to the Surety) in accordance with the terms of the Contract as to payments and shall perform all other obligations to be performed under the Contract at the time and in the manner therein set forth. Notwithstanding anything in the Contract to the contrary, the Surety shall have no obligations or liability to the Additional Obligee unless either it or Owner fulfill all of the Owner's obligations under the Contract which shall include all of the Owner's payment obligations to the Principal.
3. The aggregate liability of the Surety under this Bond to any, all or either of the Owner or the Additional Obligee, as their interests may appear, is limited to the penal sum of the Bond as may be modified by the terms and conditions of this Rider. Further, the Additional Obligee's rights hereunder are subject to the same defenses Principal and/or Surety have against the Owner. The Surety may, at its option, make any payments under said Bond by check issued jointly to the Owner and the Additional Obligee.
4. Except as modified herein, all other terms and conditions of the Bond shall remain in full force and effect.

SIGNED, SEALED AND DATED this _____ day of _____, 2019

Owner
By: _____
Title: _____

Surety
By: _____
Attorney-In-Fact

Co-Obligee
By: _____
Title: _____

Principal
By: _____
Title: _____