

INVITATION FOR BIDS

SOLICITATION INFORMATION AND SCHEDULE

Solicitation Number: **EN17-020**

Project Number: **ST1306**

Solicitation Title: **Thomas Road Improvements – 103rd Avenue to 99th Avenue**

Release Date: **October 12, 2016**

NON-MANDATORY **October 19, 2016**

Prospective Bidders' Conference: **9:00 a.m.** (local-time, Phoenix, Arizona)
Sonoran Conference Room
11465 West Civic Center Drive
Avondale, Arizona 85323

Final Date for Inquiries: **October 25, 2016**

Bid Deadline: **November 2, 2016**
3:00 p.m. (local-time, Phoenix, Arizona)

Bid Opening: **November 2, 2016**
3:00 p.m. (local-time, Phoenix, Arizona)

Department Representative: Chris Hamilton chamilton@avondale.org
623-333-4218

Procurement Administrator: Tiffany Copp tcopp@avondale.org
623-333-4213

In accordance with the City of Avondale Procurement Code, competitive sealed Bids for the services specified herein will be received by the 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 publicly opened and the Bid Price read. Bids shall be in the actual possession of the City Clerk on, or prior to, the Bid Deadline date. Late Bids shall not be considered except as provided in the City Procurement Code. Bids shall be submitted in a sealed envelope with the Solicitation Number and the Bidder's name and address clearly indicated on the front of the envelope.

There is no charge for the first set of Plans and Specifications.
Each additional set may be obtained in accordance with the City's Fee Schedule.
Plans and Specifications may be picked up at the City of Avondale.

*** The City of Avondale reserves the right to amend the solicitation schedule as necessary.**

OFFER

The undersigned (the "Bidder") hereby offers this Bid as an offer to contract with the City under the terms and conditions set forth below and certifies that Bidder has read, understands and agrees to fully comply with, and be contractually bound by, all terms and conditions as set forth in this Invitation For Bids ("IFB"), the Contract formed hereby (as defined below) and any amendments thereto, together with all Exhibits, Specifications, Plans and other documents included as part of this Contract (the "Contract Documents").

Arizona Transaction (Sales) Privilege Tax License Number: _____ Federal Employer Identification Number: _____ <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px 0;">Contractor Name</div> <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px 0;">Address</div> <div style="display: flex; justify-content: space-between; border-top: 1px solid black; padding-top: 2px;"> City State Zip Code </div>	For Clarification of this Bid contact: Name: _____ Telephone: _____ Facsimile: _____ Email: _____ <div style="text-align: center; border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px 0;">Authorized Signature for Contractor</div> <div style="text-align: center; border-top: 1px solid black; padding-top: 2px;">Printed Name</div> <div style="text-align: center; border-top: 1px solid black; padding-top: 2px;">Title</div>
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ACCEPTANCE OF OFFER AND NOTICE OF AWARD (FOR CITY OF AVONDALE USE ONLY)

Effective Date: _____ Contract No. _____ Official File: _____

CITY OF AVONDALE, an Arizona municipal corporation

David W. Fitzhugh, City Manager

ATTEST:

Carmen Martinez, City Clerk

APPROVED AS TO FORM:

Andrew J. McGuire, City Attorney

ARTICLE I - DEFINITIONS

For purposes of this Invitation for Bids, the following definitions shall apply:

1.1 “Bid” or “Offer” means a responsive bid or quotation submitted by a Bidder in response to this Invitation for Bids.

1.2 “Bid Deadline” means the date and time set forth on the cover of this IFB for the City Clerk to be in actual possession of the sealed Bids.

1.3 “Bid Opening” means the date and time set forth on the cover of this Invitation for Bids for opening of sealed Bids.

1.4 “Bidder” means any person or firm submitting a competitive Bid in response to this IFB.

1.5 “City” means the City of Avondale, an Arizona municipal corporation.

1.6 “City Representative” means the City employee who has specifically been designated to act as a contact person to the City’s Procurement Administrator, and who is responsible for monitoring and overseeing the Contractor’s performance under this Contract and for providing information regarding details pertaining to the Work.

1.7 “Confidential Information” means that portion of a Bid, proposal, Offer, Specification or protest that contains information that the person submitting the information believes should be withheld, provided (i) such person submits a written statement advising the City of this fact at the time of the submission and (ii) the information is so identified wherever it appears.

1.8 “Contract” means, collectively, the (i) Offer/Bid, (ii) this IFB, including all exhibits, (iii) the Notice of Award, (iv) the Notice to Proceed or Purchase Order(s), (v) any approved Addendum, Change Order or Amendment, (vi) the Contractor’s Certificates of Insurance and a copy of the Declarations Page(s) of the insurance policies, (vii) the Certificate of Completion and (viii) any Plans, Specifications or other documents attached, appended or incorporated herein by reference. Alternate or optional bid items will become part of this Contract only if they are accepted by the City in writing on the Price Sheet.

1.9 “Contractor” means the individual, partnership, corporation or limited liability company who has submitted a Bid in response to this IFB and who, as a result of the competitive bidding process, is awarded a contract for Materials or Services by the City.

1.10 “Contract Time” means the time period during which the Contractor must complete all of the Work related to the Project.

1.11 “Day(s)” means calendar day(s) unless otherwise specified.

1.12 “Engineer” means the City Engineer or authorized designee.

1.13 “Final Completion” shall be defined as set forth in Section 3.18 and shall occur not later than 30 Days from the date of Substantial Completion unless otherwise designated by the Engineer and subject to modification by changes in the Work as provided in Section 3.16 below.

1.14 “Invitation for Bids” or “IFB” means this request by the City for participation in the competitive bidding process according to all documents, including those attached or incorporated herein by reference, utilized for soliciting Bids for the Materials and/or Services in compliance with the City’s Procurement Code.

1.15 “MAG Specifications” means, collectively, the “Uniform Standard Specifications for Public Works Construction,” current edition as of the date of Contract award and the “Uniform Standard Details for Public Works Construction,” current edition as of the date of Contract award, which are sponsored and distributed by the Maricopa Association of Governments (“MAG”) and any amendments or supplements adopted by the City.

1.16 “MAG Supplement” means the City of Avondale Supplement to the MAG Uniform Standard Specifications and Details for Public Works Construction, dated April, 2008.

1.17 “Materials” means any personal property, including equipment, materials, replacements and supplies provided by the Contractor in conjunction with this Contract and shall include, in addition to Materials incorporated in the Project, equipment and other material used and/or consumed in the performance of the Work.

1.18 “Multiple Award” means an award of an indefinite quantity contract for one or more similar products, commodities or Services to more than one Bidder.

1.19 “Price” means the total expenditure for the defined Project, inclusive of all Materials, commodities or Services.

1.20 “Procurement Administrator” means a City employee, as designated on the cover of this IFB, who has specifically been designated to act as a contact person to the Bidders and/or Contractor relating to their IFB.

1.21 “Procurement Agent” means the City Manager or authorized designee.

1.22 “Procurement Code” means the City’s Procurement Code, as amended from time to time.

1.23 “Project” means the purpose and Work described as set forth in Section 2.1, in the “Purpose/Scope of Work” of the IFB.

1.24 “Punch List” means that list of items provided by City to Contractor at the time of Substantial Completion indicating items to be completed or corrected, including the time for completion or correction by Contractor after Substantial Completion.

1.25 “Services” means the furnishing of labor, time or effort by a Contractor, not involving the delivery of a specific end product other than reports which are merely incidental to the required performance and as further defined in this Contract. This term does not include “professional and technical services” as defined in the Procurement Code.

1.26 “Specification” means any description of the physical characteristics, functional characteristics, or the nature of a commodity, product, supply or Services. The term may include a description of any requirements for inspecting, testing, or preparing a supply or service item for delivery.

1.27 “Subcontractor” means those persons or groups of persons having a direct contract with the Contractor to perform a portion of the Work and those who furnish Materials according to the plans and/or Specifications required by this Contract.

1.28 “Substantial Completion” shall be defined as set forth in Section 3.17 below and shall occur not later than the date set forth in the Schedule, subject to modification by changes in the Work as provided in Section 3.16 below.

1.29 “Vendor” means any firms, entities or individuals desiring to prepare a responsive Bid in response to this Invitation for Bids.

1.30 “Work” means all labor, Materials and equipment incorporated or to be incorporated in the Project that are necessary to accomplish the construction required by this Contract.

ARTICLE II – BID PROCESS; BID AWARD

2.1 Purpose/Scope of Work. The Work included in this Project consists of new pavement, curb, gutter, sidewalk, streetlights, landscaping and other related miscellaneous Work. The City is issuing this IFB is to secure a qualified Arizona General Engineering Class A Licensed Contractor to perform the Work and provide Materials as more particularly described in the Specifications attached hereto as Exhibit A, and incorporated herein by reference. Bidders must submit Bids encompassing the entire Project, inclusive of the related Plans and/or Construction Drawings. Failure to do so may result in a determination that the Bid is non-responsive.

2.2 Amendment of IFB. Except as set forth in Section 3.57 below, no alteration may be made to this IFB or the resultant Contract without the express, written approval of the City in the form of an official IFB addendum or Contract amendment. Any attempt to alter this IFB/Contract without such approval is a violation of this IFB/Contract and the City Procurement Code. Any such action is subject to the legal and contractual remedies available to the City including, but not limited to, Contract cancellation and suspension and/or debarment of the Bidder or Contractor.

2.3 Preparation/Submission of Bid. Bidders are invited to participate in the competitive bidding process for the Project specified in this IFB. Bidders shall review their Bid submissions to ensure the following requirements are met.

A. Irregular/Non-responsive Bids. The City will consider as “irregular” or “non-responsive” and shall reject any Bid not prepared and submitted in accordance with the IFB and Specifications, or any Bid lacking sufficient information to enable the City to make a reasonable determination of compliance with the Specifications. Unauthorized or unreasonable exceptions, conditions, limitations, or provisions shall be cause for rejection. Bids may be deemed non-responsive at any time during the evaluation process if, in the sole opinion of the Procurement Agent, any of the following are true:

1. Bidder does not meet the minimum required skill, experience or requirements to perform the Work or provide the Materials.
2. Bidder has a past record of failing to fully perform or fulfill contractual obligations.
3. Bidder cannot demonstrate financial stability.
4. Bid submission contains false, inaccurate or misleading statements that, in the opinion of the Procurement Agent, are intended to mislead the City in its evaluation of the Bid.

B. Specification Minimums. Bidders are reminded that the Specifications in this IFB are the minimum levels required and that Bids submitted must be for products that meet or exceed the minimum level of

all features specifically listed in this IFB. Bids offering less than the minimums specified will be deemed not responsive. It shall be the Bidder's responsibility to carefully examine each item listed in the Specifications.

C. Required Submittal. Bidders shall provide **all of the following** documents to be considered a responsive Bid:

1. Complete, fully executed original of this IFB, with the Offer signed in ink by a person authorized to bind the Bidder.
2. Price Sheet.
3. Bid Bond.
4. Licenses; /DBE & MBE Status.
5. References.
6. Federal Requirements, if applicable.
7. Acknowledgment for each Addendum received, if any.

D. Bidder Responsibilities. All Bidders shall (1) examine the entire Bid package, (2) seek clarification of any item or requirement that may not be clear, (3) check all responses for accuracy before submitting a Bid and (4) submit the entire, completed Bid package by the official Bid Deadline. Late Bids shall not be considered. Bids not submitted with an **original, signed** Offer page by a person authorized to bind the Bidder shall be considered non-responsive. Negligence in preparing a Bid shall not be good cause for withdrawal after the Bid Deadline.

E. Sealed Bids. All Bids shall be sealed and clearly marked with the IFB title and number on the lower left hand corner of the mailing envelope. A return address must also appear on the outside of the sealed Bid.

F. Address. All Bids shall be directed to the following address: City Clerk, 11465 West Civic Center Drive, Suite 200, Avondale, Arizona 85323, or hand-delivered to the City Clerk's office.

G. Bid Forms. All Bids shall be on the forms provided in this IFB. It is permissible to copy these forms if required. Telegraphic (facsimile), electronic (email) or mailgram Bids will not be considered.

H. Modifications. Erasures, interlineations, or other modifications in the Bid shall be initialed in original ink by the authorized person signing the Bid.

I. Withdrawal. At any time prior to the specified Bid Opening, a Bidder (or designated representative) may amend or withdraw its Bid. Facsimile, electronic (email) or mailgram Bid amendments or withdrawals will not be considered. No Bid shall be altered, amended or withdrawn after the specified Bid Deadline, unless otherwise permitted pursuant to the City Procurement Code.

2.4 Inquiries; Interpretation of Plans, Specifications and Drawings.

A. Inquiries. Any question related to the IFB, including any part of the Plans, Specifications, Scope of Work or other Contract Documents, shall be directed to the City Representative and Procurement Administrator whose names appear on the cover page of this IFB. Verbal or telephone inquiries

directed to City staff **will not be answered**. Within two business days following the Final Date for Inquiries listed on the cover page of this IFB, answers to all questions received in writing or via e-mail will be mailed, sent via facsimile and/or e-mailed to all parties who obtained an IFB package from the City and who legibly provided a mailing address, facsimile and/or e-mail address to the City. Questions shall be submitted in writing by the date indicated on the cover page of this IFB; the City will not respond to any inquiries submitted later than the Final Date for Inquiries. The Vendor submitting such inquiry will be responsible for its prompt delivery to the City. Any correspondence related to the IFB shall refer to the title and number, page and paragraph. However, the Bidder shall not place the IFB number and title on the outside of any envelope containing questions, because such an envelope may be identified as a sealed Bid and may not be opened until the Bid Opening. Any interpretations or corrections of the proposed Contract Documents will be made only by addenda duly approved and issued by the City. The City will not be responsible for any other explanations or interpretations of the Contract Documents.

B. Addenda. It shall be the Bidder's responsibility to check for addenda issued to this IFB. Any addendum issued by the City with respect to this IFB will be available at:

City of Avondale City Hall, 11465 West Civic Center Drive, Avondale, Arizona 85323
Buyhub website at <http://eprocare.avondale.org>
City of Avondale website at www.avondale.org/procurement

C. Approval of Substitutions. The Materials, products, and equipment described in this IFB establish a standard or required function, dimension, appearance and quality to be met by any proposed substitution. No substitute will be considered unless written Substitution/Equal Request in the form attached hereto as Exhibit B, has been received by the City Representative at least 10 Days prior to the Bid Deadline. Each such request shall include the name of the Material or equipment for which it is to be substituted and a complete description of the proposed substitute, including any drawings, performance and test data and any other information necessary for evaluation of the substitute. If a substitute is approved, the approval shall be by written addendum to the IFB. Bidder shall not rely upon approvals made in any other manner.

D. Use of Equals. When the Specifications for materials, articles, products and equipment include the phrase "*or equal*," Bidder may bid upon and use materials, articles, products and equipment that will perform equally the requirements imposed by the general design. The Engineer will have the final approval of all materials, articles, products and equipment proposed to be used as an "equal." No such "equal" shall be purchased or installed without prior, written approval from the Engineer. No "equal" will be considered unless a written Substitution/Equal Request, in the form attached hereto as Exhibit B, has been received by the City Representative at least 10 Days prior to the Bid Deadline. The request shall include the name of the material or equipment for which the item is sought to be considered an equal and a complete description of the proposed equal including any drawings, cuts, performance and test data and any other information necessary for evaluation of the equal. All approval of equals shall be issued in the form of written addendum or amendment, as applicable, to this IFB or the Contract.

E. Bid Quantities. It is expressly understood and agreed by the parties hereto that the quantities of the various classes of Services and/or Materials to be furnished under this Contract, which have been estimated as stated in the Bidders' Offer, are only approximate and are to be used solely for the purpose of comparing, on a consistent basis, the Bidders' Offers presented for the Work under this Contract. The selected Contractor agrees that the City shall not be held responsible if any of the quantities shall be found to be incorrect and the Contractor will not make any claim for damages or for loss of profits because of a difference between the quantities of the various classes of Services and/or Materials as estimated and the Services and/or Materials actually provided. Contractor is responsible for ensuring that all Materials contained in the Plans for the project

are bid on the Price Sheet. Contractor shall bring any potential discrepancy between the Plans and the Price Sheet to the City's attention, either at the Prospective Bidders' Conference or by written inquiry, as set forth in Subsection 2.4(A) above. If any error, omission or misstatement is found to occur, the same shall not (1) invalidate this Contract or the whole or any part of the Scope of Work, (2) excuse Contractor from any of the obligations or liabilities hereunder or (3) entitle Contractor to any damage or compensation except as may be provided in this Contract.

2.5 Prospective Bidders' Conference. A Prospective Bidders' Conference may be held. If scheduled, the date and time of the Prospective Bidders' Conference will be indicated on the cover page of this IFB. The Prospective Bidders' Conference may be designated as mandatory or non-mandatory on the cover of this IFB. Bids shall not be accepted from Bidders who do not attend a mandatory Prospective Bidders' Conference. Bidders are strongly encouraged to attend those Prospective Bidder's Conferences designated as non-mandatory. The purpose of the Prospective Bidders' Conference will be to clarify the contents of the IFB in order to prevent any misunderstanding of the City's requirements. Any doubt as to the requirements of this IFB or any apparent omission or discrepancy should be presented to the City at the Prospective Bidders' Conference. The City will then determine if any action is necessary and may issue a written amendment or addendum to the IFB. Oral statements or instructions will not constitute an amendment or addendum to the IFB.

2.6 New Materials. All Materials to be provided by the Contractor and included in the Bid shall be new, unless otherwise stated in the Specifications.

2.7 Prices. Work shall be performed at the unit prices as set forth in the Price Sheet attached hereto as Exhibit C and incorporated herein by reference. Bid prices shall be submitted on a per unit basis by line item, when applicable and include all applicable transaction privilege (sales) tax. In the event of a disparity between the unit price and extended price, the unit price shall prevail. **NOTE: All pricing blanks must be filled in. Empty or unfilled spaces in the Bid Price Sheet shall result in a determination that a Bid is non-responsive.**

2.8 Payment; Discounts. Any Bid that requires payment in less than 30 Days shall not be considered. Payment discounts of 30 Days or less will not be deducted from the Bid Price in determining the low Bid. The City shall be entitled to take advantage of any payment discount offered, provided payment is made within the discount period. Payment discounts shall be indicated on Price Sheet.

2.9 Taxes. The City is exempt from Federal Excise Tax, including the Federal Transportation Tax. Transaction privilege tax, if any, shall be included in the unit price for each line item. It shall not be considered a lump sum payment item. Bidder should not include tax on any allowances. It is the sole responsibility of the Bidder to determine any applicable State tax rates and calculate the tax accordingly. Failure to accurately tabulate any applicable taxes may result in a determination that a Bid is non-responsive. The Bidder shall not rely on, and shall independently verify, any tax information provided by the City.

2.10 Federal Funding. It is the responsibility of the Bidder to verify and comply with federal requirements that may apply to the Work (the "Federal Requirements"). It is also the responsibility of the Bidder to incorporate any necessary amounts in the Bid to accommodate for required federal record-keeping, necessary pay structures or other matters related to the Federal Requirements. Federal Requirements, if any, shall be attached hereto as Exhibit D. In addition to any applicable Federal Requirements, this procurement is subject to a number of state and City regulations. In general, where these rules conflict, the more stringent law or rule applies.

2.11 Cost of Bid/Proposal Preparation. Bids submitted for consideration should be prepared simply and economically, providing adequate information in a straightforward and concise manner. The City does not reimburse the cost of developing, presenting or providing any response to this solicitation; the Bidder is

responsible for all costs incurred in responding to this IFB. All materials and documents submitted in response to this IFB become the property of the City and will not be returned.

2.12 Public Record. All Bids shall become the property of the City. After Contract award, Bids shall become public records and shall be available for public inspection in accordance with the City's Procurement Code, except that any portion of a Bid that was designated as confidential pursuant to Section 2.13 below shall remain confidential from and after the time of Bid opening to the extent permitted by Arizona law.

2.13 Confidential Information. If a Vendor/Bidder believes that a Bid, Specification, or protest contains information that should be withheld from the public record, a statement advising the Procurement Agent of this fact shall accompany the submission and the information shall be clearly identified. The information identified by the Vendor or Bidder as confidential shall not be disclosed until the Procurement Agent makes a written determination. The Procurement Agent shall review the statement and information with the City Attorney and shall determine in writing whether the information shall be withheld. If the City Attorney determines that it is proper to disclose the information, the Procurement Agent shall inform the Vendor or Bidder in writing of such determination.

2.14 Vendor Licensing and Registration. Prior to the award of the Contract, the successful Bidder shall (A) be registered with the Arizona Corporation Commission and authorized to do business in Arizona and (B) have a completed Request for Vendor Number on file with the City Financial Services Department. Bidders shall provide license and certification information with the Bid, attached as Exhibit E and incorporated herein by reference. Upon the City's request, corporations, limited liability companies, partnerships or other entities shall provide Certificates of Good Standing from the Arizona Corporation Commission.

2.15 Bidder Qualifications.

A. Experience and References. Bidder must demonstrate successful completion of at least three similar projects within the past 60 months, one of which must have a dollar value of at least 75% of the total bid for this Project as set forth in the Price Sheet, attached as Exhibit C. Total bid price does not include any City allowances identified. For the purpose of this Solicitation, "successful completion" means completion of a project within the established schedule and budget and "similar projects" resemble this Project in size, nature and scope. References for these three projects shall be listed on the sheet attached hereto as Exhibit F and incorporated herein by reference. *These references will be checked*, and it is Bidder's responsibility to ensure that all information is accurate and current. Bidder authorizes the City's representative to verify all information from these references and releases all those concerned from any liability in connection with the information they provide.

B. Investigation. The City's representative may conduct any investigation deemed necessary to determine the Bidder's ability to perform the Work in accordance with the Contract Documents. The three lowest Bidders may be requested to submit additional documentation within 72 hours (or as specified) to assist the City in its evaluation.

2.16 Certification. By submitting a Bid, the Bidder certifies:

A. No Collusion. The submission of the Bid did not involve collusion or other anti-competitive practices.

B. No Discrimination. It shall not discriminate against any employee or applicant for employment in violation of Federal Executive Order 11246.

C. No Gratuity. It has not given, offered to give, nor intends to give at any time hereafter, any economic opportunity, future employment, gift, loan, gratuity, special discount, trip favor or service to a City employee, officer, agent or elected official in connection with the submitted Bid or a resultant Contract. In the event that the resultant Contract is canceled pursuant to this provision, the City shall be entitled, in addition to any other rights and remedies, to recover and withhold from the Contractor an amount equal to 150% of the gratuity.

D. Financial Stability. It is financially stable, solvent and has adequate cash reserves to meet all financial obligations including any potential costs resulting from an award of the Contract.

E. No Signature/False Statement. The signature on the Bid and the Vendor Information Form is genuine. Failure to sign the Bid and the Vendor Information Form, or signing either with a false statement, shall void the submitted Bid and any resulting Contract, and the Bidder may be debarred from further bidding in the City.

2.17 Bid Bond. All Vendors desiring to prepare a responsive Bid shall submit a non-revocable bid security payable to the City in the amount of ten percent (10%) of the total Bid Price. This security shall be in the form of a bid bond, certified check or cashier's check and must be in the possession of the City Representative by the Bid Deadline. All bid security from Contractor(s) who have been issued a Notice of Award shall be held until the successful execution of all required Contract Documents and bonds. If the Contractor fails to execute the required contractual documents and bonds within the time specified, or 10 Days after Notice of Award if no period is specified, the Contractor may be found to be in default and this Contract terminated by the City. In case of default, the City reserves all rights inclusive of, but not limited to, the right to purchase material and/or to complete the Work and to recover any actual excess costs associated with such completion from the Contractor. All bid bonds shall be executed in the form attached hereto as Exhibit G, duly executed by the Bidder as Principal and having as Surety thereon a Surety company holding a Certificate of Authority from the Arizona Department of Insurance to transact surety business in the State of Arizona. Individual sureties are unacceptable. All insurers and sureties shall have, at the time of submission of the proposal, an A.M. Best's Key Rating Guide of "A-" or better as currently listed in the most recent Best Key Guide, published by the A.M. Best Company. As soon as is practicable after the completion of the evaluation, the City will (A) issue a Notice of Award for those Offers accepted by the City and (B) return all checks or bonds to those Bidders who have not been issued a Notice of Award.

2.18 Award of Contract.

A. Multiple Award. The City may, at its sole discretion, accept Bidder's Offer as part of a Multiple Award.

B. Evaluation. The evaluation of this Bid will be based on, but not limited to, the following: (1) compliance with Specifications, (2) Price, including alternates selected by the City, if any, and taxes, but excluding "as-needed" services requested by the City and (3) Bidder qualifications to perform the Work.

C. Waiver, Rejection, Reissuance. Notwithstanding any other provision of this IFB, the City expressly reserves the right to: (1) waive any immaterial defect or informality, (2) reject any or all Bids or portions thereof and (3) cancel or reissue an IFB.

D. Offer. A Bid is a binding offer to contract with the City based upon the terms, conditions and Specifications contained in this IFB and the Bidder's responsive Bid, unless any of the terms, conditions, or Specifications are modified by a written addendum or Contract amendment. Bids become binding Contracts when the Acceptance of Offer and Notice of Award is executed in writing by the City. Bidder Offers shall be valid and irrevocable for **90** Days after the Bid Opening.

E. Protests. Any Bidder may protest this IFB, the proposed award of a Contract, or the actual award of a Contract. All protests will be considered in accordance with the City Procurement Code.

ARTICLE III – GENERAL TERMS AND CONDITIONS

PART A - GENERAL

3.1 Reference Standards. The Contractor shall perform the Work required in conformance with MAG Specifications and the MAG Supplement, 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.

3.2 Plans and Specifications to Successful Contractor. The successful Contractor may obtain five sets of Plans and Specifications for this Project from the Engineer at no cost.

3.3 Contract Time. The Contract Time for this Project shall be 120 Days from the Notice to Proceed. All Work on the Project shall be completed on or before the expiration of the Contract Time.

3.4 Pre-Construction Conference. Within 30 Days of the issuance of the Notice of Award, the Contractor shall attend a pre-construction conference. The City will contact the Contractor to schedule a specific date, time and location for the pre-construction conference. The purpose of this conference is to outline specific items and procedures and to address items that require special attention on the part of the Contractor. The Contractor may also present proposed variations in procedures that the Contractor believes may (A) improve the Project, (B) reduce cost or (C) reduce inconvenience to the public. Any necessary coordination and procedures for construction inspection and staking will be addressed during the pre-construction conference. The Contractor will be required to provide the following items at, or prior to, the pre-construction conference, each of which is subject to review and approval by the Engineer:

A. Key Personnel; Subcontractors. A list of the names and emergency telephone numbers of all proposed key personnel, Subcontractors and suppliers that the Contractor intends to utilize on the Project, in the form attached hereto as Exhibit H and incorporated herein by reference. The term “Key Personnel” means individuals who will be directly assigned to this Project and includes, but is not limited to, the owner, principals, project manager, project superintendent, scheduler, construction engineer and supervisory personnel. At least two of the Bidder’s Key Personnel must have a minimum of three years’ experience in similar projects (defined above) and the scheduler must have experience in employing scheduling techniques appropriate for this Project. Resumes of Key Personnel shall be submitted upon request by the City’s representative. Proposed Subcontractors shall be qualified and have the requisite professional or technical licenses and be licensed to do business in the State of Arizona. The list shall include such information on the professional background of each of the assigned key individuals as may be requested by the City Representative. Such key personnel and Subcontractors shall be satisfactory to the Engineer and shall not be changed except with the consent of the Engineer. Additionally, the Engineer shall have the right to request that the Contractor personnel and Subcontractors be removed from the Project if, in the Engineer’s sole discretion, such personnel or Subcontractor(s) are detrimental to the Project delivery process. Upon receipt of such request, the Contractor shall remove such personnel or Subcontractor(s) unless the Contractor can provide the City with sufficient documentation to prove it is commercially impractical to replace the personnel or Subcontractor(s) with substitute personnel possessing similar qualifications. The Engineer’s approval of substituted personnel or Subcontractor(s) shall not be unreasonably withheld.

B. Progress Schedule. A construction progress schedule showing the estimated time for start and completion of the major items of Work.

C. Payment Schedule. A payment schedule showing the estimated dollar volume of Work for each calendar month during the life of the Project.

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

E. Drawings, Materials & Equipment. An itemized list of all required shop drawings, material and equipment submittals and a schedule indicating the dates each of these items will be transmitted to the City for review.

3.5 Notice to Proceed. Within 45 Days of the issuance of the Notice of Award the City 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 time required for the Contractor to obtain permits, licenses and easements 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 for a delay claim by the Contractor. No Work shall be started until after all required permits, licenses, and easements have been obtained. The Contractor shall notify the Engineer, in writing, at least 72 hours before the following events:

A. Commencement. The start of construction.

B. City Services Shut Down. Shutdown of City water, sewer, drainage, irrigation and/or traffic control facilities.

C. Well or Pump Shut Down. Shutdown of existing water wells and booster pumps. Such shutdown shall not exceed 72 hours of any facility and only one facility may be shutdown at any one time.

D. Water Lines. All draining and filling of water lines and irrigation laterals and all operations of existing valves or gauges. The City will furnish all required water meters; provided however, that the meter provided is only for construction purposes. Any domestic water meter necessary for the Project shall be included in the Bid.

E. Start-up and Testing. Start-up or testing of any water well or booster pump to be connected to any part of the existing City water system. This includes operation of existing valves necessary to accommodate the water.

3.6 Laws and Regulations. The Contractor shall keep fully informed of all rules, regulations, ordinances, statutes or laws affecting the Work herein specified, including existing and future (A) City and County ordinances and regulations, (B) State and Federal laws and (C) Occupational Safety and Health Administration (“OSHA”) standards.

3.7 Affirmative Action Report. It is the policy of the City that suppliers of goods or services to the City adhere to a policy of equal employment opportunity and demonstrate an affirmative effort to recruit, hire, and promote regardless of race, color, religion, gender, national origin, age or disability. On any Contract in excess of six months, the Contractor shall provide an annual report to the Engineer highlighting its activities to comply with this Section 3.7.

3.8 Rights-of-Way. The Contractor shall obtain a right-of-way permit for any of the Work completed in the public right-of-way. The Contractor will be responsible for any required Maricopa County permits or other agency permits. The City will provide any necessary easements for Work specified under this Contract, and the

Contractor shall not enter or occupy with workers, tools, equipment or materials any private ground outside the property of the City without the written consent of the owner thereof. The Contractor, at its own expense, is responsible for the acquisition of any additional easements or rights-of-way.

3.9 Inspection and Compliance. Each Contractor must inform itself fully of the conditions relating to the construction of the Project and the employment of labor thereon. Failure to do so will not relieve the Contractor of its obligation to furnish all material and labor necessary to carry out the provisions of this Contract. Insofar as possible in carrying out its work, the Contractor must employ such methods or means as will not cause any interruption of or interference with the Work of any other contractor. Contractor affirms that it has inspected the jobsite and has thoroughly reviewed this Contract including, without limitation, the Specifications listed on Exhibit A, as the same may be revised by the City, and is not relying on any opinions or representations of City. Contractor agrees to perform and complete such Work in strict accordance with this Contract and under the general direction of the City. Contractor agrees that any exclusions of any Work must be approved in writing by the City prior to acceptance of this Contract or same shall not be excluded hereunder. Contractor shall provide all competent supervision necessary to execute all Work and any Work incidental thereto in a thorough, first-class, workmanlike manner. It is Contractor's responsibility that all of the Work and any Work incidental thereto conforms to, and is performed in accordance with, all applicable Federal, State, County and City laws, codes, ordinances, regulations (including National Pollutant Discharge Elimination System and air pollution standards) and orders of public authorities bearing on performance of the Work.

3.10 Safety Plan. Contractor is responsible for all safety precautions and programs and shall perform the Work in accordance with the Safety Plan, which shall be submitted to the City within 10 business days after receipt of the executed Agreement and attached hereto as Exhibit I and incorporated herein by reference. The Safety Plan must be compliant with OSHA, American National Standards Institute and National Institute for Occupational Safety and Health standards. Contractor shall provide all protection and necessary supervision to implement said Safety Plan. Contractor shall take all reasonable precautions for the safety of and provide reasonable protection to prevent damage, injury or loss to: (A) employees or others on the Project, (B) the Work and materials and (C) other property at the Project or adjacent thereto. Contractor shall designate a responsible person on the Project whose duty shall be prevention of accidents.

3.11 Traffic Regulations. All traffic affected by the Work under this Contract shall be regulated in accordance with the then-current version of the *City of Phoenix-Traffic Barricade Manual* (the "Barricade Manual") which is incorporated herein by reference; provided, however, that this Contract shall govern in a conflict with the terms of the Barricade Manual. At the time of the pre-construction conference, the Contractor shall designate an employee who is well qualified and experienced in construction traffic control and safety to be responsible for implementing, monitoring and altering traffic control measures, as necessary. At the same time, the City will designate a representative who will be responsible to see that all traffic control and any alterations are implemented and monitored to the extent that traffic is carried through the Work area in an effective manner and that motorists, pedestrians, bicyclists and workers are protected from hazard and accidents.

A. Major Streets. The following shall be considered major streets: All major parkway, mile (section line), arterial and collector (mid-section line and quarter section line) streets so classified by the City.

B. Traffic Control Devices. All traffic control devices required for the Work under this Contract shall be the responsibility of the Contractor. The Contractor shall place advance warning signs (such as REDUCE SPEED, LOOSE GRAVEL, 25 MPH SPEED LIMIT and DO NOT PASS) in accordance with the Barricade Manual. The Contractor shall provide, erect and maintain all necessary flashing arrow boards, barricades, suitable and sufficient warning lights, signals and signs and shall take all necessary precautions for the protection of the Work and safety of the public. The Contractor shall provide, erect and maintain acceptable and

adequate detour signs at all closures and along detour routes. All barricades and obstructions shall be illuminated at night, and all safety lights shall be illuminated from sunset until sunrise. All barricades and signs used by the Contractor shall conform to the standard design generally accepted for such purposes and payment for all such services and materials shall be considered as included in the other pay items of this Contract.

C. Existing Signs. The Contractor shall ensure that all existing traffic signs are erect, clean and in full view of the intended traffic at all times. Street name signs at major street intersections shall be maintained erect at all times. If these signs should interfere with construction, the Contractor shall notify the Engineer, in writing, at least 48 hours in advance for City personnel to temporarily relocate or cover said signs. The Engineer will direct the Contractor as to the correct positions to re-set all traffic and street name signs to permanent locations when notified by the Contractor that the interfering construction is complete.

D. Manual Traffic Control. Manual traffic control shall be in conformity with the Barricade Manual, except that the designated liaison officer shall be contacted at the Avondale Police Department. When construction activities or traffic hazards at the construction site require the use of flagmen, it shall be the Contractor's responsibility to provide trained flagmen to direct traffic safely. When traffic hazards at construction sites warrant the use of certified police personnel to direct traffic, arrangements must be made with the liaison officer at the Avondale Police Department.

E. Contractor Equipment. The assembly and turnarounds of the Contractor's equipment shall be accomplished using adjacent local streets when possible. Equipment used and/or directed by the Contractor shall travel with traffic at all times. Supply trucks shall travel with traffic except when being spotted. Contractor shall provide a flagman or off-duty, uniformed Avondale officer to assist with spotting.

F. Traffic Alterations. During construction, it may be necessary to alter traffic control. Any such alterations shall be in accordance with the Barricade Manual. No street within the Project area may be closed to through traffic or to local emergency traffic without prior, written approval of the Engineer. Written approval may be given if sufficient time exists to allow for notification of the public at least 72 hours in advance of such closing. Partial closure of streets within the Project shall be done in strict conformity with the Barricade Manual and the Engineer's written directions.

G. Intersections. Caution should be used when excavating near intersections with traffic signal underground cable. Contractor shall notify the Engineer, in writing, 24 hours in advance of any Work at such intersections. The Contractor shall install and maintain temporary overhead traffic signal cable as specified by the Engineer when underground conduit is to be severed by excavations at intersections. The Contractor shall provide an off-duty, uniformed Avondale police officer to direct traffic while the traffic signal is turned off and the wiring is transferred. All damaged or modified traffic signal overhead and underground items shall be repaired and restored to the Engineer's satisfaction. Magnetic detector loops shall, under no circumstances, be spliced.

H. Adjacent Property Access. The Contractor shall maintain access to all businesses, schools and residences along the Project alignment at all times in accordance with the MAG Supplement, Section 107.7.1 (Access).

I. Covered Crossings. Where crossings of existing pavement occurs, no open trenches shall be permitted overnight, but plating may be permitted if conditions allow, as determined by the Engineer in his sole discretion. If plates cannot be used, crossings shall either be back-filled or the Contractor shall provide a detour.

3.12 Indemnification. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the City and each council member, officer, employee or agent thereof (the City and any such person being herein called an "Indemnified Party"), for, from and against any and all losses, claims, damages,

liabilities, costs and expenses (including, but not limited to, reasonable attorneys' fees, court costs and the costs of appellate proceedings) to which any such Indemnified Party may become subject, under any theory of liability whatsoever ("Claims") to the extent that such Claims (or actions in respect thereof) are caused by the negligent acts, recklessness or intentional misconduct of the Contractor, its officers, employees, agents, or any tier of subcontractor in connection with Contractor's work or services in the performance of this Agreement. The amount and type of insurance coverage requirements set forth below will in no way be construed as limiting the scope of the indemnity in this Section.

3.13 Insurance.

A. General.

1. Insurer Qualifications. Without limiting any obligations or liabilities of Contractor, Contractor shall purchase and maintain, at its own expense, hereinafter stipulated minimum insurance with insurance companies authorized to do business in the State of Arizona pursuant to ARIZ. REV. STAT. § 20-206, as amended, with an AM Best, Inc. rating of A- or above with policies and forms satisfactory to the City. Failure to maintain insurance as specified herein may result in termination of this Contract at the City's option.

2. No Representation of Coverage Adequacy. By requiring insurance herein, the City does not represent that coverage and limits will be adequate to protect Contractor. The City reserves the right to review any and all of the insurance policies and/or endorsements cited in this Contract but has no obligation to do so. Failure to demand such evidence of full compliance with the insurance requirements set forth in this Contract or failure to identify any insurance deficiency shall not relieve Contractor from, nor be construed or deemed a waiver of, its obligation to maintain the required insurance at all times during the performance of this Contract.

3. Additional Insured. All insurance coverage, except Workers' Compensation insurance and Professional Liability insurance, if applicable, shall name, to the fullest extent permitted by law for claims arising out of the performance of this Contract, the City, its agents, representatives, officers, directors, officials and employees as Additional Insured as specified under the respective coverage sections of this Contract.

4. Coverage Term. All insurance required herein shall be maintained in full force and effect until all Work or Services required to be performed under the terms of this Contract are satisfactorily performed, completed and formally accepted by the City, unless specified otherwise in this Contract.

5. Primary Insurance. Contractor's insurance shall be primary insurance with respect to performance of this Contract and in the protection of the City as an Additional Insured.

6. Claims Made. In the event any insurance policies required by this Agreement are written on a "claims made" basis, coverage shall extend, either by keeping coverage in force or purchasing an extended reporting option, for three years past completion and acceptance of the services. Such continuing coverage shall be evidenced by submission of annual Certificates of Insurance citing applicable coverage is in force and contains the provisions as required herein for the three-year period.

7. Waiver. All policies, except for Professional Liability, including Workers' Compensation insurance, shall contain a waiver of rights of recovery (subrogation) against the City, its agents, representatives, officials, officers and employees for any claims arising out of the Work or Services

of Contractor. Contractor shall arrange to have such subrogation waivers incorporated into each policy via formal written endorsement thereto.

8. Policy Deductibles and/or Self-Insured Retentions. The policies set forth in these requirements may provide coverage that contains deductibles or self-insured retention amounts. Such deductibles or self-insured retention shall not be applicable with respect to the policy limits provided to the City. Contractor shall be solely responsible for any such deductible or self-insured retention amount.

9. Use of Subcontractors. If any Work under this Contract is subcontracted in any way, Contractor shall execute written agreement with its Subcontractors containing the indemnification provisions set forth in this Section and insurance requirements set forth herein protecting the City and Contractor. Contractor shall be responsible for executing any agreements with its Subcontractor and obtaining certificates of insurance verifying the insurance requirements.

10. Evidence of Insurance. Contractor will provide to the City within 10 business days after receipt of the executed Agreement, and prior to commencing any Work or Services under this Contract, suitable evidence of insurance in the form of certificates of insurance and a copy of the declaration page(s) of the insurance policies as required by this Contract, issued by Contractor's insurance insurer(s) as evidence that policies are placed with acceptable insurers as specified herein and provide the required coverages, conditions and limits of coverage specified in this Contract and that such coverage and provisions are in full force and effect. Confidential information such as the policy premium may be redacted from the declaration page(s) of each insurance policy, provided that such redactions do not alter any of the information required by this Contract. The City shall reasonably rely upon the certificates of insurance and declaration page(s) of the insurance policies as evidence of coverage but such acceptance and reliance shall not waive or alter in any way the insurance requirements or obligations of this Contract. If any of the policies required by this Contract expire during the life of this Contract, it shall be Contractor's responsibility to forward renewal certificates and declaration page(s) to the City 30 Days prior to the expiration date. All certificates of insurance and declarations required by this Contract shall be identified by referencing this Contract. A \$25.00 administrative fee shall be assessed for all certificates or declarations received without a reference to this Contract. Additionally, certificates of insurance and declaration page(s) of the insurance policies submitted without referencing this Contract will be subject to rejection and may be returned or discarded. Certificates of insurance and declaration page(s) shall specifically include the following provisions:

a. The City, its agents, representatives, officers, directors, officials and employees are Additional Insureds as follows:

(i) Commercial General Liability - Under Insurance Services Office, Inc., ("ISO") Form CG 20 10 03 97 or equivalent.

(ii) Auto Liability - Under ISO Form CA 20 48 or equivalent.

(iii) Excess Liability - Follow Form to underlying insurance.

b. Contractor's insurance shall be primary insurance with respect to performance of this Contract.

c. All policies, except for Professional Liability, including Workers' Compensation, waive rights of recovery (subrogation) against City, its agents, representatives,

officers, officials and employees for any claims arising out of Work or Services performed by Contractor under this Contract.

d. ACORD certificate of insurance form 25 (2014/01) is preferred. If ACORD certificate of insurance form 25 (2001/08) is used, the phrases in the cancellation provision “endeavor to” and “but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives” shall be deleted. Certificate forms other than ACORD form shall have similar restrictive language deleted.

B. Required Insurance Coverage.

1. Commercial General Liability. Contractor shall maintain “occurrence” form Commercial General Liability insurance with an unimpaired limit of not less than \$1,000,000 for each occurrence, \$2,000,000 Products and Completed Operations Annual Aggregate and a \$2,000,000 General Aggregate Limit. The policy shall cover liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury. Coverage under the policy will be at least as broad as ISO policy form CG 00 010 93 or equivalent thereof, including but not limited to, separation of insured’s clause. To the fullest extent allowed by law, for claims arising out of the performance of this Contract, the City, its agents, representatives, officers, officials and employees shall be cited as an Additional Insured under ISO, Commercial General Liability Additional Insured Endorsement form CG 20 10 03 97, or equivalent, which shall read “Who is an Insured (Section II) is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of “your work” for that insured by or for you.” If any Excess insurance is utilized to fulfill the requirements of this subsection, such Excess insurance shall be “follow form” equal or broader in coverage scope than underlying insurance.

2. Vehicle Liability. Contractor shall maintain Business Automobile Liability insurance with a limit of \$1,000,000 each occurrence on Contractor’s owned, hired and non-owned vehicles assigned to or used in the performance of the Contractor’s Work or Services under this Contract. Coverage will be at least as broad as ISO coverage code “1” “any auto” policy form CA 00 01 12 93 or equivalent thereof. To the fullest extent allowed by law, for claims arising out of the performance of this Contract, the City, its agents, representatives, officers, directors, officials and employees shall be cited as an Additional Insured under ISO Business Auto policy Designated Insured Endorsement form CA 20 48 or equivalent. If any Excess insurance is utilized to fulfill the requirements of this subsection, such Excess insurance shall be “follow form” equal or broader in coverage scope than underlying insurance.

3. Professional Liability. If this Contract is the subject of any professional Services or Work, or if the Contractor engages in any professional Services or Work in any way related to performing the Work under this Contract, the Contractor shall maintain Professional Liability insurance covering negligent errors and omissions arising out of the Services performed by the Contractor, or anyone employed by the Contractor, or anyone for whose negligent acts, mistakes, errors and omissions the Contractor is legally liable, with an unimpaired liability insurance limit of \$2,000,000 each claim and \$2,000,000 annual aggregate.

4. Workers’ Compensation Insurance. Contractor shall maintain Workers’ Compensation insurance to cover obligations imposed by Federal and State statutes having jurisdiction over Contractor’s employees engaged in the performance of Work or Services under this Contract and shall also maintain Employers Liability Insurance of not less than \$500,000 for each accident, \$500,000 disease for each employee and \$1,000,000 disease policy limit.

5. Builder's Risk Insurance. Unless expressly waived by the City Manager in a written addendum or amendment to this Contract, the Contractor shall be responsible for purchasing and maintaining insurance to protect the Project from perils of physical loss. The insurance shall provide for the full cost of replacement for the entire Project at the time of any loss. The insurance shall include as named insureds the City, the Contractor, the Contractor's Subcontractors and subsubcontractors and shall insure against loss from the perils of fire and all-risk coverage for physical loss or damage due to theft, vandalism, collapse, malicious mischief, transit, flood, earthquake, testing, resulting loss arising from defective design, negligent workmanship or defective material. The Contractor shall increase the coverage limits as necessary to reflect changes in the estimated replacement cost.

C. Cancellation and Expiration Notice. Insurance required herein shall not expire, be canceled, or be materially changed without 30 Days' prior written notice to the City.

3.14 Performance Bond. The Contractor shall be required to furnish non-revocable security binding the Contractor to provide faithful performance of this Contract in the amount of one hundred percent (100%) of the total Contract Price payable to the City. Performance security shall be in the form of a performance bond, certified check, cashier's check or irrevocable letter of credit. This security must be in the possession of the Engineer within 10 business days after receipt of the executed Agreement from the City. If the Contractor fails to execute and deliver the security instrument as required, the Contractor may be found in default and this Contract terminated by the City. In case of default the City reserves all rights. All performance bonds shall be executed in the form attached hereto as Exhibit J, duly executed by the Contractor as Principal and having as Surety thereon a Surety company approved by the City and holding a Certificate of Authority to transact surety business in the State of Arizona by the Arizona Department of Insurance. Individual sureties are unacceptable. All Insurers and Sureties shall have, at the time of submission of the performance bond, an A.M. Best's Key Rating Guide of "A-" or better as currently listed in the most recent Best Key Guide, published by the A.M. Best Company.

3.15 Payment Bond. The Contractor shall be required to furnish non-revocable security for the protection of all persons supplying labor and material to the Contractor or any Subcontractor for the performance of any Work related to this Contract. Payment security shall be in the amount of one hundred percent (100%) of the total Contract Price and be payable to the City. Payment security shall be in the form of a payment bond, certified check, cashier's check or irrevocable letter of credit. This security must be in the possession of the Engineer within 10 business days after receipt of the executed Agreement from the City. If the Contractor fails to execute and deliver the security instrument as required, the Contractor may be found in default and this Contract terminated by the City. In case of default the City reserves all rights. All payment bonds shall be executed in the form attached hereto as Exhibit K, duly executed by the Contractor as Principal and having as Surety thereon a Surety company approved by the City and holding a Certificate of Authority to transact surety business in the State of Arizona by the Arizona Department of Insurance. Individual sureties are unacceptable. All Insurers and Sureties shall have, at the time of submission of the payment bond, an A.M. Best's Key Rating Guide of "A-" or better as currently listed in the most recent Best Key Guide, published by the A.M. Best Company.

3.16 Changes in the Work. The City may, without invalidating this Contract, order changes in the Work consisting of additions, deletions or other revisions to this Contract and the Contract Price and the Contract Time shall be adjusted as provided below. The Contract Price and/or the Contract Time may only be changed by the City's written approval authorizing said change, and said changes shall be performed under the applicable conditions of this Contract. The Contract Price shall be adjusted as a result of a change in the Work as follows:

A. Additions. When the City increases the scope of the Work, Contractor will perform the increased work pursuant to Contractor's unit prices set forth on the Price Sheet.

B. Deletions. When the City decreases the Work resulting in a decrease in Contractor's quantity of the Work, the City shall be allowed a decrease in the Contract Price amounting to the quantity of the deleted Work multiplied by the Contractor's unit prices.

C. Estimating. Whenever the City is considering a change to the Work, Contractor shall promptly, and in any event within five business days, estimate the price of the contemplated additional or deleted Work in good faith and as accurately as is then-feasible. The estimate shall show quantities of labor, material and equipment and shall be pursuant to the rates set forth in the Contractor's Bid.

3.17 Substantial Completion. When the Contractor considers that the Work is Substantially Complete, the Engineer shall prepare and submit to the Contractor a comprehensive list of Punch List items, which the Contractor may edit and supplement. The Contractor shall proceed promptly to complete and correct 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 the 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. The Certificate of Substantial Completion shall also include the Punch List as created by the Contractor and modified by the City and establish the time for completion and correction of all Punch List items. If the City and the Contractor cannot agree as to the appropriate date of Substantial Completion, such issue shall be submitted for dispute resolution in accordance with the procedures set forth in Article III, Part B below. Notwithstanding such disagreement, the Contractor shall diligently proceed with completion of the Punch List items.

3.18 Final Completion. The City shall determine when the Project and the Contractor's Work is finally completed. "Final Completion" means completion of the Project by the Contractor in accordance with the Contract Documents, certified to the City by the Contractor. Final Completion shall be achieved only upon the City's written acceptance of (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) delivery of warranties, inspection certificates, bonds and all other required documents, (H) all prerequisites for final payment and (I) submittal of Contractor's request for final payment and acceptance enclosing all required documentation. Upon Final Completion the Engineer shall issue a Certificate of Final Completion to the Contractor on behalf of the City. Following receipt of payment from the City, the Contractor shall make all payments due to the Subcontractors.

3.19 Payments to Contractor. Payment shall be conditioned upon Contractor's compliance with the payment terms and conditions set forth below. Contractor expressly acknowledges and agrees that (A) the Contract Price is an estimated amount based upon an engineer's estimate of the quantities of the Materials deemed necessary to perform the Work and (B) the amount of any payment to be made pursuant to this Contract shall be determined by the field-measured quantities of Materials actually installed by Contractor. Material or equipment delivered to the Project by or on behalf of Contractor shall not constitute material or equipment furnished in the

performance of the Work until same has been incorporated into the improvements constituting the Project. Payment shall not constitute acceptance by the City or evidence thereof of any Work performed.

A. Progress Payments.

1. On or before the 15th day of each month after construction has commenced, the Contractor shall submit to the City an application for payment consisting of the cost of the Work performed up to the end of the prior month, including the cost of material stored on the site or at other locations approved by the City. The application shall be deemed approved and certified for payment seven Days after it is submitted unless before that time the City prepares and issues a specific written finding setting forth those items in detail that are not approved for payment under this Contract. Prior to submission of the next application for payment, the Contractor shall make available at the request of the City a statement accounting for the disbursement of funds received under the previous application for purposes of audit. The extent of such statement shall be as agreed upon between the City and Contractor.

2. Within 14 Days after approval of each monthly application for payment, the City shall pay directly to the Contractor the appropriate amount for which application for payment is made, less amounts (a) previously paid by the City, (b) sufficient to pay expenses the City reasonably expects to incur in correcting deficiencies which are set forth in writing and provided to the Contractor and (c) any retainage as set forth in subsection 3.19(B) below.

3. The City's progress payment, occupancy or use of the Project, whether in whole or in part, shall not be deemed as acceptance of any Work not conforming to the requirements of this Contract.

4. Upon Substantial Completion of the Work, the City shall pay the Contractor the unpaid balance of the cost of the Work, less a sum equal to the Contractor's estimated cost of completing any unfinished items as agreed to between the City and the Contractor as to extent and time for Final Completion. The City thereafter shall pay the Contractor monthly the amount retained for unfinished items as each item is completed.

B. Retainage. With respect to the Work, the City shall retain ten percent (10%) of the amount of each estimate until Final Completion and acceptance of all Material, equipment and Work covered by this Contract.

1. Any securities submitted by Contractor in lieu of retainage as may be allowed by law, shall be deposited in an escrow account by the City. The City shall be listed as payee or multiple payees with Contractor on all such securities.

2. When the Work is fifty percent (50%) completed, one-half of the amount retained including any securities substituted pursuant to subsection 3.19 (B)(1) shall be paid to the Contractor upon the Contractor's request, provided the Contractor is making satisfactory progress on the Work and there is no specific cause or claim requiring a greater amount to be retained. After the construction Work is fifty percent (50%) completed, no more than five percent (5%) of the amount of any subsequent progress payments made under this Contract may be retained, provided the Contractor is making satisfactory progress on the Project. If, at any time, the City determines satisfactory progress is not being made, ten percent (10%) retention shall be reinstated for all progress payments made under this Contract after the determination.

C. Payment for On-site and Off-site Stored Materials. Payment shall be made on account of Materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. Payment may similarly be made for Materials and equipment suitably stored off the site, conditioned upon the Contractor furnishing evidence to the City that (1) title to the Materials and equipment will pass to the City upon payment therefore, (2) the Materials and equipment are adequately safeguarded and insured, including during transit from the off-site location to the Project site and (3) such other matters as the City may reasonably request in order to protect its interests. With the prior, written approval of the City, Contractor may advance order the bulk delivery of Materials to be incorporated into the Work over the course of this Contract. Upon delivery and receipt of supplier invoice, the City shall pay for the bulk delivery, either directly to the Contractor or to the vendor or by joint check to Contractor and vendor, and shall receive a full release for the amount paid from vendor and Contractor. Contractor agrees to assume full responsibility for the safekeeping of all such Materials and shall guarantee to the City that such Materials shall remain safe from theft or damage from any and all causes (unless caused by the sole negligence of the City). Contractor shall immediately replace, repair or restore said Materials to their original condition so as to not cause any delay in the Work, and Contractor shall indemnify and hold harmless the City for, from and against any and all loss, cost, liability or expense resulting from any loss or damage to any of the Materials described herein from any cause unless due to the City's sole negligence. Should the City have reason to believe Contractor is not properly safeguarding any of the Materials, the City shall have the right, but not the affirmative duty, to immediately take such steps as it deems necessary to do so, including removing Contractor from the job, replacing any Materials or expending any sums to properly carry out Contractor's responsibility hereunder, and any amounts so expended shall be billed back to Contractor or deducted from any sums then or thereafter due to Contractor. Contractor shall fully insure all Materials stored on site as required by the City, and if such insurance is not obtained due to a lack of insurable interest, the City shall have the right to obtain such insurance and charge the amount thereof back to Contractor or deduct said amount from any funds then or thereafter due to Contractor.

D. Title to Construction Work. The Contractor warrants that title to all Work covered by an application for payment shall pass to the City no later than the time of payment. The Contractor further warrants that upon submittal of an application for payment, all Work for which applications for payment have been previously issued and payments received from the City shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, Materials and equipment relating to the Work.

E. Final Payment.

1. Final payment, consisting of the unpaid balance of the cost of the Work shall be due and payable at Final Completion and acceptance by the City. Before issuance of final payment, the City may request satisfactory evidence that all payrolls, Materials bills and other indebtedness connected with the Work have been paid or otherwise satisfied.

2. In making final payment the City waives all claims except for:

- a. Outstanding liens.
- b. Improper workmanship or defective Materials.
- c. Work not in conformance with this Contract or Work not completed.
- d. Terms of any special warranties required by this Contract.

- e. Delivery to City of all warranties, operation and maintenance manuals, “AS-BUILT” record drawings and other documents as required by this Contract.
- f. Right to audit Contractor records for a period of three years.
- g. Claims previously made in writing and which remain unsettled.

3. Acceptance of final payment by the Contractor shall constitute a waiver of affirmative claims by the Contractor, except those previously made in writing and identified as unsettled at the time of final payment.

F. Warranty. Contractor or its assignee shall give to the City a one-year warranty against deficiencies in material and workmanship for all Work on the Project or other such warranty as required by the City Engineer, which warranty shall begin on the date that the City accepts the Work as provided in this Section. Any material deficiencies in material or workmanship identified by City staff during the one-year warranty period shall be brought to the attention of the Contractor or its assignee that provided the warranty, which shall promptly remedy or cause to be remedied such deficiencies to the reasonable satisfaction of the City Engineer. Continuing material deficiencies in a particular portion of the Work shall be sufficient grounds for the City to require (1) an extension of the warranty for an additional one-year period and (2) the proper repair of or the removal and reinstallation of, that portion of the Work that is subject to such continuing deficiencies. Regardless of whether the applicable warranty period has expired, the Contractor agrees to repair any damage to the Work caused by Contractor’s construction activities on the Property. Nothing contained herein shall prevent the City or Contractor from seeking recourse against any other third party for damage to the Work caused by such third party.

3.20 Offset.

A. Offset for Damages. In addition to all other remedies at law or equity, the City may offset from any money due to the Contractor any amounts Contractor owes to the City for damages resulting from breach or deficiencies in performance or breach of any obligation under this Contract.

B. Offset for Delinquent Fees or Taxes. The City may offset from any money due to the Contractor any amounts Contractor owes to the City for delinquent fees, transaction privilege taxes and property taxes, including any interest or penalties.

PART B - PERFORMANCE OF THE WORK

3.21 Project Videotape. The Contractor shall produce and provide a project videotape to the Engineer as required by MAG Supplement Section 105.5.3. All costs associated with the Project videotape produced in accordance with this Section shall be deemed incidental.

3.22 Soil and Subsurface Conditions. In addition to conformance to MAG Specifications, Section 102.4 (Examination of Plans, Special Provisions and Site Work), the Contractor shall make its own determinations as to the soil and subsurface conditions, including rock, caliche and ground water and shall complete the Work in whatever material and under whatever conditions may be encountered or created, without extra cost to the City pursuant to the provisions of the MAG Supplement Section 102.4.1.

3.23 Work Scheduling. Time is of the essence for this Contract. Contractor shall provide the Engineer with any requested scheduling information and a proposed schedule for performance of the Work within the Contract Time in a form acceptable to the Engineer and approved by the Engineer, in his sole and absolute discretion, providing for commencement and completion of the Work (the “Schedule”). The Schedule shall

include the date for Substantial Completion of the Work. The Engineer may revise the Schedule during the course of the Work. Contractor, to induce the City to enter into this Contract, has and does hereby agree to fully perform and complete the Work for the Contract Price within the Schedule.

3.24 Contractor's Representative. The Contractor or his authorized representative shall be present at the Work site at all times during working hours. Instructions and information provided by the Engineer to the Contractor's representative shall be considered as having been given to the Contractor, per MAG Supplement Section 105.5.2.

3.25 Prosecution of the Work. The Contractor shall prosecute the Work so that the portion of the Work completed at any point in time shall be not less than as required by the Schedule. If the delay is an Inexcusable Delay, as defined below, the Contractor shall prepare a recovery schedule for the Engineer's review and approval, showing how the Contractor will compensate for the delays and achieve Substantial Completion by the date(s) shown on the Schedule. If the Contractor is unable to demonstrate how it will overcome Inexcusable Delays, the Engineer may order the Contractor to employ such extraordinary measures as are necessary to bring the Work into conformity with the Substantial Completion date(s) set forth therein, the costs of which shall be included as part of the Cost of the Work. If the delay is an Excusable Delay, as defined below, the Engineer shall either (A) authorize an equitable extension in the Schedule to account for such delay, and equitably adjust the contract sum on account of such delay or (B) request that the Contractor prepare a recovery schedule showing how (if possible) the Contractor can achieve Substantial Completion by the applicable date shown on the Schedule, and equitably adjust the Contract Price in accordance with the provisions of this Contract on account of any extraordinary activities required of the Contractor on account of such recovery schedule.

3.26 Extensions of Time.

A. Allowable Extensions. An extension in the scheduled date of Substantial Completion will only be granted in the event of Excusable Delays affecting the Schedule for the Work. The Contractor shall be entitled to general condition costs and extra costs related to the Excusable Delay for idle labor, equipment inefficiency and lost productivity of the performance of the Work. The Contractor must submit evidence reasonably satisfactory to the City substantiating such costs. Such adjustment to the Price and Substantial Completion date shall be issued in a Change Order or Contract amendment, as applicable.

B. Excusable Delay. To the extent any of the following events results in an actual delay in the Work, such shall constitute an "Excusable Delay" (to the extent not set forth below, a delay will be considered an "Inexcusable Delay"):

1. Delays resulting from Force Majeure.
2. Differing, unusual or concealed site conditions that could not reasonably have been anticipated by the Contractor in preparing the Schedule, including, without limitation, archaeological finds and unusual soil conditions (including rock or other geological conditions), underground foundations, abandoned utility lines and water conditions.
3. Delays resulting from the existence or discovery of Hazardous Materials on the Site not brought to the Site by the Contractor.
4. Delays resulting from changes in Applicable Laws occurring after the date of execution of this Contract.

5. Delays occurring due to the acts or omissions of the City and those within the control of the City.

6. Delays occurring due to the acts or omissions of a utility, so long as Contractor has coordinated with the utility causing the delay and the delay occurs despite reasonable steps taken by Contractor to avoid the delay.

7. Delays resulting from weather conditions that make it unreasonable to perform the Work in accordance with the Schedule; provided, however, that Contractor's Schedule shall be deemed to include 15 Days for weather delays (the "Expected Delay Days"), regardless of whether such weather delays are specifically set forth in the Schedule. Contractor shall notify the City within 24 hours in writing of a weather-related delay. If Contractor fails to give the required 24-hour notice, no such weather delay will be subtracted from the Expected Delay Days. Weather delays shall not be deemed "Excusable" unless all of the Expected Delay Days have been exhausted.

8. Delays resulting from Additional Work (defined below) that cannot be performed concurrently with the Work on the Schedule.

C. Required Notice. In order to obtain an extension of time due to an Excusable Delay, the Contractor shall comply with the following requirements. The Contractor shall notify the Engineer in writing of the Excusable Delay as soon as practicable, but in no event more than seven Days after the Contractor becomes aware of the occurrence of the Excusable Delay. Such notice shall describe the Excusable Delay and shall state the approximate number of Days the Contractor expects to be delayed. After the cessation of the Excusable Delay, the Contractor shall notify the Engineer of the number of Days the Contractor believes that its activities were in fact delayed by the Excusable Delay. In the event that the delay arises as a result of a Change Order request by the City, the request for an extension of time contained in the resulting Change Order proposal shall be deemed sufficient for purposes of this subsection.

D. Determination. Within 10 Days after cessation of an event giving rise to either an Excusable Delay or Inexcusable Delay, the parties will use good faith efforts to agree on the extent to which the Work has been delayed and whether the delay is an Excusable Delay or an Inexcusable Delay. In the absence of agreement between the parties as to the then-current status of Excusable Delays and Inexcusable Delays, the Engineer will provide the Contractor with written notice of Engineer's determination of the respective number of Days of Excusable Delay and/or Inexcusable Delay. The Engineer's determination may be issued at such time as the Engineer deems reasonable, but not later than 10 Days after receipt by the Engineer of the Contractor's written request for such determination. The Contractor shall not, however, deem an issuance by the Engineer of such a determination to be a concurrence of the matters set forth in the Contractor's request. The Contractor may invoke the dispute resolution procedures set forth in Part D below with respect to such determination.

E. Concurrent Delay. To the extent the Contractor is entitled to an extension of time due to an Excusable Delay, but the performance of the Work would have been suspended, delayed or interrupted by the fault or neglect of the Contractor or by an Inexcusable Delay, the Contractor shall not be entitled to any additional costs for the period of such concurrency.

3.27 Liquidated Damages. It is expressly understood that should Contractor fail to complete the Work covered hereby within the Contract Time, the Contractor agrees to pay and shall pay to the City upon request therefore for each Day of delay beyond the original or revised scheduled time of completion of Contractor's Work as liquidated damages, and not as a penalty, in the amount per day as set forth in MAG Specifications for each Day of delay.

A. Prior to Termination. If this Contract is not terminated, the Contractor shall continue performance and be liable to the City for the liquidated damages until the Work is complete.

B. After Termination. In the event the City exercises its right of termination, the Contractor shall be liable to the City for any excess costs and, in addition, for liquidated damages until such time as the City may reasonably obtain delivery or performance of similar Services.

3.28 Suspension by the City for Convenience.

A. City Determination. The City may order the Contractor in writing to suspend, delay or interrupt all or any part of the Work without cause for such period of time as the City may determine to be appropriate for its convenience.

B. Contract Adjustments. Adjustments caused by suspension, delay or interruption shall be made for increases in the applicable contract sum and/or the date(s) of Substantial Completion. No adjustment shall be made if the Contractor is or otherwise would have been responsible for the suspension, delay or interruption of the Work, or if another provision of this Contract is applied to render an equitable adjustment.

3.29 Termination by the City for Convenience. The City may, upon 30 Days' written notice to the Contractor, terminate this Contract, in whole or in part, for the convenience of the City without prejudice to any right or remedy otherwise available to the City. Upon receipt of such notice, the Contractor shall immediately discontinue all Services affected unless such notice directs otherwise. In the event of a termination for convenience of the City, the Contractor's sole and exclusive right and remedy shall be payment for all Work performed through the date of termination. The Contractor shall not be entitled to be paid any amount as profit for unperformed Services or consideration for the City's termination by convenience.

3.30 Termination by the City for Cause.

A. Default; Cure. If the Contractor refuses or fails to supply sufficient properly skilled staff or proper Materials, or disregards laws, ordinances, rules, regulations, or orders of any public authority jurisdiction, or otherwise substantially violates or materially breaches any term or provision of this Contract, and such nonperformance or violation continues without cure for 15 Days after the Contractor receives written notice of such nonperformance or violation from the City, then the City may, without prejudice to any right or remedy otherwise available to the City, terminate this Contract.

B. Substitute Performance. Upon termination of this Contract by the City, the City shall be entitled to furnish or have furnished the Services to be performed hereunder by the Contractor by whatever method the City may deem expedient. Also, in such case, the Contractor shall not be entitled to receive any further payment until completion of the Work, and the total compensation to the Contractor under this Contract shall be the amount that is equitable under the circumstances. If the City and the Contractor are unable to agree on the amount to be paid under the foregoing sentence, the City shall fix an amount, if any, that it deems appropriate in consideration of all of the circumstances surrounding such termination, and shall make payment accordingly. The Contractor may dispute the City's assessment of the termination amount pursuant to the dispute resolution process set forth in in Part D of this Contract.

C. Contractor Insolvency. Upon the appointment of a receiver for the Contractor, or if the Contractor makes a general assignment for the benefit of creditors, the City may terminate this Contract, without prejudice to any right or remedy otherwise available to the City, upon giving three business days' written notice to the Contractor. If an order for relief is entered under the bankruptcy code with respect to the Contractor, the City

may terminate this Contract by giving three business days' written notice to the Contractor unless the Contractor or the trustee completes all of the following:

1. Promptly cures all breaches within such three-day period.
2. Provides adequate assurances of future performance.
3. Compensates the City for actual pecuniary loss resulting from such breaches.
4. Assumes the obligations of the Contractor within the established time limits.

3.31 Contract Subject to Appropriation. The City is obligated only to pay its obligations set forth in this Agreement as may lawfully be made from funds appropriated and budgeted for that purpose during the City's then current fiscal year. The City's obligations under this Agreement are current expenses subject to the "budget law" and the unfettered legislative discretion of the City concerning budgeted purposes and appropriation of funds. Should the City elect not to appropriate and budget funds to pay its Agreement obligations, this Agreement shall be deemed terminated at the end of the then-current fiscal year term for which such funds were appropriated and budgeted for such purpose and the City shall be relieved of any subsequent obligation under this Agreement. The parties agree that the City has no obligation or duty of good faith to budget or appropriate the payment of the City's obligations set forth in this Agreement in any budget in any fiscal year other than the fiscal year in which this Agreement is executed and delivered. The City shall be the sole judge and authority in determining the availability of funds for its obligations under this Agreement. The City shall keep Contractor informed as to the availability of funds for this Agreement. The obligation of the City to make any payment pursuant to this Agreement is not a general obligation or indebtedness of the City. Contractor hereby waives any and all rights to bring any claim against the City from or relating in any way to the City's termination of this Agreement pursuant to this section.

3.32 Additional Work, Materials and/or Overtime. Contractor expressly agrees that if overtime or additional workers or materials are necessary to meet the Schedule, that such overtime will be performed or additional workers or materials will be procured by the Contractor, and the additional expense thereof shall be borne by Contractor unless the delay requiring overtime was directly caused by the City, in which event Contractor shall be entitled to compensation for such overtime Work. If the City requests Contractor to perform additional Work in connection with the Project ("Additional Work"), Contractor shall charge the City a negotiated fixed amount for the Additional Work. In the event a fixed amount cannot be negotiated, Contractor shall invoice the City on a time and materials basis for the Additional Work at the unit prices set forth in the price sheet.

3.33 No Damage for Delay or Additional Work by the City. Contractor shall adjust its operations to conform to any progress schedule changes and hereby waives and releases the City from any liability for damages or expenses that may be caused to or sustained by Contractor by reason of such changes or by reason of delays in the Work, whether caused in whole or in part by conduct on the part of the City, including without limitation, any breach of this Contract or delays by other contractors or Subcontractors. Contractor's exclusive remedy in the event of delay or Additional Work by the City shall be an extension of time hereunder to complete the Work.

3.34 Risk of Loss. Contractor shall assume the risk of loss occasioned by fire, theft or other damage to Materials, machinery, apparatus, tools and equipment relating to the Work prior to actual installation in final place on the Project and acceptance by the City. Contractor shall be responsible for damage to the Materials, machinery, apparatus, tools, equipment and property of the City and other contractors resulting from the acts or omissions of its Subcontractors, employees, agents, representatives Subcontractors, and for payment of the full costs of repair or replacement of any said damage.

3.35 Protection of Finished or Partially Finished Work. The Contractor shall properly guard and protect all finished or partially finished Work and shall be responsible for the same until the entire Contract is completed and accepted by the Engineer. The Contractor shall turn over the entire Work in full accordance with this Contract before final settlement shall be made.

3.36 Character and Status of Workers. Only skilled foremen and workers shall be employed on portions of the Work requiring special qualifications. When required by the Engineer, the Contractor shall discharge any person who is, in the opinion of the Engineer, disorderly, dangerous, insubordinate, incompetent or otherwise objectionable. The Contractor shall indemnify and hold harmless the City from and against damages or claims for compensation that may occur in the enforcement of this Section. The Contractor shall be responsible for ensuring the legal working status of its employees and its Subcontractor's employees. The Contractor agrees that once assigned to Work under this Contract, key personnel shall not be removed or replaced without written notice to the City. If key personnel are not available for Work under this Contract for a continuous period exceeding 30 Days, or are expected to devote substantially less effort to the Work than initially anticipated, the Contractor shall immediately notify the City and shall, subject to the concurrence of the City, replace such personnel with personnel of substantially equal ability and qualifications.

3.37 Work Methods. The methods, equipment and appliances used on the Work shall be such as will produce a satisfactory quality of Work, and shall be adequate to complete this Contract within the Contract Time. Except as is otherwise specified in this Contract, the Contractor's procedure and methods of construction may, in general, be of its own choosing, provided such methods (A) follow best general practice and (B) are calculated to secure results which will satisfy the requirements of this Contract. The Work covered by this Contract shall be carefully laid out in advance and performed in a manner to minimize interference with normal operation and utilization of the City's right-of-way. The Contractor shall exercise caution during the course of this Work to avoid damage to all known existing or possible unknown existing underground utilities. It shall conduct its operations in such a manner as to avoid injury to its personnel and to avoid damage to all utilities. Any damage done will be repaired without delay and at the expense of the Contractor.

3.38 Safety Fencing Requirement for Trenches and Excavations. The Contractor shall provide safety construction fencing around all open trenches and excavations during all non-working hours. In addition, the Contractor shall provide safety fencing around the Project site during working hours in order to ensure public safety. The Contractor shall provide for the safety and welfare of the general public by adequately fencing all excavations and trenches that are permitted by the Engineer to remain open when construction is not in progress. Fencing shall be securely anchored to approved steel posts located not less than six feet on center, having a minimum height of six feet, and shall consist of wire mesh fabric of sufficient weight and rigidity to adequately span a maximum supporting post separation of six feet. The fencing, when installed about the periphery of excavations and trenches, shall form an effective barrier against intrusion by the general public into areas of construction. The Contractor, at all times when construction is not in progress, shall be responsible for maintaining the fencing in good repair, and upon notification by the Engineer, shall take immediate action to rectify any deficiency. Prior to the start of any excavation or trenching required for the execution of the proposed Work, the Contractor shall submit to the Engineer for approval, detailed plans showing types of materials and methods of fabrication for the protective fencing. There will be no separate measurement or payment for furnishing, installing, or maintaining protective fencing. The cost shall be considered incidental to the cost of the pipe, bridge, and any other structures for which trenching is necessary.

3.39 Plans and Shop Drawings, Samples and Substitution of Materials. All submittals shall conform to MAG Specifications, Section 105.2 (Plans and Drawings) as modified by the MAG Supplement. Contractor shall furnish, within three business days following request therefore by the City, detailed drawings of the Work, samples of Materials and other submittals required for the performance or coordination of the Work. Substitutions shall be

equal or superior to Materials specified in the Contract Documents, shall be clearly identified on submittals as “proposed substitutions” and shall be approved by the City in accordance with Section 2.4 above. Contractor shall be fully responsible for the adequacy, completeness and promptness of all such submittals. Materials shall not be furnished to the jobsite unless same is in strict compliance with the Specifications or otherwise approved in writing by the City. Approval by the City shall not relieve Contractor of full responsibility for compliance with scope, intent and performance in accordance with this Contract.

3.40 Cooperation with Utilities. The Contractor shall comply with the requirements of MAG Specifications 105.6, as modified by the MAG Supplement.

3.41 Sampling and Testing. Sampling and testing shall conform to the requirements of the MAG Specifications, Section 106, as modified by the MAG Supplement.

3.42 Cooperation between Contractors. The Contractor shall comply with the requirements of MAG Specifications, Section 105.7, as modified by the MAG Supplement.

3.43 Outdoor Construction Time Restrictions. Unless otherwise permitted by the Engineer, construction will be restricted as listed in the following table:

May 1 – October 31	November 1 – April 30
5:00 a.m. to 7:00 p.m.	6:00 a.m. to 7:00 p.m.

Construction Work shall not begin Work prior to 7:00 a.m. and shall stop by 7:00 p.m. on Saturdays, Sundays and all City, State and Federal holidays.

3.44 Construction Survey. Construction survey and as-built record drawings shall conform to the requirements of the MAG Specifications, Section 105.8 (Construction Stakes, Lines and Grades), as modified by the MAG Supplement.

3.45 Survey Control Points. Existing survey markers (either brass caps or iron pipes) shall be protected by the Contractor or removed and replaced under direct supervision of the Engineer. Survey monuments shall be constructed to the requirements of MAG Specifications, Section 405. Lot corners shall not be disturbed without knowledge and consent of the property owner. The Contractor shall replace benchmarks, monuments or lot corners moved or destroyed during construction at no expense to the City. Contractor and its sureties shall be liable for correct replacement of disturbed survey benchmarks except where the City elects to replace survey benchmarks using its own forces.

3.46 Stockpile of Materials.

A. Engineer Approval. The Contractor may, if approved by the Engineer, place or stockpile Materials in the public right-of-way provided such Materials do not prevent access to adjacent properties or prevent compliance with traffic regulations.

B. No Traffic Interference. Traffic shall not be required to travel over stockpiled Materials and proper dust control shall be maintained.

3.47 Excess Materials. When excavations are made, resultant loose earth shall be (A) utilized for filling by compacting in place or (B) disposed of off-site. Excess or unsuitable material, broken asphaltic concrete and broken portland cement concrete excavated from the right-of-way shall be removed from the Project Site and disposed of by the Contractor. Disposal of material within the Avondale City Limits or Planning Area must be

approved by the Engineer. Waste material shall not be placed on private property without express permission of the property owner. The Contractor shall, at all times, keep the premises free from accumulation of waste materials or rubbish caused by its operations. At the completion of the Work, Contractor shall remove all equipment, tools and surplus materials, and shall completely clean the premises, removing and disposing of all debris and rubbish and cleaning all stains, spots, marks, dirt, smears or other blemishes. When the Work premises are turned over to the City, they shall be thoroughly clean and ready for immediate use. Clean-up shall include removal of all excess pointing mortar materials within pipes and removal of oversized rocks and boulders left after finish grading. The Contractor shall provide for the legal disposal of all waste products and debris and shall make necessary arrangements for such disposal.

3.48 Dust Control and Water. Contractor shall implement dust control measures in accordance with MAG Specifications, Section 104.1, and the MAG Supplement. Installation and removal of fire hydrant meters should be scheduled at least three business days in advance through the City Water Billing Department. Watering shall conform to the provisions of MAG Specifications, Section 225. A deposit and installation fee in amounts set forth in the City's fee schedule is required for each meter. The cost of the water is at the prevailing rate.

3.49 Temporary Sanitary Facilities. The Contractor shall provide ample toilet facilities with proper enclosures for the use of workers employed on the Work site. Toilet facilities shall be installed and maintained in conformity with all applicable State and local laws, codes, regulations and ordinances and shall be properly lit and ventilated, and kept clean at all times. Adequate and satisfactory drinking water shall be provided at all times and under no circumstances and under no conditions will the use of common cups be permitted. The Contractor must supply sanitary drinking cups for the benefit of all employees.

3.50 Electric Power, Water and Telephone. Unless otherwise specified, the Contractor shall make its own arrangements for electric power, water and telephone. Subject to the convenience of the utility, it may be permitted to connect to existing facilities where available, but Contractor shall meter and bear the cost of such power or water, and installation and disconnect of such power, water and telephone services.

3.51 Energized Aerial Electrical Power Lines. Utility companies may maintain energized aerial electrical power lines in the immediate vicinity of this Project. Contractor shall not presume any such lines to be insulated. Construction personnel working in proximity to these lines may be exposed to an extreme hazard from electrical shock. Contractor shall ensure that its employees and all other construction personnel working on this Project are warned of the danger and instructed to take adequate protective measures, including maintaining a minimum ten feet of clearance between the lines and all construction equipment and personnel. (see: OSHA Std. 1926.550 (a) 15, as amended). As an additional safety precaution, Contractor shall call the affected utility companies to arrange, if possible, to have these lines de-energized or relocated when the Work reaches their immediate vicinity. The cost of such temporary arrangements shall be borne by the Contractor. Contractor shall account for the time necessary to cause such utility disconnection in the preparation of its Bid. Electrical utility companies may maintain energized underground electrical power lines in the immediate vicinity of this Project. These power lines represent an extreme hazard of electrical shock to any construction personnel or equipment coming in contact with them. Arizona law requires all parties planning excavations in public rights-of-way to contact all utility firms for locations of their underground facilities. Contractor shall ensure that its employees and all other personnel working near any underground power lines must be warned to take adequate protective measure. (see: OSHA Std. 1926-651 (A), as amended).

3.52 Site Clean Up. Contractor shall at all times, but not less than daily unless otherwise agreed by City Representative, keep the premises on which the Work is being performed clean and free from accumulation of any waste materials, trash, debris and excess dirt, and at all times shall remove Contractor's implements, machinery, tools, apparatus and equipment from the jobsite when not needed on the jobsite. Should the City

Representative find it necessary in his/her opinion to employ help to clean up, remove or store any of the foregoing due to failure of Contractor to do so, the expense thereof shall be charged to Contractor. Verbal notice from the City Representative on clean-up or removal is considered adequate notice hereunder, and failure to conform with his/her request within 24 hours thereof will be construed as a breach of this Contract by the Contractor and such charges will be made against Contractor's account as are necessary to accomplish the clean-up or removal. The cost of cleanup, removal or storage by the City, if not deducted by the City from monies due Contractor, shall be paid by Contractor within five business days of written demand by the City.

3.53 Use of the Site. Contractor shall at all times comply fully with all laws, orders, citations, rules, regulations, standards and statutes with respect to occupational health and safety, the handling and storage of hazardous materials, accident prevention and safety equipment and practices, including any accident prevention and safety program of the City; provided, however, that the City shall not be required to impose any safety requirements or administer any such programs and the review or requirement of any safety plan by the City shall not be deemed to release Contractor or in any way diminish its liability, by way of indemnity or otherwise, as assumed by it under this Contract. Contractor shall conduct inspections regularly to determine that safe working conditions and equipment exist and accepts sole responsibility for providing a safe place to Work for its employees and employees of its Subcontractors, laborers, suppliers of material and equipment and any other person visiting the Site, for adequacy of and required use of all safety equipment and for compliance herewith. When so ordered, Contractor shall stop any part of the Work that the City deems unsafe until corrective measures satisfactory to the City have been taken. Should Contractor neglect to adopt such corrective measures, the City may do so and deduct the cost from payments due Contractor. Contractor shall timely submit copies of all accident or injury reports to the City.

3.54 Public Information and Notification. The Contractor shall submit a public information and notification plan for this Project (the "Notification Plan") to the City Representative at the first pre-construction meeting held prior to start of construction. The Notification Plan shall include, at a minimum, the items set forth in this Section 3.54; provided, however, that the Engineer may waive any portion of the requirements of this Section upon a written determination that the Project scope does not warrant such notification. Contractor shall provide Project information to affected residents and homeowners' associations prior to and throughout the Project's duration. The Contractor shall use the Notification Plan to inform the local citizens, businesses and City officials, not less than five business days in advance, of (A) necessary operations that create high noise levels, (B) street closures, (C) detour locations, (D) haul routes and material delivery routes and (E) disruption of bus routes, mail routes and other delivery/pick-up routes.

A. Neighborhood Notification. Prior to the start of any Work on the Project, the Contractor shall distribute a preliminary "Dear Neighbor" letter (8-1/2"x11"), as submitted to and subject to the approval of the Engineer, to all businesses, property owners and residents within 600 feet of any portion of this Project. This "Dear Neighbor" letter shall include, at a minimum, the following information:

1. Contractor's name, business telephone number and the 24-hour "Hot Line" telephone number for this Project.
2. Name of Contractor's Project Manager.
3. Name of Contractor's Project Superintendent.
4. Brief description of the Project.
5. Construction schedule, including anticipated Work hours.
6. Anticipated lane restrictions, including the expected duration thereof.

- 7. Name of City’s Project Manager.
- 8. Name of the Engineer.

The Engineer shall provide the Contractor with a distribution list for this “Dear Neighbor” letter. Contractor shall (1) ensure that the letter is distributed to all persons and businesses indicated on the list provided by the Engineer and (2) provide the Engineer with a copy of the letter sent and sufficient proof of mailing. Subsequent to delivery of the “Dear Neighbor” letter, the Contractor shall distribute bi-monthly construction progress updates, including construction schedule and any additional information the Engineer deems important as a result of construction activities, to all persons and businesses included on the aforementioned distribution list. At the request of the Engineer, Contractor may be required to distribute additional public notifications. At the end of construction a final “Dear Neighbor” letter shall be distributed to the persons and businesses on the aforementioned distribution list highlighting the Contractor’s and the City’s appreciation for their patience during construction of the Project.

B. Project Signs. Unless otherwise directed by the Engineer, the Contractor shall furnish and install at least two Project signs, not less than five business days before beginning construction, at locations determined by the Engineer, to inform the public of the forthcoming Project, construction dates and 24-Hour Hotline number. The Contractor shall submit the proposed layout of the Project signs to the Engineer for approval prior to fabrication of the signs. The Contractor shall maintain the signs as necessary and update the information as directed by the Engineer. At the Final Completion of the Project, the Contractor shall remove and dispose of the signs. The Project signs shall be fabricated as follows: (1) the vinyl sheeting for the background, legend, and border shall be applied by heat bonding, except that the decal and legend for the project title, cost, and Contractor’s name shall be pressure sensitive application; (2) the four foot by eight foot (4’ x 8’) signs shall be mounted four feet above the ground level and anchored three feet into the ground with concrete backfill around the posts; and (3) sign colors shall be black letters on white background, over a ghost image of the City of Avondale logo. The information on the Project signs shall be in the format and fonts proportions as depicted on the sample sign below. The image template may be obtained from the City of Avondale Engineering Department as a computer image file.



C. 24-Hour Project Hotline. The Contractor shall be required to furnish a private 24-hour telephone line to be used solely for receiving incoming calls from local citizens or businesses with questions or complaints concerning Project construction operations or procedures (the “Hotline”). The Contractor shall include this Hotline telephone number on all public information distributed throughout the duration of the Project.

Contractor shall ensure that Contractor personnel man the Hotline during all hours that there is any Work being performed on this Project; the Hotline shall be answered by a live answering service during all other hours. The Contractor shall maintain a log of incoming calls, responses and action taken that shall be submitted to the Engineer weekly and upon request.

D. Public Meetings. The Contractor shall attend such public meetings as deemed necessary by the Engineer.

E. Press Releases. The Contractor shall, at the request of the Engineer, prepare press releases regarding the Project.

F. Payment for Public Notification. The City will pay, based on time and materials invoices, an amount not to exceed the amount designated in the Price Sheet and entitled COMMUNITY RELATIONS, for Work performed in accordance with the Notification Plan. Work that is eligible for reimbursement includes: the Project signs; the “Dear Neighbor” letters; bi-monthly progress reports; meetings with impacted businesses, residents, schools, churches or other groups; scheduling newsletter when necessary (at least monthly); temporary signs for local access; and maintaining the Hotline. No payment will be made under this item for any Day during which there are substantial deficiencies in compliance, as determined by the Engineer. The Contractor shall submit a final report/evaluation of its Notification Plan process performed for this Project. The report shall be submitted before the Contractor receives final payment.

PART C - MISCELLANEOUS

3.55 Applicable Law; Venue. This Contract shall be governed by the laws of the State of Arizona and suit pertaining to this Contract may be brought only in courts in Maricopa County, Arizona.

3.56 Conflict of Interest. This Contract is subject to the provisions of ARIZ. REV. STAT. § 38-511. The City may cancel this Contract without penalty or further obligations by the City or any of its departments or agencies if any person significantly involved in initiating, negotiating, securing, drafting or creating this Contract on behalf of the City or any of its departments or agencies is, at any time while this Contract or any extension of this Contract is in effect, an employee of any other party to this Contract in any capacity or a consultant to any other party of this Contract with respect to the subject matter of this Contract.

3.57 Contract Amendments. This Contract may be modified only by a written amendment signed by persons duly authorized to enter into contracts on behalf of the City and the Contractor; provided, however, that Change Orders may be issued and approved administratively by the City when such changes do not alter the Contract Price.

3.58 Provisions Required by Law. Each and every provision of law and any clause required by law to be in this Contract will be read and enforced as though it were included herein and, if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, this Contract will promptly be physically amended to make such insertion or correction.

3.59 Severability. The provisions of this Contract are severable to the extent that any provision or application held to be invalid by a Court of competent jurisdiction shall not affect any other provision or application of this Contract which may remain in effect without the invalid provision or application.

3.60 Independent Contractor. It is clearly understood that each party will act in its individual capacity and not as an agent, employee, partner, joint venturer, or associate of the other. An employee or agent of one party shall not be deemed or construed to be the employee or agent of the other for any purpose

whatsoever. The Contractor acknowledges and agrees that the Services provided under this Agreement are being provided as an independent contractor, not as an employee or agent of the City. Contractor, its employees and subcontractors are not entitled to workers' compensation benefits from the City. The City does not have the authority to supervise or control the actual work of Contractor, its employees or subcontractors. The Contractor, and not the City, shall determine the time of its performance of the services provided under this Agreement so long as Contractor meets the requirements of its agreed scope of work and the specifications, plans/construction drawings as set forth in Section 2.1 above and Exhibit A. Contractor is neither prohibited from entering into other contracts nor prohibited from practicing its profession elsewhere. City and Contractor do not intend to nor will they combine business operations under this Agreement.

3.61 Entire Agreement; Interpretation-Parol Evidence. This Contract represents the entire agreement of the parties with respect to its subject matter, and all previous agreements, whether oral or written, entered into prior to this Contract are hereby revoked and superseded by this Contract. No representations, warranties, inducements or oral agreements have been made by any of the parties except as expressly set forth herein, or in any other contemporaneous written agreement executed for the purposes of carrying out the provisions of this Contract. This Contract shall be construed and interpreted according to its plain meaning, and no presumption shall be deemed to apply in favor of, or against the party drafting this Contract. The parties acknowledge and agree that each has had the opportunity to seek and utilize legal counsel in the drafting of, review of, and entry into this Contract.

3.62 Assignment; Delegation. No right or interest in this Contract shall be assigned or delegated by Contractor without prior, written permission of the City, signed by the City Manager. Any attempted assignment or delegation by Contractor in violation of this provision shall be a breach of this Contract by Contractor.

3.63 Subcontracts. No subcontract shall be entered into by the Contractor with any other party to furnish any of the Materials, Services or construction specified herein without the prior, written approval of the City. The Contractor is responsible for performance under this Contract whether or not Subcontractors are used.

3.64 Rights and Remedies. No provision in this Contract shall be construed, expressly or by implication, as waiver by the City of any existing or future right and/or remedy available by law in the event of any claim of default or breach of this Contract. The failure of the City to insist upon the strict performance of any term or condition of this Contract or to exercise or delay the exercise of any right or remedy provided in this Contract, or by law, or the City's acceptance of and payment for Materials or Services, shall not release the Contractor from any responsibilities or obligations imposed by this Contract or by law, and shall not be deemed a waiver of any right of the City to insist upon the strict performance of this Contract.

3.65 Attorneys' Fees. In the event either party brings any action for any relief, declaratory or otherwise, arising out of this Contract or on account of any breach or default hereof, the prevailing party shall be entitled to receive from the other party reasonable attorneys' fees and reasonable costs and expenses, determined by the court sitting without a jury, which shall be deemed to have accrued on the commencement of such action and shall be enforced whether or not such action is prosecuted through judgment.

3.66 Notices and Requests. Any notice or other communication required or permitted to be given under this Contract shall be in writing and shall be deemed to have been duly given if (A) delivered to the party at the address set forth below, (B) deposited in the U.S. Mail, registered or certified, return receipt requested, to the address set forth below or (C) given to a recognized and reputable overnight delivery service, to the address set forth below:

**CITY OF AVONDALE
DEVELOPMENT AND ENGINEERING
SERVICES DEPARTMENT
EN17-020**

If to the City: City of Avondale
 11465 West Civic Center Drive
 Avondale, Arizona 85323
 Attn: David W. Fitzhugh, City Manager

With copy to: GUST ROSENFELD P.L.C.
 One East Washington Street, Suite 1600
 Phoenix, Arizona 85004-2553
 Attn: Andrew J. McGuire

If to Contractor: _____

 Attn: _____

or at such other address, and to the attention of such other person or officer, as any party may designate in writing by notice duly given pursuant to this Section. Notices shall be deemed received (A) when delivered to the party, (B) three business days after being placed in the U.S. Mail, properly addressed, with sufficient postage or (C) the following business day after being given to a recognized overnight delivery service, with the person giving the notice paying all required charges and instructing the delivery service to deliver on the following business day. If a copy of a notice is also given to a party's counsel or other recipient, the provisions above governing the date on which a notice is deemed to have been received by a party shall mean and refer to the date on which the party, and not its counsel or other recipient to which a copy of the notice may be sent, is deemed to have received the notice.

3.67 Overcharges by Antitrust Violations. The City maintains that, in practice, overcharges resulting from antitrust violations are borne by the purchaser. Therefore, to the extent permitted by law, the Contractor hereby assigns to the City any and all claims for such overcharges as to the goods and services used to fulfill this Contract.

3.68 Force Majeure. Except for payment for sums due, neither party shall be liable to the other nor deemed in default under this Contract if and to the extent that such party's performance of this Contract is prevented by reason of force majeure. The term "*force majeure*" means an occurrence that is beyond the control of the party affected and occurs without its fault or negligence. Without limiting the foregoing, force majeure includes acts of God; acts of the public enemy; war; riots; strikes; mobilization; labor disputes; civil disorders; fire; floods; lockouts, injunctions-intervention-acts, or failures or refusals to act by government authority; and other similar occurrences beyond the control of the party declaring force majeure which such party is unable to prevent by exercising reasonable diligence. The force majeure shall be deemed to commence when the party declaring force majeure notifies the other party, in accordance with Section 3.66, of the existence of the force majeure and shall be deemed to continue as long as the results or effects of the force majeure prevent the party from resuming performance in accordance with this Contract. Force majeure shall not include the following occurrences:

A. Late Delivery. Late delivery of equipment or materials caused by congestion at a manufacturer's plant or elsewhere, an oversold condition of the market, inefficiencies or similar occurrences.

B. Late Performance. Late performance by a Subcontractor unless the delay arises out of a force majeure occurrence in accordance with this Section 3.68.

Any delay or failure in performance by either party hereto shall not constitute default hereunder or give rise to any claim for damages or loss of anticipated profits if, and to the extent that such delay or failure is caused by force majeure. If either party is delayed at any time in the progress of the Work by force majeure, then the delayed party

shall notify the other party in accordance with Section 3.66 and shall make a specific reference to this Section, thereby invoking its provisions. The delayed party shall cause such delay to cease as soon as practicable and shall notify the other party in writing. The time of Substantial Completion or Final Completion shall be extended by written Contract amendment for a period of time equal to the time that the results or effects of such delay prevent the delayed party from performing in accordance with this Contract.

3.69 Confidentiality of Records. The Contractor shall establish and maintain procedures and controls that are acceptable to the City for the purpose of ensuring that information contained in its records or obtained from the City or from others in carrying out its obligations under this Contract shall not be used or disclosed by it, its agents, officers, or employees, except as required to perform Contractor's duties under this Contract. Persons requesting such information should be referred to the City. Contractor also agrees that any information pertaining to individual persons shall not be divulged other than to employees or officers of Contractor as needed for the performance of duties under this Contract.

3.70 Records and Audit Rights. To ensure that the Contractor and its Subcontractors are complying with the warranty under Section 3.71 below, Contractor's and its Subcontractors' books, records, correspondence, accounting procedures and practices, and any other supporting evidence relating to this Contract, including the papers of any Contractor and its Subcontractors' employees who perform any Work or Services pursuant to this Contract (all of the foregoing hereinafter referred to as "Records"), shall be open to inspection and subject to audit and/or reproduction during normal working hours by the City, to the extent necessary to adequately permit (1) evaluation and verification of any invoices, payments or claims based on Contractor's and its Subcontractors' actual costs (including direct and indirect costs and overhead allocations) incurred, or units expended directly in the performance of Work under this Contract and (2) evaluation of the Contractor's and its Subcontractors' compliance with the Arizona employer sanctions laws referenced in Section 3.71 below. To the extent necessary for the City to audit Records as set forth in this Section, Contractor and its Subcontractors hereby waive any rights to keep such Records confidential. For the purpose of evaluating or verifying such actual or claimed costs or units expended, the City shall have access to said Records, even if located at its Subcontractors' facilities, from the effective date of this Contract for the duration of the Work and until three years after the date of final payment by the City to Contractor pursuant to this Contract. Contractor and its Subcontractors shall provide the City with adequate and appropriate workspace so that the City can conduct audits in compliance with the provisions of this Section. The City shall give Contractor or its Subcontractors reasonable advance notice of intended audits. Contractor shall require its Subcontractors to comply with the provisions of this Section by insertion of the requirements hereof in any subcontract pursuant to this Contract.

3.71 E-verify Requirements. To the extent applicable under ARIZ. REV. STAT. § 41-4401, the Contractor and its Subcontractors warrant compliance with all Federal immigration laws and regulations that relate to their employees and their compliance with the E-verify requirements under ARIZ. REV. STAT. § 23-214(A). Contractor's or its Subcontractors' failure to comply with such warranty shall be deemed a material breach of this Contract and may result in the termination of this Contract by the City.

3.72 Israel. Contractor certifies that it is not currently engaged in, and agrees for the duration of this Agreement that it will not engage in, a "boycott" of Israel, as that term is defined in ARIZ. REV. STAT. § 35-393.

3.73 Right to Inspect Plant. The City may, at reasonable times, inspect the part of the plant or place of business of the Contractor or Subcontractor that is related to the performance of this Contract.

3.74 Warranties. Contractor warrants to the City that all Materials and equipment furnished shall be new unless otherwise specified and agreed by the City and that all Work shall be of first class quality, free from faults and defects and in conformance with this Contract. If at any time within one year following the date of Final

Completion and acceptance of the entire Project (or such longer period as may be provided under warranties for equipment or Materials): (A) any part of the Materials furnished in connection with the Work shall be or become defective due to defects in either labor or Materials, or both, or (B) Contractor's Work or Materials, or both, are or were not in conformance with original or amended Plans and Specifications, or supplementary shop drawings, then the Contractor shall upon written notice from the City immediately replace or repair such defective or non-conforming Material or workmanship at no cost to the City. Contractor further agrees to execute any special guarantees as provided by this Contract or required by law. Contractor shall require similar guarantees from all vendors and from all its Subcontractors. Contractor further agrees, upon written demand of the City and during the course of construction, to immediately re-execute, repair or replace any Work that fails to conform to the requirements of this Contract, whether caused by faulty Materials or workmanship, or both. In the event Contractor shall fail or refuse to make such change upon the City's written demand, the City shall have the right to have such Work re-executed, repaired or replaced, to withhold from or back charge to Contractor all costs incurred thereby.

3.75 Inspection. All Materials and/or Services are subject to final inspection and acceptance by the City. Materials and/or Services failing to conform to the Specifications of this Contract will be held at Contractor's risk and may be returned to the Contractor. If so returned, all costs are the responsibility of the Contractor. Upon discovery of non-conforming Materials or Services, the City may elect to do any or all of the following by written notice to the Contractor: (A) waive the non-conformance; (B) stop the Work immediately; or (C) bring material or service into compliance and withhold the cost of same from any payments due to the Contractor.

3.76 No Replacement of Defective Tender. Every tender of Materials shall fully comply with all provisions of this Contract. If a tender is made which does not fully conform, this shall constitute a breach of this Contract as a whole.

3.77 Shipment Under Reservation Prohibited. Contractor is not authorized to ship Materials under reservation and no tender of a bill of lading will operate as a tender of the Materials.

3.78 Liens. All Materials, Service or construction shall be free of all liens and, if the City requests, a formal release of all liens shall be delivered to the City.

3.79 Licenses. Contractor shall maintain in current status all Federal, State and Local licenses and permits required for the operation of the business conducted by the Contractor as applicable to this Contract.

3.80 Patents and Copyrights. All Services, information, computer program elements, reports and other deliverables, which may be patented or copyrighted and created under this Contract are the property of the City and shall not be used or released by the Contractor or any other person except with the prior written permission of the City.

3.81 Preparation of Specifications by Persons other than City Personnel. All Specifications shall seek to promote overall economy for the purposes intended and encourage competition and not be unduly restrictive in satisfying the City's needs. No person preparing Specifications shall receive any direct or indirect benefit from the utilization of Specifications, other than fees paid for the preparation of Specifications.

3.82 Advertising. Contractor shall not advertise or publish information concerning this Contract without prior, written consent of the City.

PART D - ALTERNATIVE DISPUTE RESOLUTION

3.83 Scope. Notwithstanding anything to the contrary provided elsewhere in the Contract Documents, except for subsection 3.86(G) below, the alternative dispute resolution (“ADR”) process provided for herein shall be the exclusive means for resolution of claims or disputes arising under, relating to or touching upon this Contract, the interpretation thereof or the performance or breach by any party thereto, including but not limited to original claims or disputes asserted as cross claims, counterclaims, third party claims or claims for indemnity or subrogation, in any threatened or ongoing litigation or arbitration with third parties, if such disputes involve parties to contracts containing this ADR provision.

3.84 Neutral Evaluator, Arbitrators. The City will select a Neutral Evaluator to serve as set forth in this ADR process, subject to the Contractor’s approval, which approval shall not be unreasonably withheld. In the event that the City and the Contractor are unable to agree upon a Neutral Evaluator, the neutral evaluation process shall be eliminated and the parties shall proceed with the binding arbitration process set forth in Section 3.86 below. The City and Contractor shall each select an arbitrator to serve as set forth in this ADR process. Each arbitrator selected shall be a member of the State Bar of the State of Arizona and shall have experience in the field of construction law. None of the arbitrators nor any of the arbitrator’s firms shall have presently, or in the past, represented any party to the arbitration.

3.85 Neutral Evaluation Process. If the parties have been unable to resolve the disputes after discussions and partnering, but the parties have agreed to a Neutral Evaluator, the following neutral evaluation process shall be used to resolve any such dispute.

A. Notification of Dispute. The City through its Engineer shall notify the Neutral Evaluator in writing of the existence of a dispute within 10 Days of the City or the Contractor declaring need to commence the neutral evaluation process.

B. Non-Binding Informal Hearing. The Neutral Evaluator shall schedule a non-binding informal hearing of the matter to be held within seven Days from receipt of notification of the existence of a dispute. The Neutral Evaluator may conduct the hearing in such manner as he deems appropriate and shall notify each party of the hearing and of its opportunity to present evidence it believes will resolve the dispute. The Neutral Evaluator shall require that each party submit a written outline of the issues and evidence intended to be introduced at the hearing and the proposed resolution of the dispute to the Neutral Evaluator before the hearing commences. Arbitrators shall not participate in such informal hearing or proceedings process. The Neutral Evaluator is not bound by the rules of evidence when admitting evidence in the hearing and may limit the length of the hearing, the number of witnesses or any evidence introduced to the extent deemed relevant and efficient.

C. Non-Binding Decision. The Neutral Evaluator shall render a non-binding, written decision as soon as possible, but not later than five Days after the hearing.

3.86 Binding Arbitration Procedure. The following binding arbitration procedure, except as provided in subsection 3.86(G) below, shall serve as the exclusive method to resolve a dispute if (A) the parties cannot agree to a Neutral Evaluator as set forth in Section 3.84 above or (B) any party chooses not to accept the decision of the Neutral Evaluator. The party requesting binding arbitration shall notify the Neutral Evaluator of a request for arbitration in writing within three business days’ of receipt of the Neutral Evaluator’s decision. If the Contractor requests arbitration or if Contractor rejects the City’s selection of a Neutral Evaluator, it shall post a cash bond with the Neutral Evaluator in an amount agreed upon by the parties or, in the event of no agreement, the Neutral Evaluator shall establish the amount of the cash bond to defray the cost of the arbitration as set forth in subsection 3.86(M) and the proceeds from the bond shall be allocated in accordance with subsection 3.86(M) by the Arbitration Panel.

A. Arbitration Panel. The Arbitration Panel shall consist of three arbitrators: the City's appointed arbitrator, the Contractor's appointed arbitrator and a third arbitrator (or "Neutral Arbitrator") who shall be selected by the parties' arbitrators as set forth in subsection 3.86(B) If more than one consultant or contractor is involved in a dispute, the consultants and/or contractors shall agree on an appointee to serve as arbitrator. The Neutral Evaluator shall not participate in the proceedings.

B. Selection of Neutral Arbitrator. The parties' arbitrators shall choose the Neutral Arbitrator within five business days of receipt of notification of a dispute from the Neutral Evaluator. The Neutral Arbitrator shall have the same qualifications as those of the arbitrators set forth in Section 3.84. In the event that the selected arbitrators cannot agree on the Neutral Arbitrator as set forth above, the Neutral Arbitrator shall be the "Default Neutral Arbitrator," a person or entity jointly selected by the City and the Contractor. If the City and the Contractor cannot agree on a Default Neutral Arbitrator, the City and the Contractor shall each submit two names to an appropriate judge who shall select one person to serve as the Default Neutral Arbitrator."

C. Expedited Hearing. The parties have structured this procedure with the goal of providing for the prompt, efficient and final resolution of all disputes falling within the purview of this ADR process. To that end, any party can petition the Neutral Evaluator to set an expedited hearing. If the Neutral Evaluator determines that the circumstances justify it, the Neutral Evaluator shall contact the selected Arbitration Panel and arrange for scheduling of the arbitration at the earliest possible date. In any event, the hearing of any dispute not expedited will commence as soon as practical but in no event later than 20 Days after notification of request for arbitration having been submitted. This deadline can be extended only with the consent of all the parties to the dispute, or by decision of the Arbitration Panel upon a showing of emergency circumstances.

D. Procedure. The Arbitration Panel will select a Chairman and will conduct the hearing in such a manner that will resolve disputes in a prompt, cost efficient manner giving regard to the rights of all parties. Each party shall supply to the Arbitration Panel a written pre-hearing statement which shall contain a brief statement of the nature of the claim or defense, a list of witnesses and exhibits, a brief description of the subject matter of the testimony of each witness who will be called to testify, and an estimate as to the length of time that will be required for the arbitration hearing. The Arbitration Panel shall review and consider the Neutral Evaluator decision, if any. The Chairman shall determine the nature and scope of discovery, if any, and the manner of presentation of relevant evidence consistent with deadlines provided herein and the parties' objective that disputes be resolved in a prompt and efficient manner. No discovery may be had of any materials or information for which a privilege is recognized by Arizona law. The Chairman, upon proper application, shall issue such orders as may be necessary and permissible under law to protect confidential, proprietary or sensitive materials or information from public disclosure or other misuse. Any party may make application to the Maricopa County Superior Court to have a protective order entered as may be appropriate to confirm such orders of the Chairman.

E. Hearing Days. In order to effectuate parties' goals, the hearing once commenced, will proceed from business day to business day until concluded, absent a showing of emergency circumstances.

F. Award. The Arbitration Panel shall, within 10 Days from the conclusion of any hearing, by majority vote, issue its award. The award shall include an allocation of fees and costs pursuant to subsection 3.86(M) herein. The award is to be rendered in accordance with this Contract and the laws of the State of Arizona.

G. Scope of Award. The Arbitration Panel shall be without authority to award punitive damages, and any such punitive damage award shall be void. The Arbitration Panel shall be without any authority to issue an award against any individual party in excess of twenty percent (20%) of the original Contract amount, but in no event shall any award exceed \$2,000,000, exclusive of interest, arbitration fees, costs and attorneys' fees. If an award is made against any individual party in excess of \$100,000, exclusive of interest, arbitration fees, costs and attorneys' fees, it must be supported by written findings of fact, conclusions of law and a statement as to how

damages were calculated. Any claim in excess of twenty percent (20%) of the original Contract amount or in excess \$2,000,000 shall be subject to the jurisdiction of the Superior Court of Arizona, Maricopa County. Any party can contest the validity of the amount claimed if an action is filed in the Superior Court.

H. Jurisdiction. The Arbitration Panel shall not be bound for jurisdictional purposes by the amount asserted in any party's claim, but shall conduct a preliminary hearing into the question of jurisdiction upon application of any party at the earliest convenient time, but not later than the commencement of the arbitration hearing.

I. Entry of Judgment. Any party can make application to the Maricopa County Superior Court for confirmation of an award, and for entry of judgment on it.

J. Severance and Joinder. To reduce the possibility of inconsistent adjudications: (1) the Neutral Evaluator or the Arbitration Panel may, at the request of any party, join and/or sever parties, and/or claims arising under other contracts containing this ADR provision, and (2) the Neutral Evaluator, on his own authority, or the Arbitration Panel may, on its own authority, join or sever parties and/or claims subject to this ADR process as they deem necessary for a just resolution of the dispute, consistent with the parties' goal of the prompt and efficient resolution of disputes, provided, however, that the Contractor, Architect/Engineer and Project professionals shall not be joined as a party to any claim made by a Contractor. Nothing herein shall create the right by any party to assert claims against another party not germane to this Contract or not recognized under the substantive law applicable to the dispute. Neither the Neutral Evaluator nor the Arbitration Panel are authorized to join to the proceeding parties not in privity with the City. Contractor cannot be joined to any pending arbitration proceeding, without Contractor's express written consent, unless Contractor is given the opportunity to participate in the selection of the non-City appointed arbitrator.

K. Appeal. Any party may appeal (1) errors of law by the Arbitration Panel if, but only if, the errors arise in an award in excess of \$100,000, (2) the exercise by the Chairman or Arbitration Panel of any powers contrary to or inconsistent with this Contract or (3) on the basis of any of the grounds provided in ARIZ. REV. STAT. § 12-1512, as amended. Appeals shall be to the Maricopa County Superior Court within 15 Days of entry of the award. The standard of review in such cases shall be that applicable to the consideration of a motion for judgment notwithstanding the verdict, and the Maricopa County Superior Court shall have the authority to confirm, vacate, modify or remand an award appealed under this Section, but not to conduct a trial, entertain the introduction of new evidence or conduct a hearing de novo.

L. Uniform Arbitration Act. Except as otherwise provided herein, binding arbitration pursued under this provision shall be governed by the Uniform Arbitration Act as codified in Arizona in ARIZ. REV. STAT. § 12-1501, *et seq.*

M. Fees and Costs. Each party shall bear its own fees and costs in connection with any informal hearing before the Neutral Evaluator. All fees and costs associated with any arbitration before the Arbitration Panel, including without limitation the Arbitration Panelists' fee, and the prevailing party's reasonable attorneys' fees, expert witness fees and costs, will be paid by the non-prevailing party, except as provided for herein. In no event shall any Arbitrator's hourly fees be awarded in an amount in excess of \$200 per hour and (1) costs shall not include any travel expenses in excess of mileage at the rate paid by the City, not to exceed a one way trip of 150 miles, and (2) all travel expenses, including meals, shall be reimbursed pursuant to the travel policy of the City in effect at the time of the hearing. The determination of prevailing and non-prevailing parties, and the appropriate allocation of fees and costs, will be included in the award by the Arbitration Panel. Fees for the Neutral Evaluator shall be divided evenly between the City and the Contractor.

N. Confidentiality. Any proceeding initiated under ADR shall be deemed confidential to the maximum extent allowed by Arizona law and no party shall, except for disclosures to a party's attorneys or accountants, make any disclosure related to the disputed matter or to the outcome of any proceeding except to the extent required by law, or to seek interim equitable relief, or to enforce an agreement reached by the parties or an award made hereunder.

O. Equitable Litigation. Notwithstanding any other provision of ADR to the contrary, any party can petition the Maricopa County Superior Court for interim equitable relief as necessary to preserve the status quo and prevent immediate and irreparable harm to a party or to the Program pending resolution of a dispute pursuant to ADR provided herein. No court may order any permanent injunctive relief except as may be necessary to enforce an order entered by the Arbitration Panel. The fees and costs incurred in connection with any such equitable proceeding shall be determined and assessed in ADR.

P. Change Order. Any award in favor of the Contractor against the City or in favor of the City against the Contractor shall be reduced to a Change Order and executed by the parties in accordance with the award and the provisions of this Contract.

Q. Merger and Bar. Any claim asserted pursuant to this ADR process shall be deemed to include all claims, demands, and requests for compensation for costs and losses or other relief, including the extension of this Contract performance period which reasonably should or could have been brought against any party that was or could have been brought into this ADR process, with respect to the subject claim. The Arbitration Panel shall apply legal principles commonly known as merger and bar to deny any claim or claims against any party regarding which claim or claims recovery has been sought or should have been sought in a previously adjudicated claim for an alleged cost, loss, breach, error, or omission.

R. Inclusion in Other Contracts. The Contractor shall cooperate with the City in efforts to include this ADR provision in all other Project contracts. Subject to Contractor's reasonable agreement, the Contractor agrees that any modification to this ADR provision that is included in the construction or other contracts shall also apply to the Contractor. It is the intent of the parties that any changes to this ADR provision in later contracts will be evolutionary and designed to incorporate the terms of this ADR provision without material changes to the substance or procedure of this ADR provision.

EXHIBIT A
TO
INVITATION FOR BIDS NO. EN17-020

[Specifications, Plans/Construction Drawings/Geotechnical Report]

See following pages.



Avondale

Development & Engineering

TECHNICAL SPECIFICATIONS

EN 17-020
Thomas Road – 103rd Avenue to 99th Avenue
(ST 1306)

Prepared by:

Jacobs Engineering Group Inc
101 N. 1st Avenue, Suite 2600
Phoenix, AZ 85003
602-253-1200

Final Submittal
August 2016



EXPIRES 12/31/2016

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TECHNICAL SPECIFICATIONS
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EXPIRES 12/31/2016

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SECTION 100 - GENERAL CONDITIONS

SECTION 104 – SCOPE OF WORK

104.01000 – Location and Project Boundaries:

The Project is located near Thomas Rd and 99th Ave in the City of Avondale, Arizona (City).

104.02000 – Scope of Work Overview:

The Work consists of new pavement, curb, gutter, sidewalk, streetlights, landscaping and other related miscellaneous Work.

SECTION 105 – CONTROL OF WORK

105.01000 – Additional Reference Standards:

The following reference standards are added to Article III, Section 3.1 of the IFB's General Terms and Conditions and are incorporated by reference.

The "ADOT Specifications" is more particularly defined as the Arizona Department of Transportation (ADOT), Standard Specifications for Road and Bridge Construction, 2008 Edition.

U.S. Department of Transportation, Manual on Uniform Traffic Control Devices (MUTCD), latest edition.

Latest revisions of ASTM, AWWA, ANSI or Federal specifications, standards and details, as applicable.

Latest revisions of MCDOT supplement to the MAG Uniform Specifications and Details for Public Works Construction, 2011, as applicable.

In the event of a conflict between the Construction Drawings and the Contract language, the Contract language shall prevail.

In the event of a conflict between (i) the ASTM, AWWA, ANSI or Federal specifications, standards and details and (ii) the MAG Uniform Standard Specifications and Details for Public Works Construction and the City Supplement to MAG Uniform Standard Specifications and Details for Public Works Construction, the MAG Uniform Standard Specifications and Details for Public Works Construction and City Supplement to MAG Uniform Standard Specifications and Details for Public Works construction shall prevail.

In the event of a conflict between the AWWA, ANSI or Federal specifications, standards and details and the Contract, the Contract shall prevail.

In the event of a conflict between the City of Phoenix Traffic Barricade Manual and the U.S. Department of Transportation Manual on Uniform Traffic Control Devices (MUTCD), the City of Phoenix Traffic Barricade Manual shall prevail.

105.02000 – Additional Reference Information and Materials:

- Geotechnical report

Note: Soils information contained in the geotechnical report was obtained and used for design purposes. It is the responsibility of the Contractor to interpret and establish soils information for bidding and construction purposes.

A copy of this report is attached to the Invitation to Bid.

Bid Item 105.30010– As-built Documentation:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for providing complete and competent as-built record document plans to the City. As-built plans shall reflect all in-place field dimensions, horizontal locations and vertical elevations for all constructed or installed improvements. All changes, additions and deletions shall be depicted graphically and represented numerically. All dimensions and elevations on the plan sheets must be verified.

The Contractor shall be required to keep a clean and current set of as-built plans during the Project’s construction duration. The as-built plans must be kept up to date for each phase of construction throughout the Project’s construction duration, especially for all underground utilities and improvements. These as-built plans shall be subject to review each month by the City’s Engineering Inspector to verify compliance with this specification and will be part of the approval process for each of the Contractor’s monthly progress payments.

Unless otherwise provided for, the Contractor shall be responsible for preparing and providing to the City all final as-built record documents for the Project using the most recent City approved plan sheets. An Arizona registered civil engineer or Arizona registered land surveyor shall seal the final as-built record documents. The final as-built record documents shall conform to the requirements of MAG Specifications Sections 105.8 and 105.15; and as specified in the City MAG Supplement. Final as-built plan sheets shall be prepared on 4 MIL, double matte, MYLAR material. A CD/DVD back-up copy of the as-builts in [.tiff] digital file format shall also be required.

Measurement for the As-built Record Document Plans will be prorated (overall project percent completion) each month over the Project’s duration. **Payment** shall be made at the **LUMP SUM** price bid and shall be considered full compensation for this work item.

105.60010 – Cooperation with Utilities:

The following utility companies may have facilities in the area of this Project. It shall be the Contractor’s responsibility to determine the exact location of the utilities prior to any construction operations and to notify the below mentioned utility companies a minimum of five (5) working days prior to commencing any work on the project. Use caution and always follow all local Blue Stake laws.

<u>Utility</u>	<u>Contact Person</u>
City of Avondale Water	Leonard Moreno (623) 764-2517
City of Avondale Sewer	Michael Yracheta (623) 333-4414

There are underground water and sewer lines running throughout the Project length.

A new 8-inch sewer stub will be included at the west end of this project and coordination with the City will be necessary. Prior to any excavations, the Contractor must call Blue Stake at (602) 263-1100 to accurately locate existing facilities.

New street light foundations will be located near the existing 16-inch waterline that runs along the Project length under the new median. Care will need to be taken to maintain appropriate clearance from the waterline. Conflicts can be avoided if facilities are installed to provide a minimum twelve inches (12-in) face-to-face clearance at the point of crossing. Prior to any excavations, the Contractor must call Blue Stake at (602) 263-1100 to accurately locate existing waterline facilities. The Contractor should hand dig carefully at these marked locations until the waterline has been found and exposed.

City of Phoenix Traffic Signals

Zeke Rios (602) 256-3409

The signal at 99th Avenue is owned by the City of Phoenix and certain improvements to the existing signal facilities are included with this project. The City will install all above-ground equipment required for signal improvements. Contractor shall be responsible for underground improvements, including new foundations, pull boxes and conduits as specified elsewhere in these Technical Specifications.

The Contractor shall maintain direct communication with the City of Phoenix during any work on the existing signal and assure adequate operation of the signal at all times. Additional signal requirements and traffic control are addressed elsewhere in these Technical Specifications.

Salt River Project (SRP)

Transmission

Kevin Oelschlager (602) 236-0893

Transmission

Floyd Hardin (602) 236-8327

Distribution

Conseulo Salaa (602) 236-0894

Irrigation

Susana Ortega (602) 236-5799

Irrigation

Tom Brennan at (602) 236-4953

Contact Tom Brennan a minimum of 72 hours before starting construction around SRP facilities.

SRP irrigation facilities are impacted by this Project. An existing box culvert under Thomas Road at 99th Avenue will be extended to the south with this Project. Modifications to the tailwater facilities are necessary at the west end of this Project near the RID canal.

Plans have been prepared for this work and included with this Project. Additional coordination requirements are addressed elsewhere in these Special Provisions.

There are overhead SRP electrical facilities running throughout the Project length. Existing street lights are affixed to the SRP poles and some will be eliminated as part of the Project.

A new electrical service will be required for the street lights to be installed in the median with this Project. Plans have been prepared for the street light work and included with this Project. Additional coordination requirements are addressed elsewhere in these Special Provisions.

Roosevelt Irrigation District (RID)

Jared Grandy at (602) 438-2200

RID irrigation facilities are located at the west end of this Project. These facilities are not expected to present a conflict with the Project.

Cox Communications (CATV, Fiber)

Rick Burton (623) 328-4086

Randy Sims (623) 328-4058

Cox Communications has facilities within the Project area. These facilities are not expected to present a conflict with the Project. Appropriate care should be taken to avoid damaging existing facilities and to maintain existing conditions upon completion of the construction process.

Century Link

Andre Hatcher (480) 254-0127

Century Link has telephone facilities located throughout the Project area. A conflict is not anticipated with the Century Link communication facilities. Appropriate care should be taken to avoid damaging existing facilities and to maintain existing conditions upon completion of the construction process.

In the event of crossing any underground Century Link facilities, the Century Link line must be potholed, and a minimum separation of 12 inches (12-in) vertical and horizontal must be maintained.

Kinder-Morgan Energy

Brice Box (623) 734-3700

There is an underground petroleum pipeline running throughout the Project length under the existing eastbound travel lanes and a new waterline is proposed to cross over the top of it. A conflict is not anticipated with the petroleum pipeline, however appropriate care should be taken to avoid damaging existing facilities and to maintain existing conditions upon completion of the construction process. Prior to any excavations, the Contractor must call Blue Stake at (602) 263-1100 to accurately locate existing pipeline facilities. The Contractor shall notify Brice Box at Kinder Morgan at least two weeks prior to commencement of pothole work to arrange for a KM Representative to be available onsite. The Contractor should hand dig carefully at these marked locations until the petroleum line has been found and exposed.

Southwest Gas (SWG)

Valerie Gallardo-Weller (602) 484-5342

There are underground gas lines in the vicinity of 99th Avenue. A conflict is not anticipated with Southwest Gas facilities. Appropriate care should be taken to avoid damaging existing facilities and to maintain existing conditions upon completion of the construction process. In the event of crossing any underground Southwest Gas facilities, the gas line must be potholed. Care will need to be taken to maintain appropriate clearances from the gas line. Conflicts can be avoided if facilities are installed to provide a minimum twelve inches (12-in) face-to-face clearance at the point of crossing. Prior to any excavations, the Contractor must call Blue Stake at (602) 263-1100 to accurately locate existing gas facilities. The Contractor should hand dig carefully at these marked locations until the gas pipe has been found and exposed. Use care to avoid damaging or breaking a small electrical tracer wire (which is used for locating purposes) that may be buried with the pipe.

Once mechanical trenching is in progress, do not dig within two feet (2-ft) of a gas pipe. This trenching shall be done by hand in order to prevent any damage to the gas pipe. In the event the Contractor should “hook” or otherwise strain a gas pipe while excavating, a call should be placed to 602-271-GASS (271-4277).

Even though there may not be any apparent damage, the strain may have damaged the wrap or a portion of the buried pipe or fittings at other locations causing a leak in the surrounding area. Also, if a steel facility is exposed and the pipe coating is found to be in need of repair, please contact the SWG office so a crew can be dispatched to rewrap the pipe. This is a service provided by SWG at no cost to the Contractor so they can monitor their steel facilities and minimize the possibility of corrosion.

When the excavations are complete, all exposed gas pipes should be protected. If the trench is more than three feet (3') wide, the pipe must be supported in a manner where the supporting material does not damage the pipe or its protective wrapping.

Before backfilling, SWG requires six inches (6-in) of bedding **and** six inches (6-in) of shading with sand or material free of rocks and able to pass through a 3/8 inch screen in order to provide firm support under the facility and to prevent damage to the pipe or pipe coating from the backfilling operation. Do not drop backfill directly on the exposed gas pipe. When compacting backfill, use extra care when directly over the gas pipe in order to avoid any damage.

The SWG system incorporates valve boxes, test points and underground vaults with manhole access and protective box covering systems. These are designed to be flush with the final surface. These facilities must be kept accessible to SWG per operating practices and requirements of the DOT Pipeline Safety Regulations.

SWG will paint yellow all valves, test pints and vault lids. It will be the responsibility of the Contractor to make sure all gas facility lids are protected before and cleaned after paving is complete.

Once the final surface has been completed, the Contractor will need to contact SWG Construction, 43rd Operations at (602) 484-5233 for a final inspection.

If a valve box, test point, or vault lid requires adjustment, notification of ten (10) working days is requested by SWG to schedule such Work.

Bid Item 105.80010 – Construction Staking, Survey and Layout:

The work under this item shall consist of furnishing all Materials, equipment, and labor necessary for providing construction survey, staking and layout for the Project. This item shall comply with MAG Specification 105.8 and as modified by the City’s MAG Supplement. **Measurement** for survey, staking and layout will be prorated (overall Project percent completion) each month over the Project’s duration. **Payment** shall be made at the **LUMP SUM** price bid and shall be considered full compensation for this Work item.

105.90000 – Miscellaneous Work

Potholing:

Before any pipe main line excavation shall take place, the Contractor shall be required to pothole and verify all utility conflicts or utility crossings; known, marked (Blue Staked) and shown on the approved plans. This includes all residential service lines which may not be marked. The Contractor shall work with the City’s Blue Stake Specialist to coordinate locating services. Failure on the Contractor’s behalf to adequately locate and verify the utility conflicts/crossings well in advance of any main line or lateral line trench excavation shall preclude any claims or extra costs by the Contractor for delays or stand-by time. All utility potholing in existing paved streets shall be done using the air/vacuum type method. Dimensions for the potholing pavement cuts shall be limited to 12 inch (12-in) by 12 inch (12-in) square holes. All potholes shall be backfilled and patched in accordance with MAG Standard Detail No. 212.

The City has obtained pothole data for the proposed utility crossings. The pothole information was used by the City of Avondale for the design of the waterline. The use of the pothole data is for additional information and does not release the Contractor from doing its due diligence when excavating near new waterline, gas, and under-ground power lines. This data shall not relieve the Contractor from complying with the “Blue Stake” Law requirements.

Trench Plates:

All trenching must be safely secured and barricaded at all times. Overnight trenching involving street cuts shall be steel plated in accordance with MAG Standard Detail No. 211. Steel plate installation shall be Type 2 (milled in) for arterial and collector streets. Type 1 (ramped) shall be allowed on local streets only. Plates are only allowed for a maximum period of five (5) business days after which the street must be permanently patched. Temporary asphalt patching, if allowed by the Engineering Inspector, is only allowed for a maximum period of five (5) business days after which the street must be permanently patched.

SECTION 107 – LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

Bid Item 107.02000 – AZPDES (NPDES) SWPPP

The Lump Sum price bid for this SWPPP work item shall include all material, labor, equipment and other incidental costs related to furnishing, installing, and maintaining the SWPPP during the project construction. Maintenance shall include but is not limited to cleaning, repair and disposal of debris and compromised devices following storm events or other water runoff on the project. All administrative costs including plan and document preparation shall also be included.

This project is subject to the Arizona Pollutant Discharge Elimination System (AZPDES) Construction General Permit (CGP) requirements under the EPA General Permit for Arizona. All subcontractors shall comply with all AZPDES CGP requirements under the supervision of the General Contractor and shall submit a completed, signed subcontractor certification form, thereby designating themselves as co-permittees. The Contractor will be expected to develop the Storm Water Pollution Prevention Plans (SWPPP) following the most recent City of Avondale Approved SWPPP Template found on City of Avondale website. Completed SWPPPs must be submitted to the City's NPDES coordinator for review before a construction permit will be issued by the City. All sections of the most recent City of Avondale Approved SWPPP Template must be complete in order for the City's NPDES coordinator to initiate a review of the submitted SWPPP. Any structural or non-structural best management practices included in the SWPPP that are not included in the City of Avondale Approved BMP List (found on the City of Avondale website) will be subject to the standards deviation process, and are not guaranteed approval.

Subsequent to approval by the City's NPDES coordinator, the Contractor will be expected to update/revise the approved SWPPP as necessary throughout the construction of the Project in order to ensure compliance with EPA, AZPDES, and CGP permit requirements. Revisions to the SWPPP requiring use of the SWPPP bid item, or any other additional items, shall be subject to approval by the City prior to implementation. The SWPPP document shall be kept at the project site at all times. The final SWPPP document shall be retained by the Contractor for three years following project completion and final acceptance by the City.

The contractor will be responsible to make submittals to the appropriate agencies. In addition to review by the City and Maricopa County Department of Transportation (MCDOT), portions of this project may be in the urbanized, non-incorporated area governed by Maricopa County Environmental Services Department. This department requires a submittal, fees, and process in addition to the standard NPDES requirements. In addition, portions of this project are within a quarter mile of the Gila River, which is an impaired waterway, and may require a special review or process from ADEQ.

The Contractor shall submit a completed, signed Notice of Intent (NOI) form (including the signed subcontractor certification forms) to the Arizona Department of Environmental Quality (ADEQ), Water Permits Section/Storm Water NOI (5415B-3), 1110 W. Washington Street, Phoenix, Arizona 85007; or fax to (602) 771-4674, or online at ADEQ's Smart NOI Web site at: <http://az.gov/app/smartnoi/>. The NOI shall be posted at the construction site at all times.

Failure by the Contractor (or any applicable subcontractors) to submit the NOI forms and certifications to ADEQ, and/or the SWPPP to the City's NPDES coordinator for review, by the start of construction activities will lead to delays in meeting EPA requirements, which will result in delay of the start of construction. The Contractor will not be entitled to any additional compensation for costs resulting from such delay of the construction start date and/or any construction activities. No construction activities shall begin until all applicable storm water pollution control devices are in place. Any additional work or costs caused by the Contractor's (or subcontractor's) failure to properly implement the SWPPP shall not be considered for compensation. The Contractor shall keep a copy of the latest STORM WATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITIES as printed in the Federal Register at the job site at all times. The Contractor shall keep a copy of the STORM

WATER BASELINE CONSTRUCTION GENERAL PERMIT COVERAGE NOTICE received from the EPA (after submittal of the NOI) at the job site at all times.

All SWPPP reports required under this contract shall be available to the public in accordance with the requirements of Section 308(b) of the Clean Water Act. The Contractor shall make plans available to the public upon request through the EPA. No conditions of the Arizona General Permit or the SWPPP shall release the Contractor from any responsibilities or requirements under other environmental statutes or regulations. Asphalt plant and concrete plants (including mobile plants) require separate AZPDES industrial permits.

Upon completion and acceptance of the work performed by a subcontractor co-permittee, either the Contractor or other subcontractors shall absolve such subcontractor of any involvement in, or responsibility for, any subsequent AZPDES violations on the project. After project completion, acceptance, and de-mobilization, the Contractor shall submit a completed, signed Notice of Termination (NOT) form to the ADEQ Water Permits Section/Storm Water NOT (5415B-3), 1110 W. Washington Street, Phoenix, Arizona 85007 or fax to (602) 771-4674, or online at ADEQ's Smart NOI Web site at: <http://az.gov/app/smartnoi/>.

As a minimum, the Contractor shall perform inspections in accordance with the scope and schedule specified in the most recent CGP Inspection and Corrective Action Report Form found on the ADEQ website. The Contractor is also encouraged to inspect all best management practices following all rainfalls, as it is the Contractor's responsibility to ensure the proper operation of each best management practice at all times. The Contractor shall maintain a record of each inspection. No other separate measurements or payments will be made relative to SWPPP items.

The Lump Sum price bid for this SWPPP work item shall include all material, labor, equipment and other incidental costs related to furnishing, installing, and maintaining the SWPPP during the project construction. Maintenance shall include but is not limited to cleaning, repair and disposal of debris and compromised devices following storm events or other water runoff on the project. All administrative costs including plan and document preparation shall also be included.

Measurement for AZPDES (NPDES) SWPPP will be prorated (overall project percent completion) each month over the project's duration. **Payment** shall be made at the **LUMP SUM** price bid and shall be considered full compensation for this work item.

Bid Item 107.15000 – Community Relations (Allowance):

The work under this item shall consist of furnishing all necessary materials, equipment, labor, services and incidentals for providing public information and notification in accordance with Article III, General Terms and Conditions, Part B Performance of the Work, Section 3.53, "Public Information and Notification" of the Contract Documents. The cost for providing a 24-hour project hot-line number service shall be reimbursed through this work item. **Payment** will be based on City-approved time and material invoices for an amount not to exceed ten thousand dollars (\$10,000.00) and shall be considered full compensation for this work item.

107.20010 – Permits:

The City of Avondale Engineering Right-of-Way (ROW) Permit fee will be waived for this project. All other required permits shall be the Contractor's responsibility to obtain and pay for, which may include but not be limited to; Maricopa County Department of Transportation (MCDOT) ROW permit, City of Phoenix ROW permit, Maricopa County Environmental Dust Control permit and City fire hydrant meter fees. The cost for all permits shall be included in the Contractor's bid price.

Bid Item 107.20020 – Permit and Development Fee for Landscape Meter (Allowance):

The work under this item shall consist of furnishing all necessary materials, equipment, and labor to apply for and obtain a permit for the landscape meter(s) pertaining to the Project. The purpose of this item is to establish an account from which to reimburse the contractor for payments made to the City of Avondale Water Services Department for the designated water meter installation(s). The cost for all permits, meter installation and development fees in correlation to the landscape meters shall be included in this item. The City of Avondale Water Services Department will furnish and install the new water meter at the designated location shown on the project plans once the contractor has installed the water service and meter box. Water provided through the 1” water meter shall only be used for planting, plant establishment, and flushing and testing of irrigation lines. Water provided through the water meter shall not be used for office, equipment, construction yard activities, dust abatement, pipeline embedment settling, watering in of pre-emergent herbicide, granite mulch or other miscellaneous construction related tasks, all such costs being considered as included in the cost of the related contract items. The construction of the service line and meter box(es) shall be covered by a separate item. ***Measurement*** shall be based on City-approved time and invoices or on a pre-approved, mutually agreed on price. ***Payment*** shall be for an amount not to exceed **Twenty Thousand dollars (\$20,000.00)** based on the approved time and invoices for landscape water meter and shall be considered full compensation for the work item

SECTION 108 – COMMENCEMENT, PROSECUTION AND PROGRESS

108.50010 – Limitation of Operations and Sequencing of Construction:

The Contractor shall be aware of and coordinate this Project’s Work with any other ongoing construction and/or traffic control in the immediate vicinity of the Project area.

Night and weekend work is not allowed unless specifically pre-approved by the City. The Contractor shall assume no night or weekend work for bidding purposes.

A minimum of two thru lanes, one each direction, shall remain open at all times. Provisions shall be made to allow for left turns including dedicated turn bays at all signalized intersections and other major collector cross-street intersections, unless otherwise specifically pre-approved by the City.

Any activities that will affect peak time traffic shall be pre-approved for times, days, and method by the City prior to implementation. Generally, no activities that affect peak time traffic on major collector and arterial streets will be allowed between 7:00 a.m. - 9:00 a.m. and from 4:00 p.m. - 6:00 p.m. Deviations may only occur when specifically approved by the City Engineer.

All work within the rights-of-way of the following streets must be stopped, equipment removed and all barricades removed the Thursday before race weekend (February – March PIR Race Week) OR (November PIR Race Week). Work may resume on Monday following race weekend.

All milling, crack sealing and pavement replacement shall be completed before any preservative seals or slurry/micro seals can be applied.

SECTION 109 - MEASUREMENT AND PAYMENT

109.00010 – General

Bid Item Numbers listed herein correspond to the Item Numbers listed in the Price Sheet of the Invitation for Bid (IFB), included herein as Exhibit “C”.

Measurement for each bid item shall be done in the units installed or percent complete as indicated in the Price Sheet of the IFB's Exhibit "C". Measurement shall be for all work that is satisfactorily completed in place, with no allowance for waste, and that which is verified by field measurements as applicable.

In general, payments to the Contractor shall be in accordance with Article 3, General Terms and Conditions, Section 3.13, "Payments to Contractor" of the Contract Documents. Specific bid item payment guidelines shall be in accordance with the MAG Specifications as applicable unless as revised or more particularly described in these Technical Specifications. Payment will be made at the Unit Price or Lump Sum price that was bid and as shown in the Price Sheet of the IFB's Exhibit "C" and shall constitute payment in full for furnishing all materials, equipment, appurtenances, labor, plant and tools necessary to provide a complete Project in a workmanlike and satisfactory manner as shown by the Plan Drawings and in the Contract Documents described herein.

Bid Item 109.10010 – Mobilization/Demobilization:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary to provide the Contractor a one-time, round trip mobilization/demobilization of the Contractor's personnel equipment, supplies and incidentals, establishment of offices, buildings and other facilities, required for the performance of the work on the Project, including preparatory work and operations prior to the commencement of the work on the Project site. ***Measurement and Payment*** for mobilization and demobilization shall be done in two equal parts of the Contractor's Bid Item **LUMP SUM** price. The first half payment shall be included in the Contractor's initial invoice and the second half payment shall be made after the Project has reached Substantial Completion as declared by the City and shall be considered full compensation for this work item.

Bid Item 109.50010 - Miscellaneous Reimbursable (Allowance):

The work under this item shall consist of furnishing all necessary materials, equipment, and labor for work not covered by the Contract plans or documents due to an unforeseen field condition or other circumstance that has been identified during the construction phase as necessary to complete the Project. No work shall be performed under this item unless it is authorized, in writing, by the City or authorized representative. The scope of work, conditions, completion schedule and pricing for any extra work must be mutually agreed on and approved by the City before the work can commence. ***Measurement*** shall be based on City-approved time and material invoices or on a pre-approved, mutually agreed on price. ***Payment*** shall be for an amount not to exceed fifty thousand dollars (\$50,000.00) based on the approved time and material invoices or the pre-determined, pre-approved price for each separate extra work item and shall be considered full compensation for the work item.

SECTION 200 – EARTHWORK

Bid Item 215.01510 – Earthwork for Retention Basins:

The work under this item shall consist of furnishing all materials, equipment, and labor for the construction of a retention basin. This work consists of excavation of a retention basin and includes shaping and compacting and construction of dikes where indicated on the plans. Construction shall be in accordance with the approved plans. ***Measurement*** will be made per cubic yard for cut and fill within the 14-foot wide limits shown on the plans, including excavation, grading, compaction, and dike construction where called for on the plans. ***Payment*** will be made at the unit price bid per **CUBIC YARD** of material excavated and properly disposed of, and such payment shall be compensation in full for the work complete in place.

SECTION 300 – STREETS AND RELATED WORK

Bid Item 301.01000 – Subgrade Preparation:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for preparation of natural or excavated areas prior to the placement of any sub-base material, pavement, curbs and gutters, driveways, sidewalks or other structures. Unless provided for in another bid item, this work shall include the removal and disposal of all unsuitable material, including existing pavement and other obstructions in accordance with MAG Specification Section 301.

Within the area where the existing roadway will be completely removed or new pavement widening will occur there is a high likelihood of encountering unstable moist soil conditions. Prior to placing structural fill or aggregate base, the exposed grade should be scarified to a depth of 12 inches (Note: Increased depth over MAG Specification Section 301), moisture conditioned to optimum (± 2 percent) and compacted to at least 95 percent of maximum dry density as determined by ASTM D-698. The deeper scarification depth is recommended to compensate for the previous disturbance caused by any previous farming or adjacent site activities.

Where the existing irrigation ditch is located and new pavement will be constructed over it, remove the unstable soils to a minimum depth of 2 feet below the existing ditch grades; deeper excavations may be required if the loose, wet areas extend deeper. The wet soils shall be set aside to dry and be re-compacted once they have dried sufficiently, or other suitable soils may be imported if the Contractor desires.

As an alternate to complete removal of the unsuitable soils and with the concurrence of the City Engineer, the soils can be lime stabilized in accordance with Section 309.0102 of these Special Provisions.

The Contractor shall be required to provide and pay for all quality control geotechnical testing in accordance with the MAG Specifications and the City's MAG Supplement. **Measurement** for Subgrade Preparation will be by the square yard, measured by the total accepted area of new pavements, including paved shoulders, tapers, turnouts and driveways that are paved or surfaced with an aggregate base material. The areas under concrete curb and gutter, sidewalk and concrete driveway entrances will not be included. Unless provided for in other separate bid items or unless otherwise specified; Clearing and Grubbing, Roadway Excavation, Borrow Excavation, and Fill Construction shall not be measured, in which case payment for these earthwork items, if required, shall be included in the unit price for Subgrade Preparation. Soil stabilization, treatments and/or soil replacement of unsuitable materials shall be included in the unit price for Subgrade Preparation. **Payment** for Subgrade Preparation shall be made at the unit price bid per **SQUARE YARD** and shall be considered full compensation for this work item.

Bid Item 301.02000 – Subgrade Preparation (Farm Road):

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for preparation of natural or excavated areas prior to the grading and compacting of a new dirt farm road as specified on the project plan documents. Unless provided for in another bid item, this work shall include the removal and disposal of all unsuitable material including unstable moist soils and other obstructions in accordance with MAG Specification Section 301. The Contractor shall be required to provide and pay for all quality control geotechnical testing in accordance with the MAG Specifications and the City's MAG Supplement. **Measurement** for Subgrade Preparation (Farm Road) will be by the square yard, measured by the total accepted area of new farm road, graded and compacted. Clearing and Grubbing, Roadway Excavation, Borrow Excavation, and Fill Construction

within the limits of the new farm road construction shall not be measured, in which case payment for these earthwork items, if required, shall be included in the unit price for Subgrade Preparation (Farm Road). **Payment** for Subgrade Preparation (Farm Road) shall be made at the unit price bid per **SQUARE YARD** and shall be considered full compensation for this work item.

Bid Item 309.01012 – Lime Slurry Stabilization, 12” Depth (Contingent Item):

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for preparation and treatment of unstable moist soils to obtain appropriate stability and density to meet MAG Specification Section 301 for subgrade materials. Treatment locations shall be identified by the Contractor and approved by the City Engineer prior to commencing with the work. Unless provided for in another bid item, this work shall include the removal and disposal of all unsuitable material including unstable moist soils and other obstructions in accordance with MAG Specification Section 301.

Unsuitable soils can be mixed with a minimum of 5% of either chemical lime slurry per MAG Specification Section 309 or dry cement per MAG Specification Section 311. A minimum thickness of 12 inches of treated soil will be required. Prior to a final decision on the amount of stabilized soil required, a 12-inch thick test section will be prepared in one of the worst areas to see if 12 inches is sufficient. After allowing the section to cure for a day or two, the section shall be tested for adequate compaction. The Contractor shall be required to provide and pay for all quality control geotechnical testing in accordance with the MAG Specifications and the City’s MAG Supplement.

Measurement for this item will be by the square yard, measured by the total area treated as approved by the City Engineer, including grading and compaction and testing to the top of subgrade. Clearing and Grubbing, Roadway Excavation, Borrow Excavation, and Fill Construction within the limits of the lime stabilization shall not be measured, in which case payment for these earthwork items, if required, shall be considered incidental and included in the unit price for this item. **Payment** for Lime Stabilization, 12” Depth shall be made at the unit price bid per **SQUARE YARD** and shall be considered full compensation for this work item, complete in place.

Bid Item 310.03275 – Aggregate Base Course:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for the placement of an approved, imported aggregate base course material on top of a prepared subgrade per the required design thickness, grade, cross-section and compaction as specified on the project plan documents and in accordance with MAG Specification Sections 310, 701 and 702. Aggregate base course shall not be placed on a prepared subgrade until the City Engineer or authorized representative has inspected and accepted the underlying subgrade. The Contractor shall be required to provide and pay for all quality control geotechnical testing in accordance with the MAG Specifications and the City’s MAG Supplement. Use of Reclaimed Concrete Material (RCM) is not allowed.

Use of Reclaimed Asphalt Pavement (RAP) aggregates or “millings” produced on-site for the intended use in the underlying base or subgrade material must be approved by the City Engineer or authorized representative. Imported or stockpiled RAP milling material allowed to be used in lieu of or blended with virgin aggregate base course material shall be screened and meet MAG Specification Sections 310 and 702. RAP millings must be uniformly mixed with an imported virgin aggregate base course material.

Measurement for aggregate base course material will be per ton furnished and placed. Copies of material delivery tickets will be required for quantity verification purposes. Reclaimed Asphalt Pavement (RAP) aggregates or “millings” produced on-site shall not be included in this measurement.

Payment shall be made at the unit price bid per **TON** and shall be considered full compensation for this work item.

Bid Item 317.01000 – Mill Existing AC Pavement:

The work under this item shall consist of removal and the hauling of existing Asphalt Concrete (AC) pavement by mechanically milling in preparation for AC surface course overlay as specified on the plan documents. The eight (8) feet of AC pavement adjacent to the existing curb shall be milled to a depth of two (2) inches; the remaining existing asphalt pavement shall be milled to a depth of one (1) inch. Work also includes the sealing of existing pavement cracks with a City approved sealant and method in the existing asphalt concrete pavement areas that are designated to be overlaid after all milling and asphalt patching is complete to the City's satisfaction. Manholes, valves, or similar obstructions shall be lowered and/or removed prior to milling. City shall have first rights to receive the AC millings. Contractor shall haul millings to the City yard if City accepts millings. Millings may be used at other locations on the project site for stabilization, dust mitigation or other purposes as directed by the City. If the City refuses AC millings, Contractor shall dispose of milling under this bid item. Costs for special milling around structures, extra-thickness milling, sweeping, and the necessary labor and equipment required to load, haul-off and dispose of the milled materials shall be included in the unit bid price for this work item. **Payment** will be made at the unit price bid per **SQUARE YARD** of AC milled and disposed of, and such payment shall be compensation in full for the item complete in place.

Bid Item 321.01200 – Asphaltic Concrete Pavement (12.5 mm Surface Course HV):

Bid Item 321.01300 – Asphaltic Concrete Pavement (19 mm Base Course HV):

The work under this item shall consist of furnishing all materials, equipment, and labor for the placement and compaction of asphaltic concrete surface course shall be in accordance with MAG Section 321. Placement and compaction of material will be as a surface course for new pavement or as an overlay for existing pavement, as indicated on the plans. The surface course mix shall be provided with an asphalt binder in accordance with MAG Section 710.

The Contractor shall submit written certification that the asphalt meets all requirements of MAG Section 710 for each mix matching **high-volume arterial roadways (Gyratory)**. Materials and mix design proposed to be used in the project must meet all the quality/design criteria prescribed for that specific material/design in the MAG Standard Specification Section 710 or elsewhere within the Standard Specification. Mix design and materials submittals are required for review and approval by the City. Contractor shall be responsible for all costs incurred for resubmittal of rejected mix designs and or materials until they are approved by the City. The City reserves the right to have a test laboratory do quality assurance testing for pavement materials. The results may be used by the Engineer during the approval process.

Paving shall not commence until the City Engineer or their representative has accepted the asphalt base course and bituminous tack coat has been applied. **Payment** for asphaltic concrete pavement will be made at the unit price bid per **TON**, and such payment shall be compensation in full for the item complete in place.

Bid Item 329.02000 – Emulsified Bituminous Tack Coat:

The work under this item shall consist of the furnishing and application of an emulsified asphalt tack coat in accordance with MAG Specifications Sections 329 and 713 with the application rate set at **0.08** gallons per square yard. Immediately before application, the underlying base course or other designated surface area shall be thoroughly cleaned of dirt, debris or other objectionable material.

Application shall not take place until the Engineer or authorized representative has inspected and approved the cleaned surface area. **Measurement** for Emulsified Bituminous Tack Coat will be made by the TON of diluted material applied. **Payment** shall be made at the unit price bid per TON and shall be considered full compensation for this work item.

Bid Item 332.10200 – MAG Type II Slurry Seal Application:

This item consists of the application of an approved MAG slurry seal mix on existing pavement surfaces per the contract documents and as shown in the project overview drawings or as otherwise directed by the City. Work under this item shall be in accordance with the MAG Standard Specifications Section 332 and any other section(s) referred therein. Emulsified asphalt for slurry seal shall be grade CQSH per MAG Specifications Section 713 and the slurry seal aggregate shall be Type II per Table 715-1 of MAG Specifications Section 715. All materials; emulsified asphalt, slurry seal aggregate and the job mix formulas shall be approved by the City prior to application. The Contractor shall be responsible for any necessary testing of materials for compliance. The contractor shall protect all manhole covers, water valve box lids, clean-out lids and survey monuments from the slurry seal. The Contractor shall re-establish location and alignment of any striping and pavement markings per the approved project plans.

Traffic control set-up and maintenance shall be the responsibility of the contractor (see Bid Item 401.01000). Streets with new pavement or new pavement surface treatments shall not be open for public use until all permanent lane striping is complete, or until temporary striping and/or temporary traffic control (barricades) have been provided in accordance with an approved plan.

Material costs shall include the required quantities of mineral aggregates, filler material, asphalt binder, tack oil, rolling and all incidentals necessary to complete the work. Costs for lay-out, any additional surface prep including cleaning/sweeping as necessary and removal of raised pavement markers, if required, shall be included in the unit bid price for this item. Application of blotting materials and other excess materials removal/clean-up to prevent tracking shall be included in the unit bid price for this item. All RPM's are to be replaced under a separate Bid Item per the approved project plans. All re-striping and pavement marking will be performed under a separate Bid Item per the approved project plans. **Payment** will be made at the contract unit price bid per **SQUARE YARD** measured in place. Payment will be considered full compensation for the completed work including all labor, materials, equipment, and all incidentals necessary to complete the work.

Bid Item 340.01110 – 6” Vertical Curb and Gutter, MAG Detail 220-1, Type “A”:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for the construction of new Portland Cement concrete curb and gutter at the locations, grades and elevations shown on the project plan documents. All curb and gutter work shall be constructed in accordance with MAG Specification Section 340, the designated MAG Detail No. 220-1, Type A., and the City of Avondale Supplement to the MAG Specifications as applicable. Curb and gutter constructed in the median should be sloped in the direction of the pavement per the MAG Detail. The Contractor shall verify line and grade prior to placing any concrete. **Measurement** for Curb and Gutter will be per **LINEAR FOOT** installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this work item.

Bid Item 340.01210 – Concrete Sidewalk, MAG Std. Detail 230 (4” thick):

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for the construction of concrete sidewalk at the locations, grades and elevations shown on the project plan documents. The sidewalk width shall be match existing or as otherwise shown on the plans. All

concrete sidewalk work shall be constructed in accordance with MAG Specification Section 340 and MAG Detail No. 230. **Measurement** for concrete sidewalk will be per **SQUARE FOOT** installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this work item.

Bid Item 340.01304 Pedestrian Ramp, City of Phoenix Det P1236:

Bid Item 340.01306– Pedestrian Ramp, COA Det A1235(Mod):

Bid Item 340.01307– Bike Transition Ramp, Detail C:

The work under this item shall consist of furnishing all materials, equipment, and labor for construction of Portland cement concrete, ADA compliant pedestrian sidewalk ramps and bike ramp at the locations shown on the plans. Also included in this work, is the material, equipment, and labor necessary to provide a transition from the adjacent sidewalk to the ramp. Sidewalk ramps shall be in accordance with MAG Standard Specification Section 340 and shall be constructed per City of Avondale and City of Phoenix standards and standard details identified in the plans. Care shall be taken with the installation of concrete sidewalk ramps to protect in place any existing pavement, fencing, gates, or walls that may be present. Any damage to existing pavement, fencing, gates or walls will need to be repaired to their current condition at the Contractor's expense. **Measurement** for pedestrian ramp will be per each ramp constructed. **Payment** will be made at the unit price bid per **EACH** ramp constructed, and such payment shall be compensation in full for the item complete in place.

Bid Item 340.01452 – Driveway Entrance, COA Det. A1252 (Residential):

The work under this item shall consist of furnishing all materials, equipment, and labor for construction of driveways at locations and widths shown on the plans. Driveways shall be constructed in accordance with MAG Standard Specification Section 340 and City of Avondale Standard Detail A1252. Care shall be taken with the installation of residential driveways to protect in place any existing fencing, gates, or walls that may be present. Any damage to existing fencing, gates or walls will need to be repaired to their current condition at the Contractor's expense. **Payment** will be made at the unit price bid per **EACH** driveway and such payment shall be compensation in full for this item complete in place.

Bid Item 340.01600 – Concrete Valley Gutter and Apron:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for the construction of concrete valley gutter and apron at the locations, grades, elevations and dimensions shown on the project plan documents. All Concrete Valley Gutter and Apron work shall be constructed in accordance with MAG Standard Specification Section 340 and MAG Standard Detail 240. The Contractor shall verify line and grade prior to placing any concrete and have reviewed by City's Engineering Inspector prior to placing concrete. **Measurement** for concrete valley gutter and apron will be per each **SQUARE FOOT** installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this work item.

Bid Item 340.04225 – Median Nose Transition, COA Detail A1220 (Monolithic Construction):

The work under this item shall consist of furnishing all materials, equipment, and labor for the construction of a median nose transition per City of Avondale Standard Detail A1220, as shown on the plans or as otherwise directed by the Engineer. All pavement marking installations shall conform to City approved project plans and contract documents including the City of Avondale General Signing and Striping Notes, these Technical Specifications, the latest City of Avondale MAG

Supplement Part 1200. All markings shall be per City of Avondale standards within the City's right-of-way. The Manual of Uniform Traffic Control Devices (MUTCD) shall govern in all cases.

Bullnose shall be painted yellow to ten-feet beyond the end with reflective beads. All items shall be in accordance with MAG Standard Specifications Section 340 unless otherwise specified. The Contractor shall be required to layout the proposed permanent bullnose paint location and limits. After layout, the Contractor shall request City field inspection to verify and approve the layout. City requires two (2) Avondale Business Days' notice (Monday through Thursday; daytime only) to schedule field inspections. Upon approval, Contractor shall install permanent thermoplastic paint. The Contractor shall use City of Avondale Standard Detail A1220 for the limits of paint application.

Payment will be made at the unit price bid per **EACH** median nose transition constructed and such payment shall be compensation in full for the item complete in place including painting as described above.

Bid Item 342.01200 – Brick Pavers:

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of Brick Pavers per City of Avondale Standard Detail A1221 and as described herein. Brick Pavers shall be in accordance with MAG Standard Specification Section 342. **Measurement** for Brick Pavers shall be per Square Yard installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this Work item, including brick, sand, subgrade preparation, mud-mortar setting bed at all brick-landscape edges, and aggregate base course, complete in-place. No additional payment shall be made for Earthwork, Fine Grading, Soil Preparation, or Export, as these work items are considered incidental to the Brick Paver work.

Bid Item 345.01410 – Adjust Water Valve Box and Cover to Grade:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for the lowering and subsequent final adjustment of any new or existing water valve box and cover to match the adjacent finished grade as shown on the project plan documents. Adjustment work shall be completed in accordance with MAG Specification Section 345 and City of Avondale Detail A1310. **Measurement** for water valve box and cover adjustment will be per **EACH** one adjusted in place complete. **Payment** shall be made at the unit price bid and shall be considered full compensation for this work item.

Bid Item 350.01124 – Remove Irrigation Pipe, Backfill and Compact: The work under this item shall consist of furnishing all materials, equipment, and labor necessary for removing and disposing of existing irrigation pipe, backfilling and compaction with engineered fill where shown on the plans. Engineered fill in non-pavement areas shall be in compliance with MAG Section 211, areas of engineered fill underneath roadway surfaces shall use 1-sack slurry. **Payment** for irrigation pipe removal, backfill, and compaction will be made at the contract unit price per **LINEAR FOOT** and shall be considered full compensation for this work item.

Bid Item 350.01500 – Remove Concrete Headwall: The work under this item shall consist of furnishing all materials, equipment, and labor necessary for removing and disposing of existing concrete headwalls where called out on the plans. **Payment** for concrete headwall removal will be made at the contract unit price per **EACH** concrete headwall removed and shall be considered full compensation for this work item.

Bid Item 350.01600 – Remove Concrete Irrigation Structure: The work under this item shall consist of furnishing all materials, equipment, and labor necessary for removing and disposing of existing SRP headwalls, trashrack, pipe and appurtenances, and backfilling and compaction with engineered fill where shown on the plans, located on the north side of Thomas Road near the Roosevelt Irrigation District Canal (approximately Station 74+50). Engineered fill in non-pavement areas shall be in compliance with MAG Section 211, areas of engineered fill underneath roadway surfaces shall use 1-sack slurry. ***Measurement*** for the removal of SRP Irrigation Structure will be a Lump Sum and shall include removing headwalls, trashrack, pipe and appurtenances, disposal of waste and the backfill and compaction of existing ground. ***Payment*** for this work will be made for a **LUMP SUM** price to Remove Concrete Irrigation Structure complete and shall be considered full compensation for this work item.

Bid Item 350.01800 – Remove Existing Concrete Curb and Gutter:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for the removal of existing concrete curb and gutter as shown on the project plan documents. All concrete removals shall be in accordance with MAG Standard Specifications Section 350. The Contractor shall include all removal related costs in this bid item work including saw cut, loading, hauling and off-site disposal. Locations, limits and quantities shall be per plan and/or as designated by the City's Engineering Representative. ***Measurement*** for removal of existing concrete sidewalk, ramp, driveway and slab will be per each **LINEAR FOOT** removed. ***Payment*** shall be made at the unit price bid and shall be considered full compensation for this work item.

Bid Item 350.01810 – Remove Existing Concrete Valley Gutter & Apron:

Bid Item 350.01900 – Remove Existing Concrete Sidewalk, Ramp, Driveway and Slab:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for the removal of existing concrete sidewalk, ramp, driveway and slab as shown on the project plan documents. All concrete removals shall be in accordance with MAG Standard Specifications Section 350. The Contractor shall include all removal related costs in this bid item work including saw cut, loading, hauling and off-site disposal. Locations, limits and quantities shall be per plan and/or as designated by the City's Engineering Representative. ***Measurement*** for removal of existing concrete sidewalk, ramp, driveway and slab will be per each **SQUARE FOOT** removed. ***Payment*** shall be made at the unit price bid and shall be considered full compensation for this work item.

Bid Item 350.04000 – Remove and Salvage Traffic Sign:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for removing and disposing or salvaging and delivering existing sign panels, posts and foundations, backfill and restoration of the ground to match the surrounding surface where applicable, as shown on the plans.

Prior to actual removal, the contractor shall have new signage installed or temporary signage in place keeping the roadway signage current with existing or improved conditions, if applicable. The Contractor shall contact City of Avondale Traffic Operations Supervisor, Bennie Robinson at 623-333-4231, to identify all sign panels that may be salvaged prior to disposal. Salvaged sign panels shall be delivered to the City of Avondale Municipal Operations Services Center (MOSC), 399 E. Lower Buckeye Road, Avondale, AZ at no additional cost to the City. ***Measurement*** for removal and salvage

of traffic signs shall be measured per EACH (ea) sign removed, including removing and disposing of all posts and foundations, or EACH (ea) removal and mounting sign panels on new or existing posts. **Payment** for removal and salvage or relocation of signs will be made at the unit price bid per **EACH**, which shall be full compensation for the work, complete, including furnishing all labor and equipment required.

Bid Item 351.23000 – Relocate Exiting Gate:

The work under this item shall consist of removing existing double steel post gate at Station 86+75 and relocating both halves of same gate approximately 40 feet to north beyond the new right-of-way, as directed by City Inspector. Gate shall be reset in-kind with concrete foundations. **Measurement** for relocating existing gate shall be measured per EACH and shall include removal and relocation of both halves of existing gate, the new concrete foundations and any appurtenances necessary for it to reasonably perform as it does in its current location. **Payment** will be made at the unit price bid per **EACH**, and such payment shall be compensation in full for the item completed.

Bid Item 351.46004 – Remove & Salvage Exiting Street Light:

The work under this item shall consist of removing existing street light mast arm with luminaire from existing SRP power poles at the locations shown on plans, in accordance with SRP requirements. Power poles shall remain in place and energized. Contractor shall notify SRP in advance at (602) 236-2872 to coordinate any work impacting SRP electrical facilities. Salvaged materials shall be delivered to the City of Avondale Municipal Operations Service Center at 399 E. Lower Buckeye Road during normal business hours. Contact Bennie Robinson (623) 333-4231 for coordination. **Measurement** for removal and salvage of existing street light shall be measured per EACH and shall include the mast arm with luminaire and any appurtenances or electrical work associated with removing equipment from each SRP pole. **Payment** will be made at the unit price bid per **EACH**, and such payment shall be compensation in full for the item completed.

SECTION 400 – RIGHT OF WAY & TRAFFIC CONTROL

Bid Item 401.01000– Traffic Control:

The work under this item shall consist of providing all required traffic control barricades, devices, signage, temporary paint pavement markings (striping), flagmen set-ups, pilot cars and other related maintenance as necessary, in accordance with MAG Standard Specification Section 401 and as amended by the City’s “Traffic Regulations” Section of the General Terms and Conditions of the Contract Documents and the City’s MAG Supplement as applicable. Traffic Control shall be further defined by site specific pre-approved traffic control plans (TCPs) and such costs consisting of preparing and submitting ATSSA certified traffic control plans for approval shall be included. Plans must be submitted to the City of Avondale for review and approval a minimum of three (3) Avondale Business Days (M – TH) prior to the start of the related work. The plans must be complete, detailed and meet the City’s submittal guidelines.

Road closures for convenience of the Contractor shall not be allowed. During construction activities, a minimum of two thru lanes, one each direction, shall remain open at all times. Provisions shall be made to allow for left turns including dedicated turn bays at all signalized intersections and other major collector cross-street intersections, unless otherwise specifically pre-approved by the City. Any activities that will affect peak time traffic shall be pre-approved for times, days, and method by the City prior to implementation. Generally, no activities or traffic restrictions that affect peak time traffic

on major collector and arterial streets will be allowed between 6:00 a.m. - 9:00 a.m. and from 4:00 p.m. - 7:00 p.m., M-F. Deviations may only occur when specifically pre-approved by the City.

It shall be the responsibility of the Contractor to provide, erect, maintain, remove and/or relocate all temporary and existing traffic control devices and signal indications necessary to properly mark and control the construction area(s) for the safe and efficient movement of all roadway users including pedestrians. The Contractor shall inspect and maintain all installed temporary traffic control devices at least once during a twenty-four (24) hour period. More frequent intervals of inspection and maintenance shall be made during periods of high winds or other detrimental conditions including a continuing problem maintaining the signs and devices. All temporary traffic control devices shall be ballasted with sandbags.

The work shall not start until the traffic control plans have been approved by the City. Payment for uniformed off-duty police officers shall be paid under a separate bid item as an allowance. **Measurement** for Traffic Control will be prorated (overall project percent completion) each month over the project's duration. The Contractor is responsible for all costs incurred in replacing lost or damaged traffic control devices and traffic control warning signs. **Payment** for Traffic Control shall be made at the **LUMP SUM** price bid and shall be considered full compensation for this work item.

Bid Item 401.01100 – Uniformed Off-Duty Officer (Allowance):

The work under this item shall consist of providing a Uniformed Off-Duty Police Officer to coordinate and direct on-site traffic control when construction activities are within 200-ft of a signalized street intersection and the activities impact traffic movement, or as otherwise required or directed by the City. Prior approval of the use of a Uniformed Off-Duty Police Officer shall be obtained from the City of Avondale. The City of Avondale Police Department shall have the first right of refusal to provide the service. Contractor shall provide at least 72 hours of prior notice. Contractor shall contact Frances Jones (fjones@avondale.org) or at (623) 333-7260 Monday through Thursday between 6 am and 4 pm to schedule a Uniformed Off-Duty Police Officer. If the Contractor contracts directly with the City of Avondale Police, then the Contractor will be responsible to provide worker's compensation insurance coverage. **Measurement** and **Payment** for a police officer will be on an hourly basis not to exceed five thousand dollars (\$5,000.00).

SECTION 430 LANDSCAPING AND PLANTING

Bid Item 430.01002 – Landscape Restoration (Allowance):

The Work under this item shall consist of furnishing all materials, equipment, and labor for the restoration of any existing landscape and irrigation systems as identified on the plans. All items shall be in accordance with **SECTION 4300 "LANDSCAPING"**, and any additional details called out on the plans. **Measurement** for Landscape Restoration shall be per Lump Sum for complete restoration of the impacted areas. **Payment** shall be made at the unit price bid and shall be considered full compensation for this Work item, complete in-place.

Bid Item 430.01005 – Plants 3 and 5 Gallon:

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the plants as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4300 "LANDSCAPING"**, and any additional details called out on the plans. **Measurement** for Plants 3 and 5 Gallon shall be per Each installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this Work item, complete in-place.

Bid Item 430.01053 – Tree 36” Box:

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the tree as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4300 “LANDSCAPING”**, and any additional details called out on the plans. **Measurement** for Tree 36” Box shall be per Each installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this Work item, complete in-place.

Bid Item 430.30000 – 2” Thick Decomposed Granite (All Gradations and Colors):

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the decomposed granite as specified and shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4300 “LANDSCAPING”**, and any additional details called out on the plans. Contractor shall supply a 5-gallon bucket sample for review and approval by City and Landscape Architect prior to ordering. City and Landscape Architect reserve the right to reject the DG sample until the acceptable size and color is achieved. The City and Landscape Architect reserve the right to obtain an alternate supplier if a suitable sample cannot be achieved by Contractor. **Measurement** for 2” Thick Decomposed Granite (All Gradations and Colors) shall be per Square Foot installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this Work item, complete in-place.

Bid Item 430.30001 – 2” Decomposed Granite with Pre-Emergent (Retention Basin):

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of decomposed granite at the proposed retention basin. All items shall be in accordance with **SECTION 4300 “LANDSCAPING”**, and any additional details called out on the plans. Contractor shall use three-quarter inch ($\frac{3}{4}$ ”) decomposed granite, colored Jesse Red, or other City approved equal. Surface of the retention basin shall be treated with Surflan® Pre-Emergent Herbicide or other City approved equal. Contractor shall use two applications of Surflan® at the rate recommended by the manufacturer, one application prior to placement of decomposed granite, and one after the placement of decomposed granite. **Measurement** for this item shall be per **SQUARE YARD** and includes any surface preparation, placement of decomposed granite and application of herbicide as prescribed. **Payment** will be made at the unit price bid, and such payment shall be compensation in full for this item.

SECTION 440 – SPRINKLER IRRIGATION SYSTEM INSTALLATION

Bid Item 440.01101 – 1” Sleeve (SCH 40 PVC):

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the 1” Sleeve (SCH 40 PVC) as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4400 “IRRIGATION SYSTEM”**, and any additional details called out on the plans. **Measurement** for the 1” Sleeve (SCH 40 PVC) shall be per Lineal Foot installed in place. **Payment** shall be made at the linear foot price bid and shall be considered full compensation for this Work item, complete in-place, including all appurtenances.

Bid Item 440.011004 – 4” Sleeve (SCH 40 PVC):

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the 4” Sleeve (SCH 40 PVC) as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4400 “IRRIGATION**

SYSTEM", and any additional details called out on the plans. **Measurement** for the 4" Sleeve (SCH 40 PVC) shall be per Lineal Foot installed in place. **Payment** shall be made at the linear foot price bid and shall be considered full compensation for this Work item, complete in-place, including all appurtenances.

Bid Item 440.01106 – 6" Sleeve (SCH 40 PVC):

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the 6" Sleeve (SCH 40 PVC) as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4400 "IRRIGATION SYSTEM"**, and any additional details called out on the plans. **Measurement** for the 6" Sleeve (SCH 40 PVC) shall be per Lineal Foot installed in place. **Payment** shall be made at the linear foot price bid and shall be considered full compensation for this Work item, complete in-place, including all appurtenances.

Bid Item 440.01109 – 1" Ball Valve Assembly:

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the 1" Ball Valve Assembly as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4400 "IRRIGATION SYSTEM"**, and any additional details called out on the plans. **Measurement** for the 1" Ball Valve Assembly shall be per Each installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this Work item, complete in-place, including all appurtenances.

Bid Item 440.01200 – 3/4" Drip Lateral Pipe (Class 200 PVC):

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the 3/4" Drip Lateral Pipe (SCH 40 PVC) as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4400 "IRRIGATION SYSTEM"**, and any additional details called out on the plans. **Measurement** for the 3/4" Drip Lateral Pipe (SCH 40 PVC) shall be per Lineal Foot installed in place. **Payment** shall be made at the linear foot price bid and shall be considered full compensation for this Work item, complete in-place, including all appurtenances.

Bid Item 440.01201 – 1" Mainline Pipe (SCH 40 PVC):

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the 1" Mainline Pipe (SCH 40 PVC) as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4400 "IRRIGATION SYSTEM"**, and any additional details called out on the plans. **Measurement** for the 1" Mainline Pipe (SCH 40 PVC) Including Tie-in to Existing Irrigation System shall be per Lineal Foot installed in place. **Payment** shall be made at the linear foot price bid and shall be considered full compensation for this Work item, complete in-place, including all appurtenances.

Bid Item 440.01400 – Irrigation Solar Controller:

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the Irrigation Solar Controller as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4400 "IRRIGATION SYSTEM"**, and any additional details called out on the plans. **Measurement** for the Irrigation Solar Controller shall be per Each installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this Work item, complete in-place, including all appurtenances.

Bid Item 440.03000 – Multi-Outlet Emitter:

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the Multi-Outlet Emitters as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4400 “IRRIGATION SYSTEM”**, and any additional details called out on the plans. **Measurement** for the Multi-Outlet Emitters shall be per Each installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this Work item, complete in-place, including all appurtenances.

Bid Item 440.03001 – Single Outlet Emitter:

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the Single Outlet Emitters as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4400 “IRRIGATION SYSTEM”**, and any additional details called out on the plans. **Measurement** for the Single Outlet Emitters shall be per Each installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this Work item, complete in-place, including all appurtenances.

Bid Item 440.50001 – Electric Valve 1” (Drip Remote Control Valve Assembly):

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the 1” Drip Remote Control Valve Assembly as shown on the Project plan documents and as described herein. All items shall be in accordance with **SECTION 4400 “IRRIGATION SYSTEM”**, and any additional details called out on the plans. **Measurement** for the Electric Valve 1” (Drip Remote Control Valve Assembly) shall be per Each installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this Work item, complete in-place, including all appurtenances.

SECTION 460 – STRIPING & SIGNING RELATED WORK

Bid Item 460.02000 – Remove Thermoplastic Stripe:

Pavement marking obliteration shall be accomplished by the contractor as indicated on the plans or as directed by the Engineer.

Pavement markings shall be removed to the fullest extent possible from the pavement by any method that does not materially damage the surface, color, or texture of the usable pavement. Abrasive blasting, using air or water, is an acceptable method for removing pavement markings; however, other methods may be approved by the Engineer. Overpainting of markings with paint or asphalt will not be permitted.

Sand or other material deposited on the pavement as a result of removing pavement markings shall be removed as the work progresses. Accumulations of sand or other material, which might interfere with drainage or might constitute conditions adverse to traffic safety, shall be removed by the contractor.

Where blast cleaning is used for the removal of pavement markings or for removal of objectionable material, the residue, including dust, shall be removed immediately after contact between the sand and the surface being treated. Such removal shall be by a vacuum attachment operating concurrently with the blast cleaning operation, or by other methods approved by the Engineer. Blast cleaning shall not be used within 12 feet of a lane occupied by public traffic unless a suitable barrier separates traffic from the area being cleaned.

Obliteration or removal of raised pavement markers shall include removal of the marker and adhesive pad, or adhesive pad alone if the marker is missing.

Any damage to the pavement caused by pavement marking removal shall be repaired by methods acceptable to the Engineer. When asphalt slurry is used to repair damage to the pavement caused by pavement marking removal or the obliteration of the marks remaining after the markings have been removed, the asphalt slurry shall be placed parallel to the new direction of travel and shall be at least two feet in width.

Measurement of thermoplastic stripe removal shall be measured per **LINEAR FOOT** (lf) along the center line of the pavement marking line and will be based on a four-inch-wide line complete in place provided and constructed per Section 1001.3 of the MAG Supplement Specifications and Standard Signing Detail A1033. Measurement for striping with a plan width greater or less than the basic four inches as shown on the plans or directed by the Engineer will be made by the same method and then adjusted by the following factor:

$$\frac{\text{Plan Width of Striping (inches)} \times \text{Linear Feet}}{4 \text{ (inches)}}$$

No measurement will be made of the number of linear feet of gaps in dashed lines. **Payment** for: Thermoplastic stripe removal, measured as described above will be paid for as full compensation for the work, complete in place, including furnishing all labor and equipment.

Bid Item 461.01520 – Paint Symbol (Bike Lane):

Bid Item 461.01600 – Paint Median Island:

This work under item consists of providing all materials, equipment, and labor for the preparation and application of all permanent traffic paint and preformed pavement markings on new and/or existing pavement surfaces. Application of traffic paint and preformed pavement markings shall conform to the project plan documents, replace previous or restore existing pavement markings or as otherwise directed by the City Engineer or authorized representative. Application of traffic paint and preformed pavement markings shall be in accordance with the City of Avondale General Signing and Striping Notes, Part 1000 of the City of Avondale Supplement to the MAG Specifications and Details, and Section 461 of the latest MCDOT Supplement to the MAG Specifications and Details. Longitudinal lane striping, stop bars, cross-walks, and other lane delineation markings shall be paint.

The Contractor shall be required to survey and layout all the pavement markings including lane striping start/stops, spacing, symbol/legend locations, cross-walks and stop bars per the project plan documents or as otherwise directed. All temporary markings, layout markings and any associated temporary signage shall be provided by the Contractor at no additional cost to the City. After layout, the Contractor shall request a City field inspection to verify and approve the pavement markings layout. The City requires a minimum of two (2) Avondale business days (Monday - Thursday; daytime only) to schedule striping field inspections. Upon approval, the Contractor shall precede with application of the permanent traffic paint pavement markings. For asphalt pavement overlays and other asphalt pavement surface treatments on existing streets, the Contractor shall be responsible for measuring, documenting, setting off-set references and/or whatever necessary to re-establish location and alignment of any existing striping and pavement markings.

Traffic control set-up and maintenance shall be the responsibility of the Contractor. Unless otherwise directed, streets with new pavement or new pavement re-surface treatments shall not be open for public traffic use until all permanent pavement marking is complete, or until temporary striping and/or temporary traffic control (barricades) have been provided in accordance with an approved plan.

Measurement for permanent traffic paint and preformed pavement markings shall be measured in accordance with the MCDOT Supplement to MAG Specifications Section 461.4 with lane striping by the **LINEAR FOOT** and symbols and legends by **EACH** unit applied. **Payment** for permanent traffic paint and preformed pavement markings shall be made per the unit price(s) bid in accordance with the MCDOT MAG Supplement Specification Section 461.5 and shall be considered full compensation for this work item.

Bid Item 461.02100 – Remove Thermoplastic Symbol (Bike Lane & Arrow, “ONLY”):

Bid Item 461.02110 – Remove Thermoplastic Arrow (Left & Right Turn):

Thermoplastic symbol and arrow removal shall be accomplished by the contractor as indicated on the plans or as directed by the Engineer.

Pavement mark symbols shall be removed to the fullest extent possible from the pavement by any method that does not materially damage the surface, color, or texture of the usable pavement. Abrasive blasting, using air or water, is an acceptable method for removing pavement markings; however, other methods may be approved by the Engineer. Overpainting of markings with paint or asphalt will not be permitted.

Sand or other material deposited on the pavement as a result of removing pavement marking symbols shall be removed as the work progresses. Accumulations of sand or other material, which might interfere with drainage or might constitute conditions adverse to traffic safety, shall be removed by the contractor.

Where blast cleaning is used for the removal of pavement marking symbols or for removal of objectionable material, the residue, including dust, shall be removed immediately after contact between the sand and the surface being treated. Such removal shall be by a vacuum attachment operating concurrently with the blast cleaning operation, or by other methods approved by the Engineer. Blast cleaning shall not be used within 12 feet of a lane occupied by public traffic unless a suitable barrier separates traffic from the area being cleaned.

Any damage to the pavement caused by pavement marking symbol removal shall be repaired by methods acceptable to the Engineer. When asphalt slurry is used to repair damage to the pavement caused by pavement marking symbol removal or the obliteration of the marks remaining after the markings have been removed, the asphalt slurry shall be placed parallel to the new direction of travel and shall be at least two feet in width.

Measurement of thermoplastic symbol and arrow removal shall be measured per **EACH** symbol to be removed complete in place. **Payment** for Thermoplastic symbol removal, measured as described above will be paid for at the unit price bid and shall be considered full compensation for the work, complete in place, including furnishing all labor and equipment to a condition acceptable to the City of Avondale.

Bid Item 462.01100 – 4” White Thermoplastic Traffic Stripe:

Bid Item 462.01200 – 4” Yellow Thermoplastic Traffic Stripe:

Bid Item 462.01511 – Thermoplastic Symbol Left Turn Arrow:

The work under these items consist of furnishing all materials, equipment, and labor for the application of temporary paint, permanent thermoplastic, pavement symbols, and reflectorized raised pavement markers on new and/or existing pavement surfaces, and to replace or restore previous road striping or as otherwise directed by the City. All pavement marking, symbol and raised pavement marker installations shall conform to the Contract Documents, including the City of Avondale General Signing and Striping Notes, Part 1000 of the MAG Supplemental Specifications, the

MCDOT Supplement to the MAG Uniform Standard Specifications and Details for Public Works Construction, 2008, these Technical Specifications, and as shown on the Project Plans.

The Contractor shall be required to survey, layout and provide temporary marking and provide any associated temporary signage at no additional cost to the City. After layout, the contractor shall request City field inspection to verify and approve the layouts. The City requires two (2) Avondale business days (M-Th; daytime only) to schedule striping field inspections. Upon approval, the Contractor shall install temporary paint based striping. After a 30 day period, the Contractor shall return and install permanent thermoplastic striping. The Contractor shall proceed to complete installation if the permanent thermoplastic line striping, pavement markings, and reflectorized markers only after the City has approved the layout. For asphalt pavement overlays and other asphalt pavement surface treatments on existing streets, the Contractor shall be responsible for measuring, documenting, setting off-set references and/or whatever necessary to re-establish location and alignment of any existing striping and pavement markings. The Contractor shall replace any striping that has been obliterated or removed during construction.

Traffic control set-up and maintenance shall be the responsibility of the contractor. Streets with new pavement or new pavement surface treatments shall not be open for public use until all permanent lane striping is complete, or until temporary striping and/or temporary traffic control (barricades) have been provided in accordance with an approved plan.

Measurement for Thermoplastic pavement markings, longitudinal and transverse lines, such as edge lines, lane lines, gore lines, cross-walks and stop bars, will be measured by the **LINEAR FOOT** along the center line of the pavement stripe and will be based on a 4-inch wide stripe. Measurement for striping with a plan width greater or less than the basic 4 inches as shown on the plans or requested by the Engineer will be made by the following method:

$$\frac{\text{Plan Width of Striping (inches)} \times \text{Linear Feet}}{4 \text{ (inches)}}$$

No measurement will be made of the number of linear feet of skips in the dashed line.

Double marking lines, consisting of two 4-inch wide stripes will be measured as two individual marking lines. Crosswalk lines, stop bars, stop lines, gore lines, cross hatch lines, and chevron lines will be measured for centerline length and adjusted for widths other than 4 inches as defined above.

Thermoplastic pavement symbols and legends will be measured per **EACH** unit applied. Each pavement symbol and each legend, as shown on the Plans, will be considered a unit. The railroad symbol includes the cross bars, both R, and the transverse lines.

No separate measurement will be made for cleaning and preparing the pavement surface, including abrasive sweeping and high-pressure air spray. The cost of disposal of excess material, cleaning fluids, and empty material containers will be considered as included in the contract items.

Removal of curing compound from new Portland cement concrete pavement and the application of primer-sealer, which is to be applied to both old and new Portland cement concrete pavement, prior to application of thermoplastic striping or marking, shall be measured by the linear foot or unit each, respectively, depending on the nature of the work to be done, and in accordance with the items of work established in the contract fee schedule.

Payment for Thermoplastic Traffic Stripe and Symbols, measured as described above, will be paid for at the unit price bid and shall be considered full compensation for the work, complete in place, including furnishing all labor and equipment to a condition acceptable to the City of Avondale.

Bid Item 463.01100 – Reflectorized Raised Pavement Marker (Type D, Yellow, 2-Way):

Bid Item 463.01200 – Reflectorized Raised Pavement Marker (Type G, Clear, 1-Way):

Bid Item 463.01400 – Reflectorized Raised Pavement Marker (Type 911-A, Blue, 2-Way):

The work under this item consists of providing all materials, equipment, and labor for the preparation and application of all permanent traffic Reflectorized Raised Pavement Marker (RPMs) on new and/or existing pavement surfaces. Application of RPMs shall conform to the project plan documents, replace previous or restore existing RPMs or as otherwise directed by the Engineer or authorized representative. Application of RPMs shall be in accordance with Section 463 of the latest MCDOT Supplement to the MAG Specifications and Details. Contractor shall include all survey, layout, adhesive and surface preparation costs. The Contractor shall also be required to remove any existing RPMs as required at no additional cost to the City.

Measurement for Reflectorized Raised Pavement Marker (RPMs) shall be measured by **EACH** marker furnished and placed. **Payment** shall be made at the unit price bid and shall be considered full compensation for this work item.

Bid Item 464.02000 – Perforated Sign Post:

Bid Item 464.02001 – Perforated Sign Post Foundation:

Bid Item 465.01003 – Flat Sheet Aluminum Sign Panel, Diamond Grade:

Signing installation shall conform to the City of Avondale General Signal and Striping Notes, ADOT Signing and Marking Details, MCDOT Supplement to MAG Specifications and Details, the plans, and these special provisions. All materials for signing shall be in accordance with Section XI of the City of Avondale Supplement to MAG Uniform Standard Specifications and Details for Public Works Construction or with Section 1001 of the MAG Supplemental Specifications.

Measurement of sign posts shall be measured per **LINEAR FOOT** complete in place provided and constructed per Section 1001.3 of the City of Avondale Supplement to MAG Specifications and Standard Detail A1033.

Measurement of flat sheet aluminum sign panel (Diamond Grade) shall be per **SQUARE FOOT**.

Measurement of sign post foundation shall be per **EACH** foundation complete in place constructed per the MCDOT Supplement to MAG Standard Detail 2058.

Payment for perforated sign post, perforated sign post foundation and flat sheet aluminum sign panel (Diamond Grade) measured as described above will be paid as full compensation for the work, complete in place, including furnishing all labor, materials and equipment.

SECTION 470 TRAFFIC SIGNAL & LIGHTING RELATED WORK

Bid Item 470.00020 – Remove and Salvage Traffic Signal Poles and Equipment:

Bid Item 470.00030 – Remove Foundations, Pull Boxes, and Conductors:

The work under this item shall consist of furnishing all labor, equipment and materials required to remove and salvage the existing traffic signal poles and equipment, as called for in the plans. As part of this work, the contractor shall coordinate with SRP Electric to de-energize the signal prior to the removal if necessary.

Construction Requirements:

The Contractor shall carefully remove the existing A-poles and equipment, as identified in the plans, in a manner so as to prevent any damage to the removed equipment or the existing conductors

Salvaged equipment that is not re-installed on the new pole installations shall be delivered to the City of Phoenix. Contact City of Phoenix Traffic Operations at 602-262-6733 a minimum of two (2) working days in advance of delivery for location.

Measurement to remove and salvage existing A-poles and equipment will be per **LUMP SUM** for the completed work in its entirety as indicated on the plans and delivery of the salvaged items to the City of Phoenix or as directed on the plans. **Payment** to remove and salvage traffic signal poles and equipment measured as described above will be paid as full compensation for the work, complete in place, including furnishing all labor, materials and equipment. No separate measurement or payment will be made for additional materials or hardware required to complete this work, the cost considered incidental and included in the contract price.

Measurement to remove foundations, pull boxes, and conductors will be per **LUMP SUM** for the completed work in its entirety as indicated on the plans and disposed of as directed by the City. **Payment** to remove foundations, pull boxes, and conductors measured as described above will be paid as full compensation for the work, complete in place, including furnishing all labor, materials and equipment. No separate measurement or payment will be made for additional materials or hardware required to complete this work, the cost considered incidental and included in the contract price.

Bid Item 471.60010 – Street Light Junction Box (Avondale Detail A1090):

The work under this item shall consist of furnishing all labor, equipment and materials required to install street light junction boxes at the locations shown on the project plan documents. All work shall conform to the latest City of Avondale MAG Supplement; Standard Detail A1090 as modified herein. The junction box is to be constructed of a polymer concrete composite material with a matching bolt down (penta-head type) polymer concrete lid. The manufacturer shall be Fiberlyte, Armocast or other approved equal. Junction box size dimensions to be 15" X 21" X 12" ± due to variations between manufacturers. The lid ID label shall read "ELECTRIC". Boxes shall be installed flush with the final adjacent grade. Wiring costs shall not be included in this bid item but shall be included in the appropriate street light bid item. **Measurement** will be per **EACH** street light junction box furnished and installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this work item.

Bid Item 471.60047 – No. 7 Pull Box:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for installation of No. 7 pull box and lid at the locations shown on the project plan documents or as otherwise directed by the City. The No. 7 pull box and lid shall be in accordance with ADOT standard specifications and the City of Phoenix Supplement to MAG Uniform Standard Specifications and Details for Public Works Construction. Lids shall be marked as "City of Phoenix Traffic Signals". All pull box lids shall be Fiberlyte or approved equal. **Measurement** will be per **EACH** pull box installed, which includes providing and installation in accordance with project documents. **Payment** shall be made at the unit price bid and shall be considered full compensation for this work item.

Bid Items 471.61112 – Sch. 40 PVC Electrical Conduit 2" w/1/4" Nylon Pull Rope and #8 Bare Copper Wire (Trench):

Bid Items 471.61212 – Sch. 40 PVC Electrical Conduit 2 1/2" w/1/4" Nylon Pull Rope and #8 Bare Copper Wire (Trench):

Bid Items 471.61213 – Sch. 40 PVC Electrical Conduit 2 1/2" w/1/4" Nylon Pull Rope and #8 Bare Copper Wire (Horizontal Bore):

Bid Items 471.61280 – Sch. 80 PVC Electrical Conduit 2 ½" w/1/4" Nylon Pull Rope and #8 Bare Copper Wire (Trench):

The work under these items shall consist of furnishing all labor, equipment and materials required to install electrical conduit at the locations and size per the project plans. The wire, rope, materials, and tools associated with this item shall be considered incidental to the unit cost for providing and installing conduit. All conduits shall be Schedule 40 or 80 PVC. All new conduit runs shall have a # 8 Bond Copper Wire & Nylon pull rope. Trenching, back filling, replacing pavement, curb and gutter, sidewalk etc and any additional traffic control including steel plates are considered incidental to this item and not paid separately. Conduit crossing the roadway shall be installed by directional boring, unless otherwise specified on the plans. All directional boring shall be measured as bored footage with two conduit runs, but not the total length of individual runs added together. All transverse trenches and trenches through the intersection shall be backfilled with one (1) sac CLSM per MAG specifications section 728 and pavement replacement shall be type B with the "T"-Top per MAG Standard Detail 200. Pavement replacement for all longitudinal trenches outside the intersection shall be Type A with the "T"-Top per MAG Standard Detail 200. (Refer to MAG Standard Specifications, Section 336.) Directional boring of conduit should only be conducted under all existing roadways and driveways. The Contractor shall pothole conduit runs at locations where potential conflicts exist. The cost with this item shall be incidental to the work and shall not have a separate pay item. Hand digging is considered a form of potholing and is included in the cost associated with this item. Furnish and install conduit, except when otherwise indicated in these Technical Specifications or on the Project Plans.

Measurement will be per **LINEAR FOOT** of trenching or bore, not actual conduit pipe length furnished and installed in place. ***Payment*** shall be made at the unit price bid and shall be considered full compensation for this work item complete in place, including all necessary labor, materials and equipment.

Bid Item 472.61500 – Pole Foundation, Type PB (Push Button):

Bid Item 472.61600 – Pole Foundation, Type Giraffe Light Pole:

The work under these items shall consist of furnishing all labor, equipment and materials required to construct the traffic signal pole foundations as called for in the Project Plans, including foundations for traffic signals, cabinet and electrical service pedestal for the traffic signals and intersection lighting system. The foundations shall be constructed in accordance with COA Standard Detail No. A1074 and/or Section 472 of the MCDOT Supplement to MAG Specifications, except when otherwise indicated in these Technical Specifications or the Project Plans. The Contractor is responsible for furnishing all anchor bolts and rebar as shown in applicable standard details. All foundation reinforcement cages shall be furnished and installed by the Contractor. No separate measurement or payment will be made for additional materials or hardware required to complete this work, the cost considered included in the contract price. ***Payment*** for constructing signal pole and cabinet foundations, as measured above, will be paid for at the contract unit price **EACH** for the work complete in place, including all necessary labor, materials and equipment.

Bid Item 477.71840 – LED Streetlight (Pole, Mast Arm, Luminaire, and Photocell) and Foundation Complete:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary to install an LED streetlight at the locations designated on the plans. The Contractor shall furnish and install the concrete foundation complete. The Contractor shall install pole, mast arm, photocell and luminaire. The Contractor shall furnish and install all required electrical conduit and conductor

wiring, fuses/connectors from the luminaire to the junction box. The concrete foundation and pole shall be in accordance with City of Avondale Standard Details A1084-1 and A1084-2. The mast arm shall be in accordance with City of Avondale Standard Details A1084-3. The luminaire shall be per luminaire options table on the plans or approved equal based on photometric analysis. Photocell shall be per luminaire manufacturer recommendations. Electrical wiring shall be in accordance with City of Avondale Standard Detail A1091. All construction shall be in accordance with City of Avondale Standard Specifications Section 801. The Contractor shall schedule a field meeting with the designated SRP inspector and the City inspector prior to commencing this work to clarify all requirements and expectations of SRP and the City, including the location of the power source(s). **Measurement** will be per **EACH** LED Streetlight installed, complete in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this work item, including installation of pole, mast arm, luminaire and construction/installation of foundation.

SECTION 500 – STRUCTURES RELATED WORK

Bid Items 505.06504 – Concrete Scupper & Spillway, COA Det A1510, S/W=5', Curb Opening=4':

The work under this item shall consist of furnishing all materials, equipment, and labor for construction of Portland cement concrete scuppers at the location shown on the plans. All construction shall be in accordance with MAG Standard Specification Section 505 and City of Avondale Standard Detail A1510. The work shall include all excavation, compaction, backfill and grade/slope restoration required for the scupper installation and safety rail if required. **Payment** will be made at the unit price bid per **EACH** scupper inlet installed, and such payment shall be compensation in full for the item complete in place.

Bid Item 505.30100 – Reinforced Concrete Box Culvert Extension and Headwall, SRP Std Details (Contingent Item)

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for the construction of a Portland Cement reinforced concrete box culvert to the size and at the location, elevations and inverts shown on the project plan documents. All construction shall be in accordance with Salt River Project (SRP) Standards and Specifications as specified on the plans. SRP Specifications are included for reference in Appendix B of these Special Provisions.

The Contractor shall coordinate all work with SRP, including any dry-up schedule and maintain available irrigation as required. The work shall include removal of existing canal lining and debris, providing temporary irrigation by-pass if required, all excavation, compaction, backfill, grade/slope restoration, canal lining, concrete, reinforcement, form work and connection of the new box extension to the existing box culvert, and new headwall in accordance with SRP standards. All work shall be accomplished to the satisfaction of the SRP inspector. **Measurement** will be per **LUMP SUM** for the new box culvert extension, headwall, lining and related items, complete in place. **Payment** shall be made at the **LUMP SUM** price bid and shall be considered full compensation for this work item, complete in place, including all necessary labor, materials and equipment.

Bid Item 523.10124 – Concrete Headwall, MAG Det 501, Straight Type, 24" Pipe:

Bid Item 523.11124 – Concrete Headwall, MAG Det 501, "L" Type, 24" Pipe:

Bid Item 523.20024 – Concrete Trashrack, SRP Det, 24" Pipe:

The work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of a concrete headwall or trashrack where indicated on the plans. Construction shall be in accordance with applicable MAG Details 501-1, 501-2 and 502-1.9 for headwalls and SRP Details and Specifications for trashrack. Installation of a metal safety rail shall be included in accordance with

MAG Standard Specification Section 520, 530, and 771 and MAG Standard Detail 145, Type 1. **Measurement** will be per **EACH** headwall or trashrack constructed, including safety rail, and connections to new pipe and existing ditch. **Payment** will be made at the unit price bid and such payment shall be compensation in full for the item complete in place.

SECTION 600 – WATER & SEWER RELATED WORK

Bid Items 610.10540 – New Water Service:

The work under this item shall consist of furnishing all materials, equipment, and labor for adding new water service connection to the right-of-way limits in accordance with MAG standard specifications 610.11 and the City of Avondale Supplement to MAG Uniform Standard Specifications and Details for Public Works Construction.

Work includes installing new 1-inch Type K copper water service connection to existing water main per City of Avondale Detail No. A1300 using a heavy duty double strap bronze service saddle, installing meter box with cover, and capping end of the water service line within right-of-way as noted on the plans. Service line can be open trenched or bored. If open trench method is used, copper service line shall be bedded and shaded with approved sand to 1-ft over top of pipe and remaining backfill to be 100% ABC. Payment will be made at the unit price bid per **EACH** new water service connection installed, and such payment shall be compensation in full for the item complete in place.

Bid Item 615.04008 – 8” PVC Sewer Line:

The work under this item shall consist of furnishing all materials, equipment, and labor for the installation of an 8-inch PVC pipe for sanitary sewer and storm sewer applications. PVC shall be SDR-35 conforming to MAG Section 745.

The sanitary sewer line construction will conform to MAG Section 615 and will connect to an existing sanitary sewer manhole at the location and grades shown on the plans in accordance with MAG Section 745.4.1. The north end of the sewer line shall be plugged per MAG Detail 427.

The storm sewer line will serve as an equalizer pipe between retention basins and open at each end.

All work shall be inspected and tested in accordance with MAG Section 611.

This item shall include furnishing and installing all appurtenances and fittings. The work shall include excavation, removal of obstructions, pipe bedding, backfilling, compaction, sheeting and bracing, testing, supporting other utilities across trenches; furnishing and installing pipe, fittings, pipe plug and all appurtenances. **Measurement** shall be per **LINEAL FOOT** of pipe installed. For the sanitary sewer pipe, work shall be measured from the center of the manhole. **Payment** will be made at the unit price bid and such payment shall be compensation in full for the item complete in place including backfill, compaction, manhole connection, capping and plugging the line.

Bid Item 618.20324 – 24-inch RGRCP, CLASS III:

This work consists of installation of 24-inch rubber-gasket reinforced concrete pipe (RGRCP) where indicated on the plans. Construction shall be in accordance with MAG Section 618. Concrete pipe shall meet the requirements of ASTM C-76, Class III and MAG Section 735. Work includes furnishing and installing new pipe, construction of concrete collars on the pipe, excavation and backfill, subgrade preparation, bedding and compaction. **Payment** will be made at the unit price bid per **LINEAR FOOT** installed, and such payment shall be compensation in full for the item complete in place.

Bid Item 625.01101 – SRP Manhole w/Base, Frame and Cover, SRP Detail:

The work under this item shall consist of furnishing all materials, equipment, and labor for installing a new manhole as shown on the plans, and in accordance with SRP Standard Specification, included as Appendix B in these Special Provisions. The connection of the pipe approaching and leaving the manhole shall be an incidental item to this work. The manhole shall be constructed in accordance with SRP Detail provided on the drawings. **Payment** will be made at the unit price bid for **EACH** manhole constructed, and such payment shall be compensation in full for the item complete in place.

Bid Item 635.04000 – Earthen Irrigation Ditch with 2-foot Bottom, MAG Det 520:

The work under this item shall consist of furnishing all materials, equipment, and labor for constructing a dirt irrigation ditch to the lines and grades specified on the plans. Dirt ditch shall be compacted to a minimum density of 85 percent. **Payment** will be made at the unit price bid per **LINEAL FOOT** of dirt ditch constructed, and such payment shall be compensation in full for the item complete in place.

SECTION 700 – MATERIALS

SECTION 757 – SPRINKLER IRRIGATION SYSTEM

Bid Item 757.40002 – Backflow Prevention Device Smaller than 3” (with Concrete pad and Cage):

The Work under this item shall consist of furnishing all materials, equipment, and labor necessary for the installation of the Backflow Prevention Device Smaller than 3” (with Concrete Pad and Cage) as shown on the Project plan documents and as described herein. **Measurement** for the Backflow Prevention Device Smaller than 3” (with Concrete Pad and Cage) shall be per Each installed in place. **Payment** shall be made at the unit price bid and shall be considered full compensation for this Work item, complete in-place, including all appurtenances.

SUPPLEMENTAL SPECIFICATIONS

SECTION 4300 – LANDSCAPING

4300.1 DESCRIPTION: is modified to add the following:

The work under this section shall consist of furnishing all labor, materials, and equipment to install seeding, decomposed granite, trees, shrubs, and ground covers as designated for installation.

4300.2 GENERAL: is modified to add the following:

The Contractor shall furnish all labor, materials, equipment, and incidental and appurtenant items of work needed to install the landscape, to the lines and details shown in the plans.

Applicable publications listed below form a part of this specification:

- Arizona Nursery Association Growers Committee Recommended Average Tree Specifications (Revised 2011).
- American Standard for Nursery Stock (2004)

The Contractor shall perform all work in accordance with all applicable laws, codes and regulations required by authorities having jurisdiction over such work and provide for all inspections and permits required by Federal, State and local authorities in furnishing, transporting and installing materials as shown or for completing the work identified herein.

All planting areas shall be left free of construction debris including but not limited to concrete, grout, asphalt, rebar, wood, nails, debris and/or toxic material and graded to a level to permit landscape and irrigation construction. Compact trenches, foundation backfill or other filled excavations prior to turning the site over to the Landscape Contractor.

Compaction of fill areas for planting shall be at 85% maximum. No soil preparation or planting shall begin before the site has been cleared and cleaned of debris. The Engineer shall approve the condition of all planting areas prior to commencement of soil preparation for planting. Commencement of work indicates acceptance of job site conditions by the Contractor.

The Contractor shall cooperate and coordinate with other contractors and trades working in and adjacent to landscape areas.

The Contractor shall maintain stakes set by others until all parties concerned mutually agree upon their removal.

The Contractor shall ship materials with Certificates of Inspection required by governing authorities.

If any of the specified plant material is not obtainable, submit proof of non-availability in writing, together with a proposal for use of equivalent materials, similar in appearance, ultimate height, shape, habit of growth and general soil requirements. Send the availability letter to the Engineer within 30 days of Notice to Proceed. The definition of Non-availability is the contractor contacting a minimum of seven (7) different sources. The Contractor may make substitutions of a larger size of the same species and variety with the approval by the Engineer and at no additional cost to the Contracting Agency.

Before delivery, submit Certificates of Compliance, certifying that materials meet the specified requirements. Submit certified copies of the compliance reports for the following materials:

- Transporting of cacti and landscape plant materials (from the Arizona Department of Agriculture)
- Soil amendments and conditioners
- Decomposed Granite

Certification shall indicate suppliers name, address, telephone number, date of purchase, name, model number and technical description of item purchased, and quantity of each item purchased.

The Engineer reserves the right to take and analyze samples of materials for conformity to the specifications at any time. The Contractor shall furnish the samples upon request. Immediately remove rejected materials from the site at the Contractor's expense. The Contractor shall pay for the cost of removing any materials not meeting specifications.

All herbicide / pesticide applicators shall possess a valid license from the State of Arizona Office of Pest Management for application of structural pesticide. All Landscape Contractors are required to furnish a copy of their license from the State, which shall list the names of those employees approved as applicators. Application of structural pesticides shall not take place until the Engineer receives a copy of the license.

As directed by the Engineer, treat all non-paved areas with a chemical contact herbicide, such as Round Up or approved equal, to kill existing weeds. Clear, grub and remove the weeds after weed kill has been established, to the satisfaction of the Engineer. No separate measurement or payment will be made for clearing and grubbing the cost of which is considered included in other items of work.

Finished grades for landscape areas shall be a smooth, uniform surface, free of abrupt grade changes or depressions. Finished soil grades adjacent to paving, curbs or headers shall be as shown in the drawings and may be adjusted by the Engineer for surface materials. No separate measurement or payment will be made for finish grading the cost of which is considered included in other items of work.

Maintain proper surface drainage within all planted areas. Any grading conditions found in the plans or specifications, in obstructions on the site, or in prior work done by another party that the Contractor feels precludes establishing proper drainage, shall be brought to the attention of the Engineer in writing for resolution.

During the installation of landscape plantings, keep pavements clean and work areas in a neat and orderly condition on a daily basis. Remove all debris, trash and excess materials generated by the landscape installation. Sweep, scrub or hose affected areas as directed by the Engineer to maintain a clean and neat work area.

Existing Utilities: Contractor shall call for "blue stake" as required. Exercise extreme caution in all planting operations as there are underground utilities throughout the entire area. Contractor shall study and be familiar with the location of these obstructions and underground utilities. Place plantings where shown on the plans. If there are obstructions or underground utilities, relocate plants clear of any interference at the direction of the Engineer. Contractor shall repair all damages caused by him to obstructions and underground utilities at no expense to property owner or Contracting Agency. Determine location of underground utilities and perform work in a manner, which will avoid possible damage. Hand excavate, as required, to minimize possibility of damage to underground utilities.

Maintain grade stakes until all parties concerned mutually agree on removal.

The Contractor shall layout all plant material using stakes or flags to indicate the location of all plant materials. Spacing of shrub and groundcover material shall be as specified in schedule and as shown on the plans. Determine from the plan scale the location and spacing of trees, locating them as accurately as the scale permits. Accomplish preliminary adjustments to conform to actual site conditions. Contractor shall have all plant material locations reviewed and approved by the Engineer prior to planting.

Contractor shall not begin planting operations until landscape grading and irrigation system installation is complete, tested, and is fully operable by the irrigation controller.

Add the following new Subsection to the MAG Specifications:

4300.2.1 LANDSCAPE AND IRRIGATION RESTORATION

4300.2.1.1 GENERAL: Contractor shall verify exact limits of disturbance with Engineer in all areas designated on the plans as Landscape and Irrigation Restoration Areas. All work shall be in accordance with these specifications and standard Sections 430 and 440.

Contractor shall provide new decomposed granite and salvage and reset all boulders in all disturbed areas. Contractor shall match color and gradation of any decomposed granite in these Landscape and Irrigation Restoration Areas, and supply new decomposed granite as necessary to bring disturbed areas back to original condition that shall be a minimum of 2 inches in depth and comply with the project plans, details, and special conditions, including all applications of pre-emergent. Contractor shall contact Engineer for review and approval of Landscape and Irrigation Restoration materials.

Contractor shall replace any existing concrete sidewalk, header, lighting and electrical components, etc. in all disturbed areas. Contractor shall match color, finish, and size of any concrete in these Landscape and Irrigation Restoration Areas and supply any concrete as necessary to bring disturbed areas back to original condition and shall be in compliance with the project plans, details, and special conditions. All replacement concrete shall be a minimum of MAG Class 'A' and shall be in accordance with MAG Standard Sections 300 and 700. Contractor shall contact Engineer for review and approval of Landscape and Irrigation Restoration materials. All electrical work shall be in conformance with MAG, NEC latest standards, and these Special Conditions.

The work shall also consist of reconstructing, modifying, or repairing the existing irrigation systems as shown on the project drawings and in areas as designated on the plans. The contractor shall be required to repair and or replace all disturbed or damaged irrigation components, returning their operation to 100 percent within 24 hours following initial disturbance of any of the irrigation components. The existing irrigation that will be impacted includes the turf irrigation and drip irrigation system for the trees, shrubs and ground covers. The work shall include furnishing and installing the various irrigation sleeving, piping, drip emitters, gate valves, electric control valves, turf spray heads and nozzles, wiring, and valve boxes, including required excavation and backfill at the designated locations shown on the project plans or as directed by the Engineer. All work shall be in accordance with the details shown on the project plans, or as directed by the Engineer and the requirements of these Special Provisions. The existing irrigation components shall be protected and maintained in their current condition where feasible or repaired, replaced, extended and reconnected in areas including but not limited to, those areas that are disturbed during the construction, areas shown on the project plans or as directed by the Engineer. The contractor shall be required to maintain water to all existing plant materials throughout the duration of the contract using repairs, reconnections, replacements or rerouting of the system as approved by the Engineer. The contractor shall ensure that the entire existing and new irrigation systems within the project limits are operational and functional and shall test and receive approval from the Engineer prior to proceeding with any other related work. The Engineer shall inspect and give approval prior to backfilling. All work shall be as-built prior to backfilling.

Construct the irrigation system using the sprinklers, emitters, valves, piping, fittings, controllers, wiring, and other components, of sizes and types to match existing equipment, as shown on the project plans and as called for in these specifications. The system shall be constructed to grades and conform to areas and locations as shown on the drawings.

All replacement or repair materials shall match the existing materials. Irrigation materials and components shall be from the same manufacturer as originally installed. Emitters shall have the same volume output as original. PVC pipe may be from a different manufacturer but the grade shall be the same as originally installed. All mainline fittings shall be Schedule 80; all lateral fittings shall be Schedule 40.

4300.2.1.2 CONSTRUCTION REQUIREMENTS:

4300.2.1.2.1 Protection of Existing Vegetation: The work shall include the protection of all existing plant material. Contractor shall take great care to protect in place all existing plant material. Contractor shall replace in like kind and size any existing plant material removed, damaged, or destroyed at no cost to the Contracting Agency and to the satisfaction of the Engineer. The Contractor shall identify and the Engineer review existing plant materials within the disturbance areas. Salvage and relocate or replace all plant material in conflict with the roadway construction as designated in Landscape and Irrigation Restoration Areas in like kind and size per the direction of the Engineer.

Identify, protect, and maintain existing vegetation within the protected areas indicated on the Contract Drawings during the Contract from the Notice-To-Proceed to Final Acceptance. Perform the Work of this Section in accordance with the standards of the Tree Care Industry Association (TCIA). Do not perform any work within the protected areas unless approved by the Engineer. Do not store materials within the protected areas. Do not permit vehicle parking, foot traffic, or other activity not approved in writing by the Engineer within the protected areas. Provide labor and new and undamaged materials that constitute “Best Practice” to meet the letter and intent of this Contract. Follow the safety requirements of ANSI Z133.1.

4300.2.1.2.2 Verification of Conditions: Prior to the start of construction, conduct on-site inspections of plants and vegetation with the Engineer, and identify and inventory the plants and vegetation that are to remain in place during this area tour. Field measure and stake Project improvements as needed for establishing the location and limits of disturbance. Contractor shall document all existing conditions with video or photographic log. Copy of dated video and photographic log shall be submitted to the Engineer.

4300.2.1.2.3 Construction within Protected Areas:

4300.2.1.2.3.1 Demolition and Construction Activities: Perform demolition and construction activities within protected areas in a manner that minimizes damage to tree roots and branches. Use hand tools where necessary. Make minimal use of construction equipment within the protected areas.

Use such equipment within the protected area only when approved by the Engineer. Notify the Engineer 72 hours prior to the use of the equipment within the protected areas. Provide bridging materials, such as protective planking, in protected areas where such construction equipment operates.

When utilities must be installed within protected areas, bore under the protected areas whenever possible instead of digging open trenches through them.

4300.2.1.2.3.2 Excavating around Trees and Shrubs: Excavate around trees and shrubs within protected areas only where indicated on the Contract Drawings. When work that may impact protected plants occurs, plan the work to assure minimal disturbance to the plants, follow good horticultural practices, and direct pruning and wound treatment in accordance with this Section.

4300.2.1.2.3.3 Protecting Root Systems: Protect root systems from damage due to run-off or spillage of noxious materials in solution during storage or construction activities. Protect root systems from flooding or soil erosion. Provide a minimum of 2 layers of untreated burlap as a covering over exposed root face areas. Do not disturb or excavate protected root zone areas unless specifically authorized to do so by the Engineer. Where trenching for utilities is required within protected areas, excavate under or over roots by hand digging under the authority of the Engineer. If large roots are encountered, or if a condition potentially fatal to the plant is observed, notify the Engineer prior to continuing or commencing work. Do not cut main lateral roots or taproots, those 2-1/2 inches in diameter or greater; however, smaller roots that interfere with the installation of new work may be cut.

Cut smaller roots with sharp pruning instruments, but do not break or chop roots. Excavate root systems by hand in areas where new construction is required within protected areas. Use a narrow-

tine spading fork to expose roots. Cut exposed roots back from the new construction. Do not permit exposed roots to dry out before permanent backfills is placed. Provide temporary earth cover, or pack the roots with peat moss, and wrap the roots with burlap. Water and maintain the roots in a moist condition, and temporarily support and protect them from damage until they are permanently relocated and covered with backfill. Provide imported topsoil backfill to cover exposed roots in soil cuts. Do not overload root zones by placing backfill above the existing grade.

4300.2.1.2.4 Protecting or Restoring Irrigation System: The work under this item shall consist of testing, reconstructing or modifying the existing irrigation systems that are damaged by the roadway improvements.

Some as-built information for the irrigation areas that are expected to be disturbed are available, however the data on those as-builts have not been confirmed and contractor assumes all responsibilities for any damage caused by their actions to the existing system at no cost to the owner. The underground location of the irrigation facilities is unknown. The contractor shall take care to minimize disturbance to these areas.

All construction for the roadway improvements shall be coordinated to ensure that the existing irrigation system and its associated electrical controls are fully functional within 48 hours of any modifications. Any work activities that require more than 48 hours of outage shall be coordinated with the Engineer for approval and alternate irrigation methods such as truck watering or temporary “rain for rent” systems will be required as directed by the Engineer. The cost of alternate irrigation methods necessary due to extended irrigation system outages will be at the contractor’s expense, at no cost to the Contracting Agency.

All work shall be in accordance with the details shown on the project plans, or as directed by the Engineer and the requirements of these Specifications. All work shall be inspected and approved by the Engineer prior to backfilling.

4300.2.1.2.5 Repair/Restoration: Restore all landscape areas and other surface improvements that were to remain in place, but that have been damaged by the Contractor’s actions or omissions. Restore landscape areas as nearly as possible to the original condition.

4300.2.1.2.6 Repairing Damaged Plants: Where damage to vegetation has occurred, prune plants in accordance with Tree Care Industry Association (TCIA) standards to remove branches from the work area, and where needed to maintain the health of the plant. Remove material in a manner that yields minimal impact and is approved by the Engineer.

4300.2.1.2.7 Replacing Damaged Plants: Remove plants that were identified by the Engineer to remain in place, but that are damaged during the course of the work to an extent that they cannot be repaired; and replace the damaged plants with new plants of the same type and value. Remove and replace damaged plants as directed by the Engineer. Base the value of plants that are to be replaced on the criteria found in the Council of Tree and Landscape Appraisers’ “Guide for Plant Appraisal”, as evaluated by the Engineer. Remove and replace damaged plants at no additional cost to the Contracting Agency. Plants shall be replaced at the following sizes or as directed by the Engineer.

Existing Plant Material Size Replacement Size

Trees:

2” Caliper	24” Box
4” Caliper	36” Box

6" Caliper

54" Box

Shrubs:

All Existing Shrubs

5 Gallon

4300.2.1.3 CLEANING:

Clean up the ground areas under plants remaining in place as directed by the Engineer. Wash off foliage that becomes soiled, or when directed to do so by the Engineer. Remove materials that fall or flow into protected areas. Provide protective barriers as needed or as directed by the Engineer to prevent materials from falling or flowing into protected areas.

4300.2.1.4 WASTE MANAGEMENT:

Gather and dispose of spoils and vegetative waste, including dead and damaged plants and the trimmings accumulated from the operations to clear and remove existing vegetation. Dispose of spoils and vegetative waste off-site in conformance with the regulations imposed by the local authorities, and in an area approved for such disposal by the local authorities.

4300.2.1.5 MAINTENANCE OF VEGETATION:

Care for and maintain existing vegetation within protected areas as indicated on the Contract Drawings. Provide water and labor as needed for plant health, growth, and for washing down soiled foliage. Provide fertilizer, deep root fertilization, pesticides, anti-desiccants, and other materials and labor as needed to maintain the existing plants in a healthy and growing condition. Provide plant maintenance for the duration of the Contract, until Final Acceptance.

4300.2.1.6 AS-BUILTS:

The Contractor shall keep and maintain separate record drawings ("field redlined as-builts"), corrected shop drawings, or other drawings necessary for the Engineer to show the landscape and irrigation work as constructed. These field redlined as-builts shall be kept on the worksite and they shall be maintained clear, accurate and current as changes occur that may differ with the bid set construction documents and addendums. All landscape and irrigation related elements buried or backfilled shall be recorded in the "field redlined as-builts" prior to burial and backfilling occurs. The Contractor shall submit the updated field redlined as-built plans with monthly pay estimates to the Engineer. Complete field redlined as-built plans that the contractor maintains shall be submitted to the Engineer in a format that will allow the Engineer to create the formal as-built plans. The Contractor shall submit the field redlined as-built plans to the Engineer prior to the end of each construction phase. No extra measurement or direct payment will be made for this work; the cost being considered included in the price of the contract items.

4300.2.1.7 MEASUREMENT AND BASIS OF PAYMENT:

Measurement and Payment for the landscape and irrigation restoration areas will be at the contract unit prices bid per Lump Sum and shall include all costs, materials, equipment, labor, and operations necessary for full restoration of all decomposed granite, concrete sidewalk, concrete header, irrigation, plant material, record drawings, and other miscellaneous items to the satisfaction of the Engineer.

4300.4 DECOMPOSED GRANITE AREA: Delete in its entirety and replace with:

Decomposed granite shall be native, local, desert, decomposed granite stone at the size and color specified on the plans. The decomposed granite shall be from a single source, free from coating, clay, caliche or organic matter. Contractor shall provide Engineer with a one-ton sample of material spread on-site to the required depth as indicated on the plans as well as a gradation report showing that the

proposed granite is in compliance with the required gradations for review and approval a minimum of 15 working days prior to installation.

Contractor must examine the subgrade, verify the elevations, and observe the conditions under which the work is to be performed. The existing grade shall be fine graded and raked free of organic matter and other debris one-inch diameter and larger and then compacted.

Any existing weeds or Bermuda grass growing in designated landscape areas shall be treated with a post-emergent spray, such as "Round-up", or an approved equal. Any existing or new trees or vegetation shall be protected from the spray drift. There will be no separate measurement or payment for the weed spraying and removal. Weeds must be completely eradicated from all areas of the landscape and where designated by the Engineer. The Contractor shall remove all non-planted vegetation from all areas designated to receive decomposed granite (by chemical or mechanical means) and maintain the designated areas "vegetation-free" for a minimum period of 30 working days prior to placement of the decomposed granite, or as specified by the Engineer.

All weed control products and herbicides shall be approved for use by the Engineer prior to any applications. Contractor shall submit copies of all manufacture specifications and application rates to the Engineer for review and approval prior to application. Herbicides and weed control shall only be performed by a licensed applicator; Contractor shall supply information on applicator to the Engineer for approval.

The sub-grade, prior to granite placement, shall be compacted to 85 percent of the maximum proctor density, as determined in accordance with the requirements of Arizona Test Methods 230 or 235, depending on the test method used to determine the compaction density (Sand Cone or Nuclear Method). Compaction testing and associated report shall be provided to the Engineer and sealed by a registered professional engineer specialized in geotechnical investigation with all cost for testing and report of results to be provided by the Contractor at no cost to the Contracting Agency.

Contractor shall apply three (3) applications of pre-emergent:

1. One application of pre-emergent herbicide prior to installing granite
2. One application after granite has been installed, compacted, and raked level
3. One application 30 Days prior to the end of the maintenance period

The Engineer is to be notified prior to all pre-emergent applications. Contractor shall provide spray tickets to Engineer after every application.

The pre-emergent herbicide shall be applied in the manner recommended by the manufacturer to prevent germination of noxious weeds (broadleaf and grasses), and shall be equivalent to Surflan, Dimension, or an approved equal, and shall be applied at a rate specified by the manufacture to control weeds in an ornamental setting. Pre-emergent herbicide shall be applied to the designated granite areas, prior to the final water settling operation. Water to activate the pre-emergent herbicide shall be applied to the areas of the herbicide application as recommended by the manufacturer's label.

The amount of water specified by the manufacturer may be adjusted due to rainfall, if approved by the Engineer.

After the first application of pre-emergent the granite shall be installed and shall be rolled or raked to remove any irregularities, tire marks etc. Installation shall provide a two-inch depth of decomposed granite after compacting. During the final spreading and final grading operations, all surfaces within the decomposed granite areas shall be passed over by the spreading and grading equipment a minimum of 2-times. Equipment operations for spreading, grading, raking, chemical application,

water settling, and any other operations shall be done in a manner that uniformly maximizes the vehicle(s) wheel compaction over the surface area. All vehicles used for spreading, grading and raking the decomposed granite shall have one set of wheels with floatation tires having a minimum width of 18-inches to allow equal compaction of the granite. The use or application of granite by any method (conveyor belt etc.) shall not relieve the Contractor of providing granite compaction to a level approved by the Engineer. Methods of compacting such as rolling, water settling, etc., shall be approved by the Engineer.

After placing, spreading, compacting, and grading the decomposed granite the Contractor shall water settle the total thickness of the decomposed granite to remove the fine material from the surface. The water settling operation, noted above, shall be completed by applying water at minimum depth of one-half inch over the decomposed granite areas placed or as approved by the Engineer. This water settling technique can be used to water in the second application of pre-emergent in compliance with pre-emergent Manufacturer recommendations and as approved by the Engineer.

Unless otherwise specified in the drawings, granite finish grade shall be one inch (1") below top of adjacent hardscape surfaces.

4300.4.1 DECOMPOSED GRANITE MINUS:

Contractor shall supply and place decomposed granite in areas and colors as designated on the plans. Gradation requirements for the decomposed granite shall be as indicated on the project plans.

Contractor shall provide samples to the Engineer for all granite as specified on the plans for approval by the Engineer prior to placement.

Contractor shall provide samples to the Engineer for all granite as specified above for approval by the Engineer a minimum of 30 days prior to placement. Sample size shall be a minimum of one (1) ton of decomposed granite, spread on-site, to the depth as required on the plans. Contractor shall provide a certificate of compliance from the decomposed granite supplier ensuring that the material meets the gradation requirements.

4300.5 TREE, SHRUB, AND GROUND COVER PLANTING: is modified to add the following:

The Contractor shall coordinate pre-approval of plant material and delivery with the Engineer and applicable nurseries as required.

Upon delivery to the site, plant all nursery stock as soon as possible. Until planting, plants shall not be exposed to excessive sun or drying winds. The Contractor shall immediately replace any stock, which is not satisfactory in the opinion of the Engineer with acceptable stock.

Perform the planting of all trees during favorable weather conditions, during the season or seasons, which are normal for such work, as determined by acceptable local practice.

Planting pit width for trees and shrubs shall be excavated to a minimum width in each direction of two and a half (2 ½) times the size of the root ball of the plant to be planted. Contractor shall stockpile the native soil that was excavated. Native soil shall be blended with amenities for backfilling planting soil. Any excess native soil not utilized for plant backfill shall be removed from site and properly disposed of by the contractor. No separate measurement or payment will be made for the removal of excess soil from the site the cost of which is considered included in the item of work. Contractor shall scarify the walls of the planting pit to the satisfaction of the Engineer.

Remove any rock or other underground obstructions, if possible, to the depth necessary to permit proper planting, according to plans and specifications. When encountering underground construction, obstructions, or rock in the excavation of planting areas, the Contractor may select other locations of

the planting only upon approval of the Engineer. Prior to any work, the Contractor must be knowledgeable of the locations of all existing underground installations, and their protection is his responsibility. At the expense of the Contractor, correct all damage to the satisfaction of the Engineer. Coordinate all work with other trades so conflicts will not exist or delay the work in any way. Coordinate grades with earthwork and with placement of irrigation systems fixtures.

All planting pits shall be completely filled with water and allowed to completely drain so that all sides and bottom soil of planting pit is thoroughly moist prior to any plant being installed.

Planting pits shall be backfilled with equal parts of native soil, stabilized organic compost, and sand and be watered settled to a grade sufficient, that in the setting of the plant, the finish grade is level, after settlement, will be the same as that at which the plants were grown (see details in landscape plans).

Container Removal: Remove container by turning plant upside down, supporting root ball with hand and tapping container gently to dislodge plant. Support root ball with both hands until planted in pit. Do not injure root ball, or hold plant by the stem.

Box Removal: Remove bottom of plant boxes before planting. Remove sides of box without damage to root ball after positioning plant.

Set container and boxed stock on undisturbed native soil, plumb, and hold rigidly in center of pit or trench with top of ball at elevation as shown on planting details. When set, place additional soil backfill and fertilizer tablets around base and sides of ball, and work each layer to settle planting soil backfill to eliminate voids and air pockets. Working in six-inch (6") lifts of planting backfill mix, water settle the area every twelve inches (12") of depth applied around plant thoroughly before placing next two lifts, repeat process until completed.

After removal of plants from containers or box sides, superficially cut edge-roots with a sharp knife on sides and tease out feeder roots to assure positive contact and embedment into planting soil.

After watering, refill any settlement within basins to required grade with native soil.

Prune, thin out and shape trees and shrubs in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by the Engineer, do not cut tree leaders, and remove only injured or dead branches. All pruning shall occur per the direction of the Engineer. Any pruning of trees shall be performed by a certified arborist or under the direct supervision of a certified arborist. Contractor shall submit name and certification of arborist to the Engineer for review prior to any pruning activities.

Remove from site any excessively pruned or malformed stock resulting from improper pruning and replace at no additional cost to the Contracting Agency.

Stake trees as identified on the plans. Stake all trees specified for staking in line with prevailing winds. Stakes shall be 2-inch round knot-free pine, length as required and installed as follows:

Stakes shall be placed immediately adjacent to, but in no case through, the root ball, and penetrate at least 6 inches into undisturbed soil, be aligned vertically, be pointed at one end, and be aligned so as not to interfere with the existing branch structure of the tree, extending 5 to 6 feet above grade.

Staple vinyl for fastening trees to stakes to the wood stakes, or otherwise attached to prevent removal of the vinyl. Provide not less than three (3) stakes spaced equally around trees (see tree staking details). After the Engineer has reviewed tree staking, remove all growth stakes, labels, and ties from trunks of trees and shrubs and be properly disposed of.

4300.5.5 Ground Cover Areas: delete in its entirety and replace with:

All ground cover plants and planting procedures shall be in accordance with Section 430.5.6.

4300.5.6 Shrub and Tree Pits: add the Following:

Plant Layout: The Contractor shall stake the location of individual trees, shrubs and accent plants, and layout the perimeter of ground cover areas in accordance with the plans for the Engineer to approve. The Contractor shall also make adjustments in the plant locations as directed by the Engineer and plant trees, shrubs, ground covers and accent plants after establishing final grades and plant locations with approval of the Engineer.

Delivery: Deliver plants just prior to planting. Deliver all packaged materials in containers showing weight, analysis and name of manufacturer that the Contractor will use during the planting operations. Contractor shall protect materials from deterioration during delivery and while stored on site. Submit certification of contents, quantity and source of all plants and planting materials to the Engineer for approval.

Protection of Plant Materials: If there is a delay in planting for more than 6 hours after delivery, protect the plants from the sun, wind and mechanical damage. Keep roots and root balls moist, watering as often as necessary to maintain good health and vigor. Remove and replace all damaged and unhealthy plants as directed by the Engineer. Do not bend or bind any plants in such a manner as to damage bark, break branches or destroy their natural shape. Provide adequate protection for root systems. Do not handle container plants by their foliage, branches or trunks.

Pre-Delivery Inspection of Materials: Prior to delivery of any species to the project site, the Contractor shall make the necessary arrangements with the Engineer for an inspection of the plant material. The Contractor will pay for travel and expenses to non-local nurseries, out of the metropolitan Phoenix area, when requested by the Contractor. Remove immediately from the site any plants found to be unsuitable in growth habit or condition, or plants, which are not true to the specification, and replaced with acceptable plants.

The Contractor shall notify the Engineer at least 48 hours in advance for any inspection of the plant material at the offsite location. Prior to notifying the Engineer, the Contractor shall physically verify that all of the designated plant material meets the specified sizes and conditions.

Constructions of Plant Pits and Trenches: Prior to planting perform a percolation test on all plant pits to determine that adequate drainage exists. Fill the pits full with water. Allow the pits 24 hours to drain. If any pit has not substantially drained, install a rock caisson. Each caisson shall have a four-foot deep (4') by 8-inch (8") diameter hole filled with AASHTO No 57 aggregate filled to the bottom of the pit. Increase the depth of the caissons if encountering ground water, caliche, or impervious rock.

No separate measurement or payment will be made for the installation of rock caissons, if required, the cost of which is considered included in the item of work.

4300.5.6 Shrub and Tree Pits: Modify the second paragraph to read:

Plant backfill mix - The planting backfill mix for trees, shrubs, ground covers and accent plants shall consist of equal parts 1/3 native soil, 1/3 stabilized organic compost, and 1/3 sand. Provide twenty (20) pounds of Live Earth Brand (www.liveearth.com) Granular Soil Conditioner, or equal, per cubic yard of plant backfill mix.

4300.8 PLANT GUARANTEE AND MAINTENANCE: add the following:

Contractor shall begin maintenance immediately after the Engineer has accepted entire plantings.

Contractor shall maintain landscape work until final acceptance, but in no case less than 120 days after the Engineer accepts the work.

Contractor shall instruct the Contracting Agency's Maintenance personnel in the proper maintenance and operation of landscape work.

The Contractor shall furnish all labor, materials, equipment, tools, services, skill, etc., required to maintain the landscape in an attractive condition throughout the contract period. Contractor shall maintain new landscaping within the project limits on a weekly basis for the duration of construction and establishment/maintenance periods. Maintenance of plant materials shall include, but not be limited to, pruning, weeding, fertilizing, irrigation programming, pest control, and landscaped areas trash and debris clean up, per specifications. Maintenance shall be performed a minimum of once a week throughout the maintenance period.

Contractor Supervisor shall be responsible for the training and supervision of the maintenance personnel's performance of their duties during the maintenance period.

All materials as noted (but not limited to this list) shall conform to the bid specifications:

- Pre-emergent
- Fertilizer, soil amendments, and conditioners
- Plant material
- Decomposed granite

Tree and Shrub Care: Maintain trees and shrubs in a healthy, growing condition by performing necessary operations, including the following:

Pruning: Prune and shape only as necessary to maintain the usual form of the plant, to stimulate growth, to maintain growth within space limitations, to provide for sight visibility, and to maintain a natural appearance. Do not shear plant material. Any plant material improperly maintained, as determined by the Engineer, the Contractor shall remove and replace at no additional cost to the Contracting Agency.

Staking: Inspect stakes weekly and adjusted or removed as necessary.

Weed Control: In groundcover area, keep areas between plants free of weeds. Use recommended, legally approved, herbicides whenever possible. Avoid frequent soil cultivation.

Ground Cover Care: Foster attractiveness at all times by following these practices:

Granite Areas: Inspect landscape granite weekly. Remove man-made debris, weeds, and grass controlled with chemicals. Any erosion that has occurred in any granite areas the Contractor shall be remedy, repair and replace granite at the Contractor's expense.

Weed Control: Keep all landscape areas free of weeds with pre-emergent and/or selective contact herbicides. Cultivating or hoeing weeds is not an allowed practice. The Contractor shall eradicate all noxious weeds or the Contracting Agency will not accept the project.

Unless otherwise authorized, the Contractor shall maintain all landscape areas, as he completes them during the course of work, on a continuous basis and until Engineer's final project acceptance. The Contractor shall provide adequate and experienced personnel to accomplish the maintenance. Maintenance shall include keeping the landscape areas free of debris on a weekly basis, chemical control and hand removal of weeds, fertilization as needed, cultivating the planting areas, and repairing tree stakes. An Arizona licensed pesticide applicator shall perform all chemical control.

The Contractor shall notify the Engineer 48 hours prior to the application of any chemical treatments. Qualified personnel shall do chemical mixing and use the application equipment in the presence of the Engineer. The Engineer shall approve the personnel, materials and methods of application of chemicals prior to beginning the operation.

All plant material and installation shall be 100% guaranteed by the Contractor for an additional 120 Calendar Days following completion of the Plant Establishment Period and the acceptance of the planting areas by the Engineer.

Contractor shall replace plants within seven days of notification from the Engineer. Remove and replace dead, damaged or vandalized plants within seven days of notification. Install replacement plants of the same kind and size as originally specified and as described in the contract documents.

Keep plants in a healthy, growing condition by watering, pruning, spraying, weeding and any other necessary operation of maintenance. Keep plant beds free of weeds, grass and other undesirable vegetation. The Contractor shall inspect the plants at least once per week and perform appropriate maintenance. Pruning and re-staking shall be required as needed to remove any plant growth conflicting with vehicular or pedestrian movement.

The Contractor shall maintain the irrigation system as specified in Section 440 and make any necessary repairs regardless of cause to assure a complete and operational system as originally designed and constructed. Make repairs within 24 hours of detection.

There shall be no separate measurement and payment for the Plant Guarantee and Maintenance Period. This cost shall be included in landscape bid items for: plant materials and inert groundcover. Contracting Agency will hold ten percent of each landscape bid item amount in addition to retention for distribution until after the maintenance and establishment period.

4300.9 PLANT ESTABLISHMENT PERIOD: Delete in its entirety and replace with:

The Contractor shall request an inspection by the Engineer when the Contractor believes the landscape work is substantially complete and the planting and related work is complete. After this initial inspection, and subject to his approval of the work, the Engineer will issue a written field notification to the Contractor setting the effective beginning date for the Plant Establishment Period. The Plant Establishment Period for trees, shrubs, and ground cover shall be for a period of 120 days, but is subject to extension by the Engineer if the Contractor improperly maintains the landscape planting, appreciable plant replacement is required, or other corrective work becomes necessary. This work is incidental to other bid items within this section and there is no separate payment for the Plant Establishment Period.

At final project acceptance or at the end of the plant establishment period, the Engineer will make a final acceptance inspection of the planted areas.

4300.10 MEASUREMENT AND PAYMENT: Delete the second paragraph in its entirety and replace with:

The basis of Measurement and Payment for plants is the price bid per each complete in place as shown on the project plans, details, and Special Conditions. Payment shall be full compensation for all labor, material, equipment, and incidental and appurtenant work for planting trees and shrubs and maintaining new plant material during construction and establishment/maintenance periods.

The basis of Measurement and Payment for the decomposed granite will be at the contract unit prices bid per Square Foot for the inert materials as shown on the project plans, details, and Special Conditions and shall include all costs, materials, equipment, labor, and operations necessary for the

finished grading (parkway grading), installation, and associated weed control and pre-emergent applications for installing decomposed granite.

SECTION 4400 –IRRIGATION SYSTEM

4400.1 DESCRIPTION: add the following:

The Contractor shall furnish all labor, materials, tools, equipment, and services necessary for the execution and completion of the irrigation system work as indicated on the drawings and as described in these specifications and the General Conditions.

The plans indicate a detailed layout of irrigation lines, laterals, sprinklers, and emitter locations; however, for graphic clarity some of the piping on the plans is diagrammatically outside of the planting areas. The Contractor shall follow the intent of the plan layout and shall review and obtain written approval from the Engineer for any requested changes.

Due to the scale of the drawings, it is not possible to indicate all offsets, fittings and sleeves that may be required. The Contractor shall carefully investigate the structural and finished conditions affecting all of his work and plan his work accordingly, furnishing such offsets, fittings and sleeves as may be required to meet such conditions. All work called for on the drawings by notes or details shall be furnished and installed whether or not specifically mentioned in the specifications.

The irrigation system shall be constructed using the emitters, valves, piping, fittings, controllers, wiring, and other components, of sizes and types as shown on the drawings and as called for in these specifications. The system shall be constructed to grades and conform to areas and locations as shown on the drawings.

Add the following new sub-section to the MAG Specifications:

4400.2 GENERAL: add the following:

The plans indicate a detailed layout of irrigation lines, laterals, sprinklers and emitter locations; however, some of the piping on the plans is diagrammatically outside of the planting areas for graphic clarity. The Contractor shall follow the intent of the plan layout and shall review and obtain written approval from the Engineer for any requested changes. The Contractor shall maintain project record (as-built) drawings during the irrigation system construction as described below:

Maintain on-site and separate from documents used for construction, one complete set of contract documents as Project Record Documents. Keep documents current on a daily basis. Current up-to-date Record Drawings are a prerequisite for scheduled payments. Do not permanently cover work until recording Record Drawing information. Record pipe and wiring network alterations. Record installed work that is different from shown on the construction drawings. Record accurate reference dimensions, measured from at least two permanent reference points, of each irrigation system valve-assembly, each controller, each sleeve end, each wire splice location, each stub-out for future pipe or wiring connections, and all other irrigation components enclosed within a valve box.

Prior to Final Review, obtain from the Engineer a reproducible Mylar copy of the drawings. Using technical drafting pen, duplicate information contained on the project drawings maintained on site. Label each sheet "Record Drawing". Completion of the Record Drawings will be a prerequisite for the Final Review.

The irrigation system shall be constructed using the emitters, valves, piping, fittings, controllers, wiring, and other components, of sizes and types as shown on the drawings and as called for in these

specifications. The system shall be constructed to grades and conform to areas and locations as shown on the drawings.

All underground work shall be inspected and approved by the Construction Manager or City representative prior to Contractor backfilling areas.

Add the following new sub-sections to the MAG Specifications:

4400.2.1 Permits: The Contractor shall obtain and pay for all permits and fees for installation or construction of the work included under this section, required by legally constituted authorities having jurisdiction, each at the proper time. He shall also arrange for and pay all costs in connection with any inspections and examination required by these authorities.

4400.2.2 Execution: The Contractor shall examine the work areas and working conditions that will affect the work of this section. The Contractor shall not proceed with work until correcting the unsatisfactory conditions.

4400.2.3 References: Conform to the requirements of reference information listed below except where requirements are more stringent or are shown or specified in the Contract Documents.

American Society of Testing Materials (ASTM) - Specifications and Test Methods specifically referenced in this Section, and Underwriter Laboratories (UL) - UL wires and cables, Contracting Agency Supplements to MAG and MAG Standards.

4400.2.4 Quality Assurance: A licensed and bonded plumber(s) shall execute work involving plumbing for installation of meters, vaults, meter boxes, water taps, copper piping, backflow preventer(s), and related work. Secure a permit from Contracting Agency at least 48 hours prior to start of installation.

Tolerances: Specified depths of mains and lateral pipes are minimums. Settlement of trenches is cause for removal of finish grade treatment, refilling, re-compaction, and repair of finish grade treatment.

Coordinate work with other trades.

For a period of one year (365 days) from Final Acceptance, the Contractor shall guarantee/warranty irrigation materials, equipment, and workmanship against defects. The Contractor shall replace any pavement damage resulting from the installation of the irrigation system and repair damage to grading, soil preparation, or planting at no additional costs to the Contracting Agency. Make repairs within three (3) days following notification by the Engineer.

4400.2.5 Cleaning: Maintain continuous cleaning operation throughout the duration of the work. Dispose of, off-site at no additional cost to the Contracting Agency, all trash or debris generated by installation of the irrigation system.

4400.2.6 Operation and Maintenance Manuals: Submit four (4) operation and maintenance manuals to the Engineer for review prior to final acceptance. The manuals should include the complete cut sheets and repair material breakdowns for all materials and products used; guarantee statement, complete operating and maintenance instructions on all major equipment. The Contractor shall provide a demonstration to maintenance personnel, with Engineer present, of how to adjust and maintain all emitter types, controller functions, and recommended controller programs, as established by the Contractor. The Contractor shall also review recommended watering rates and irrigation schedules for new plant materials.

4400.2.7 Preliminary, Substantial, and Final Walk-Through Inspections: Arrange for a preliminary walk-through with the Engineer, when the entire system is operational. Operate each zone

in its entirety, additionally, open all valve boxes and expose item covered, if directed. Generate a list of items to be corrected and make adjustments, “fine tuning” the entire system by regulating valves, and setting pressure regulators at proper and similar pressure to provide proper coverage. Flush and adjust all emitters for optimum performance while preventing water from getting onto walks, roadways, and buildings. Adjustments may include, at no additional cost to the Engineer and the Contracting Agency, additional emitters, tubing, and flush end caps as required.

The Contractor shall correct all items generated from the preliminary walk-through and then arrange for a Substantial Completion walk-through. The Contractor shall rework any items deemed not acceptable by the Engineer to the Engineer’s complete satisfaction. The maintenance period will not begin unless authorized by the Engineer. Provide all accessories, charts, record drawings and equipment, as required, before scheduling the Final walk-through.

Following the Landscape Maintenance Period the Contractor shall schedule a Final Walk-through inspection to review the system and make any necessary adjustments to the watering schedule.

4400.3 MATERIALS:

Add the following new sub-sections to the MAG Specifications:

4400.3.1 Equipment to be Furnished: All materials to be new and bear the appropriate National Association seal of approval for example, NSF, US, etc. Procure similar equipment from the same manufacturer and internal parts shall be common and interchangeable. Parts listing and source replacement will be furnished to the Engineer.

In addition to the materials required to complete the work as shown on the plans and as directed by the Engineer and these specifications the Contractor shall be required to provide additional spare parts and equipment necessary to utilize the installed irrigation components, see related requirements under 440.10.1 Project Closeout.

4400.3.2 Submittals: Prepare and make submittals in accordance with conditions of the Contract, and as follows: A minimum of thirty (30) days prior to beginning work on the irrigation system the Contractor shall submit one electronic copy in PDF format of manufacturers' catalog cuts, specifications, and operating instructions for equipment shown on the materials list covering materials listed below and any other items requested by the Engineer or that Contractor intends to utilize on the project. Do not order materials until the Engineer reviews and approves the products. Quantities of materials need not be included.

Submit the following:

- Pipe
- Automatic Controller
- Controller Grounding Materials
- Drip Irrigation Equipment
- Fittings and Solvents
- Wire and Connectors
- Backflow Preventer
- Ball Valves
- Pressure Regulating Valves
- Backflow Preventer Enclosure
- Valve Boxes

- Pressure Regulators
- Gate Valves
- Automatic Control Valves
- Solenoids and adapters
- PVC Nipples
- Vaults (Contracting Agency Std.)
- Valve I.D. Tags
- Quick Couplers
- Meter Box (Contracting Agency Std.)
- Meters (Comply with Contracting Agency Standards)
- Geotextile Fabric

Shop Drawings: Submit shop drawings called for by the details. Show products required for proper installation, their relative locations, and critical dimensions.

All items shall be those specified and approved by the Engineer. The Contractor shall not make substitutions without approval.

All submittals or shop drawings that are rejected in whole or in part shall be resubmitted and approved by the Engineer prior to the start of any field operations.

4400.3.3 Staking: The Contractor shall mark with powdered lime, routing of pressure supply line and stake locations of various components, control valves and emitters. Unless otherwise specified, the system layout is schematic. Accomplish preliminary adjustments to conform to actual site conditions during staking. Should changes be required the Contractor shall obtain approval of the Engineer prior to actually performing the work. Water connection supplied by the Contractor shall be as shown on the plans or as designated by the Engineer and the Contracting Agency and the utility concerned.

4400.5 TRENCH EXCAVATION AND BACKFILL: add the following:

Waterlines continuously pressurized – 18-inches minimum for 2-1/2” and smaller pipes, 24-inches minimum for 3” and larger pipes.

Control wire – 2-inches minimum below top of mainline pipe, or 18-inches minimum where installed in separate trench from mainline pipe.

Lateral sprinkler lines – 12-inches minimum for 2” and smaller pipes, 18-inches minimum for 2-1/2” and larger pipes.

Plastic lines in sleeves under pavement at mainline depth or 36 inches minimum when under driving surface.

Pipe trenches shall be straight but if obstructions necessitate a change of direction, follow the limits of curvature for PVC pipe in strict accordance with pipe manufacturer recommendations.

Trenches may curve to change direction or avoid obstructions within the limits of the curvature for PVC pipe. Minimum radii of curvature are 25 feet for 2-inch diameter pipe, 100 feet for 3- and 4-inch diameter pipe, and 150 feet for 6-inch pipe. All curvature results from the bending of the pipe lengths. No deflection will be allowed at a pipe joint.

Add the following new sub-section to the MAG Specifications:

4400.5.1 Bedding, Backfilling, and Compaction: Contractor shall bed pipe bedded in at least three inches (3") of finely graded native soil or sand to provide a firm, uniform bearing. After leveling, surround the pipe with additional finely grained native soil or sand to at least 4" over the top of the pipe.

Bedding sand shall be required when site conditions dictate and clean backfill meeting the specifications is not available. It shall also be required under asphalt and concrete pavements such as roadways, parking surfaces and plazas.

Trench backfill, sufficient to anchor the pipes, may be deposited before pipeline pressure testing, except that joints shall remain exposed until satisfactory completion of testing.

Trenches and excavations shall be backfilled with clean material from excavations. Remove organic material as well as rocks larger than $\frac{3}{8}$ " in diameter. Place acceptable material in lifts, the height of which shall not exceed that which can be effectively compacted, depending on the type of equipment and methods used. The Contractor shall backfill trenches and excavations restoring the specified thickness of topsoil to the upper part of the trench. Compaction shall be in accordance with Section 301.

In appropriate types of soil, the Engineer may authorize the use of flooding in lieu of tamping. Under no circumstances shall vehicle wheels be used for compacting soil.

If settlement occurs and subsequent adjustments in pipe, valves, irrigation heads, turf or other plantings, or other construction are necessary, the Contractor shall make all required adjustments without cost to the Contracting Agency.

4400.6 PIPE INSTALLATION:

Add the following new sub-section to the MAG Specifications:

4400.6.1 Piping: Provide pipe, schedule and size as shown on the drawings and per Section 757 and as specified herein.

PVC Pipe: Snake pipe in trench as much as possible to allow for expansion and contraction. Provide a firm, uniform bearing for the entire length of each pipeline to prevent uneven settlement. Install pipe in accordance with ASAE Standard, ASAE 376. Pipe shall be clean prior to installation and the Contractor shall maintain the pipe in that condition during installation. When pipe laying is not in progress, close the open ends of the pipe by the approved means.

The Contractor shall provide sand bedding or fine-grained material when encountering ledge rock, hardpan, or boulders. The Contractor shall compact bedding material to provide a minimum depth of bed between pipe and rock of three (3) inches.

Make solvent welded joints in accordance with ASTM D-2855, and use the type of solvent and primer recommended by the pipe manufacturers. Apply primer and solvent to the pipe ends in such a manner that no material is on the interior surface or forced into the interior of the pipe during insertion. Excess solvent on the exterior of the joint shall be wiped clean immediately after assembly. Do not expose the pipeline to water for at least 12 hours after assembling the last solvent welded joint.

Use schedule 80 pipe for threaded joints. Do not use solvent on threaded pipe. Threaded joints shall be hand tightened, with final tightening with a strap wrench as necessary to prevent leaks.

Fittings for use with mainline pipe under 2 ½" and smaller shall be schedule 80, pipe 3" and larger shall be ductile iron.

Fittings for lateral pipe 2 ½" and smaller shall be schedule 40.

All pipe 3” and larger shall be rubber ring gasketed.

Protect the pipe from damage during assembly. Use only padded jaw vises and strap wrenches. Remove and replace any nicked, scarred or otherwise damaged plastic pipe. Exercise care to avoid stress on a previously made joint.

When PVC to metal pipe connectors is required, accomplish these connections first. Use a plastic adapter with external pipe thread (male), screwing it into the metal internal pipe threads (female). Use Teflon tape, or equal, on all plastic to metal threaded joints. Hand-tighten the joint and utilize a light wrench, as necessary, to prevent leaks.

Separate piping or conduit of different trades crossing each other by a minimum of six (6”) inches in the vertical direction.

Install thrust blocks for fittings on pipe greater than or equal to 3-inch diameter or any diameter rubber gasketed pipe. Use 3,000 PSI concrete, 2-mil plastic, and No. 4 Rebar. Use cast-in-place concrete bearing against undisturbed soil. Size, orientation and placement shall be as shown on the installation details. Wrap fitting with plastic to protect bolts, joint, and fitting from concrete. Install rebar as shown on the installation details.

Use a joint restraint harness on pipe greater than or equal to 3-inch diameter or any diameter rubber-gasketed pipe wherever joints do not have positive restraint by flanged fittings, threaded fittings, and/or thrust blocks. Use a joint restraint harness with transition fittings between metal and PVC pipe, where weak trench banks or vertical directional changes do not allow the use of thrust blocks, or where extra support is required to retain a fitting or joint. Use bolts, nuts, retaining clamps, all-thread, or other joint restraint harness materials, which are zinc plated or galvanized.

Use restrained casing spacers for gasketed pipe routed through sleeving. Provide Ford Uni-Flange Restrained Casings Spacers or approved equal. Construct restrainer body and runner supports of high strength ductile iron meeting ASTM A536 and grade 65-42-12. Connecting rods must meet ASTM A242, ANSI/AWWAC111/A21.11. Construct runners of ultra high molecular weight polymer. Install harness in the manner recommended by the manufacturer and in accordance with accepted industry practices. Install self-restraining casing spacers at all gasketed pipe bell joints and every 10 feet along the gasketed mainline pipe installed through sleeving. Provide correct number and type of restraints per manufacturer’s requirements.

Provide Flush End Caps at the end of lateral drip lines at locations as shown on the plans or directed by the Engineer. Construct Flush End Caps as per the plan details. There will be no separate measurement or payment for Flush End Caps as the cost of which are considered included in other irrigation items.

Add the following new sub-section to the MAG Specifications:

4400.6.2 Sleeving:

Sleeve any piping located under asphalt, concrete, or other pavements, size and schedule as noted on the plans. If not noted, sleeves shall be Schedule 40, and a minimum of 2 times larger than the pipe being sleeved. Use separate conduit within the main sleeve for wiring, or as directed by the Engineer.

All horizontal borings, as indicated on the plans and as required by these specifications, shall be considered included in the cost of the sleeve being installed.

When any cutting or removal of asphalt and/or concrete work is necessary, it shall be saw cut in accordance with MAG Section 601.2.7. The Contractor shall obtain permission to cut asphalt or concrete from the Engineer. When piping on the drawings is shown in paved area, but running parallel and adjacent to planted areas, the intent of the drawings is to install the piping in the planted area.

Asphalt cut and patch operations necessary for sleeve installation is incidental to the sleeve installation. Do all asphalt cutting with proper equipment to allow straight and true cuts through the full depth of the asphalt. Trench shall be in accordance with MAG Standard Detail 200-1 "T" top. The Contractor shall replace any patchwork if the patch compacts more than 1/2 inch or if any of the patches becomes dislodged within one year. All asphalt shall comply with MAG Section 336.

All sleeves crossing an irrigation district pipe such as RID, RWCD, or SRP shall be in accordance with the project plans, specifications, and Irrigation district's Standard Details. In addition, sleeves crossing irrigation district facilities shall be installed with pipe, as called for on the project plans, that utilizes 45 degree bends (preferred) or 90 degree bends (where necessary) at the casing ends to extend the pipe to no lower than the springline of the irrigation district pipeline per the plans. No separate measurement or payment will be made for bore operations and related materials, the cost being included within the casing for which the materials and labor are necessary.

Extend sleeve ends 12 inches beyond edge of hardscape, or sidewalks. Cap sleeve ends and mark with stakes. Provide mule-tape, rope or wire through sleeve and secure each end to stake at surface grade, for future use. Cover sleeve ends with duct tape prior to backfill.

4400.7 VALVES, VALVE BOXES, AND SPECIAL EQUIPMENT INSTALLATION: add the following:

Install all remote control valves, gate valves, hydrometers, pressure reducing valves, wye strainers, emitter flush plugs, and quick coupling valves in suitable plastic valve access box of proper size as required for easy access to the installed components. All valve boxes supplied shall be Carson 1324 super jumbo, Carson 910 round, or 510 emitter irrigation boxes as shown on plans or approved equal. Economy boxes are not an acceptable alternative. Install all valve boxes with a six-inch minimum gravel sump as indicated on the drawings. Line the sump with Geotextile fabric. Geotextile fabric shall be non-woven class B in accordance with MAG Standard Specification 796.2.2.

All valve boxes and covers are to be colored tan in decomposed granite and green in turf with all covers embossed with letters/numbers as identified in details.

Backflow Prevention Assembly: Install the Backflow Prevention Assembly per the details shown on the drawings and City of Avondale Standard Detail A1326 requirements. All backflow components shall be lead free and utilize lead free solder in all connections. Connect the backflow prevention assembly to the existing water meter with type K hard copper. Place the backflow prevention unit at the location shown on the project plans. Provide enclosure to secure the assembly. Do not operate the irrigation system until the assembly has been tested and certified to meet the requirements of the Contracting Agency. Backflow Prevention Assembly enclosure shall be powder coated tan from the manufacture. Contractor shall submit paint color chip sample to Engineer for approval of enclosure. After the Contractor installs and the Engineer approves the installation of the backflow assemblies, the Contracting Agency will inspect and test the systems to ensure that it is operating correctly and meets with the Contracting Agency standards and approve the system.

Wiring: All wiring for remote control valve operation shall be UF-600, UL listed for direct burial usage. The control wire shall be 14 AWG colored red, the common 12 AWG white. Run a spare single green 14-gauge spare wire from the irrigation controller and loop into each of the remote control valve boxes. Place all wires in continuous runs between the Irrigation controller and the valve to which it controls without splices. The Engineer will only allow splices when the run length exceeds 2500 feet. Place all splices in splice boxes and record locations of the boxes on the as-built drawings.

4400.8 SPRINKLER HEAD INSTALLATION AND ADJUSTMENT: add the following:

All emitter heads shall be of the types and sizes as indicated on the plans. Install emitters in relation to finished grade as indicated on the plans.

The Contractor shall be responsible for sprinkler and emitter outlet adjustment for a period of one hundred and twenty (120) days as described in the establishment period below.

4400.9 AUTOMATIC CONTROL SYSTEM INSTALLATION: add the following:

Solar Controller: Automated Control System shall be Hybrid Series solar controller as specified on the plans or approved equal. Controller shall be mounted in manufacturer's stainless steel enclosure on 4ft tall stainless steel mounting pole with stainless steel mounting bracket and solar panel kit. Solar panel shall be mounted flush with top of stainless steel enclosure. Install controller per manufacturer's specifications. All control wires shall be run through center of post with conduit sweeps at bottom through concrete footing. Contractor shall submit complete shop drawings to Engineer for review prior to installation. Contractor shall orientate solar panel for maximum exposure to south and western sun. Contractor shall furnish and install all grounding equipment as indicated on the drawings.

The Contractor shall provide station-area coverage maps, sealed in plastic, for each controller installed. Provide surge protection on the power sources.

Automatic remote control valves for solar controllers shall be DC electric solenoid operated of the types and sizes as indicated on the plans. They shall be compatible with the system operating pressure and design. The solenoid shall be a DC latching compatible with the solar controller. Contractor shall provide solenoid adapters compatible with remote control valves. Remote control valves shall have the valve body and bonnet constructed of glass-filled nylon. All valves shall be equipped with stainless steel self-cleaning screen for dirty water applications, and with female pipe thread connections.

The solenoid plunger shall be spring-loaded so the valve, no matter how installed, will operate in any position and shall be constructed of stainless steel. The diaphragm shall be of durable nylon reinforced neoprene. Valve bonnet shall be equipped with an internally operated manual bleed mechanism for manual operation of the valve at any time. Secure the valve bonnet to the valve body by corrosion resistant stainless steel bolts.

Control wiring shall be U.L. approved for direct underground burial and shall be 14-1 AWG minimum size for control wires and 12-1 AWG minimum size for common wires or as noted on the drawings. Place the control and common wiring in the same trench as the mainline, beside the mainline at the bottom of the trench.

Bundle control wires where contained within the same trench and tape together at 10-foot intervals along wire routing. Do not tape wires together where contained within sleeves and conduit. Provide a 24-inch excess length of wire in an 8-inch diameter expansion loop at each 90-degree change of direction, at both ends of sleeves, and at 100-foot intervals along the wire routing. Do not tape wiring within expansion loops.

All wiring for all 120 and 24 volt connections must meet the National Electrical Code and be UL listed.

Make wire connections to remote control electric valves and splices in the field if approved by Engineer using 3M DBY/R-6 or Paige DB14-4 wire splices, no others will be accepted.

It is important that the wire splice be waterproof so that there is no chance for leakage of water and corrosion build-up on the joint.

4400.10 FLUSHING AND TESTING: add the following:

Provide all necessary pumps, bypass piping, storage tanks, meters, supply piping, and fittings in order to perform testing properly. The Contractor shall backfill the trench to prevent movement of the pipe under pressure. Expose couplings and fitting. Purge air from pipeline before test. Subject the mainline pipe to 120 PSI for four (4) hours. Maintain constant pressure to the subject mainline pipe. No allowable pressure loss will be allowed.

Replace any defective pipe, fitting, joint, valve, or appurtenance. Repeat the test until the subject mainline pipe meets the above maximum allowable volume loss during the test period.

Perform an operational test of the irrigation system in the presence of the Engineer and a representative from the Contracting Agency Maintenance Division. Contact the Engineer and Contracting Agency Authorized Representative three working days prior to testing.

A coverage test shall be performed after sprinkler heads have been installed and shall demonstrate that each section or unit in the irrigation system is constructed to provide uniform head-to-head coverage of the areas serviced.

Operation of all valves, flow sensors, gate and ball valves, drip systems, ET devices and remote monitoring equipment (computer central or internet) shall be demonstrated prior to project acceptance and start of maintenance.

Add the following new sub-section to the MAG Specifications:

4400.10.1 PROJECT CLOSEOUT:

General: All requirements and procedures for submittal of pertinent data relating to closing out of Project upon completion of the project work. Detailed instructions elsewhere in these Specifications may require that certain items listed herein to be submitted prior to Substantial Completion of the Project. This Section is complementary to the General Conditions and Special Conditions and nothing herein shall be considered to waive any requirements of the General Conditions or Special Conditions.

Submit: Letter from Contractor and Irrigation Controller Manufacturer's Representative guaranteeing four total training sessions for Irrigation Controller Programming. Both Contractor and Irrigation Controller Manufacturer's Representative must sign letter.

Final Payment: Receipt and approval of all items specified in this Section is a prerequisite for final payment.

Record Drawings: Contractor shall provide Record Drawings, which shall clearly show all differences between the Contract work as drawn and as installed. Show all work added to the Contract that is not on the Contract drawings. Contractor shall maintain a set of Record Drawings at the job site. Keep these legible and current and shall be available for inspection at all times by Contracting Agency. The record drawings shall show all changes in the Contract work, or work added, on these Record Drawings in a contrasting color, including work changed by Addendum or Bulletin. 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 two permanent points. Record Drawings shall indicate exact routing of all piping, irrigation, power, and control wiring, etc., depict any irrigation lateral line modifications or adjustments on the plans. Record Drawings shall contain the names, addresses, and phone number of the Subcontractors. The Contractor shall sign the Record Drawings. The Contracting Agency shall review the Record Drawings and shall be the sole judge of the acceptability of these drawings. Upon Substantial Completion of the Project, Contractor shall submit the redlined record drawings to the Engineer for preliminary review. Contractor shall make all corrections required and resubmit revised copy to the Engineer for review. Upon acceptance of the redlined record drawings and prior to final payment, the Contractor shall submit to the Engineer the corrected and final version of the record drawing redlines. The Contractor will be responsible for recording redlines onto the Mylar for the final record set of drawings prior to final project acceptance.

Maintenance Manual and Operating Instructions: Upon completion of the installation of all work, Contractor shall furnish four (4) complete bound copies of operating and maintenance instructions and parts lists for all materials and equipment. Including electrical, irrigation, pump and control items supplied. Operating instructions shall include complete operating sequence, control diagrams, description of method of operating machinery, machine serial numbers, factory order numbers, parts lists, instruction books, supplier's phone numbers and addresses and individual equipment guarantee. Parts lists shall be complete in every respect, showing all parts and part numbers for ready reference. Assemble Maintenance Manual and Operating Instructions in hardback 3-ring loose-leaf binders. Suitably label and index all material contained therein for ready reference. Upon Substantial Completion of the Project work, submit one copy of the Maintenance Manual and Operating Instructions to Engineer for review. Upon receipt of notice of acceptance, deliver the additional copies to the Contracting Agency.

Guarantees and Warranties: Submit all required guarantees and warranties to the Contracting Agency. Provide all written guarantees, warranties or certificates required. Guarantees and warranties shall be a part of maintenance manual.

Spare Parts and Maintenance Materials: The Contractor shall deliver to the Contracting Agency the spare parts, extra stock and maintenance materials listed below, and shall obtain a signed receipt for these materials. Materials shall be neatly packaged and identified, per each specification section.

Spare parts required prior to project closeout:

- Two (2) of each size remote control valve installed
- Two (2) keys to irrigation controller
- Ten (10) of each emitter type and volume installed
- Four (4) DC latching solenoids and adapters
- Two (2) keys (5' handle) for each type of gate and ball valve installed

Semi-final and Final Review: When Contractor is of the opinion that the Project is substantially complete, he shall send to the Engineer a written statement that the Project is substantially complete (naming a date) and shall request a semi-final inspection by the Engineer to determine the status of completion. The Engineer must receive such notice at least three days before the requested inspection date. If the Engineer finds that the Project is substantially complete, he will prepare a Certificate of Substantial Completion, attaching thereto a list or "Punch List" of items to be completed or corrected. If the Engineer does not concur in the Contractor's claim of Substantial Completion, the Contractor shall continue to maintain the site until the Engineer accepts the project. When all items on the

“Punch List” are completed or corrected, the Contractor shall send to the Engineer a statement that the Project is complete and request a final inspection. If the project is complete and all “Punch List” items are completed or corrected, the Engineer will issue a final acceptance letter. After completion of the procedures outlined above, the Contractor shall submit his final application for payment in accordance with the Agreement, the General Conditions and Special Conditions.

Final Checkout of Project and Equipment of Contracting Agency: Before acceptance and final payment, at a time arrived at with the Engineer a complete checkout and test shall be made of all irrigation, mechanical and electrical systems, architectural and structural devices, etc., with the Engineer. For this purpose, each trade concerned shall provide a skilled operating engineer or technician for a period of at least one day. This person, together with selected operating personnel, shall test all systems and devices and demonstrate the complete operation and required maintenance of each.

Maintenance: Maintain irrigation system for duration of 90 calendar days from formal written acceptance by Engineer. Make periodic examinations and adjustments to irrigation system components in order to achieve the most desirable application of water. Following completion of Contractor's maintenance period, Contracting Agency will be responsible for maintaining system in working order during remainder of guarantee/warranty period, for performing necessary minor maintenance, for protecting against vandalism, and for preventing damage after landscape maintenance operation. The Contractor shall for a period of one year from Final Acceptance, guarantee/warranty irrigation materials, equipment, and workmanship against defects. The Contractor shall replace any pavement damage resulting from the installation of the irrigation system and repair damage to grading, soil preparation, seeding, sodding, or planting at no additional cost to the Contracting Agency. Make repairs within 48 hours following notification by the Engineer. The Contracting Agency has the right to make emergency corrections and back-charge to the contract for his/her costs when determined necessary by the Engineer.

Clean Up: Remove from site machinery, tools, excess materials, and rubbish upon completion of work. Maintain a clean and orderly jobsite on a daily and ongoing basis. Do not allow trash, discarded material and other debris to blow around on the project. Discard all materials off site at an approved sanitary landfill.

4400.11 MEASUREMENT AND PAYMENT: delete in its entirety and replace with:

Payment for the irrigation distribution system is the bid price for each element of work identified on the bid schedule. These unit cost prices shall be full compensation for the system complete in-place as described herein and on the plans. If an item of work is noted on the plans but does not appear on the bid schedule the cost of that item is considered included in the cost of other items of work and no direct measurement or payment will be made.

Thomas Road Improvements – 103rd Avenue to 99th Avenue

EN17-020

Plans

CITY OF AVONDALE

MAYOR
KENNETH WEISE

VICE MAYOR
STEPHANIE KARLIN

COUNCIL MEMBERS

SANDI NIELSON
BRYAN KILGORE
JIM MCDONALD
DAVID IWANSKI
LORENZO SIERRA

CITY MANAGER

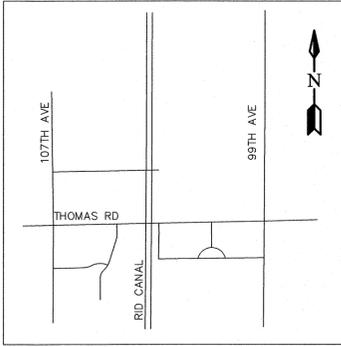
DAVID FITZHUGH

CITY CLERK

CARMEN MARTINEZ



**THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
CITY PROJECT NO. ST1306 (EN17-020)**
Sections 29 & 32, T2N, R1E



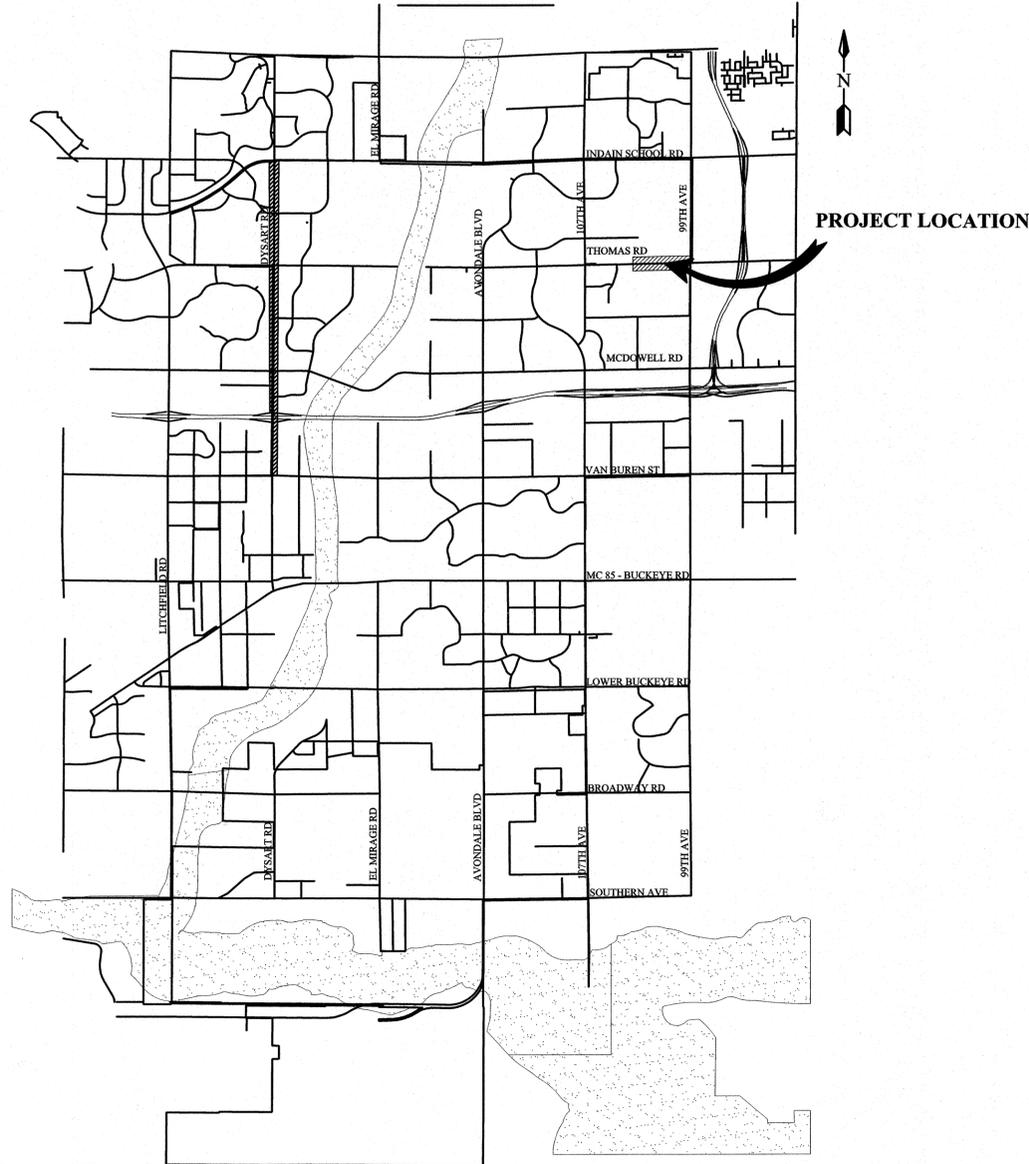
VICINITY MAP

Utility Notification

THESE PLANS HAVE BEEN SUBMITTED TO THE FOLLOWING UTILITY COMPANIES. WHERE THE WORK TO BE DONE CONFLICTS WITH ANY OF THESE UTILITIES, THE CONFLICTS SHALL BE RESOLVED AS SPECIFIED IN THE SPECIAL NOTES AND/OR AS OTHERWISE NOTED ON THESE PLANS. CONFLICTS ARISING DURING THE COURSE OF CONSTRUCTION FROM UNFORESEEN CIRCUMSTANCES SHALL BE REPORTED TO THE INTERESTED UTILITY COMPANY AND BE RESOLVED BY THEM AND THE DESIGN ENGINEER.

	CONTACTED	REPLIED
SALT RIVER POWER DISTRICT PHONE NUMBER:	JOLIE DONAHUE COMPANY REPRESENTATIVE	12/14/15 DATE
CENTURYLINK PHONE NUMBER:	COMPANY REPRESENTATIVE	12/7/15 DATE
COX COMMUNICATIONS PHONE NUMBER:	FRANK CANALES COMPANY REPRESENTATIVE	12/7/15 DATE
SOUTHWEST GAS PHONE NUMBER:	JEREMY ELSER COMPANY REPRESENTATIVE	1/12/16 DATE
SALT RIVER IRRIGATION DISTRICT PHONE NUMBER:	PAM RAFFIELD COMPANY REPRESENTATIVE	1/29/16 DATE
ROOSEVELT IRRIGATION DISTRICT PHONE NUMBER:	HEATHER REID COMPANY REPRESENTATIVE	1/8/16 DATE
KINDER MORGAN ENERGY PHONE NUMBER:	P.P. MARTIN COMPANY REPRESENTATIVE	2/8/16 DATE

AREA MAP



ENGINEER

JACOBS
RICHARD WALLACE, P.E.
101 N 1ST AVENUE, SUITE 2600
PHOENIX, AZ 85003
PHONE: (602) 253-1200
FAX: (602) 253-1202

SURVEYOR

CRS, INC
CARL SITTERLY
8752 E PICCADILLY RD
SCOTTSDALE, AZ 85251
PHONE: (480) 620-1382

OWNER

CITY OF AVONDALE
DAVID JANOVER, P.E. (CITY ENGINEER)
11465 W CIVIC CENTER DRIVE
AVONDALE, ARIZONA 85323
PHONE: (623) 333-4200
FAX: (623) 333-0420

BENCHMARK

POINT NAME: 23081-1
FOUND: 3" MCHD BC IN HH 0.6' DN, NO STAMPING
LOCATION: THE INTERSECTION OF
THOMAS RD AND 99TH AVE
N=902212.5761
E=591564.6959
ELEV=1028.3434
HORIZONTAL SYSTEM: AZ STATE PLANE,
1983 CENTRAL ZONE (AT GROUND)
VERTICAL DATUM: NAVD 88

ROOSEVELT IRRIGATION DISTRICT APPROVAL

The Roosevelt Irrigation District (RID) has reviewed these plans solely for conformance to RID standards and specifications as related to RID Irrigation and/or drainage facilities. RID makes no representations or warranties regarding the suitability, and/or adequacy, of the items being constructed to meet, fulfill, or otherwise satisfy, their intended purpose. RID approves these plans for concept only and accepts no liability for errors or omissions. RID Right-of-Way Crossing Permit required prior to construction.

ROOSEVELT IRRIGATION DISTRICT _____ DATE _____
RID PERMIT NUMBER _____

APPROVALS

[Signature]
CITY ENGINEERING DEPARTMENT
10-3-16
DATE

THE CITY APPROVES THESE PLANS FOR CONCEPT ONLY
AND ACCEPTS NO LIABILITY FOR ERRORS OR OMISSIONS

"AS-BUILT CERTIFICATION"

I HEREBY CERTIFY THAT THE "AS-BUILT" INFORMATION SHOWN HEREON
WAS OBTAINED UNDER MY DIRECT SUPERVISION AND IS CORRECT AND
COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF

REGISTERED LAND SURVEYOR/ENGINEER _____
REGISTRATION NUMBER _____ DATE _____

SHEET INDEX

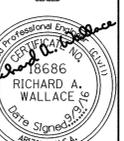
1	COVER SHEET
2	GENERAL NOTES AND LEGEND
3-4	QUANTITY SUMMARY
5-7	TYPICAL SECTIONS
8	DETAILS
9	PIPE AND DRIVEWAY PROFILES
10-15	PAVING PLAN AND PROFILE
16-18	STREET LIGHT LAYOUT
19-21	TRAFFIC SIGNAL PLAN
22	SIGNING AND STRIPING COVER
23-25	SIGNING AND STRIPING PLANS
26	LANDSCAPE SUMMARY AND NOTES
27	LANDSCAPE DETAILS
28	IRRIGATION SUMMARY AND NOTES
29-30	IRRIGATION DETAILS
31-36	LANDSCAPE / IRRIGATION PLANS
37-40	SRP DETAILS (1 to 4)

NOTE:
ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE CITY OF AVONDALE'S SUPPLEMENT TO M.A.G. SPECIFICATIONS AND STANDARD DETAILS CURRENTLY ON FILE AND AVAILABLE AT THE CITY OF AVONDALE'S ENGINEERING DEPARTMENT OR ONLINE AT THE CITY OF AVONDALE'S WEBSITE.

JACOBS
101 NORTH 1st AVENUE, SUITE 2600
PHOENIX, ARIZONA 85003
PHONE: 1.602.253.1200 FAX: 1.602.253.1202



CAPITAL IMPROVEMENT PROJECT
THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
ST1306 (EN17-020)



EXPIRES 12/31/16
ORIGINAL PLAN DATE
LATEST REVISION DATE
09/9/2016
SHEET NUMBER
1 OF 40
PROJECT NUMBER
ST1306



ABBREVIATIONS *

AASHTO.....	American Association of State Highway and Transportation Officials	LC.....	Long Chord
AB.....	Aggregate Base	LS.....	Lump Sum
AC.....	Asphaltic Concrete	Lt.....	Left
AC.....	Aluminum Cap	MAG.....	Maricopa Association of Governments
ACBC.....	Asphaltic Concrete Base Course	Matl.....	Material
ACFC.....	Asphalt Concrete Friction Course	MC.....	Maricopa County
ACI.....	American Concrete Institute	MCDOT.....	Maricopa County Department of Transportation
ACP.....	Asbestos Cement Pipe	MH.....	Manhole
ACSC.....	Asphalt Concrete Surface Course	Min.....	Minimum
ADOT.....	Arizona Department of Transportation	Mod.....	Modify
Ahd.....		Mon.....	Monument
AISC.....	American Institute of Steel Construction	NC.....	Normal Crown
APS.....	Arizona Public Service Company	NPDES.....	National Pollutant Discharge Elimination System
Asph.....	Asphalt	NPI.....	Non Pay Item
ASTM.....	American Society for Testing Materials	NTS.....	Not to Scale
AWS.....	American Welding Society	OC.....	On Center
B/C.....	Back of Curb	OD.....	Outside Diameter
BC.....	Brass Cap	P.....	Pavement (Surface Elevation)
BCR.....	Begin Curb Return	Ped.....	Pedestal
BCT.....	Breakaway Cable Terminal	Pc.....	Point of Curvature
Bdy.....	Boundary	PCC.....	Point of Compound Curvature
Bev.....	Bevel(ed)	PCC.....	Portland Cement Concrete
BFS.....	Begin Full Super	PCCP.....	Portland Cement Concrete Pavement
Bit.....	Bituminous	PI.....	Point of Intersection
Bk.....	Back	POB.....	Point of Beginning
Bkfl.....	Backfill	POC.....	Point on Curve
BLM.....	Bureau of Land Management	POE.....	Point of End
BM.....	Bench Mark	POT.....	Point on Tangent
C&G.....	Curb and Gutter	PP.....	Power Pole
Cab.....	Cabinet	PRC.....	Point of Reverse Curvature
CAP.....	Corrugated Aluminum Pipe	Prel.....	Preliminary
CAPA.....	Corrugated Aluminum Pipe Arch	Proj.....	Project
CB.....	Catch Basin	Prop.....	Proposed
CBC.....	Concrete Box Culvert	PRVC.....	Point of Reverse Vertical Curvature
CG.....	Cattle Guard	PT.....	Point of Tangency
CIP.....	Cast Iron Pipe	PVC.....	Point of Vertical Curvature
CIPP.....	Cast-in-Place Pipe	PVC.....	Poly Vinyl Chloride
Clear(ance).....		PVI.....	Point of Vertical Intersection
CLD.....	Concrete Lined Ditch	Pvmt.....	Pavement
CMP.....	Corrugated Metal Pipe	PVT.....	Point of Vertical Tangency
CMPA.....	Corrugated Metal Pipe Arch	Q.....	Quantity of Drainage Runoff
CO.....	Clean Out	Qtr.....	Quarter
Conc.....	Concrete	QW.....	Qwest Communications
Conn.....	Connection	R.....	Radius
Const.....	Construction	R.....	Range
Cont.....	Continuous	RCP.....	Reinforced Concrete Pipe
Cor.....	Corner	Rdwy.....	Roadway
Corr.....	Correction (VPI to VC)	Rebar.....	Reinforcing Bar
CP.....	Concrete Pipe	Reinf.....	Reinforced(ing)
CR.....	Crown	Reloc.....	Relocate
CSP.....	Corrugated Steel Pipe	Rem.....	Remove
CSPA.....	Corrugated Steel Pipe Arch	Ret.....	Retain(ing)
CTB.....	Concrete Treated Base	RGRCP.....	Rubber Gasket Reinforced Concrete Pipe
DA.....	Drainage Area	RR.....	Railroad
DE.....	Drainage Easement	Rt.....	Right
Def.....	Deflection	R/W.....	Right of Way
Det.....	Detail	S.....	Slope
DIP.....	Ductile Iron Pipe	Sch.....	Schedule
Dm.....	Drain(age)	SCS.....	Soil Conservation Service
D/W.....	Driveway	SD.....	Sight Distance
Dwg.....	Drawing	SD.....	Storm Drain
E.....	Electric(ity)	SE.....	Slope Easement
e.....	External	Sec.....	Section
ECR.....	End Curb Return	SG.....	Subgrade
EFS.....	End Full Super	Shldr.....	Shoulder
El.....	Elevation	Shr.....	Shrinkage
Emb.....	Embankment	Sh.....	Sheet
EP.....	Edge of Pavement	Sk.....	Skew
Esmt.....	Easement	Specs.....	Specifications
Exc.....	Excavation	SRP.....	Salt River Project
Exist.....	Existing	SS.....	Sanitary Sewer
Exp Jt.....	Expansion Joint	Sta.....	Station
F/C.....	Face of Curb	Std.....	Standard
FCDMC.....	Flood Control District of Maricopa County	Struc.....	Structural
FF.....	Finished Floor (Elevation)	Subdiv.....	Subdivision
FH.....	Fire Hydrant	Super.....	Superelevation
Fnd.....	Found	Sw.....	Swell
Fwy.....	Freeway	S/W.....	Sidewalk
G.....	Gutter (Flow Line Elevation)	SWG.....	Southwest Gas Corporation
ga.....	Gauge	T.....	Tangent Length
GB.....	Grade Break	T.....	Township
GLO.....	General Land Office	TC.....	Top of Curb
GM.....	Gas Meter	TCE.....	Temporary Construction Easement
Gnd.....	Ground	Trans.....	Transition
GP.....	Guy Pole	TrRk.....	Trash Rack
Gr.....	Grade	TS.....	Traffic Signal Pole
GR.....	Guardrail	Typ.....	Typical
GV.....	Gas Valve	VC.....	Vertical Curve
HDPE.....	High Density Polyethylene	VCP.....	Vitrified Clay Pipe
Hdw.....	Headwall	VG.....	Valley Gutter
HH.....	Hand Hole	w/.....	with
HI.....	High	w/o.....	without
HW.....	High Water	WM.....	Water Meter
ID.....	Inside Diameter	WV.....	Water Valve
Inv.....	Invert	WWF.....	Welded Wire Fabric
Irr.....	Irrigation		
L.....	Length of Curve		

* Standard dictionary abbreviations not included.

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION PUBLISHED BY THE MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) DATED JANUARY 2015, TOGETHER WITH THE MCDOT SUPPLEMENT TO THE MAG STANDARD SPECIFICATIONS DATED JANUARY 2015 AND THE PROJECT SPECIAL PROVISIONS.
2. STANDARD DETAILS REFER TO THE MAG UNIFORM STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION UNLESS NOTED OTHERWISE.
3. ALL EXISTING UTILITY LINES SHOWN ON THE PLANS ARE FROM AVAILABLE UTILITY RECORDS. THE CONTRACTOR SHALL VERIFY THE ACTUAL LOCATION BEFORE STARTING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT "ARIZONA 811" BY DIALING 8-1-1, PRIOR TO BEGINNING CONSTRUCTION.
4. UTILITIES INTERFERING WITH CONSTRUCTION SHALL BE RESET OR RELOCATED BY THE UTILITY COMPANY CONCERNED UNLESS NOTED OTHERWISE.
5. DISPOSAL OF ALL WASTE MATERIAL, BROKEN CONCRETE, ETC. WILL BE THE RESPONSIBILITY OF THE CONTRACTOR, SUBJECT TO THE APPROVAL OF THE ENGINEER.
6. ALL STATIONS AND CALL OUT DISTANCES LEFT AND RIGHT REFER TO THE CONSTRUCTION CENTERLINE UNLESS NOTED OTHERWISE.
7. ALL TREES, BUSHES AND OBSTACLES INSIDE THE EXISTING RIGHT-OF-WAY WHICH INTERFERE WITH CONSTRUCTION, SHALL BE REMOVED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. ANY FENCES DAMAGED DURING CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE COUNTY.
8. ALL PAVED TURNOUTS SHALL HAVE THE SAME ASPHALT AND BASE REQUIREMENTS AS THE ADJACENT ROADWAY UNLESS NOTED OTHERWISE.
9. THE CONTRACTOR SHALL OBTAIN ALL THE NECESSARY PERMITS FROM LOCAL GOVERNMENTS FOR WORK WITHIN THEIR JURISDICTION.
10. CONSTRUCTION ACTIVITIES SHALL NOT INTERFERE WITH MAIL DELIVERY. THE CONTRACTOR SHALL TEMPORARILY RELOCATE MAILBOXES AS NECESSARY TO PROVIDE UNINTERRUPTED MAIL SERVICE. THIS IS A NON-PAY ITEM.

KINDER MORGAN NOTES

1. A KINDER MORGAN 6-INCH HIGH PRESSURE REFINED PETROLEUM PRODUCT PIPELINE IS WITH THE LIMITS OF THIS PROJECT. IN THE INTEREST OF PUBLIC SAFETY AND FOR PIPELINE PROTECTION, THE FOLLOWING PROVISIONS SHALL BE MET FOR THE CONSTRUCTION OF IMPROVEMENTS NEAR KINDER MORGAN PIPELINES.

EXACT PIPELINE LOCATION CAN ONLY BE DETERMINED BY POTHOLE AT MAXIMUM 50 FEET INTERVALS (OR AS REQUIRED BY THE ON-SITE KM REPRESENTATIVE). THE POTHOLE WORK MUST BE PERFORMED BY HAND EXCAVATION AND IN THE THE PRESENCE OF A PIPELINE REPRESENTATIVE.

NOTIFY KM RIGHT OF WAY SPECIALIST BRICE BOX AT (623) 734-3700 AT LEAST TWO WEEKS PRIOR TO COMMENCEMENT OF WORK. BRICE BOX WILL ARRANGE FOR A PIPELINE REPRESENTATIVE TO BE PRESENT DURING WORK NEAR THE PIPELINES.

ROOSEVELT IRRIGATION DISTRICT GENERAL NOTES:

1. THE TERM DISTRICT AS USED IN THESE PLANS SHALL REFER TO THE ROOSEVELT IRRIGATION DISTRICT (RID).
2. THE DISTRICT CONSTRUCTION OBSERVER MUST APPROVE THE SCHEDULING OF ALL CONSTRUCTION ACTIVITIES WITHIN THE DISTRICT RIGHT-OF-WAY. THE DISTRICT MAY REQUIRE THAT SOME OR ALL OF THE CONSTRUCTION FOR THE PROJECT BE COMPLETED ONLY DURING A SCHEDULED DRY-UP OF THE MAIN CANAL.
3. ALL CONSTRUCTION PLANS AFFECTING DISTRICT FACILITIES MUST BE REVIEWED AND APPROVED BY THE IRRIGATION DISTRICT.
4. THE CONTRACTOR SHALL CONTACT THE DISTRICT'S CONSTRUCTION OBSERVER AT (602) 284-7017, A MINIMUM OF 15 CALENDAR DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
5. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING A RIGHT-OF-WAY CROSSING PERMIT FROM THE DISTRICT BEFORE ANY WORK CAN COMMENCE WITHIN DISTRICT RIGHT-OF-WAY.
6. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR REVIEW BY THE DISTRICT'S ENGINEER AS MAY BE NECESSARY FOR THE EXECUTION OF THE WORK AND AS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS.
7. STATIONS SHOWN ARE APPROXIMATE AND MAY BE VARIED AS DIRECTED BY THE DEVELOPER'S ENGINEER.
8. ALL EXISTING IRRIGATION FACILITIES DISTURBED BY NEW CONSTRUCTION SHALL BE RECONSTRUCTED TO CURRENT RID STANDARDS.
9. ALL CONSTRUCTION INCLUDING, BUT NOT LIMITED TO: EQUIPMENT, FENCING, SPOILS, ETC. MUST REMAIN OUTSIDE OF DISTRICT RIGHT-OF-WAY UNLESS OTHERWISE APPROVED BY THE DISTRICT CONSTRUCTION OBSERVER.
10. EXISTING IRRIGATION FACILITIES MUST REMAIN OPERATIONAL, AND SHALL NOT BE DISTURBED OR RENDERED INACCESSIBLE TO RID OPERATIONS AND MAINTENANCE STAFF.

ROOSEVELT IRRIGATION DISTRICT GRADING NOTES:

1. THE CONTRACTOR SHALL PROVIDE SMOOTHLY AND EVENLY GRADED FINISHED GROUND SURFACES ABOUT ALL DISTRICT FACILITIES WITHIN THE PROJECT AREA.
2. THE CONTRACTOR SHALL IMPORT ADDITIONAL FILL MATERIAL OR EXPORT EXCESS CUT MATERIAL AS REQUIRED TO PROVIDE SATISFACTORY FINISHED GRADING ABOUT DISTRICT FACILITIES AS INDICATED ON THE APPROVED PLANS OR AS DIRECTED BY THE DISTRICT CONSTRUCTION OBSERVER.
3. FINISHED GRADING SHALL BLEND SMOOTHLY INTO EXISTING GRADES.
4. FINISHED SURFACES SHALL BE GRADED TO DIRECT DRAINAGE AWAY FROM DISTRICT FACILITIES.
5. O&M ROADS SHALL BE CONSTRUCTED WITH A MINIMUM ELEVATION 6" ABOVE ADJACENT FIELDS AND A 2% CROSS SLOPE UNLESS OTHERWISE NOTED.
6. O&M ROADS ADJACENT TO CANAL PRISM SHALL BE CONSTRUCTED WITH A MINIMUM ELEVATION 6" ABOVE ADJACENT FIELDS AND A 2% CROSS SLOPE AWAY FROM CANAL PRISM AREA UNLESS OTHERWISE NOTED.

		PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT	PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE	PROJECT NUMBER: ST1306 (EN17-020)
EXPIRES 12/31/16				
ORIGINAL PLAN DATE				
LATEST REVISION DATE				
09/9/2016				
SHEET NUMBER				
2 OF 40				
PROJECT NUMBER				
ST1306				

SUMMARY OF ESTIMATED QUANTITIES

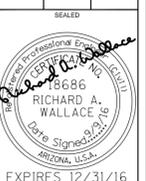
ITEM NUMBER	ITEM DESCRIPTION	UNIT	SHEET NUMBER																		TOTAL	
			10	11	12	13	14	15	16	17	19	20	22	23	24	25	32	33	34	35		36
215.01510	EARTHWORK FOR RETENTION BASINS	CY	42	277	198	78	114	38														747
301.01000	SUBGRADE PREPARATION	SY	1,235	1,640	2,487	1,598	2,262	1,870														11,093
301.02000	SUBGRADE PREPARATION (FARM ROAD)	SY	551	1,111	876																	2,538
310.03275	AGGREGATE BASE COURSE	TON	751	996	1,511	971	1,374	1,008														6,611
NPI	REMOVE EXISTING AC PAVEMENT	SY	666	1,216	1,191	1,189	1,783	1,392														7,437
317.01000	MILL EXISTING AC PAVEMENT	SY	678	1,256	1,259	1,261	767															5,221
321.01200	ASPHALTIC CONCRETE PAVEMENT (12.5 MM SURFACE COURSE HV)	TON	280	315	408	311	329	203														1,774
321.01300	ASPHALTIC CONCRETE PAVEMENT (19 MM BASE COURSE HV)	TON	202	267	406	261	369	352														1,857
329.02000	EMULSIFIED BITUMINOUS TACK COAT	TON	0.6	0.9	1.2	0.9	1.1	0.7														5.4
340.01110	6" VERTICAL CURB & GUTTER, MAG DET 220-1, TYPE A	LF	612	1,500	1,422	1,500	1,493	638														7,165
NPI	CURB OPENING, DETAIL A	EA	3	2	2	1	2	1														11
340.01130	ROLL CURB & GUTTER, MAG DET 220, TYPE C	LF	40																			40
340.01210	CONCRETE SIDEWALK, MAG DET 230 (4" THICK)	SF	330				800	2,697														3,827
340.01304	PEDESTRIAN RAMP, CITY OF PHOENIX DET P1236	EA						1														1
340.01306	PEDESTRIAN RAMP, COA DET A1255 (MOD)	EA	2		4																	6
340.01307	BIKE TRANSITION RAMP, DETAIL C	EA					1															1
340.01452	DRIVEWAY ENTRANCE, COA DET A1252 (RESIDENTIAL)	EA			1			1														2
340.01600	CONCRETE VALLEY GUTTER AND APRON	SF			970																	970
340.04225	MEDIAN NOSE TRANSITION, COA DET A1220 (MONOLITHIC CONSTRUCTION)	EA			2																	2
342.01200	BRICK PAVERS	SY																				87
345.01410	ADJUST WATER VALVE BOX AND COVER TO GRADE	EA	2		3		2	2														9
350.01124	REMOVE IRRIGATION PIPE, BACKFILL & COMPACT, D=24"	LF	27		41																	68
350.01500	REMOVE CONCRETE HEADWALL	EA	1		1																	2
350.01600	REMOVE CONCRETE IRRIGATION STRUCTURE	EA	1																			1
350.01800	REMOVE EXISTING CONCRETE CURB AND GUTTER	LF	145		120																	265
350.01810	REMOVE EXISTING CONCRETE VALLEY GUTTER AND APRON	SF	730		746																	1,476
350.01900	REMOVE EXISTING CONCRETE SIDEWALK, RAMP, DRIVEWAY AND SLAB	SF	751		548		754	904														2,957
350.04000	REMOVE AND SALVAGE TRAFFIC SIGN	EA														5	1					6
351.23000	RELOCATE GATE	EA			1																	1
351.46004	REMOVE AND SALVAGE STREET LIGHT POLE (MAST ARM AND LUMINAIRE ONLY)	EA								5	3											8
430.01005	PLANT - 3 AND 5 GAL	EA																				464
430.01053	TREE - 36 INCH BOX	EA																				38
430.30000	2" DECOMPOSED GRANITE (ALL GRADATIONS AND COLORS)	SY																				72,618
430.30001	2" DECOMPOSED GRANITE WITH PRE-EMERGENT (RETENTION BASIN)	SY	329	695	370	680	870	606														3,550
440.01101	1" SLEEVE (SCH. 40 PVC)	LF																				164
440.01104	4" SLEEVE (SCH. 40 PVC)	LF																				175
440.01106	6" SLEEVE (SCH. 40 PVC)	LF																				164
440.01109	1" BALL VALVE ASSEMBLY	EA																				2
440.01200	3/4" DRIP LATERAL PIPE (CLASS 200 PVC)	LF																				4,590
440.01201	1" MAINLINE PIPE (SCH. 40 PVC)	LF																				1,238
440.01400	IRRIGATION SOLAR CONTROLLER	EA																				1
440.03000	MULTI-OUTLET EMITTER	EA																				76
440.03001	SINGLE-OUTLET EMITTER	EA																				464
440.50001	ELECTRIC VALVE 1" (DRIP REMOTE CONTROL VALVE ASSEMBLY)	EA																				4
460.02000	REMOVE THERMOPLASTIC STRIPE	LF												7,896	9,850							17,746
461.01520	PAINT SYMBOL (BIKE LANE MARKING SET)	EA												1	1							2
461.01600	PAINT MEDIAN ISLAND	LF												3	1							4
461.02100	REMOVE THERMOPLASTIC SYMBOL (BIKE LANE & ARROW, "ONLY")	EA													1							1
462.02110	REMOVE THERMOPLASTIC ARROW (LEFT & RIGHT TURN)	EA													1	3						4
462.01100	4" WHITE THERMOPLASTIC TRAFFIC STRIPE	LF													4,529	4,070						8,599
462.01200	4" YELLOW THERMOPLASTIC TRAFFIC STRIPE	LF													2,025	1,740						3,765
462.01511	THERMOPLASTIC SYMBOL LEFT TURN ARROW	EA													2	2						4
463.01100	REFLECTORIZED RAISED PAVEMENT MARKER (TYPE D, YELLOW, 2-WAY)	EA													101	87						188
463.01200	REFLECTORIZED RAISED PAVEMENT MARKER (TYPE G, CLEAR, 1-WAY)	EA													92	88						180
463.01400	REFLECTORIZED RAISED PAVEMENT MARKER (TYPE BB, BLUE, 2-WAY)	EA													2	1						3
464.02000	PERFORATED SIGN POST	LF													35	12						47
464.02001	PERFORATED SIGN POST FOUNDATION, MCDOT DET 2058	EA													3	1						4
465.01003	FLAT SHEET ALUMINUM SIGN PANEL, DIAMOND GRADE	SF														13	24	23				60
470.00020	REMOVE AND SALVAGE TRAFFIC SIGNAL POLES AND EQUIPMENT	LS														1						1
470.00030	REMOVE FOUNDATIONS, PULL BOXES, AND CONDUCTORS	LS																				1
471.60010	STREET LIGHT JUNCTION BOX (AVONDALE DETAIL A1090)	EA								6	6											12
471.60047	NO. 7 PULL BOX	EA																				3
471.61112	SCH. 40 PVC ELECTRICAL CONDUIT, 2" W/ 1/4" NYLON PULL ROPE AND #8 BARE COPPER WIRE (TRENCH)	LF																				116
471.61212	SCH. 40 PVC ELECTRICAL CONDUIT, 2 1/2" W/ 1/4" NYLON PULL ROPE AND #8 BARE COPPER WIRE (TRENCH)	LF								900	900	105										1,905

REVISIONS
DATE
BY

JACOBS
101 NORTH 1st AVENUE, SUITE 2600
PHOENIX, ARIZONA 85003
PHONE: 1.602.253.1200 FAX: 1.602.253.1202



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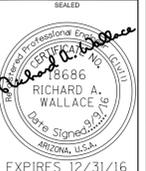
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471.61213	SCH. 40 PVC ELECTRICAL CONDUIT, 2 1/2" W/ 1/4" NYLON PULL ROPE AND #8 BARE COPPER WIRE (HORIZONTAL BORE)	LF																			200	200
471.61280	SCH. 80 PVC ELECTRICAL CONDUIT, 2 1/2" W/ 1/4" NYLON PULL ROPE AND #8 BARE COPPER WIRE (TRENCH)	LF									100	90										190
472.61500	POLE FOUNDATION, TYPE PB (PUSH BUTTON), DET 4720	EA																			1	1
472.61600	POLE FOUNDATION, TYPE GIRAFFE LIGHT POLE	EA																			1	1
477.71840	LED STREET LIGHT (POLE, MAST ARM, LUMINAIRE, AND PHOTOCELL) AND FOUNDATION COMPLETE	EA									6	6										12
505.06504	CONCRETE SCUPPER & SPILLWAY, COA DET A1510, S/W=5', CURB OPENING=4'	EA						1														1
505.30100	REINFORCED CONCRETE BOX CULVERT EXTENSION AND HEADWALL, SRP DESIGN (IRRIGATION)	LS								1												1
523.10124	CONCRETE HEADWALL, MAG DET 501, STRAIGHT TYPE, 24" PIPE	EA	1		2																	3
523.11124	CONCRETE HEADWALL, MAG DET 501, 'L' TYPE, 24" PIPE	EA	1																			1
523.20024	CONCRETE TRASH RACK, SRP DET, 24" PIPE	EA	1																			1
523.71196	CONCRETE HEADWALL, ADOT BOX CULVERT DET 6.08-1, 6.08-3 (FOR SRP CANAL)	EA							1													1
610.10540	NEW WATER SERVICE	EA			1																	1
615.04008	8" PVC SANITARY SEWER SDR 35 W/FITTINGS COMPLETE IN PLACE	LF	98					15	41													154
618.20324	24" RGRCP, CLASS III	LF	80		32																	112
625.01101	SRP MANHOLE W/BASE, FRAME AND COVER, PER SRP DET	EA	1																			1
635.04000	EARTHEN IRRIGATION DITCH WITH 2-FOOT BOTTOM, MAG DET 520	LF	211	500	484	500	500	216														2,411
757.40002	BACKFLOW PREVENTION DEVICE SMALLER THAN 3" (WITH CONCRETE PAD AND CAGE)	EA																				1

REVISIONS
DATE
BY

JACOBS
101 NORTH 1st AVENUE, SUITE 2600
PHOENIX, ARIZONA 85003
PHONE: 1.602.253.1200 FAX: 1.602.253.1202

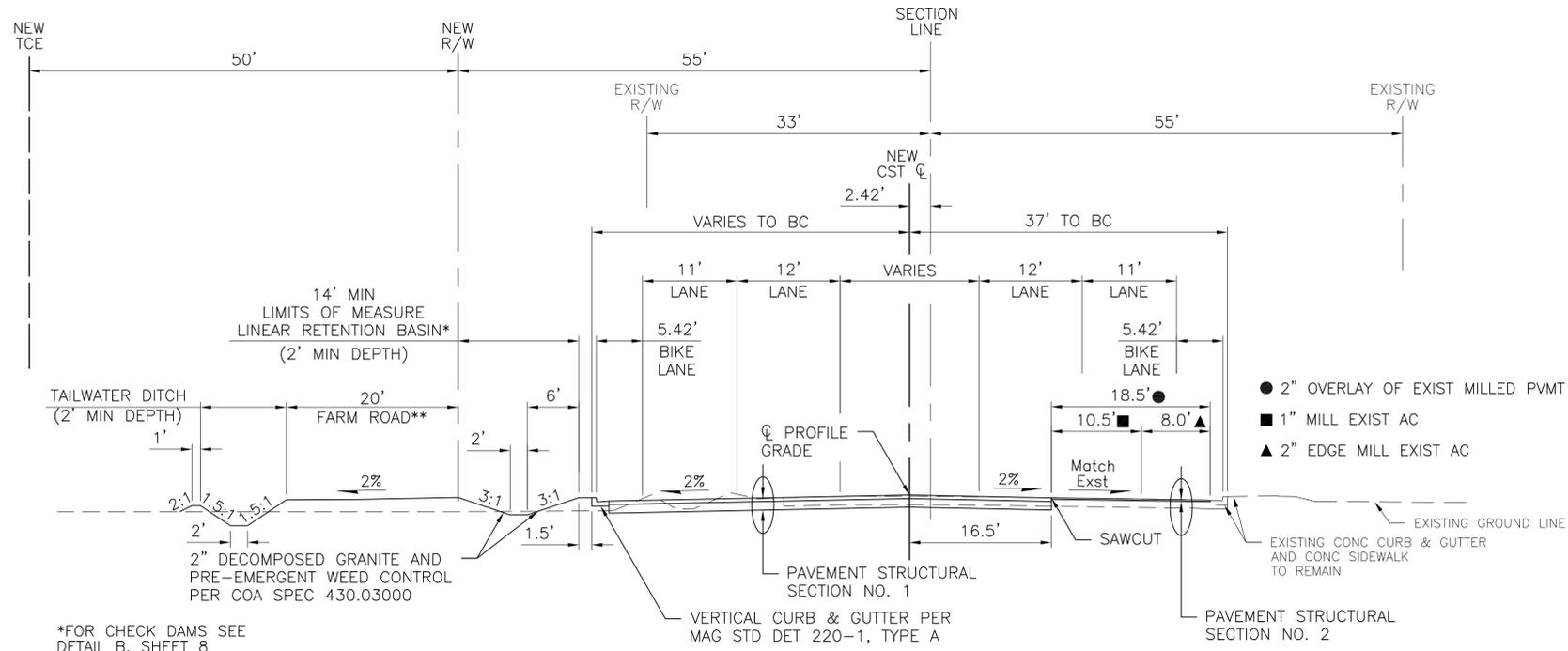


PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT
PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
PROJECT NUMBER: ST1306 (EN17-020)



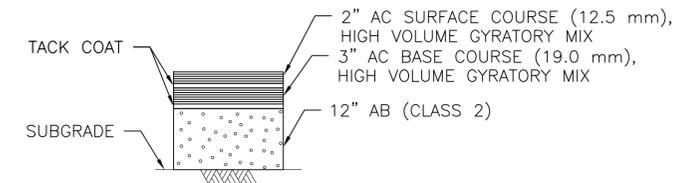
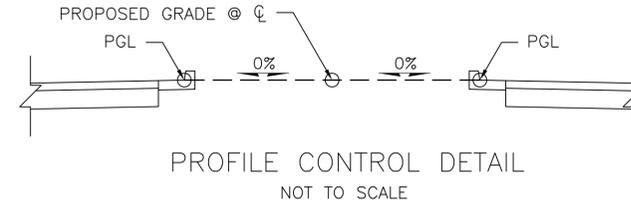
SEALING DATE: 09/9/2016
LATEST REVISION DATE: 09/9/2016
SHEET NUMBER: 4 OF 40
PROJECT NUMBER: ST1306



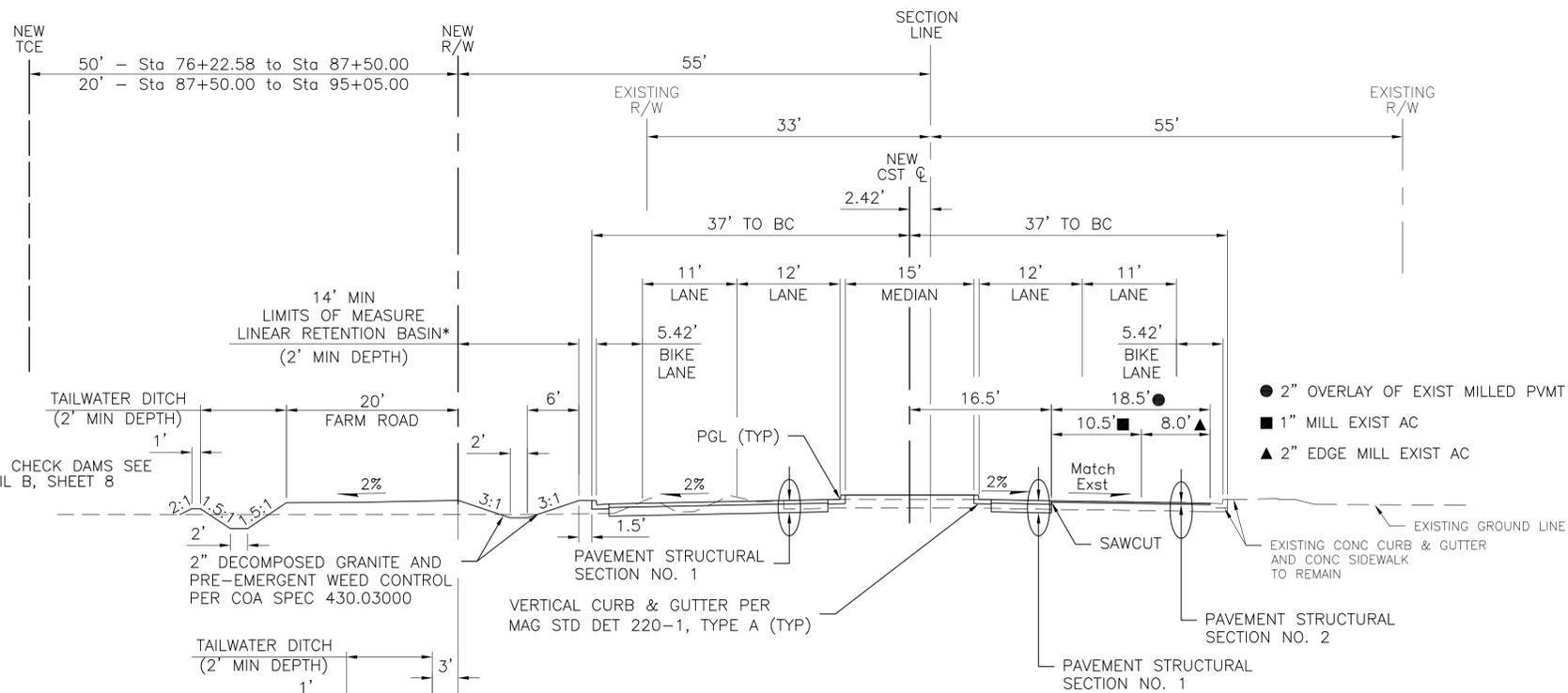


THOMAS ROAD
TYPICAL SECTION
STA 74+38.49 to STA 76+22.58

*FOR CHECK DAMS SEE
DETAIL B, SHEET 8
**STA 74+38.49 TO
STA 76+61.93 SEE PLANS
FOR FARM ROAD ELEVATIONS

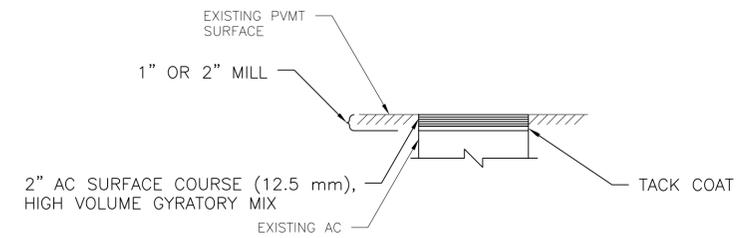


TOTAL THICKNESS = 17"
SECTION NO. 1
REMOVE & REPLACE

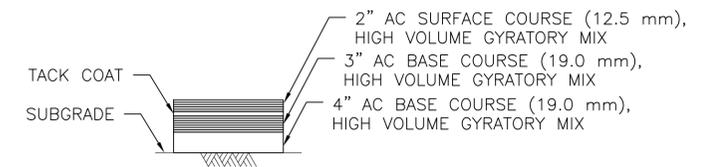


THOMAS ROAD
TYPICAL SECTION
STA 76+22.58 to STA 95+05.00

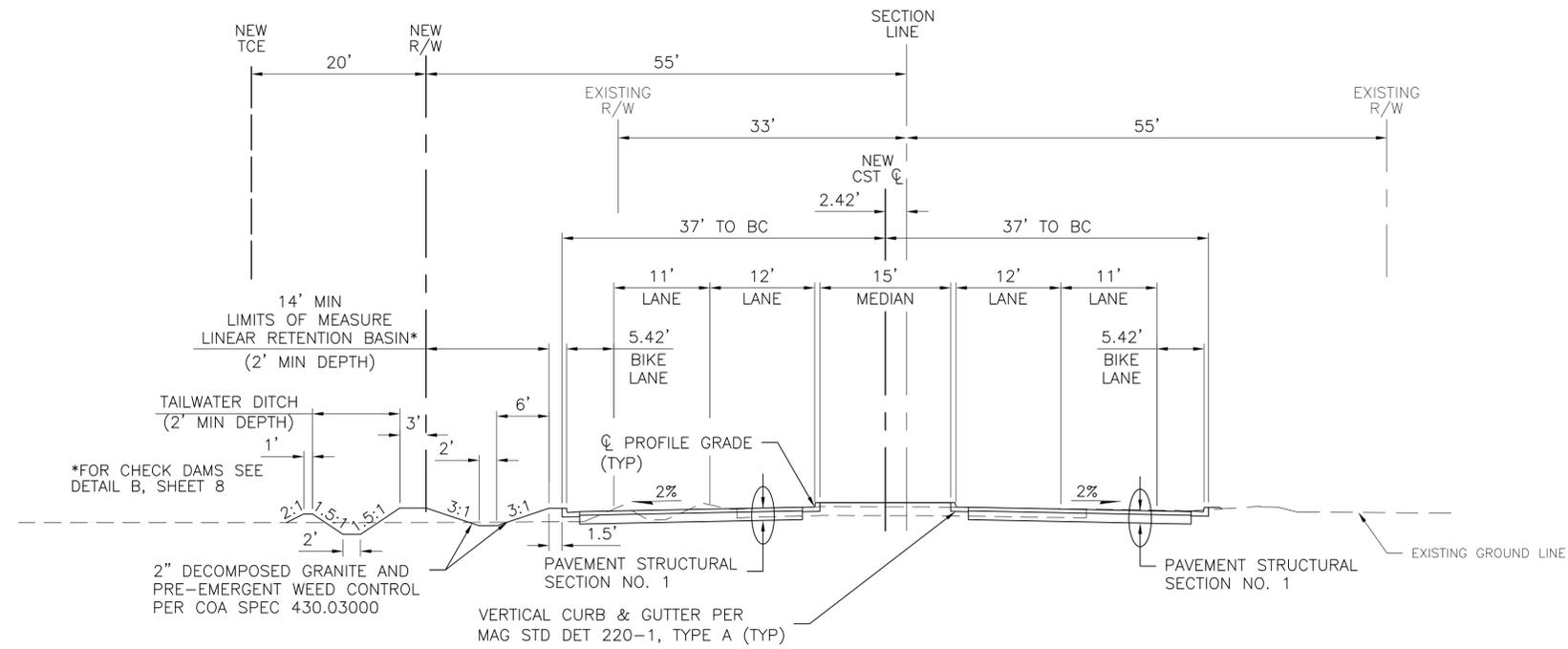
*FOR CHECK DAMS SEE
DETAIL B, SHEET 8



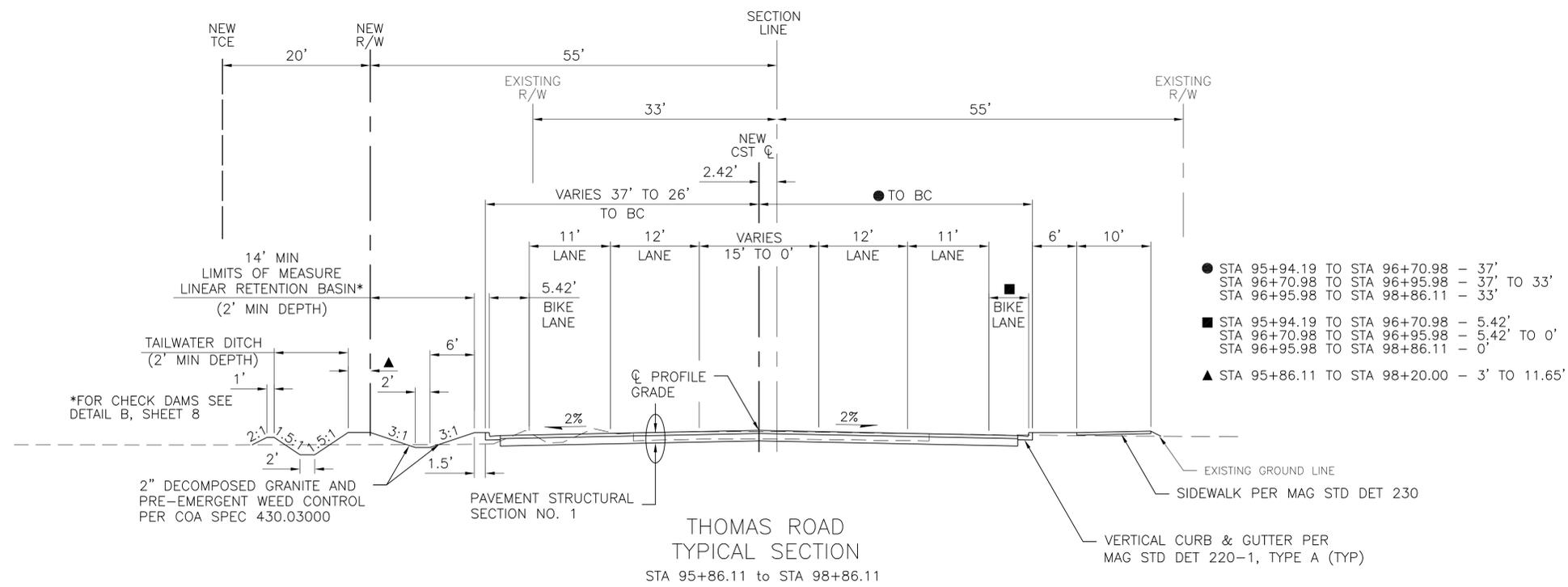
TOTAL THICKNESS = 2"
SECTION NO. 2
MILL & OVERLAY



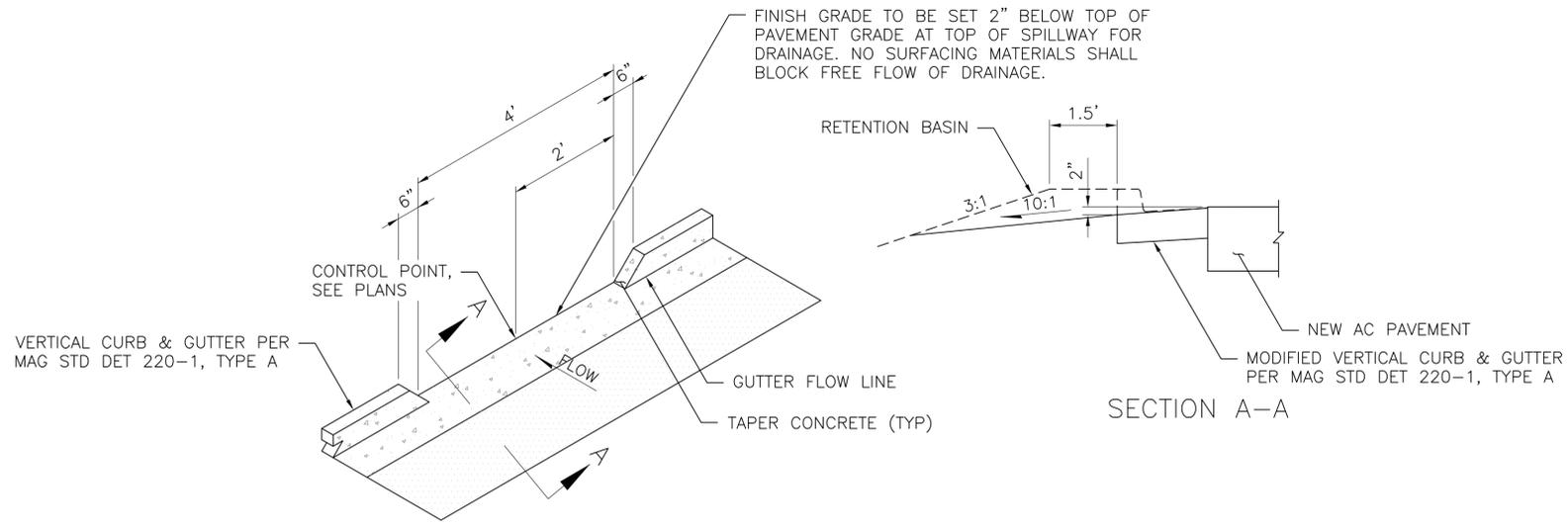
TOTAL THICKNESS = 9"
SECTION NO. 3
SHALLOW COVER
(OVER EXIST SRP BOX CULVERT)
STA 99+60.00 to STA 99+90.00



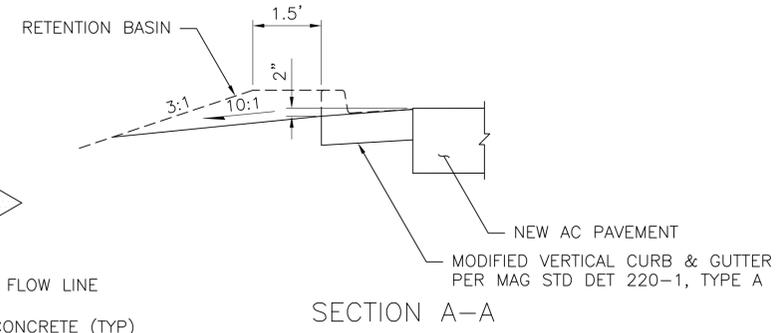
THOMAS ROAD
TYPICAL SECTION
STA 95+05.00 to STA 95+86.11



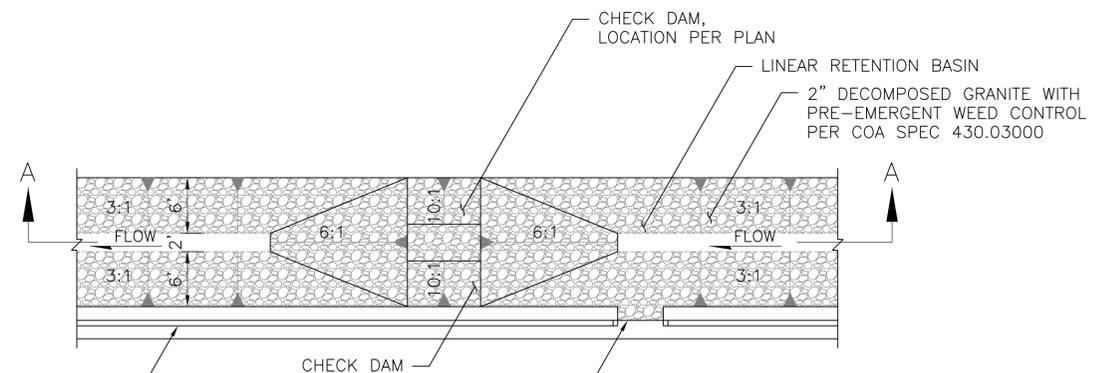
THOMAS ROAD
TYPICAL SECTION
STA 95+86.11 to STA 98+86.11



DETAIL A

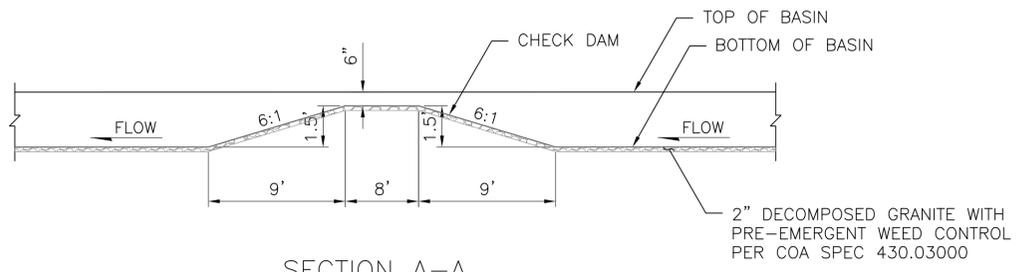


SECTION A-A



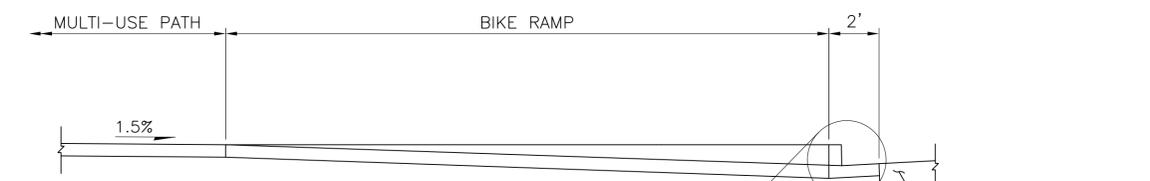
CHECK DAM PLAN VIEW

VERTICAL CURB & GUTTER PER MAG STD DET 220-1, TYPE A

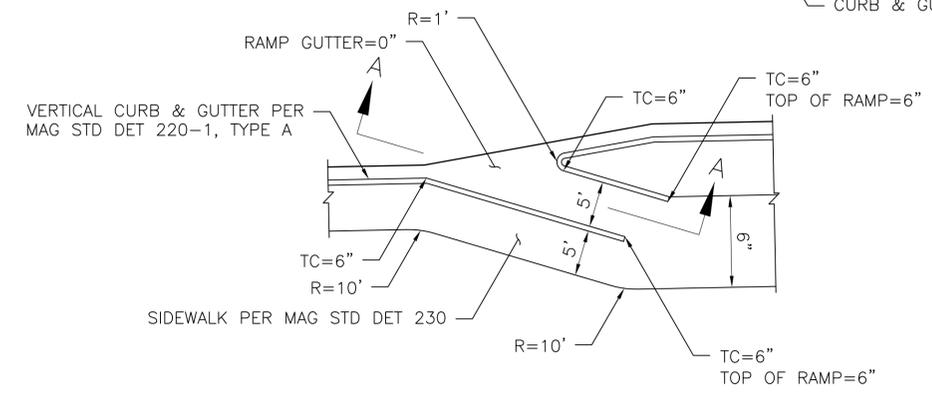


SECTION A-A

DETAIL B



SECTION A-A



BIKE TRANSITION RAMP
DETAIL C

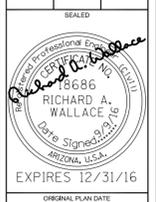


REVISION	DATE	BY	CHKD

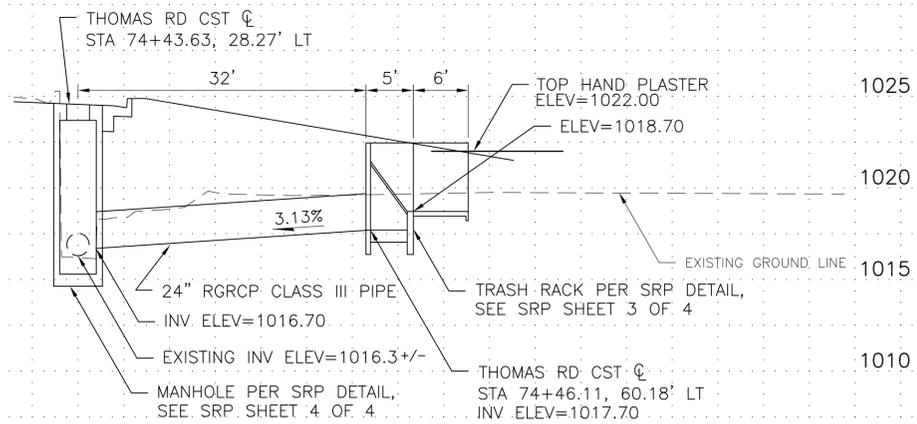
JACOBS
101 NORTH 1st AVENUE, SUITE 2600
PHOENIX, ARIZONA 85003
PHONE: 1.602.253.1200 FAX: 1.602.253.1202



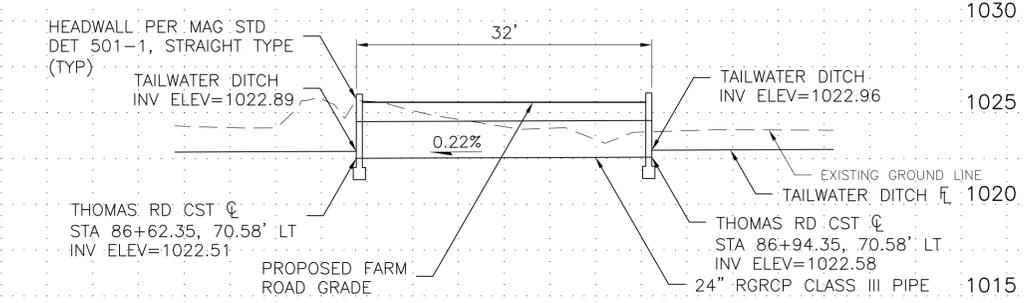
CAPITAL IMPROVEMENT PROJECT
THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
ST1306 (EN17-020)



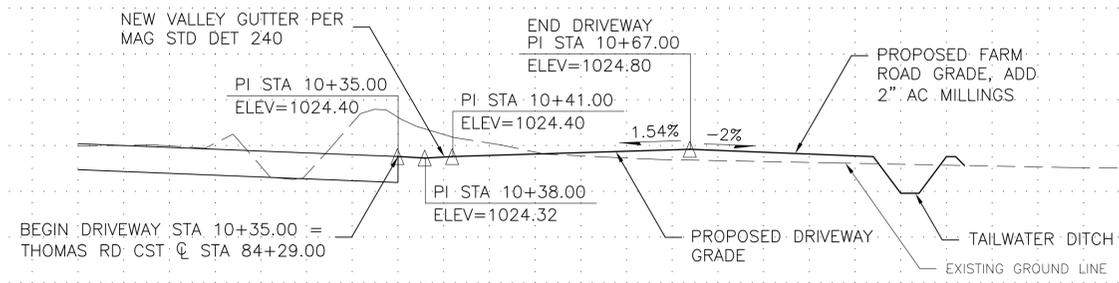
LATEST REVISION DATE
09/9/2016
SHEET NUMBER
8 OF 40
PROJECT NUMBER
ST1306



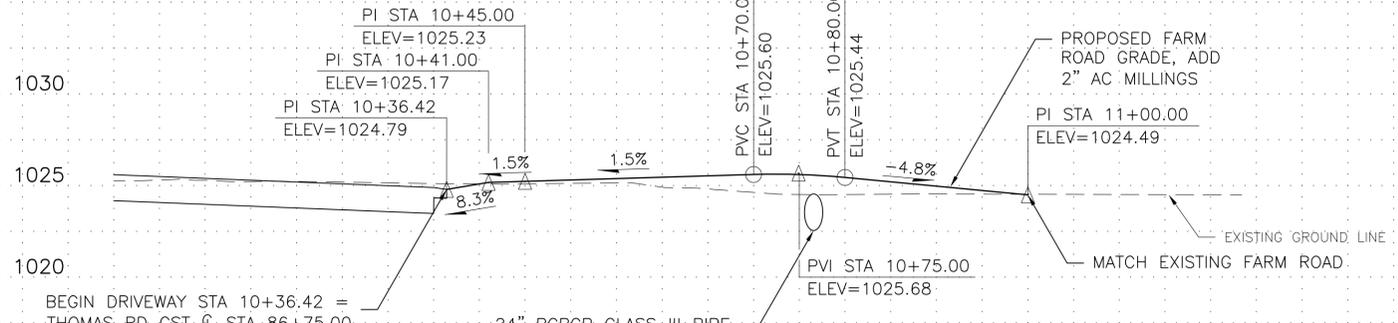
PIPE DETAIL
STA 74+44



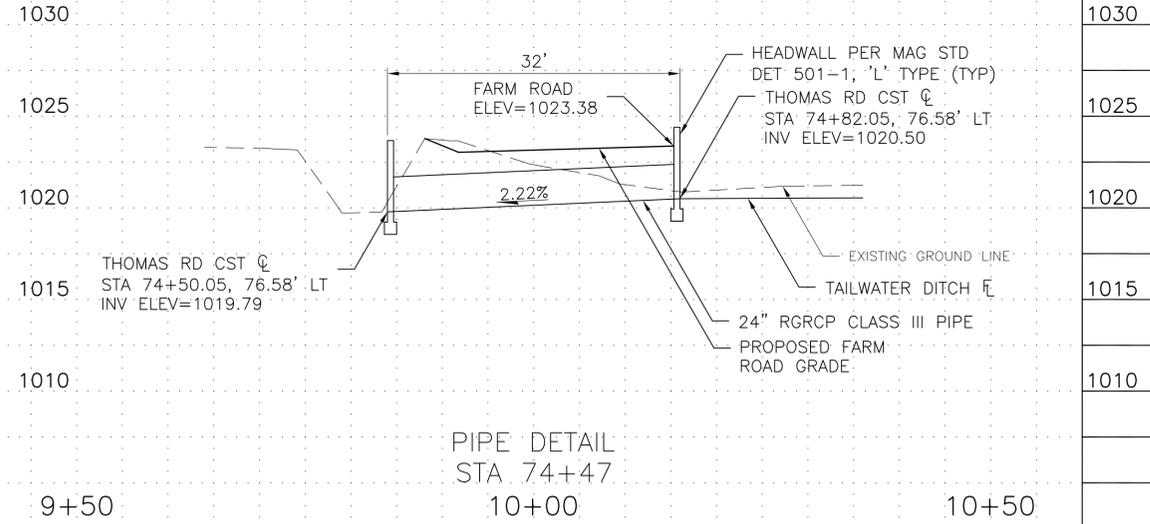
DRIVEWAY PIPE DETAIL
STA 86+75



FARM ROAD DRIVEWAY PROFILE
(LOOKING WEST)
STA 84+29



FARM ROAD DRIVEWAY PROFILE
(LOOKING WEST)
STA 86+75



PIPE DETAIL
STA 74+47

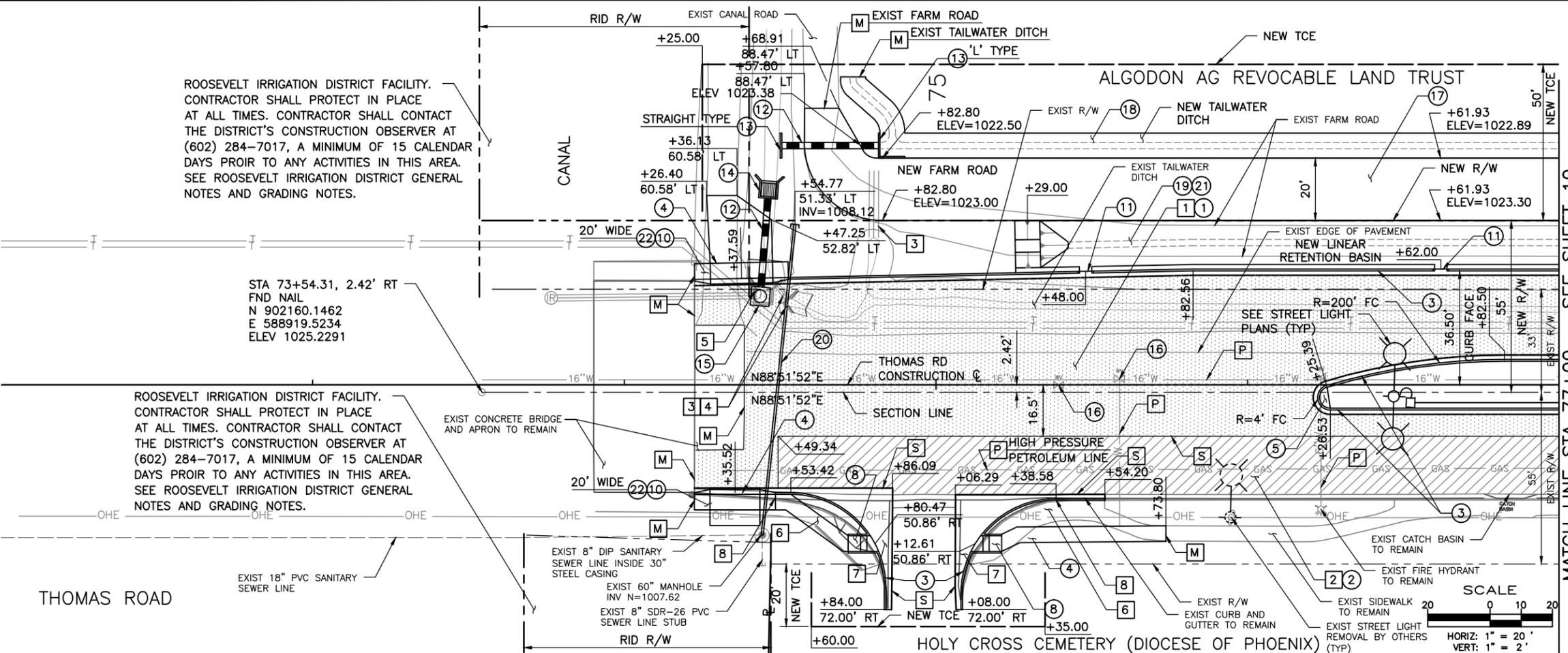
 101 NORTH 1st AVENUE, SUITE 2600 PHOENIX, ARIZONA 85003 PHONE: 1.602.253.1200 FAX: 1.602.253.1202	
PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE PROJECT NUMBER: ST1306 (EN17-020)	
ORIGINAL PLAN DATE: _____ LATEST REVISION DATE: _____ SHEET NUMBER: 9 OF 40 PROJECT NUMBER: ST1306	



ROOSEVELT IRRIGATION DISTRICT FACILITY. CONTRACTOR SHALL PROTECT IN PLACE AT ALL TIMES. CONTRACTOR SHALL CONTACT THE DISTRICT'S CONSTRUCTION OBSERVER AT (602) 284-7017, A MINIMUM OF 15 CALENDAR DAYS PRIOR TO ANY ACTIVITIES IN THIS AREA. SEE ROOSEVELT IRRIGATION DISTRICT GENERAL NOTES AND GRADING NOTES.

ROOSEVELT IRRIGATION DISTRICT FACILITY. CONTRACTOR SHALL PROTECT IN PLACE AT ALL TIMES. CONTRACTOR SHALL CONTACT THE DISTRICT'S CONSTRUCTION OBSERVER AT (602) 284-7017, A MINIMUM OF 15 CALENDAR DAYS PRIOR TO ANY ACTIVITIES IN THIS AREA. SEE ROOSEVELT IRRIGATION DISTRICT GENERAL NOTES AND GRADING NOTES.

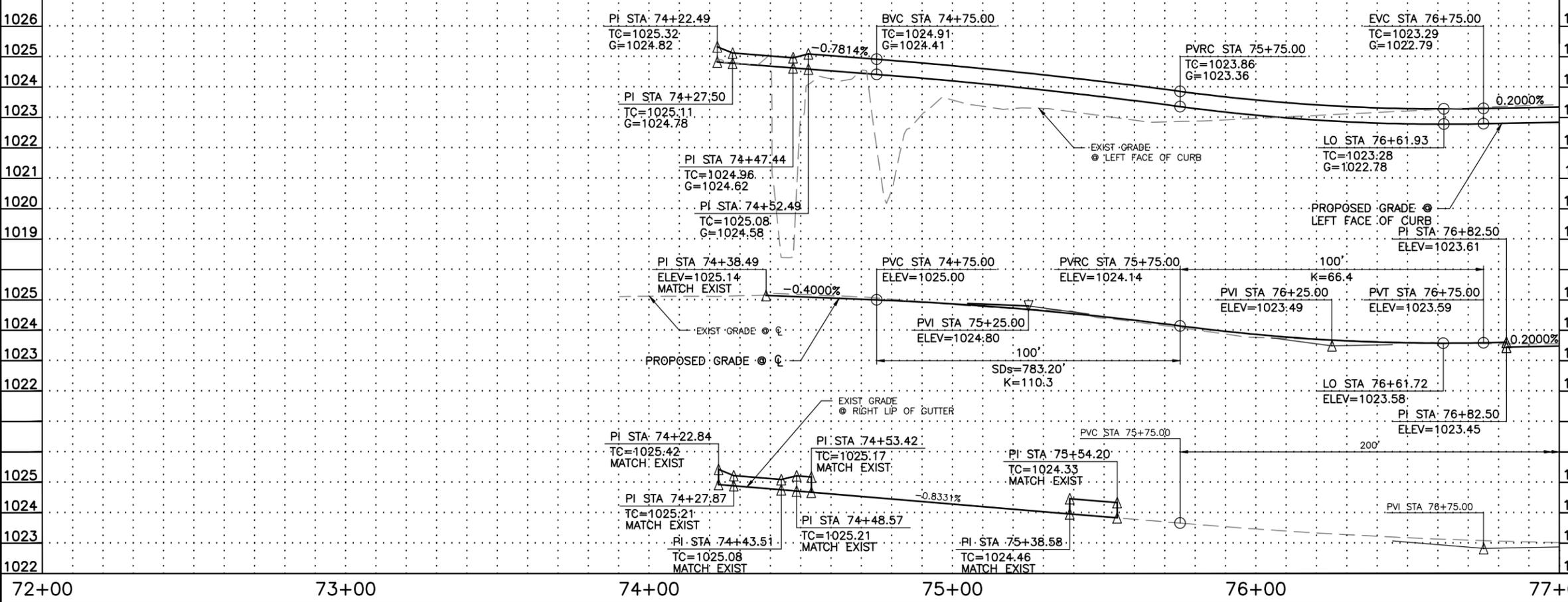
STA 73+54.31, 2.42' RT
FND NAIL
N 902160.1462
E 588919.5234
ELEV 1025.2291



MATCH LINE STA 77+00 - SEE SHEET 10

REMOVAL/RELOCATION NOTES		
NO.	DESCRIPTION	AMOUNT
1	REMOVE EXISTING AC PAVEMENT	666 SY
2	MILL EXISTING AC PAVEMENT	678 SY
3	REMOVE EXISTING IRRIGATION PIPE	27 LF
4	REMOVE EXISTING HEADWALL	1 EA
5	REMOVE EXISTING IRRIGATION STRUCTURE	1 EA
6	REMOVE EXISTING SIDEWALK	751 SF
7	REMOVE EXISTING VALLEY GUTTER APRON	730 SF
8	REMOVE EXISTING CURB & GUTTER	145 SF
P	PROTECT IN PLACE	
M	MATCH EXIST	
S	SAWCUT	

CONSTRUCTION NOTES		
NO.	DESCRIPTION	AMOUNT
1	NEW PAVEMENT PER TYPICAL SECTION NO. 1 AC SURFACE COURSE, (12.5 mm) AC BASE COURSE, (19.0 mm) AGGREGATE BASE COURSE BITUMINOUS TACK COAT SUBGRADE PREPARATION	134 TON 202 TON 751 TON 0.4 TON 1,235 SY
2	NEW PAVEMENT PER TYPICAL SECTION NO. 2 AC SURFACE COURSE, (12.5 mm) BITUMINOUS TACK COAT	74 TON 0.2 TON
3	CONSTRUCT VERTICAL CURB & GUTTER PER MAG STD DET 220-1, TYPE A	612 LF
4	CONSTRUCT SIDEWALK PER MAG STD DET 230	330 SF
5	INSTALL MEDIAN CONCRETE PAVERS PER CITY OF AVONDALE STD DET A1221, SEE LANDSCAPE PLANS	
6	CONSTRUCT SIDEWALK RAMP PER CITY OF AVONDALE STD DET A1255 MOD, R=30' BC	2 EA
7	ROLL CURB MAG STD DET 220-1, TYPE C	40 LF
8	CONSTRUCT CURB OPENING PER DETAIL A, SHEET 8	2 EA
9	INSTALL 24" RGRCP CLASS III PIPE, SEE PIPE PROFILES SHEET 9	64 LF
10	CONSTRUCT HEADWALL PER MAG STD DET 501-1, TYPE PER PLAN	2 EA
11	CONSTRUCT TRASH RACK PER SRP DETAIL, SEE SRP SHEET 3 OF 4	1 EA
12	CONSTRUCT MANHOLE PER SRP DETAIL, SEE SRP SHEET 4 OF 4	1 EA
13	ADJUST VALVE PER CITY OF AVONDALE STD DET A1310	2 EA
14	CONSTRUCT FARM ROAD PER TYPICAL SECTIONS, SHEETS 5 & 6	551 SY
15	CONSTRUCT TAILWATER DITCH PER TYPICAL SECTION, SHEETS 5 & 6	211 LF
16	CONSTRUCT LINEAR RETENTION BASIN PER TYPICAL SECTIONS, SHEETS 5 & 6	31 CY
17	INSTALL 8" SDR-35 PVC SEWER LINE STUB FROM MANHOLE, MAINTAIN 3' MINIMUM COVER	98 LF
18	INSTALL 2" DECOMPOSED GRANITE (RETENTION BASIN)	290 SY
19	CURB TRANSITION MAG STD DET 221, 4 EA	20 LF



MATCH LINE STA 77+00 - SEE SHEET 10

101 NORTH 1st AVENUE, SUITE 2600
PHOENIX, ARIZONA 85003
PHONE: 1-800-253-1200 FAX: 1-602-253-1202

CAPITAL IMPROVEMENT PROJECT
 THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
 PROJECT NUMBER: ST1306 (EN17-020)

EXPIRES 12/31/16

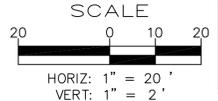
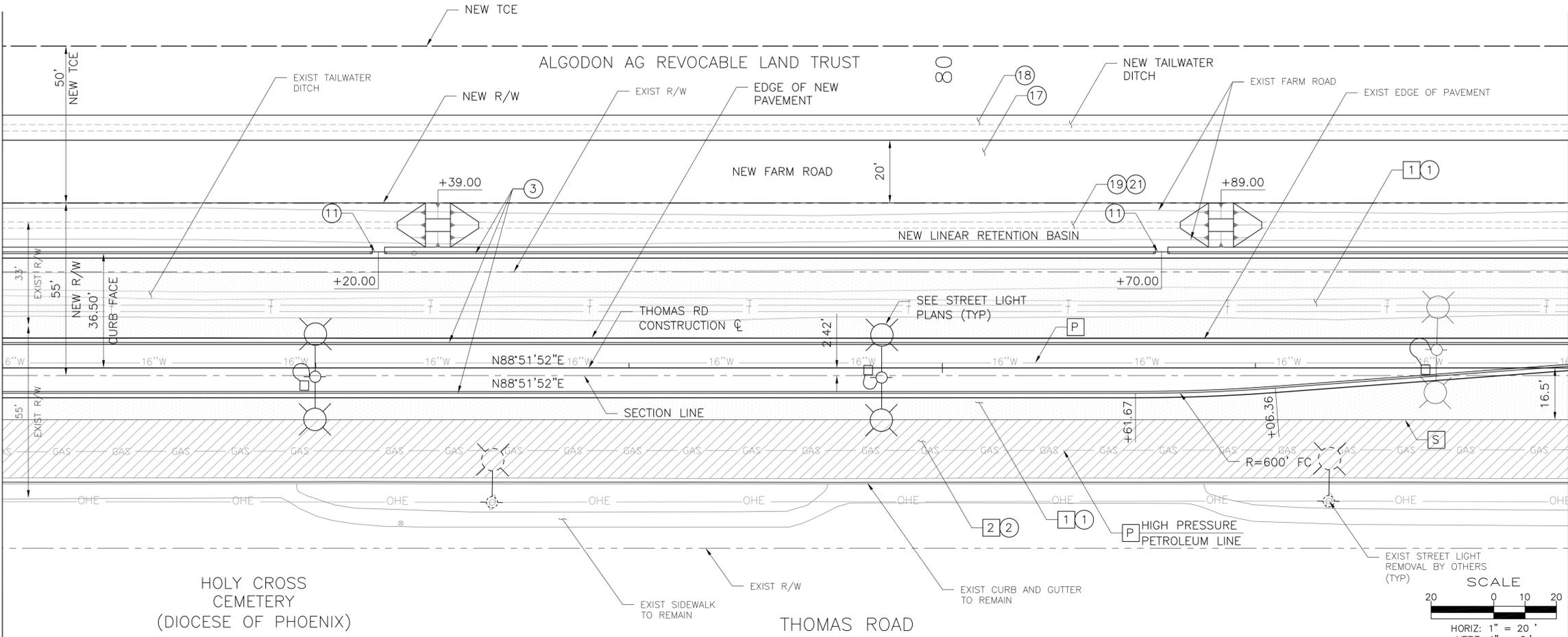
DATE: 09/9/2016

SHEET NUMBER: 10 OF 40

PROJECT NUMBER: ST1306

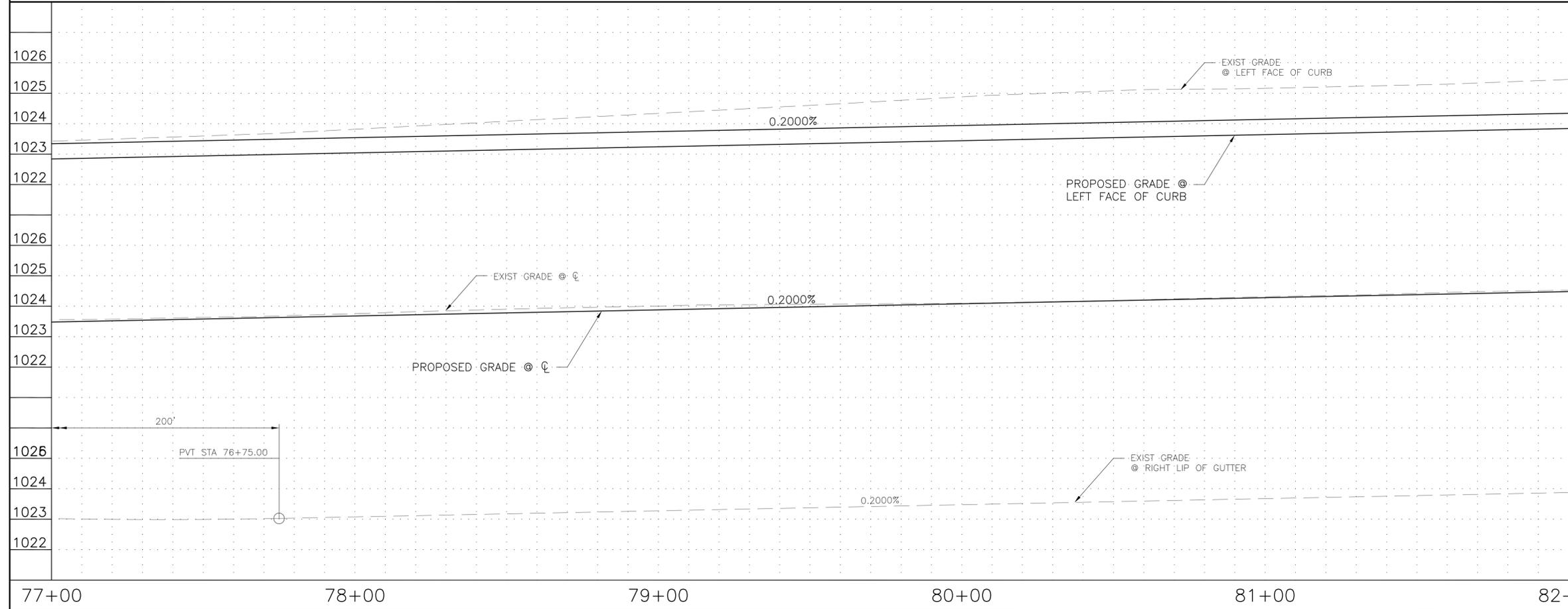
MATCH LINE STA 77+00 - SEE SHEET 9

MATCH LINE STA 82+00 - SEE SHEET 11



REMOVAL/RELOCATION NOTES		
NO.	DESCRIPTION	
1	REMOVE EXISTING AC PAVEMENT	1,216 SY
2	MILL EXISTING AC PAVEMENT	1,256 SY

CONSTRUCTION NOTES		
NO.	DESCRIPTION	
1	NEW PAVEMENT PER TYPICAL SECTION NO. 1 AC SURFACE COURSE, (12.5 mm) 178 TON AC BASE COURSE, (19.0 mm) 267 TON AGGREGATE BASE COURSE 996 TON BITUMINOUS TACK COAT 0.5 TON SUBGRADE PREPARATION 1,640 SY	
2	NEW PAVEMENT PER TYPICAL SECTION NO. 2 AC SURFACE COURSE, (12.5 mm) 137 TON BITUMINOUS TACK COAT 0.4 TON	
3	CONSTRUCT VERTICAL CURB & GUTTER PER MAG STD DET 220-1, TYPE A	1,500 LF
11	CONSTRUCT CURB OPENING PER DETAIL A, SHEET 8	2 EA
17	CONSTRUCT FARM ROAD PER TYPICAL SECTION, SHEETS 5 & 6	1,111 SY
18	CONSTRUCT TAILWATER DITCH PER TYPICAL SECTION, SHEETS 5 & 6	500 LF
19	CONSTRUCT LINEAR RETENTION BASIN PER TYPICAL SECTIONS, SHEETS 5 & 6	277 CY
21	INSTALL 2" DECOMPOSED GRANITE (RETENTION BASIN)	695 SY



101 NORTH 1st AVENUE, SUITE 2600
 PHOENIX, ARIZONA 85003
 PHONE: 1.602.253.1200 FAX: 1.602.253.1202

PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT
 PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
 PROJECT NUMBER: ST1306 (EN17-020)

SEALED

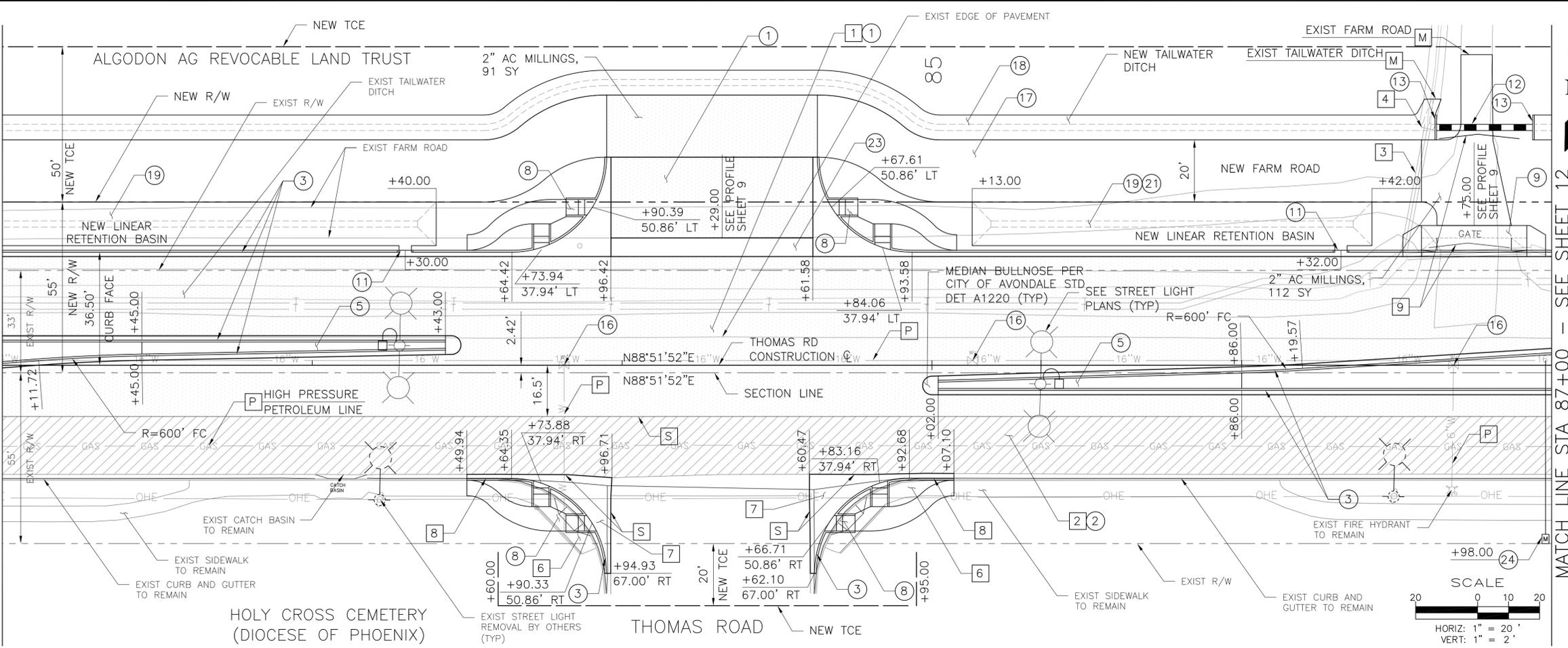
 RICHARD A. WALLACE
 License No. 18686
 ARIZONA, U.S.A.
 EXPIRES 12/31/16
 ORIGINAL PLAN DATE

LATEST REVISION DATE: 09/9/2016
 SHEET NUMBER: 11 OF 40
 PROJECT NUMBER: ST1306

Call at least two full working days before any digging operations.
 ARIZONA 811
 1-800-878-8111 (TOLL FREE)
 In Maricopa County: (602) 263-1100

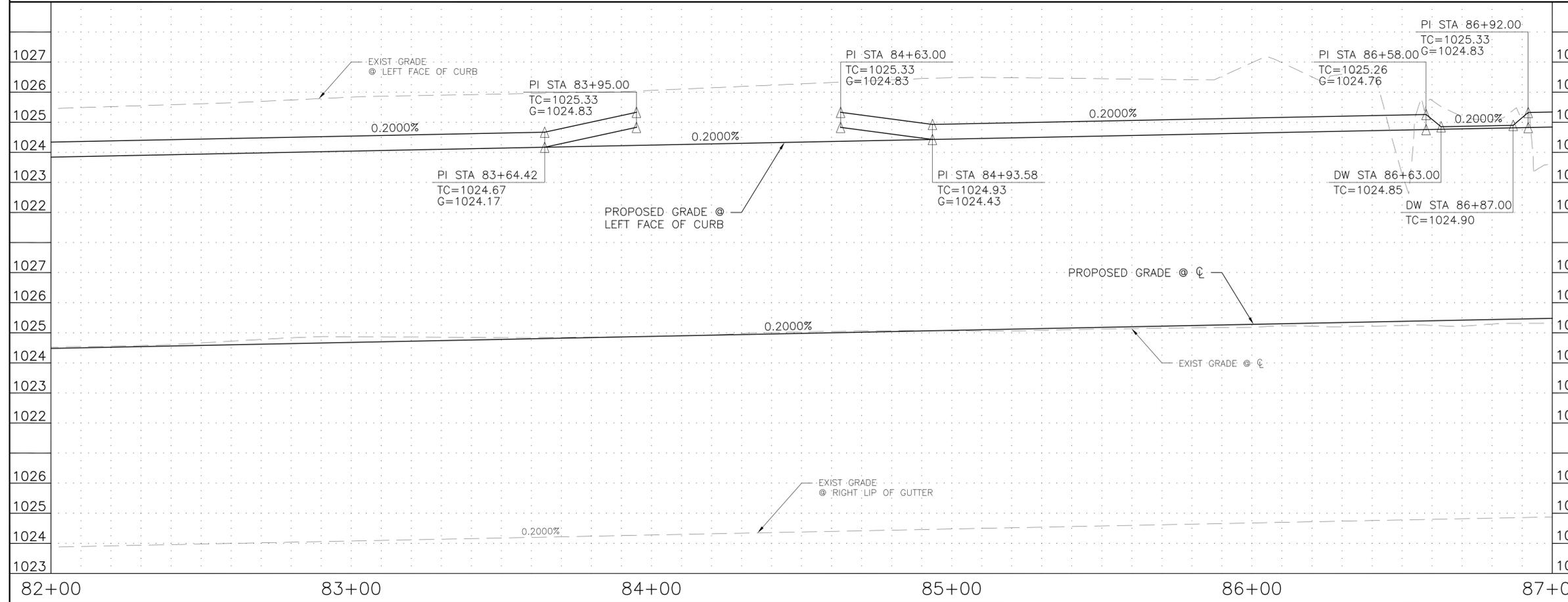
MATCH LINE STA 82+00 - SEE SHEET 10

MATCH LINE STA 87+00 - SEE SHEET 12



REMOVAL/RELOCATION NOTES		
NO.	DESCRIPTION	QUANTITY
1	REMOVE EXISTING AC PAVEMENT	1,191 SY
2	MILL EXISTING AC PAVEMENT	1,259 SY
3	REMOVE EXISTING STORM DRAIN PIPE	41 LF
4	REMOVE EXISTING HEADWALL	1 EA
6	REMOVE EXISTING SIDEWALK	548 SF
7	REMOVE EXISTING VALLEY GUTTER APRON	746 SF
8	REMOVE EXISTING CURB & GUTTER	120 LF
9	RELOCATE EXISTING GATE TO NORTH	1 EA
P	PROTECT IN PLACE	
M	MATCH EXIST	
S	SAWCUT	

CONSTRUCTION NOTES		
NO.	DESCRIPTION	QUANTITY
1	NEW PAVEMENT PER TYPICAL SECTION NO. 1 AC SURFACE COURSE, (12.5 mm) 271 TON AC BASE COURSE, (19.0 mm) 406 TON AGGREGATE BASE COURSE 1,511 TON BITUMINOUS TACK COAT 0.8 TON SUBGRADE PREPARATION 2,487 SY	
2	NEW PAVEMENT PER TYPICAL SECTION NO. 2 AC SURFACE COURSE, (12.5 mm) 137 TON BITUMINOUS TACK COAT 0.4 TON	
3	CONSTRUCT VERTICAL CURB & GUTTER PER MAG STD DET 220-1, TYPE A	1,422 LF
5	INSTALL MEDIAN CONCRETE PAVERS PER CITY OF AVONDALE STD DET A1221, SEE LANDSCAPE PLANS	
8	CONSTRUCT SIDEWALK RAMP PER CITY OF AVONDALE STD DET A1255 MOD, R=30' BC	4 EA
9	CONSTRUCT DRIVEWAY PER CITY OF AVONDALE STD DET A1252 (34' WIDE), SEE DRIVEWAY PROFILE SHEET 9	1 EA
11	CONSTRUCT CURB OPENING PER DETAIL A, SHEET 8	2 EA
12	INSTALL 24" RGRCP CLASS III PIPE, SEE PIPE PROFILE SHEET 9	32 LF
13	CONSTRUCT HEADWALL PER MAG STD DET 501-1, STRAIGHT TYPE	2 EA
16	ADJUST VALVE PER CITY OF AVONDALE STD DET A1310	3 EA
17	CONSTRUCT FARM ROAD PER TYPICAL SECTION, SHEETS 5 & 6	876 SY
18	CONSTRUCT TAILWATER DITCH PER TYPICAL SECTION, SHEETS 5 & 6	484 LF
19	CONSTRUCT LINEAR RETENTION BASIN PER TYPICAL SECTIONS, SHEETS 5 & 6	198 CY
21	INSTALL 2" DECOMPOSED GRANITE (RETENTION BASIN)	370 SY
23	CONSTRUCT VALLEY GUTTER PER MAG STD DET 240	970 SF
24	INSTALL 1" WATER SERVICE CONNECTION PER CITY OF AVONDALE STD DET A1300	1 EA



JACOBS
101 NORTH 1st AVENUE, SUITE 2600
PHOENIX, ARIZONA 85003
PHONE: 1.602.253.1200 FAX: 1.602.253.1202

Avondale

CAPITAL IMPROVEMENT PROJECT
THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
PROJECT NUMBER: ST1306 (EN17-020)

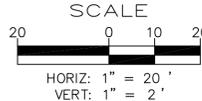
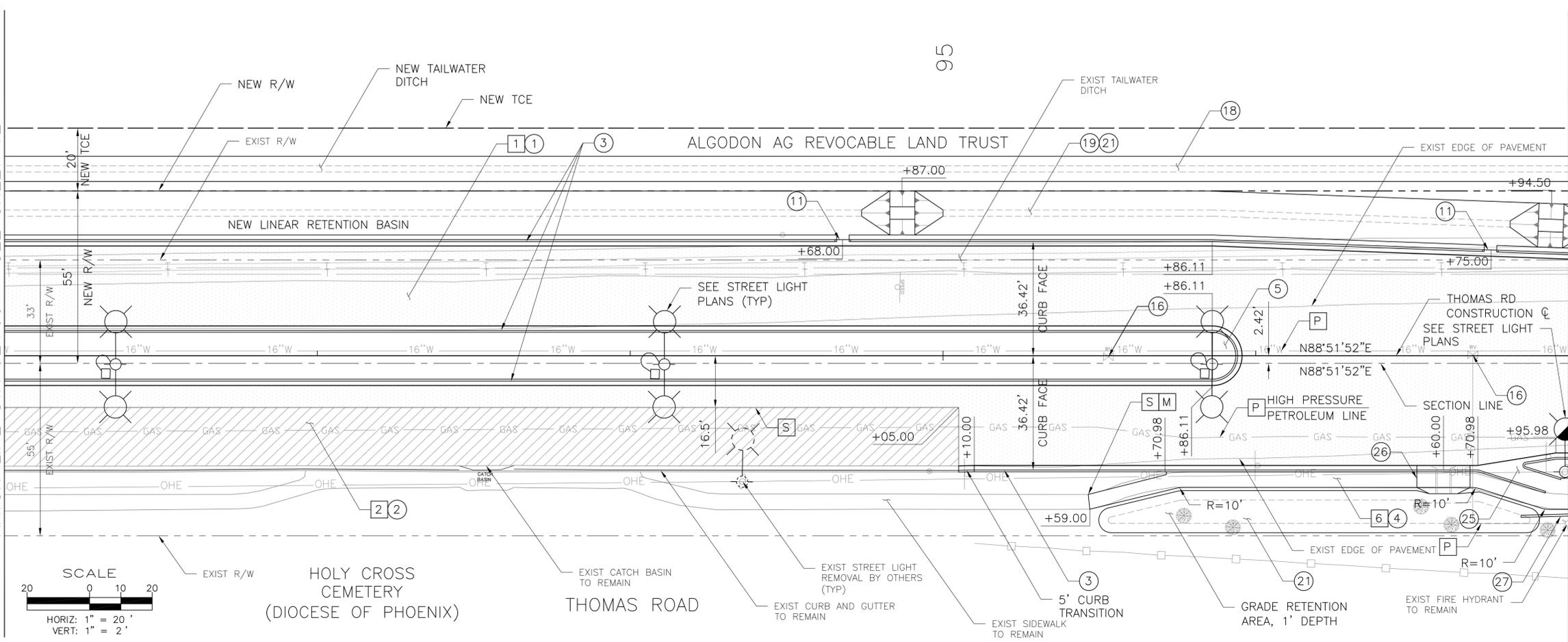
SEAL: [Signature]
RICHARD A. WALLACE
REGISTERED PROFESSIONAL ENGINEER
ARIZONA, U.S.A.
EXPIRES 12/31/16
ORIGINAL PLAN DATE

LATEST REVISION DATE: 09/9/2016
SHEET NUMBER: 12 OF 40
PROJECT NUMBER: ST1306

Call at least two full working days before any height adjustments.
ARIZONA811
Dig 811 or 1-800-878-2267 (TODAY)
In Maricopa County: (602) 253-1100

MATCH LINE STA 92+00 - SEE SHEET 12

MATCH LINE STA 97+00 - SEE SHEET 14

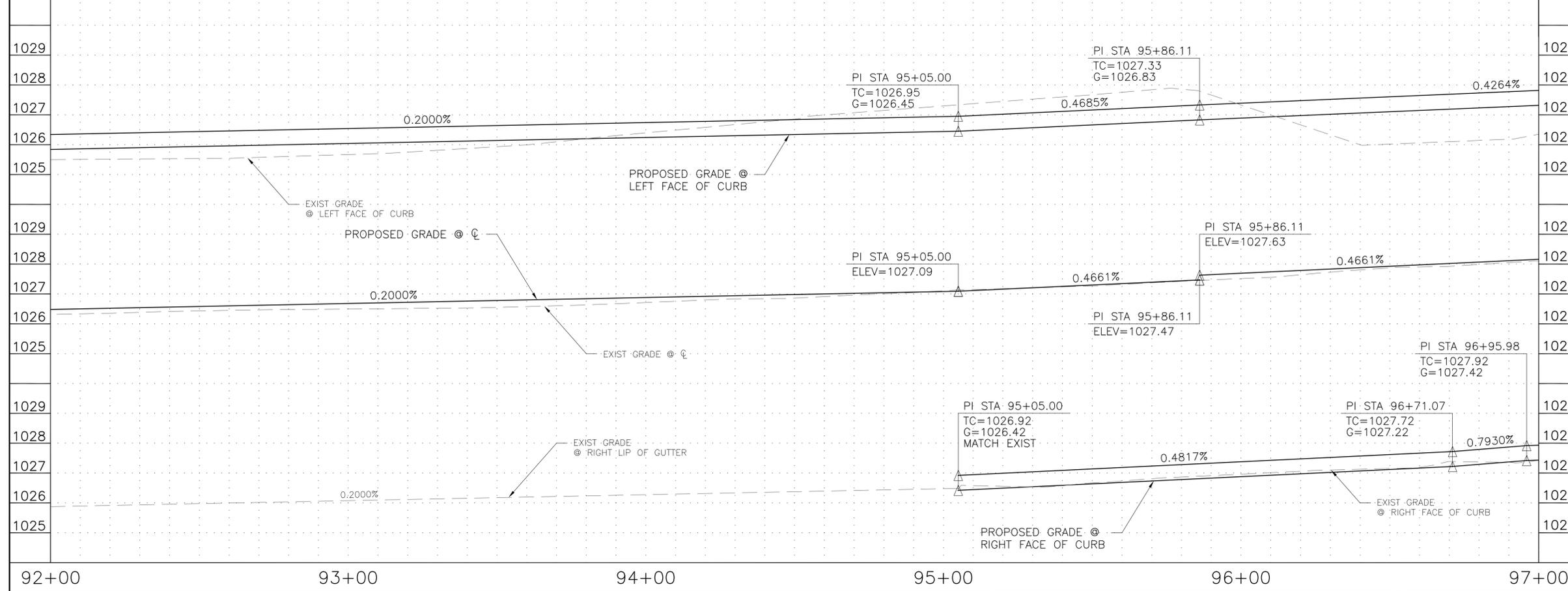


HOLY CROSS CEMETERY (DIOCESE OF PHOENIX)

THOMAS ROAD

REMOVAL/RELOCATION NOTES		
NO.	DESCRIPTION	
1	REMOVE EXISTING AC PAVEMENT	1,783 SY
2	MILL EXISTING AC PAVEMENT	767 SY
6	REMOVE EXISTING SIDEWALK	754 SF

CONSTRUCTION NOTES		
NO.	DESCRIPTION	
1	NEW PAVEMENT PER TYPICAL SECTION NO. 1 AC SURFACE COURSE, (12.5 mm) 246 TON AC BASE COURSE, (19.0 mm) 369 TON AGGREGATE BASE COURSE 1,374 TON BITUMINOUS TACK COAT 0.8 TON SUBGRADE PREPARATION 2,262 SY	
2	NEW PAVEMENT PER TYPICAL SECTION NO. 2 AC SURFACE COURSE, (12.5 mm) 83 TON BITUMINOUS TACK COAT 0.3 TON	
3	CONSTRUCT VERTICAL CURB & GUTTER PER MAG STD DET 220-1, TYPE A	1,493 LF
4	CONSTRUCT SIDEWALK PER MAG STD DET 230	800 SF
5	INSTALL MEDIAN CONCRETE PAVERS PER CITY OF AVONDALE STD DET A1221, SEE LANDSCAPE PLANS	
11	CONSTRUCT CURB OPENING PER DETAIL A, SHEET 8	2 EA
16	ADJUST VALVE PER CITY OF AVONDALE STD DET A1310	2 EA
18	CONSTRUCT TAILWATER DITCH PER TYPICAL SECTION, SHEETS 5 & 6	500 LF
19	CONSTRUCT LINEAR RETENTION BASIN PER TYPICAL SECTIONS, SHEETS 5 & 6	114 CY
21	INSTALL 2" DECOMPOSED GRANITE (RETENTION BASIN)	870 SY
25	CONSTRUCT BIKE TRANSITION RAMP, DETAIL C, SHEET 8	1 EA
26	CONSTRUCT SCUPPER PER CITY OF AVONDALE STD DET A1510	1 EA
27	INSTALL 8" PVC PIPE	15 LF

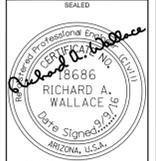


92+00 93+00 94+00 95+00 96+00 97+00

JACOBS
101 NORTH 1st AVENUE, SUITE 2600
PHOENIX, ARIZONA 85003
PHONE: 1.602.253.1200 FAX: 1.602.253.1202

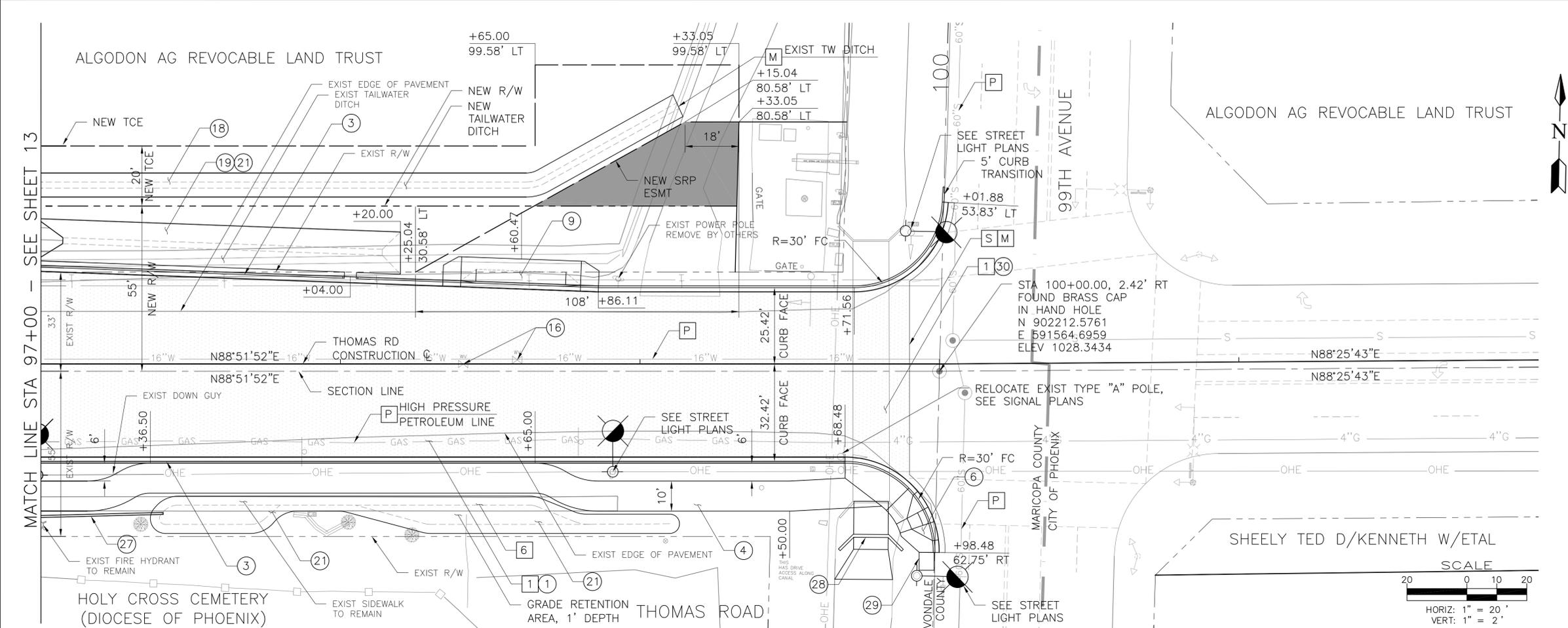


CAPITAL IMPROVEMENT PROJECT
THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
PROJECT NUMBER: ST1306 (EN17-020)



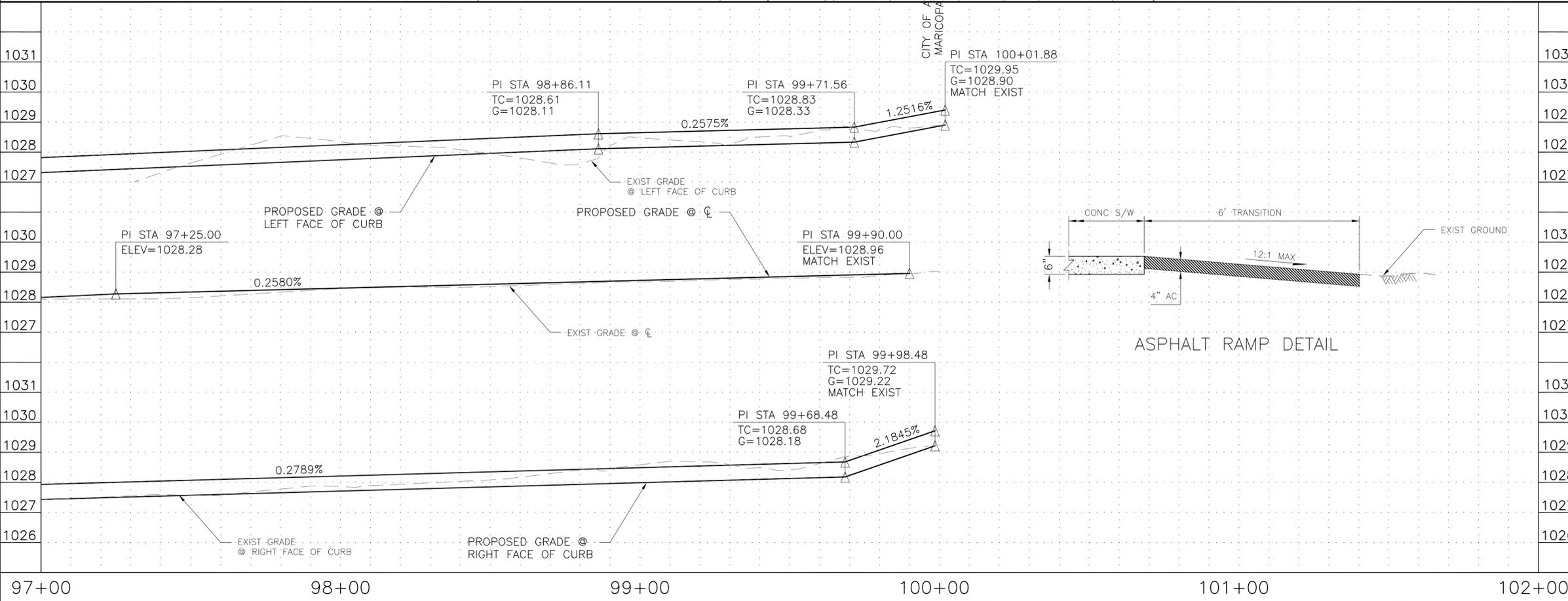
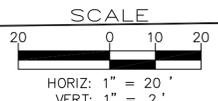
EXPIRES 12/31/16
ORIGINAL PLAN DATE
LATEST REVISION DATE
09/9/2016
SHEET NUMBER
14 OF 40
PROJECT NUMBER
ST1306





REMOVAL/RELOCATION NOTES		
NO.	DESCRIPTION	QUANTITY
1	REMOVE EXISTING AC PAVEMENT	1,392 SY
6	REMOVE EXISTING SIDEWALK	904 SF

CONSTRUCTION NOTES		
NO.	DESCRIPTION	QUANTITY
1	NEW PAVEMENT PER TYPICAL SECTION NO. 1 AC SURFACE COURSE, (12.5 mm) 180 TON AC BASE COURSE, (19.0 mm) 271 TON AGGREGATE BASE COURSE 1,008 TON BITUMINOUS TACK COAT 0.6 TON SUBGRADE PREPARATION 1,659 SY	
3	CONSTRUCT VERTICAL CURB & GUTTER PER MAG STD DET 220-1, TYPE A	638 LF
4	CONSTRUCT SIDEWALK PER MAG STD DET 230	2,697 SF
6	CONSTRUCT SIDEWALK RAMP PER CITY OF PHOENIX STD DET P1236 MOD	1 EA
9	CONSTRUCT DRIVEWAY PER CITY OF AVONDALE STD DET A1252 (30' WIDE)	1 EA
11	CONSTRUCT CURB OPENING PER DETAIL A, SHEET 8	1 EA
16	ADJUST VALVE PER CITY OF AVONDALE STD DET A1310	2 EA
18	CONSTRUCT TAILWATER DITCH PER TYPICAL SECTION, SHEETS 5 & 6	216 LF
19	CONSTRUCT LINEAR RETENTION BASIN PER TYPICAL SECTIONS, SHEETS 5 & 6	38 CY
21	INSTALL 2" DECOMPOSED GRANITE (RETENTION BASIN)	606 SY
27	INSTALL 8" PVC PIPE	41 LF
28	NEW CONCRETE BOX CULVERT EXTENSION PER SRP DETAIL, SEE SRP SHEET 1 & 2 OF 4	160 SF
29	PAVEMENT AC TRANSITION RAMP FROM SIDEWALK TO NATURAL GROUND (5' WIDE X 6' LONG) PER DETAIL THIS SHEET	
30	NEW PAVEMENT PER TYPICAL SECTION NO. 3 AC SURFACE COURSE, (12.5 mm) 23 TON AC BASE COURSE, (19.0 mm) 34 TON BITUMINOUS TACK COAT 0.1 TON SUBGRADE PREPARATION 211 SY	



1031	1031
1030	1030
1029	1029
1028	1028
1027	1027
1030	1030
1029	1029
1028	1028
1027	1027
1031	1031
1030	1030
1029	1029
1028	1028
1027	1027
1026	1026

JACOBS
101 NORTH 1st AVENUE, SUITE 2600
PHOENIX, ARIZONA 85003
PHONE: 1.602.253.1200 FAX: 1.602.253.1202

Avondale

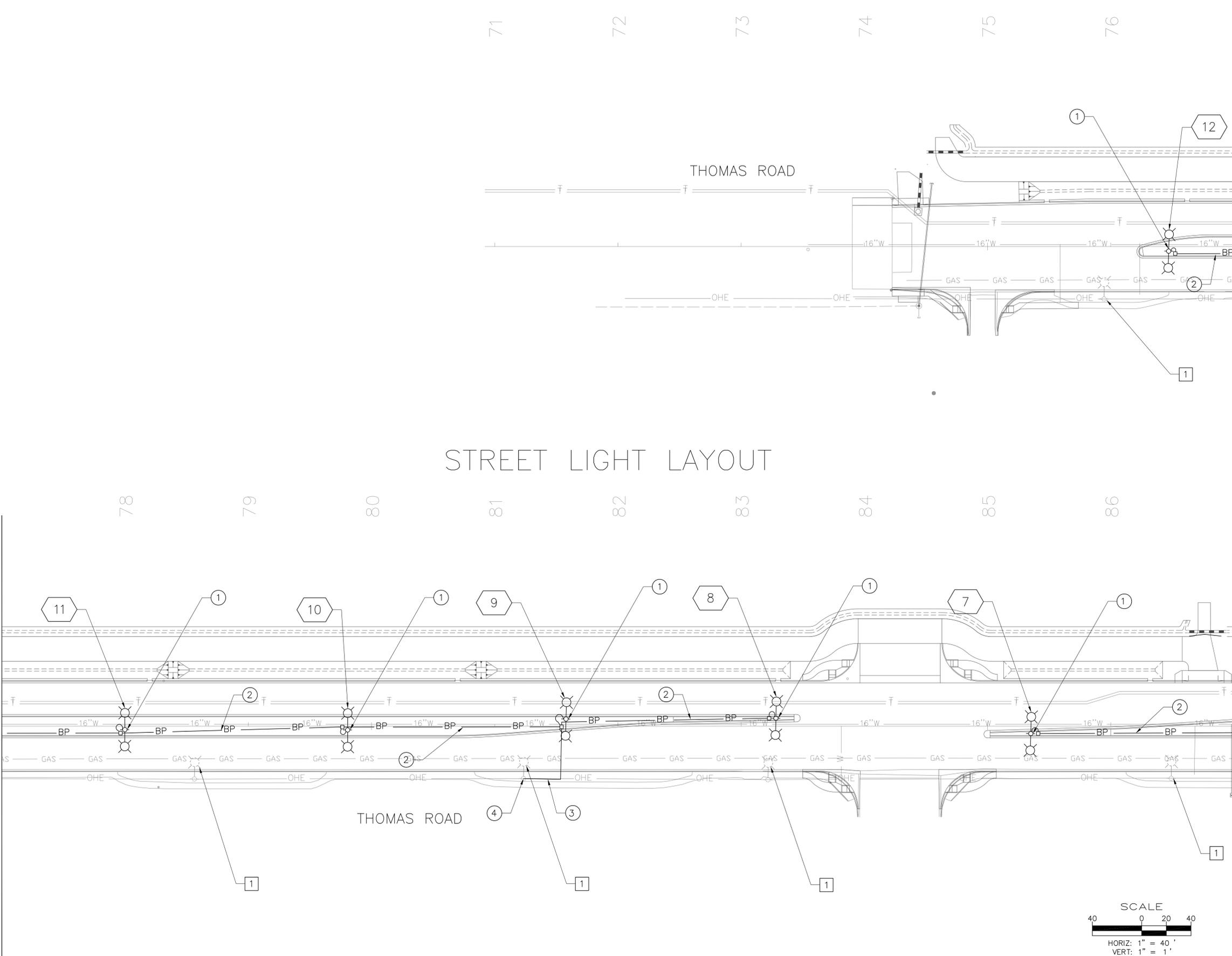
CAPITAL IMPROVEMENT PROJECT
THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
PROJECT NUMBER: ST1306 (EN17-020)

SEAL
RICHARD A. WALLACE
EXPIRES 12/31/16
ORIGINAL PLAN DATE

LATEST REVISION DATE
09/9/2016
SHEET NUMBER
15 OF 40
PROJECT NUMBER
ST1306

Call at least two full working days before any height adjustments.
ARIZONA811
Dig 811 or 1-800-878-2247 (TOD-8247)
In Maricopa County: (602) 263-1100

MATCH LINE STA 77+00 - SEE ABOVE RIGHT

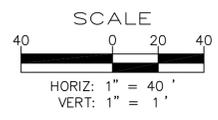


MATCH LINE STA 87+00 - SEE SHEET 17

MATCH LINE STA 77+00 - SEE BELOW LEFT



STREET LIGHT LAYOUT



REMOVAL/RELOCATION NOTES	
DESCRIPTION	QUANTITY
1 REMOVE AND SALVAGE EXISTING MAST ARM AND LUMINAIRE.	5 EA

CONSTRUCTION NOTES	
DESCRIPTION	QUANTITY
1 INSTALL NEW LUMINAIRE, POLE, JUNCTION BOX, AND FOUNDATION.	6 EA
2 INSTALL NEW UNDERGROUND SCH. 40 PVC 2 1/2\"/>	

GENERAL NOTES	
DESCRIPTION	
1. ALL POLE BASE CENTERS TO BE LOCATED MINIMUM OF 2.5FT FROM CENTER OF WATER MAIN.	
2. CONDUIT ROUTE SHOWN IS DIAGRAMMATIC. CONTRACTOR TO FIELD VERIFY ROUTE AND MAINTAIN 2 FOOT HORIZONTAL CLEARANCE FROM THE WATER MAIN, EXCEPT FOR CROSSINGS.	

REVISION	DATE

JACOBS
 101 NORTH 1st AVENUE, SUITE 2600
 PHOENIX, ARIZONA 85003
 PHONE: 1.602.253.1200 FAX: 1.602.253.1202



PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT
 PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
 PROJECT NUMBER: ST1306 (EN17-020)

SEAL
 55516
 MARIE M. BAGINSKI
 Date Signed: 09/16/16
 ARIZONA, U.S.A.
 EXPIRES 12/31/16
 ORIGINAL PLAN DATE

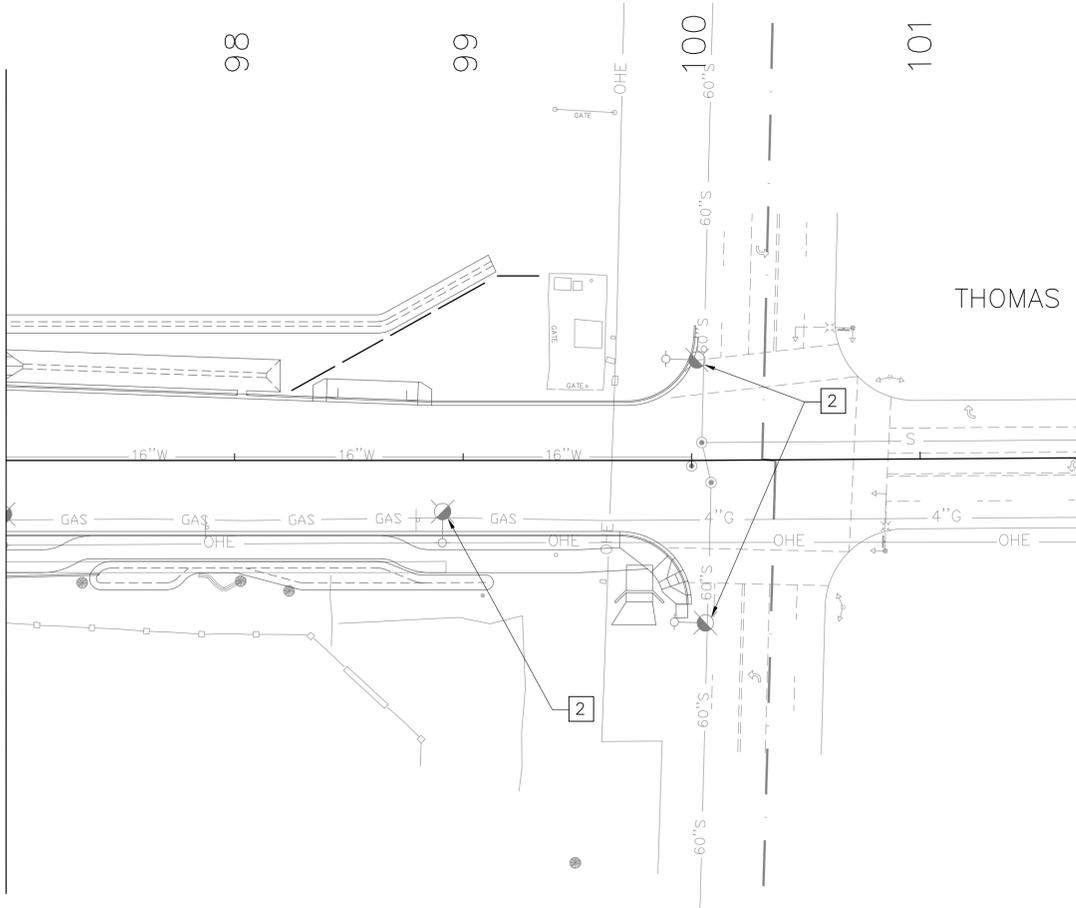
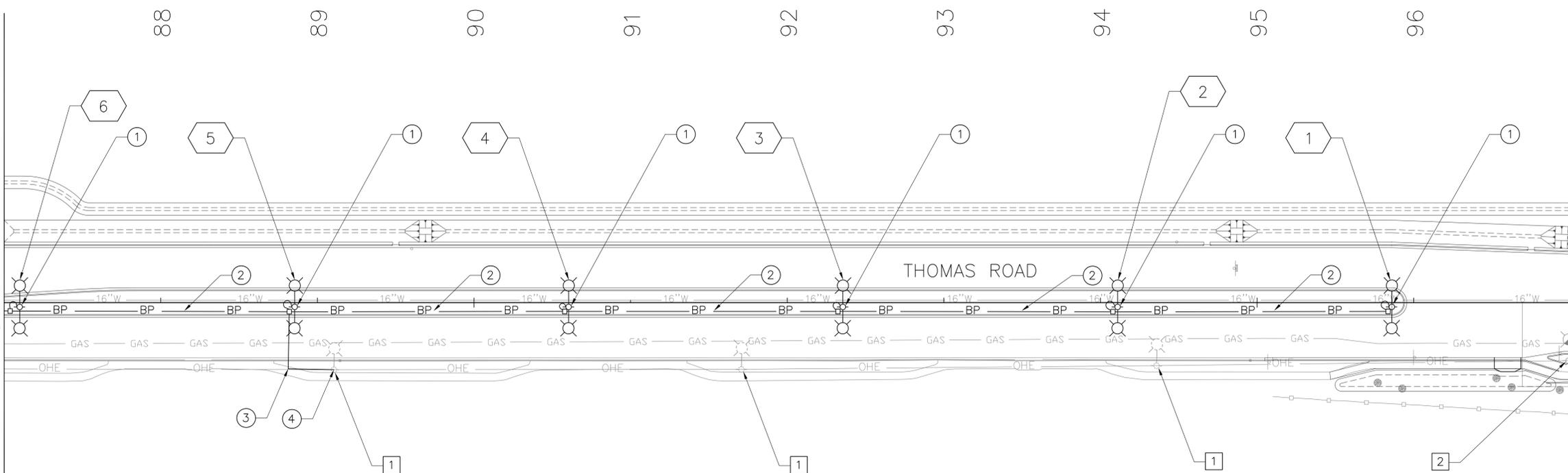
LATEST REVISION DATE: 09/9/2016
 SHEET NUMBER: 16 OF 40
 PROJECT NUMBER: ST1306



MATCH LINE STA 87+00 - SEE SHEET 16

MATCH LINE STA 97+00 - SEE ABOVE RIGHT

MATCH LINE STA 97+00 - SEE BELOW LEFT

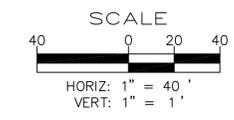


STREET LIGHT LAYOUT

REMOVAL/RELOCATION NOTES	
DESCRIPTION	QUANTITY
1 REMOVE AND SALVAGE EXISTING MAST ARM AND LUMINAIRE.	3 EA
2 PROTECT IN PLACE EXISTING LIGHT POLE.	4 EA

CONSTRUCTION NOTES	
DESCRIPTION	QUANTITY
1 INSTALL NEW LUMINAIRE, POLE, JUNCTION BOX, AND FOUNDATION.	6 EA
2 INSTALL NEW UNDERGROUND SCH. 40 PVC 2 1/2" CONDUIT.	900 LF
3 INSTALL NEW UNDERGROUND SCH. 80 PVC 2 1/2" CONDUIT.	90 LF
4 COORDINATE WITH CITY AND SRP FOR SERVICE CONNECTION DETAILS.	

GENERAL NOTES	
DESCRIPTION	
1. ALL POLE BASE CENTERS TO BE LOCATED MINIMUM OF 2.5FT FROM CENTER OF WATER MAIN.	
2. CONDUIT ROUTE SHOWN IS DIAGRAMMATIC. CONTRACTOR TO FIELD VERIFY ROUTE AND MAINTAIN 2 FOOT HORIZONTAL CLEARANCE FROM THE WATER MAIN, EXCEPT FOR CROSSINGS.	



STREET LIGHT LAYOUT

REVISIONS

JACOBS
101 NORTH 1st AVENUE, SUITE 2600
PHOENIX, ARIZONA 85003
PHONE: 1.602.253.1200 FAX: 1.602.253.1202

Avondale

PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT
PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
PROJECT NUMBER: ST1306 (EN17-020)

SEAL

EXPIRES 12/31/16
ORIGINAL PLAN DATE

LATEST REVISION DATE: 09/9/2016
SHEET NUMBER: 17 OF 40
PROJECT NUMBER: ST1306

Call at least two full working days before any height excavation.

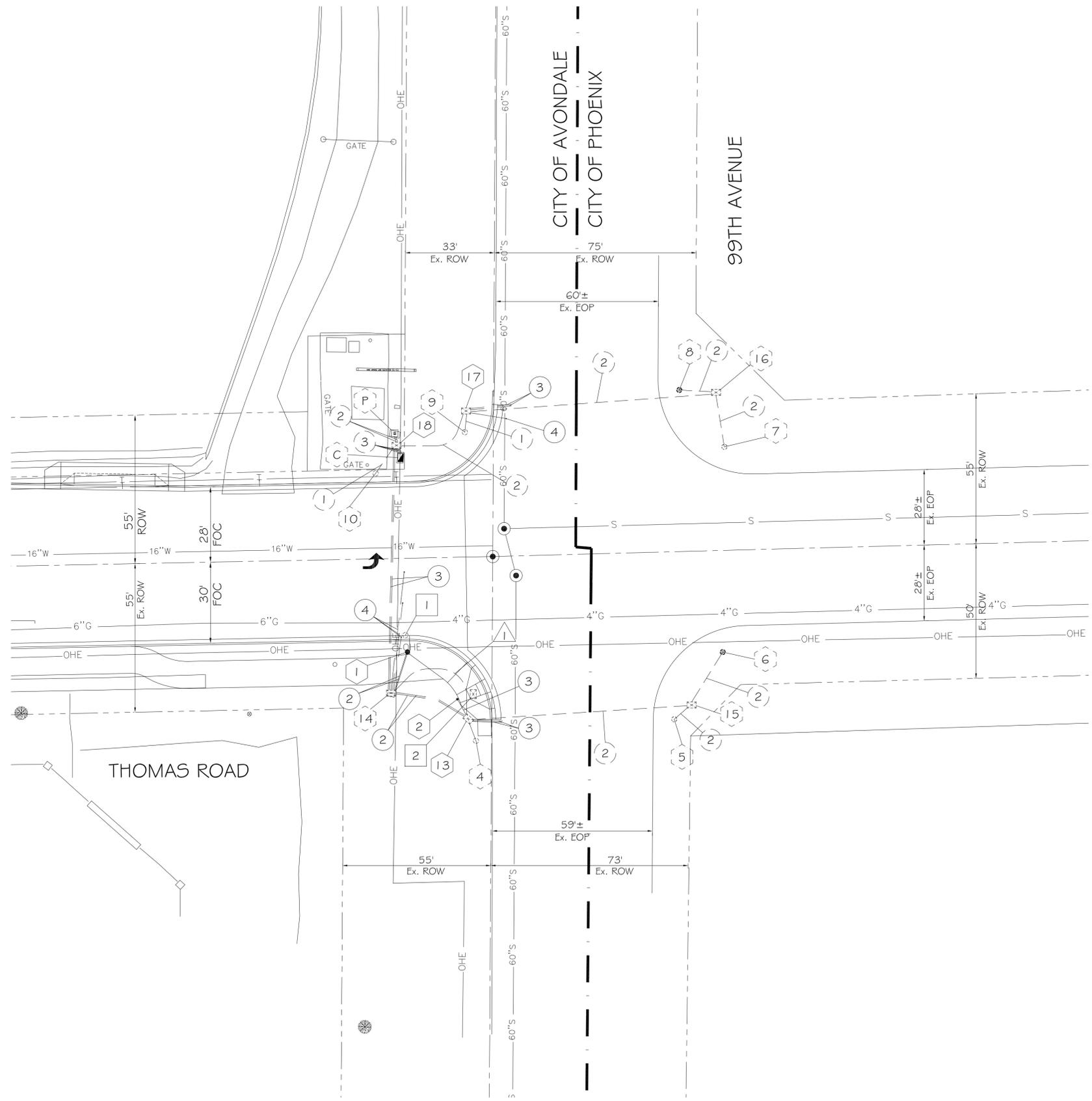
ARIZONA811
Digging in Arizona

Dial 811 or 1-800-878-8847 (TOD-8847) in Maricopa County (602) 263-1100



F.H.W.A. REGION	STATE	PROJ. NO.	NO.	TOTAL
9	ARIZ.	ST 1306 (EN 17-020)	19	40

JACOBS
 101 NORTH 1st AVENUE, SUITE 2600
 PHOENIX, ARIZONA 85003
 PHONE: 1.602.253.1200 FAX: 1.602.253.1202
 DR: SMT DES: SMT CK: SMK DATE: 09/13/16



1. GENERAL NOTES:
- 1.1 The contractor shall notify the City Of Phoenix Traffic Signal Shop (602-262-6733) a minimum of fourteen (14) calendar days prior to beginning any traffic signal work. Submittals of all equipment shall be furnished to the Signal Shop and approved prior to the ordering of any traffic signal equipment. The contractor shall verify that they have the most current set of drawings prior to start and ordering of any equipment.
 - 1.2 Foundation elevations must be within 1/4" of finished sidewalk grade.
 - 1.3 The Contractor shall layout all ADA ramps, junction boxes and foundation locations for approval by the traffic signal representative prior to any excavation.
 - 1.4 A minimum of four (4) feet of clearance is required between all traffic signal poles and the back edge of sidewalk pedestrian ramps.
 - 1.5 Traffic Signal Plan approval is valid for 365 calendar days from date sealed. If signal construction has not begun prior to the 365 days elapsing, the signal plans must be re-submitted for approval or an extension granted by the Deputy Director Traffic Services or an authorized representative to ensure that existing traffic signal equipment locations and standard detail references are current.
 - 1.6 The contractor shall have a complete set of construction drawings including current City of Phoenix standard details on site at all times during signal construction activities.

2. CONTRACTOR NOTE FOR CITY OF PHOENIX TRAFFIC SIGNAL POLES
- 2.1 Signal poles shall be powder coated with a color prescribed by the Traffic Signal Construction Supervisor. Contact the Supervisor at (602) 262-6733 to confirm color.

3. WORK TO BE PERFORMED BY THE CONTRACTOR
- The contractor shall provide the traffic signal equipment as indicated in note 2.1. The contractor is to provide all underground work including, but not limited to:

- 3.1 - All demolition work, unless otherwise noted
 - All trenching
 - All pole foundations
 - All pole anchor cages, nuts and bolts required for pole foundations installed by the contractor
 - All junction boxes with 18" of sump
 - All conduit runs

- 3.2 All underground conduits shall be schedule 40 rigid polyvinyl chloride (PVC) installed 24 inches to 30 inches below finished grade with the exception of loop lead-in conduits, which shall be schedule 40 rigid PVC installed in accordance with the latest City of Phoenix Standard Detail Sheet. All conduits shall be installed in straight lines (unless approved by the Signal Shop Inspector) junction box to junction box or junction box to signal equipment foundation with one 90 degree sweep on each end as specified in the plans. All conduits entering junction boxes shall be vertical. Conduits in all foundations shall be located as close as possible to center of the foundation and vertical with foundation below the bottom of the cover. All conduit ends except those in the controller cabinet foundation will be provided with a "bell end" fitting of appropriate size.

4. WORK TO BE PERFORMED BY CITY OF PHOENIX SIGNAL CREWS
- The City of Phoenix traffic signal crews will provide and install all above ground traffic signal equipment including:
- All signal heads
 - All pedestrian heads
 - All signal wiring
 - All pole grouting

PROPOSED FOUNDATION SCHEDULE

NO.	TYPE	OFFSET FROM THOMAS RD M	OFFSET FROM 99th AVE M
1	LM	35 ft. SOUTH	31 ft. WEST
2	PB	53 ft. SOUTH	13 ft. WEST

EXISTING FOUNDATION SCHEDULE

NO.	TYPE	OFFSET FROM THOMAS RD M	OFFSET FROM 99th AVE M
4	M	68 ft. SOUTH	6 ft. WEST
5	A	62 ft. SOUTH	68 ft. EAST
6	M	38 ft. SOUTH	86 ft. EAST
7	A	38 ft. NORTH	86 ft. EAST
8	M	60 ft. NORTH	69 ft. EAST
9	LM	46 ft. NORTH	11 ft. WEST
10	M	32 ft. NORTH	44 ft. WEST
C	CONT	37 ft. NORTH	35 ft. WEST
P	PSP	46 ft. NORTH	37 ft. WEST

REMOVE & REPLACE JUNCTION BOX SCHEDULE

NO.	TYPE	OFFSET FROM THOMAS RD M	OFFSET FROM 99th AVE M
13	#7	60 ft. SOUTH	9 ft. WEST
17	#7	54 ft. NORTH	10 ft. WEST
18	#7	42 ft. NORTH	36 ft. WEST

EXISTING JUNCTION BOX SCHEDULE

NO.	TYPE	OFFSET FROM THOMAS RD M	OFFSET FROM 99th AVE M
14	#5	50 ft. SOUTH	37 ft. WEST
15	#5	57 ft. SOUTH	74 ft. EAST
16	#5	59 ft. NORTH	83 ft. EAST

INSTALL

- 1 thru 10 See Foundation Schedule
- 13 thru 18 See Junction Box Schedule

- 1 1" Schedule 40 PVC
- 2 2" Schedule 40 PVC
- 3 2 1/2" Schedule 40 PVC
- 4 2" Schedule 40 PVC with #10 Copper Pull Wire bent over lip of stubout - for loops

REMOVE

- 1 Traffic Signal Foundation - 1 Type A - 1
- 2 Traffic Signal Junction Box - 1

ABANDON IN PLACE

- 1 Conduit



PER CITY OF PHOENIX CITY CODE CHAPTER 2, SECTION 2-28, THESE PLANS ARE FOR OFFICIAL USE ONLY & MAY NOT BE SHARED WITH OTHERS EXCEPT AS REQUIRED TO FULFILL THE OBLIGATIONS OF YOUR CONTRACT WITH THE CITY OF PHOENIX.

APPROVED BY:
TRAFFIC SIGNAL ENGINEER
ACTING STREET TRANSPORTATION TRAFFIC SERVICES DEPUTY DIRECTOR

TRAFFIC SIGNAL PLAN
CITY OF PHOENIX, ARIZONA
STREET TRANSPORTATION DEPARTMENT
THOMAS ROAD AT 99th AVENUE

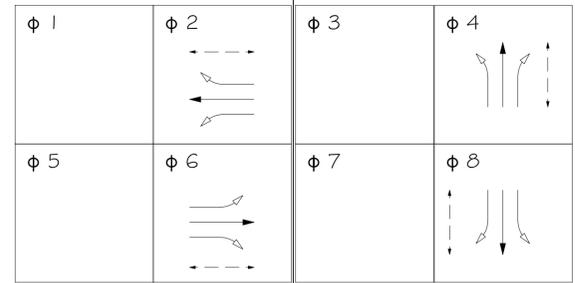
FOUNDATION

PROJECT #:	FILE NO: 10360			
DR: SMT	DES: SMT	CK: SMK	SHEET NO:	TOTAL SHEETS:
DATE: SEPT 2016	DATE: SEPT 2016	DATE: SEPT 2016	19	40
SCALE: 1" = 20'	QS. #: 14-5			

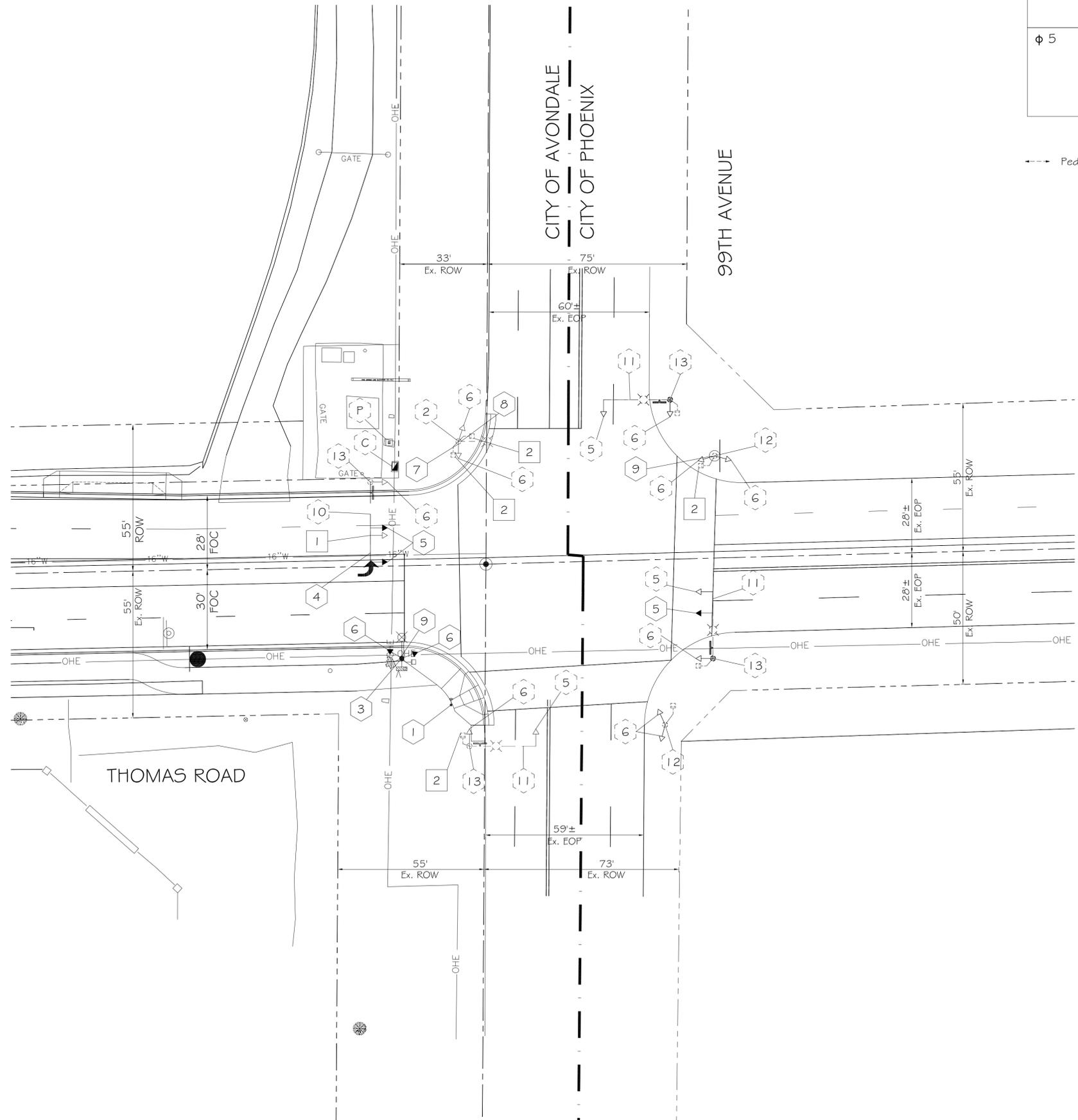
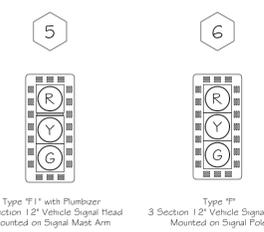


F.H.W.A. REGION	STATE	PROJ. NO.	NO.	TOTAL
9	ARIZ.	ST1306 (EN17-020)	20	40

JACOBS
 101 NORTH 1st AVENUE, SUITE 2600
 PHOENIX, ARIZONA 85003
 PHONE: 1.602.253.1200 FAX: 1.602.253.1202
 DR: SMT DES: SMT CK: SMK DATE: 09/13/16



--- Pedestrian Phase ← Protected Phase ← Permitted Phase



EQUIPMENT LIST

- 1 Traffic Signal Pole Type PB - 1 New
 - 2 Traffic Signal Pole Type LM - 1 Existing
 - 3 Traffic Signal Pole Type Giraffe Light Pole - 1 New
 - 4 10' Signal Mast Arm Extension - 1 New
 - 5 Type F1 12" Signal Head - 3 New, 4 Existing Mast Arm Mount w/ Plumbizer
 - 6 Type F 12" Signal Head - 2 New, 10 Existing Pole Mount
 - 7 Pole Mounted Sign - 1 New "R9-3" with "R9-3bR"
 - 8 Pole Mounted Sign - 1 New "R9-3" with "R9-3bL"
 - 9 Pole Mounted Sign - 2 New "R9-3"
 - 10 20' Signal mast Arm - 1 Existing
 - 11 25' Signal Mast Arm - 3 Existing
 - 12 Traffic Signal Pole Type A - 2 Existing
 - 13 Traffic Signal Pole Type M - 4 Existing
 - C 8 Phase Controller Cabinet - 1 Existing
 - P Power Service Pedestal - 1 Existing
- Luminaire
 HPS - 1 New
 HPS - 4 existing
- Signs at Signal
 Illuminated Street Sign - 4 existing
 Signal Pole Mount - 4 existing
- Pedestrian Head - 1 New, 7 existing
- APS Push Buttons - 1 New
- Wireless Radio - 1 New
- CCTV Camera - 1 New

REMOVE

- 1 Type F1 8" Signal Head - 1
- 2 Pedestrian Head - 4



APPROVED BY:
 TRAFFIC SIGNAL ENGINEER
 ACTING STREET TRANSPORTATION TRAFFIC SERVICES DEPUTY DIRECTOR

"PER CITY OF PHOENIX CITY CODE CHAPTER 2, SECTION 2-28, THESE PLANS ARE FOR OFFICIAL USE ONLY & MAY NOT BE SHARED WITH OTHERS EXCEPT AS REQUIRED TO FULFILL THE OBLIGATIONS OF YOUR CONTRACT WITH THE CITY OF PHOENIX."

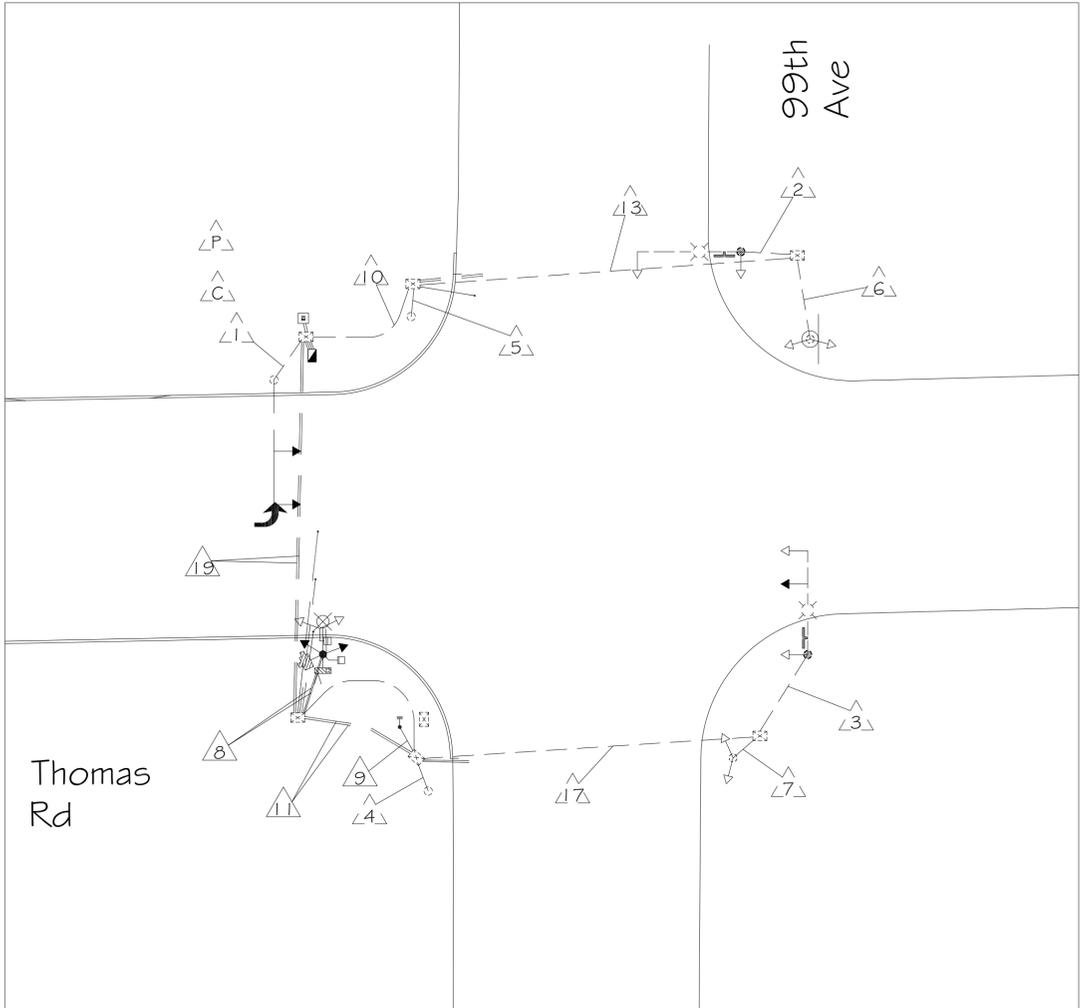
TRAFFIC SIGNAL PLAN
 CITY OF PHOENIX, ARIZONA
 STREET TRANSPORTATION DEPARTMENT
 THOMAS ROAD AT 99th AVENUE

PROJECT #:		FILE NO: 10360	
DR: SMT	DES: SMT	CK: SMK	SHEET NO: 20
DATE: SEPT 2016	DATE: SEPT 2016	DATE: SEPT 2016	TOTAL SHEETS: 40
SCALE: 1" = 20'		QS. #: 14-5	



F.H.W.A. REGION	STATE	PROJ. NO.	NO.	TOTAL
9	ARIZ.	ST1306 (EN17-020)	21	40

JACOBS
 101 NORTH 1ST AVENUE, SUITE 2600
 PHOENIX, ARIZONA 85003
 PHONE: 1.602.253.1200 FAX: 1.602.253.1202
 DR: SMT DES: SMT CK: SMK DATE: 09/13/16



C Controller to #7 Junction Box

CONDUIT 1	CONDUIT 2	CONDUIT 3	CONDUIT 4

P Power Service Pedestal to #7 Junction Box

CONDUIT 1	CONDUIT 2

1 NWC Junction Box to Mast Arm Pole

CONDUIT 1	CONDUIT 2

2 NEC Junction Box to Mast Arm Pole

CONDUIT 1	CONDUIT 2

3 SEC Junction Box to Mast Arm Pole

CONDUIT 1	CONDUIT 2

4 SWC Junction Box to Mast Arm Pole

CONDUIT 1	CONDUIT 2

5 NWC Junction Box to LM Pole

CONDUIT 1

6 NEC Junction Box to A Pole

CONDUIT 1

7 SEC Junction Box to A Pole

CONDUIT 1

8 SWC Junction Box to Giraffe Light Pole

CONDUIT 1	CONDUIT 2
#10 Bare Copper #10 AWG White 5C IMSA Cable 20C IMSA Cable	#10 Bare Copper CCTV Cable (1) ITS Cable (1)

9 SWC Junction Box to PB Pole

CONDUIT 1
#10 Bare Copper #10 AWG White 5C IMSA Cable 20C IMSA Cable

10 NWC Junction Box to NWC Junction Box

CONDUIT 1

11 SWC Junction Box to SWC Junction Box

CONDUIT 1	CONDUIT 2
#10 Bare Copper #10 AWG White 5C IMSA Cable 20C IMSA Cable	#10 Bare Copper #10 AWG White 5C IMSA Cable 20C IMSA Cable

13 NWC Junction Box to NEC Junction Box

CONDUIT 1	CONDUIT 2

17 SEC Junction Box to SWC Junction Box

CONDUIT 1	CONDUIT 2

19 SWC Junction Box to NEC Junction Box

CONDUIT 1	CONDUIT 2
#10 Bare Copper #10 AWG White 5C IMSA Cable 42C IMSA Cable	#10 Bare Copper Detector Lead In (2) EVP Detection Cable (1) EVP Confirmation Cable (1) CCTV Cable (1) ITS Cable (1)



APPROVED BY:
 TRAFFIC SIGNAL ENGINEER
 ACTING STREET TRANSPORTATION TRAFFIC SERVICES DEPUTY DIRECTOR

"PER CITY OF PHOENIX CITY CODE CHAPTER 2, SECTION 2-28, THESE PLANS ARE FOR OFFICIAL USE ONLY & MAY NOT BE SHARED WITH OTHERS EXCEPT AS REQUIRED TO FULFILL THE OBLIGATIONS OF YOUR CONTRACT WITH THE CITY OF PHOENIX."

TRAFFIC SIGNAL PLAN
 CITY OF PHOENIX, ARIZONA
 STREET TRANSPORTATION DEPARTMENT
 THOMAS ROAD AT 99th AVENUE

WIRING

PROJECT #:	FILE NO: 10360			
DR: SMT	DES: SMT	CK: SMK	SHEET NO: 21	TOTAL SHEETS: 40
DATE: SEPT 2016				
SCALE: 1" = 20'	QS. #: 14-5	21	40	

CITY OF AVONDALE

SIGNING AND STRIPING PLANS

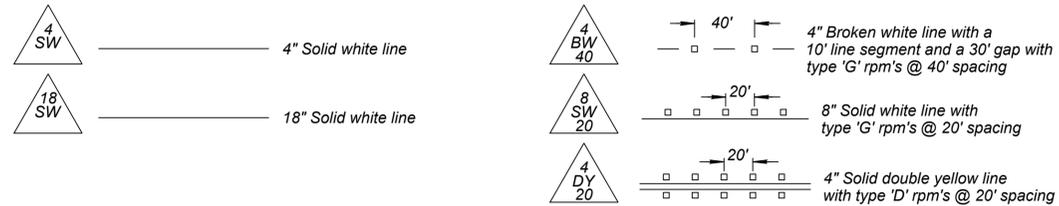
THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE

PROJECT NO. ST1306

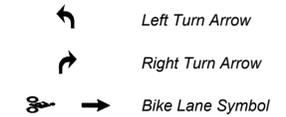
SIGNING AND STRIPING GENERAL PLAN NOTES

- The City of Avondale Engineering Department shall be notified three (3) business days prior to starting any signing or striping work.
- Unless otherwise specified, all pavement marking and traffic control signing installations and removals shall conform to the requirements set forth in the City of Avondale "Construction Specifications" Section XI. Items not covered under the City specifications shall conform to the Maricopa County Department of Transportation (MCDOT) standard drawings, details and specifications or the "Manual on Uniform Traffic Control Devices" (MUTCD) latest edition, as applicable. Sign requirements, guidelines, and warranties shall be in accordance with the MUTCD most recent edition.
- The Contractor shall be responsible for the layout and installation of the permanent pavement markings following control points that have been set no more than 50 feet apart along the lines to be striped. Pavement marking dimensions are to the center of the stripe for single line striping, and to the center of the space between the two lines for double line striping. Where curb and gutter are present, dimensions are to the back of the curb. The Contractor shall schedule inspection of the pavement marking layout at least three (3) business days prior to layout and installation of permanent pavement marking. Inspection shall take place during daytime and on a business day prior to installation of permanent pavement markings.
- Pavement marking drawings are schematic only and not to scale. The Contractor shall follow all dimensions, notes, details and standards when installing pavement striping, markings and markers.
- Temporary traffic control shall conform to the most recent edition of the City of Phoenix "Traffic Barricade Manual," the "MUTCD," and/or as directed by the City of Avondale.
- Unless otherwise directed, all final location lane striping including crosswalks and stop bars shall be thermoplastic material applied at a minimum thickness of 60 mil. All pavement symbols, arrows, and lettering shall be thermoplastic, Type I (permanent) preformed pavement markings. Temporary pavement markings shall be reflectorized traffic paint. Temporary striping of a half street roadway shall be thermoplastic.
- All signs shall conform to the MUTCD and shall be made from .080 inch thick aluminum. Sign posts and extensions shall be galvanized square perforated steel tubing per City standards. Height requirements shall be in accordance with the MUTCD.
- All traffic control sign faces shall be constructed of diamond grade reflective sheeting such as 3M standard, unless otherwise noted.
- All signs shall have a minimum clearance from the edge of the sign to the face of the curb of at least two (2) feet. If no curb exists, the minimum clearance shall be at least ten (10) feet from the edge of the pavement. All signs shall be placed so as to not interfere with pedestrian movement.
- Any traffic control signage, including street name signs, which may be located within ten (10) feet of an existing street light pole, may be properly mounted to the pole with approval from the City. Sign locations and offsets may be adjusted by the City to improve visibility.
- All concrete median curb noses shall be painted with yellow reflective safety paint from the front of the bullnose back ten (10) feet.
- Raised pavement markers (RPMs) shall be installed on arterial roadways with existing RPMs or roadways without full street lighting. All raised pavement markers shall be installed in accordance with ADOT Standard Drawings 4-M-2.02, 4-M-2.03.1, 4-M-2.03.2, and 4-M-2.04. Two-way Type M raised pavement markers shall be installed adjacent to fire hydrants per City of Avondale standards.
- Any existing signage that is required to be relocated by the Contractor shall be removed, protected, and stored for reinstallation by the Contractor. Damaged signage shall be replaced at the Contractor's expense. Any existing signs required to be permanently removed by the Contractor shall be salvaged for return to the City.
- The Contractor shall remove all existing pavement markings and striping in conflict with the final striping plan by ultra high-pressure water (36,000 psi per MAG specifications). All removal methods shall be done in conformance with EPA requirements. If the removal of striping causes a depression of 1/8 inch or greater in the pavement surface, the Contractor shall fill and slurry seal the area per MAG Standard Specification 713 & 715, Type II.
- The Contractor shall clean the roadway surface to the satisfaction of the City by power broom, street sweeping, air jet blowing, and/or water jet/truck prior to the placement of all pavement markings. The road pavement surface shall be absolutely dry. The air and pavement temperatures shall not be less than 55° F and 61° F for the placement of thermoplastic marking and Type I marking tape, respectively.
- Street name signs located at all intersections shall have block numbers. Block numbers shall be assigned by the City's Building Division. Block numbers shall be installed per City specifications.

STRIPING LEGEND



STRIPING SYMBOL LEGEND



FOR ADDITIONAL STRIPING SYMBOLS AND LEGENDS SEE THE M.C.D.O.T. PAVEMENT MARKING MANUAL. USE ONLY THE STRIPING SYMBOLS THAT ARE ON THE STRIPING PLAN. DO NOT CREATE STRIPING SYMBOLS THAT ARE NOT IN THE M.C.D.O.T. PAVEMENT MARKING MANUAL.

STRIPING QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
460.02000	Remove Thermoplastic Stripe	LF	17,746
461.01520	Paint Symbol (Bike Lane Marking Set)	EACH	2
461.01600	Paint Median Island	EACH	4
461.02100	Remove Thermoplastic Symbol	EACH	1
462.02110	Remove Thermoplastic Arrow	EACH	4
462.01100	4" White Thermoplastic Traffic Stripe	LF	8,599
462.01200	4" Yellow Thermoplastic Traffic Stripe	LF	3,765
462.01511	Thermoplastic Symbol Left Turn Arrow	EACH	4
463.01100	Reflectorized Raised Pavement Marker, Type D	EACH	188
463.01200	Reflectorized Raised Pavement Marker, Type G	EACH	180
463.01400	Reflectorized Raised Pavement Marker, Type BB	EACH	3

SIGN SUMMARY

THOMAS ROAD STATION	SIGN CODE	NEW	REMOVE & SALVAGE	LEGEND	WIDTH (IN)	HEIGHT (IN)	TYPE D SHEETING AREA (SQ. FT.)	TYPE P POST LENGTH (FT)	Remarks
76+43	R4-7	X		Keep Right	24	30	5	11.5	
76+43	M-3-L	X		Type 3 OM	12	36	3		Install Below R4-7
83+26	R4-7	X		Keep Right	24	30	5	11.5	
83+26	M-3-L	X		Type 3 OM	12	36	3		Install Below R4-7
85+19	R4-7	X		Keep Right	24	30	5	11.5	
85+19	M-3-L	X		Type 3 OM	12	36	3		Install Below R4-7
94+85	R2-1-45		X	Speed Limit 45					
94+85	R2-1-45	X		Speed Limit 45	30	36	7.5	12	
95+86	R4-7	X		Keep Right	24	30	5		Mount on Light Pole
95+86	M-3-L	X		Type 3 OM	12	36	3		Install Below R4-7
97+88	M-2		X	Type 2 OM					
98+80	M-2		X	Type 2 OM					
98+91	R3-17	X		Bike Lane	30	24	5		Mount on Light Pole
98+91	R3-17B	X		Ends	30	12	2.5		Install Below R3-17
100+87	R3-7-R		X	Right Lane Must Turn Right					
104+83	R3-7-R		X	Right Lane Must Turn Right					
107+83	W9-101L		X	Thru Traffic Merge Left					

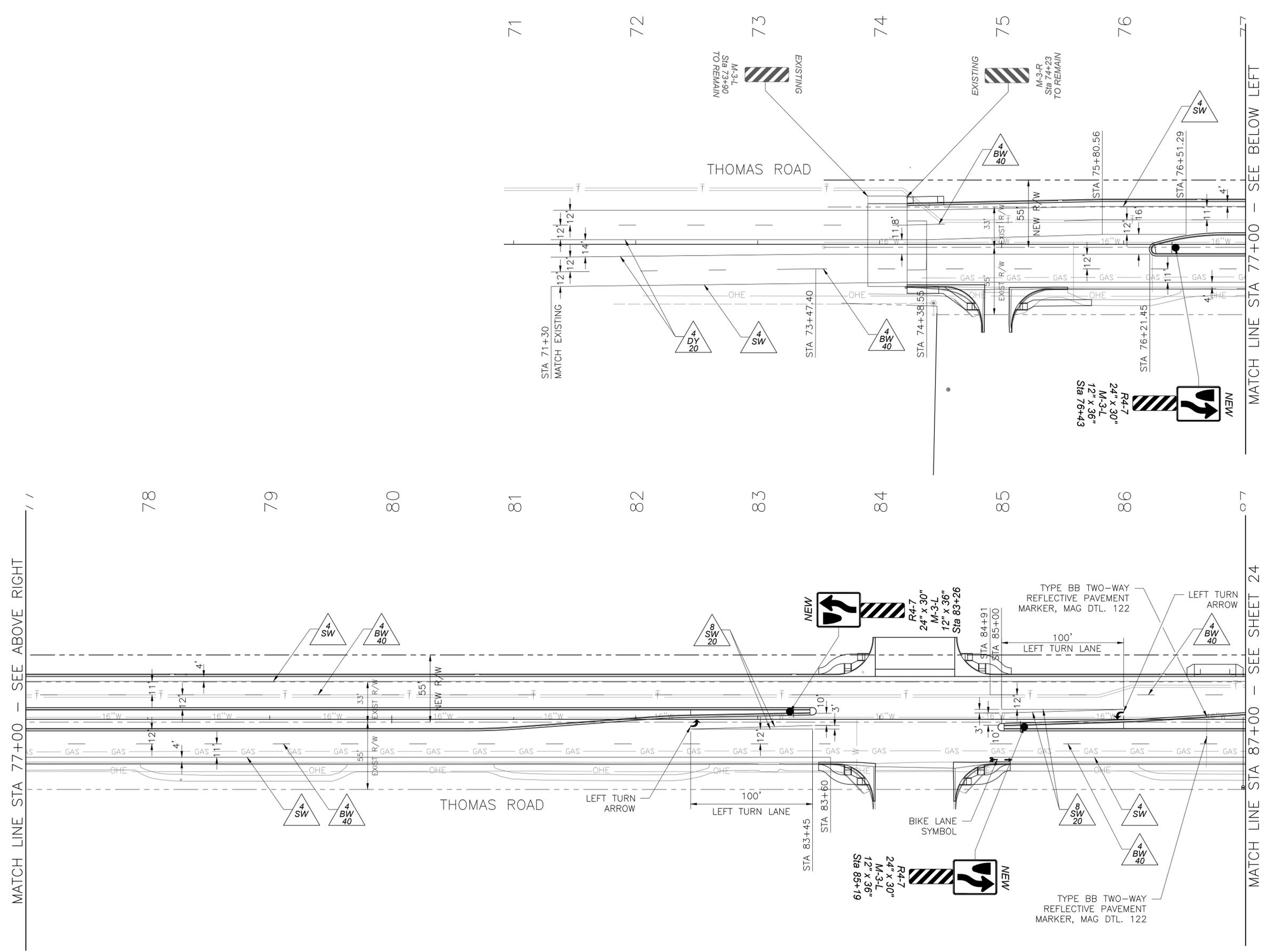
All existing signs not designated as "Remove & Salvage" are to remain protected in place.

JACOBS
 101 NORTH 1st AVENUE, SUITE 2600
 PHOENIX, ARIZONA 85003
 PHONE: 1.602.253.1200 FAX: 1.602.253.1202

CAPITAL IMPROVEMENT PROJECT
 THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
 PROJECT NUMBER: ST1306 (EN17-020)

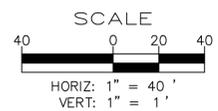
SHANTHI M. KRISHNAN
 City Engineer
 EXPIRES: 6/30/18
 ORIGINAL PLAN DATE
 LATEST REVISION DATE
09/9/2016
 SHEET NUMBER
22 OF **40**
 PROJECT NUMBER
ST1306

MATCH LINE STA 77+00 - SEE ABOVE RIGHT



MATCH LINE STA 87+00 - SEE SHEET 24

MATCH LINE STA 77+00 - SEE BELOW LEFT

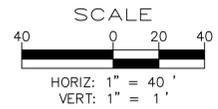
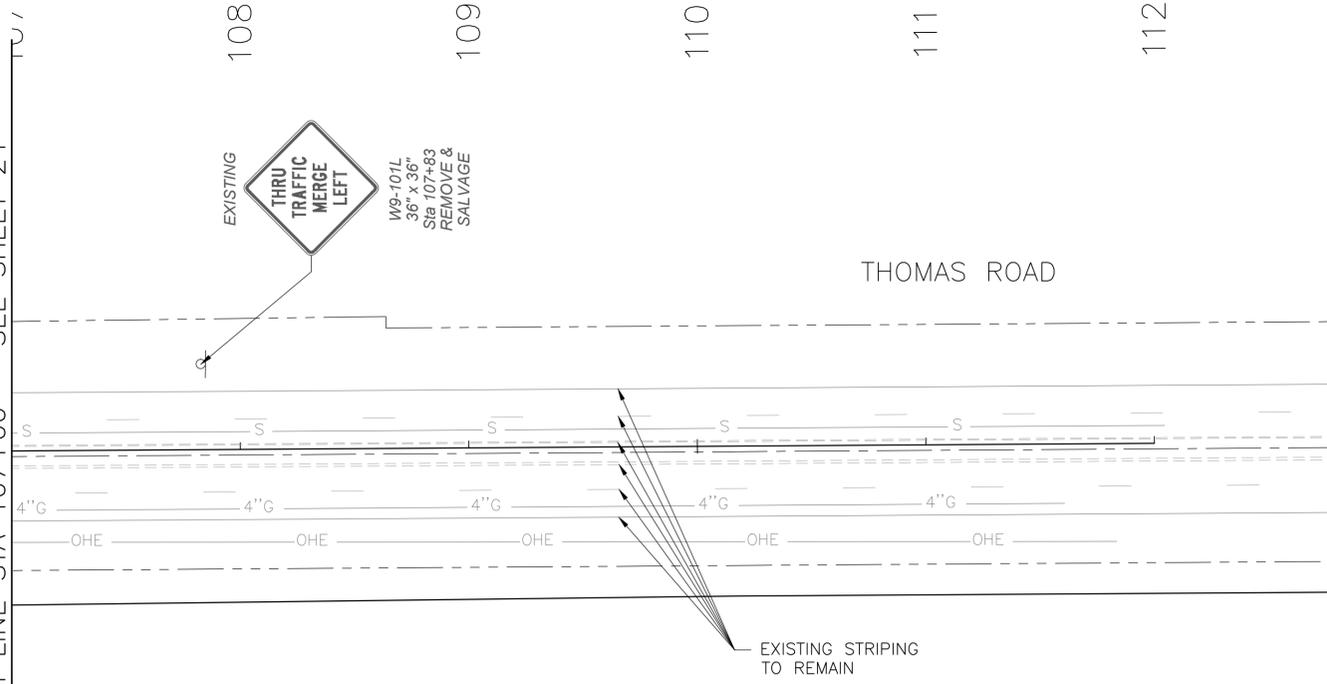


APPROVED BY:	
TRAFFIC SIGNAL ENGINEER	
STREET TRANSPORTATION DIR.	
STREET TRANSPORTATION TRAFFIC SERVICES DEPUTY DIRECTOR	
DEPUTY STREET TRANSPORTATION DIR.	



<p>101 NORTH 1st AVENUE, SUITE 2600 PHOENIX, ARIZONA 85003 PHONE: 1.602.253.1200 FAX: 1.602.253.1202</p>	<p>PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT</p> <p>PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE</p> <p>PROJECT NUMBER: ST1306 (EN17-020)</p>
<p>SEAL</p> <p>SHANTHI M. KRISHNAN State of Arizona, U.S.A.</p> <p>EXPIRES: 6/30/18</p>	<p>LATEST REVISION DATE: 09/9/2016</p> <p>SHEET NUMBER: 23 OF 40</p> <p>PROJECT NUMBER: ST1306</p>

MATCH LINE STA 107+00 - SEE SHEET 24



APPROVED BY:	
TRAFFIC SIGNAL ENGINEER	
LATEST REVISION DATE	
09/9/2016	
SHEET NUMBER	
25 OF 40	
PROJECT NUMBER	
ST1306	



JACOBS
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 PHONE: 1.602.253.1200 FAX: 1.602.253.1202

PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT
 PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
 PROJECT NUMBER: ST1306 (EN17-020)



EXPIRES: 6/30/18
 ORIGINAL PLAN DATE

LATEST REVISION DATE

09/9/2016

SHEET NUMBER

25 OF 40

PROJECT NUMBER

ST1306

LANDSCAPING GENERAL NOTES

- ALL LANDSCAPE AND IRRIGATION INSTALLED WITHIN THE PUBLIC RIGHT-OF-WAY OR OTHER CITY MAINTAINED AREAS SHALL BE INSTALLED PER THE APPROVED PLANS. ALL LANDSCAPING APPROVED AS A PART OF THE SITE PLAN PROCESS SHALL BE INSTALLED PER THE APPROVED PLANS. ANY DEVIATIONS TO THE APPROVED PLANS REQUIRE CITY APPROVAL.
- PERMITS ARE REQUIRED FOR ELECTRICAL CONNECTIONS, INCLUDING ELECTRIC METER INSTALLATION, BACKFLOW PREVENTERS AND WORK WITHIN THE CITY RIGHT-OF-WAY OR CITY DEDICATED PROPERTY. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING THESE PERMITS PRIOR TO THE COMMENCEMENT OF ANY WORK.
- ALL LANDSCAPE PROJECTS REQUIRING CITY MAINTENANCE OR WITHIN THE CITY RIGHT-OF-WAY SHALL BE INSPECTED FOR THE FOLLOWING:
 - PLANT LOCATIONS: THESE LOCATIONS SHALL BE STAKED IN THE FIELD WITH IDENTIFICATION AS TO TREES OR SHRUBS, OR HOLES FOR THE PLANT MATERIALS MAY BE DUG WITH IDENTIFICATION OF PLANT TYPE. USE OF THIS METHOD DOES NOT RELIEVE THE CONTRACTOR OF ANY PLANT RELOCATIONS MADE BY THE CITY.
 - SUBSTANTIAL COMPLETION: AN INSPECTION AT COMPLETION OF THE LANDSCAPE AND IRRIGATION INSTALLATION WILL BE MADE. ANY DEFICIENCIES IN THE INSTALLATION WILL BE NOTED AND CORRECTED BY THE CONTRACTOR DURING THE MAINTENANCE PERIOD.
 - FINAL ACCEPTANCE: A FINAL INSPECTION IS REQUIRED PRIOR TO CITY ACCEPTANCE OF THE LANDSCAPE AND IRRIGATION IMPROVEMENTS.
- SEPARATE INSPECTIONS ARE REQUIRED FOR THE WATER TAP, METER INSTALLATION, BACKFLOW PREVENTER AND ELECTRICAL CONNECTIONS. CALL CITY ENGINEER A MINIMUM OF 24 HOURS PRIOR TO ARRANGE FOR THESE INSPECTIONS.
- LANDSCAPE AND IRRIGATION WHICH IS INSTALLED ON PRIVATE PROPERTY IN CONJUNCTION WITH A CITY APPROVED SITE PLAN WILL BE INSPECTED FOR CONFORMANCE TO THE APPROVED SITE PLAN PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIALS, INSTALLATION, AND REQUIRED PERMIT FEE COST FOR THE WATER METER(S) DESIGNATED TO SERVE THE IRRIGATION SYSTEM.
- INSTALLATION OF THE LANDSCAPE INCLUDING ADDITION OF GROUND PLANE MATERIALS SHALL NOT IMPEDE THE FLOW OF DESIGNED DRAINAGE FACILITIES NOR DECREASE THE DESIGN VOLUME OF ANY DETENTION/RETENTION BASINS.
- THE CONTRACTOR IS RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL UNDERGROUND UTILITIES DURING THE LANDSCAPE INSTALLATION.
- ALL TREES SHALL MAINTAIN A MINIMUM OF 6'-0" CLEARANCE FROM ANY CITY WATER OR SEWER LINE. ALL PLANTINGS SHALL MAINTAIN A SUFFICIENT DISTANCE TO ANY SANITARY AND STORM SEWER MANHOLES TO ALLOW ACCESS BY MAINTENANCE VEHICLES.
- ALL ROCK GROUNDCOVER AREAS SHALL BE SPRAYED WITH PRE-EMERGENT HERBICIDE BY A LICENSED APPLICATOR AS PART OF INSTALLATION AS FOLLOWS (A MINIMUM OF THREE (3) APPLICATIONS ARE REQUIRED):
 - PRIOR TO THE APPLICATION OF GRANITE.
 - AFTER GRANITE APPLICATION.
 - PRIOR TO FINAL ACCEPTANCE.
 - THE CITY SHALL BE FURNISHED WITH WRITTEN DOCUMENTATION OF THE SCHEDULE OF APPLICATION DATES
- AS-BUILT DRAWINGS OF THE LANDSCAPE AND IRRIGATION SYSTEM ARE REQUIRED PRIOR TO ACCEPTANCE BY THE CITY AND FOR PROJECTS WITHIN THE CITY RIGHT-OF-WAY OR CITY OWNED PROPERTY. THE AS-BUILT DRAWINGS SHALL BE HARD COPY BOND SCANNED TO PDF SHOWING THE LOCATIONS OF ALL PLANTINGS AND THE DIMENSIONS TO FIXED POINTS OF ALL IRRIGATION EQUIPMENT, PIPING ETC.
- ALL TREES WITHIN VEHICULAR SIGHT DISTANCE/VISIBILITY CLEAR ZONES SHALL HAVE A VERTICAL CANOPY CLEARANCE/CLEAR TRUNK TO 7' ABOVE THE NEAREST CURB.
- THE LANDSCAPE WILL BE MAINTAINED BY THE DEVELOPER OR CONTRACTOR FOR A PERIOD OF NINETY (90) DAYS FOLLOWING A PRELIMINARY INSPECTION AND ACCEPTANCE BY THE CITY. IF NOT HEALTHY AT THE END OF THE MAINTENANCE PERIOD, MAINTENANCE SHALL BE CONTINUED UNTIL THE PLANT MATERIAL IS APPROVED BY THE CITY.
- CONTRACTOR MUST SUBMIT A DECOMPOSED GRANITE SAMPLE TO CITY PRIOR TO ORDERING.
- THE JOB SITE, AT THE COMPLETION OF THE CONSTRUCTION, SHALL BE CLEANED OF ANY DEBRIS OR SPOIL RESULTING FROM THE CONSTRUCTION. NO JOB WILL BE CONSIDERED COMPLETE UNTIL ALL CURBS, PAVEMENT, AND SIDEWALKS HAVE BEEN SWEEP CLEAN OF ALL DIRT AND DEBRIS, AND ALL SURVEY MONUMENTS ARE INSTALLED ACCORDING TO THE PLANS AND CITY SPECIFICATIONS.
- ALL EQUIPMENT AND MATERIALS NOT SHOWN OR SPECIFIED ON THE PLANS OR IN THE SPECIFICATIONS BUT WHICH ARE REQUIRED TO COMPLETE THIS INSTALLATION, SHALL BE SUPPLIED BY THE CONTRACTOR AS PART OF THIS CONTRACT WORK.
- ALL LANDSCAPE SHALL COMPLY WITH CITY STANDARDS, MAG SPECIFICATIONS AND THESE SPECIFICATIONS.
- LANDSCAPE REMOVAL IS A NON PAY ITEM (N.P.I.) AND THE COST FOR VEGETATIVE REMOVAL SHOULD BE INCLUDED IN SITE PREPARATION WORK ASSOCIATED WITH EACH ITEM OF WORK.
- ALL EXISTING TREES AND SHRUBS UNLESS NOTED ARE TO BE PROTECTED IN PLACE. THE REMAINDER OF EXISTING VEGETATION (WEEDS, ETC.) UNLESS NOTED OTHERWISE SHALL BE REMOVED AND DISPOSED OF AS PART OF THE DEMOLITION PHASE OF THIS CONTRACT (NPI). ALL MATERIALS ARE TO BE REMOVED FROM PROJECT AREA AND DISPOSED OF PROPERLY OFF-SITE AT THE CONTRACTOR'S EXPENSE UNLESS OTHERWISE NOTED. (COMPACT THOSE AREAS DESIGNATED FOR PAVEMENT TO 95% OR AS SPECIFIED IN THE SOILS REPORT AND SCARIFY EXISTING SUBGRADE A MINIMUM OF 8-INCH DEPTH IN AREAS TO BE PLANTED).
- ALL PLANT MATERIAL, OTHER THAN TREES, SHALL CONFORM TO GRADING, TYPE, ETC., AS SET FORTH IN "THE AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN. ALL TREES SHALL CONFORM TO THE CURRENT "ARIZONA NURSERY ASSOCIATION TREE SPECIFICATIONS" AND M.A.G. SPEC 795.7. SHOULD ANY CONFLICTS IN SPECIFICATIONS OCCUR, THE ARIZONA NURSERY ASSOCIATION'S SPECIFICATIONS SHALL PREVAIL.
- LANDSCAPE ARCHITECT AND CITY REPRESENTATIVE RESERVES THE RIGHT TO INSPECT SHRUBS AND CONTAINERIZED TREES FOR CONDITION OF ROOT BALLS. FOR ANY SUCH INSPECTION WHICH MAY DESTROY ROOT BALL, CONTRACTOR SHALL SUPPLY ADDITIONAL PLANTS AT NO COST TO THE CITY.

LANDSCAPING GENERAL NOTES CONTINUED

- THE CONTRACTOR SHALL HAVE THE PLANT PITS INSPECTED AND APPROVED BY THE LANDSCAPE ARCHITECT AND CITY REPRESENTATIVE PRIOR TO PLANTING. CONTRACTOR SHALL REQUEST INSPECTION 48 HOURS IN ADVANCE.
- CONTRACTOR SHALL STAKE TREE AND SHRUB LOCATIONS FOR 5-GALLON PLANTS AND LARGER, AND HAVE LOCATIONS APPROVED BY THE LANDSCAPE ARCHITECT AND CITY REPRESENTATIVE PRIOR TO INSTALLATION. STAKES SHALL BE MARKED WITH PLANT NAME OR PLANT LEGEND ITEM NUMBER FROM PLANS.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE JOB SITE TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT COULD AFFECT THE INSTALLATION OF ANY WORK SET FORTH IN THESE PLANS PRIOR TO SUBMITTING A BID.
- THE CONTRACTOR IS ADVISED THAT DAMAGE TO ANY PORTION OF THIS PROJECT'S EXISTING PAVEMENT, CURBING AND SURROUNDING AREA THAT IS NOT NOTED ON THE PLANS TO BE REMOVED, AS A RESULT OF THIS PROJECT, IS TO BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ANY DEBRIS RESULTING FROM THE DEMOLITION AND CONSTRUCTION. AT NO TIME SHALL ANY OF THIS MATERIAL OBSTRUCT THE NORMAL OPERATION OF ANY ADJOINING STREET OR ANY AREAS ASSOCIATED WITH THIS PROJECT.
- QUANTITIES ARE GIVEN ONLY FOR REFERENCE PURPOSES. CONTRACTOR TO VERIFY ALL LANDSCAPE QUANTITIES AND REPORT ANY DISCREPANCIES IMMEDIATELY. IN CASE OF A DISCREPANCY BETWEEN THE QUANTITIES INDICATED ON THE DRAWINGS AND THE TOTAL NUMBER INDICATED ON THE MATERIALS LIST OR BID TAB, THE DRAWINGS SHALL BE ACCEPTED AS CORRECT.
- CONTRACTOR SHALL VERIFY THE EXISTENCE AND LOCATION OF ALL EXISTING AND PROPOSED UNDERGROUND UTILITIES AND STRUCTURES PRIOR TO STARTING ANY WORK. REPORT IMMEDIATELY TO THE OWNER ANY CASES WHERE PLANT MATERIAL SHALL BE RELOCATED TO AVOID THE UTILITIES. DAMAGE BY THE CONTRACTOR TO ANY WORK SHALL BE REPLACED AND/OR REPAIRED BY THE CONTRACTOR AT HIS/HER EXPENSE.
- ALL LANDSCAPE AREAS SHALL HAVE AN APPLIED TOPPING OF DECOMPOSED GRANITE. FINISH GRADE AREAS ARE TO BE RAKED AND COMPACTED AS SPECIFIED IN MAG SECTIONS 430 AND LEFT SMOOTH AND EVEN.

CITY OF AVONDALE DSD PLANTING NOTES:

- ALL SINGLE TRUNK TREES SHALL BE 2 INCH CALIPER MINIMUM AT TIME OF INSTALLATION. ALL MULTI-TRUNK TREES SHALL BE 1-1/2 INCH CALIPER MINIMUM AT TIME OF INSTALLATION. TREE CALIPERS FOR STANDARD (SINGLE) TRUNK TREES SHALL BE MEASURED AT THE WIDEST POINT WITHIN THE FIRST 4 TO 6 INCHES ABOVE THE SOIL LINE FOR TREES WITH 4 INCH CALIPER AND LESS; AND 6 TO 12 INCHES FOR TREES GREATER THAN 4 INCH CALIPER. TREE CALIPER FOR MULTI-TRUNK TREES SHALL BE MEASURED AT THE WIDEST TRUNKS ORIGINATE FROM THE SOIL. CALIPER OF MULTIPLE TRUNK TREES SHALL BE DETERMINED BY TAKING THE AVERAGE CALIPER OF ITS 2 LARGEST TRUNKS.
- TREE CALIPER AND HEIGHT SHALL GOVERN OVER ANY OTHER PLANTING SIZE INFORMATION PROVIDED ON THE DRAWINGS. TREES SPECIFIED BY CONTAINER SIZES ONLY SHALL NOT BE ACCEPTED.
- THE PROPERTY OWNER AND/OR LESSEE SHALL BE RESPONSIBLE TO INSTALL/MAINTAIN ALL LANDSCAPING WITHIN THE RIGHT-OF-WAY. ALL LANDSCAPING SHALL BE MAINTAINED AS APPROVED ON THE LANDSCAPE MAINTENANCE SCHEDULE.
- A 3 FOOT CLEAR SPACE IS REQUIRED AROUND ALL FIRE SUPPRESSION EQUIPMENT. NO PLANTS MAY BE INSTALLED THAT WILL ENCROACH UPON THIS CLEAR SPACE WHEN MATURE.
- PLANTINGS WITHIN ANY SITE VISIBILITY EASEMENT SHALL BE MAINTAINED SO THAT NO LIMBS HANG LOWER THAN SEVEN (7) FEET AND SHRUBS OR OTHER PLANTS PLANTED WITHIN ANY SIGHT VISIBILITY EASEMENT SHALL BE NO TALLER THAN TWO (2) FEET AT FULL GROWTH.
- THE CITY APPROVES THESE PLANS FOR CONCEPTS ONLY AND ACCEPTS NO LIABILITY FOR ERRORS OR OMISSIONS.

NOTE:

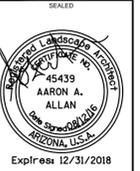
ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF AVONDALE SUPPLEMENT TO MAG SPECIFICATIONS & STANDARD DETAILS CURRENTLY ON FILE AND AVAILABLE AT THE CITY OF AVONDALE ENGINEERING DEPARTMENT.

LANDSCAPE & IRRIGATION RESTORATION NOTES:

- CONTRACTOR SHALL VERIFY LIMITS OF DISTURBANCE WITH ENGINEER. DISTURBED DECOMPOSED GRANITE SHALL HAVE NEW DECOMPOSED GRANITE MATCHING EXISTING SIZE, COLOR, & GRADATION TO ENSURE A MINIMUM OF 2" COVER OF DECOMPOSED GRANITE. ALL EXISTING PLANT MATERIAL SHALL BE PROTECTED IN PLACE UNLESS SPECIFICALLY CALLED FOR REMOVAL OR DIRECTLY IMPACTED BY WORK IMPROVEMENTS. ANY PLANT MATERIAL DAMAGED OR DESTROYED BY CONTRACTOR ACTIVITIES SHALL BE REPLACED IN LIKE KIND AND SIZE AT NO COST TO THE OWNER. NO RELOCATED OR REPLACEMENT PLANT MATERIAL SHALL EXCEED 24" MATURE HEIGHT IF LOCATED WITHIN SIGHT DISTANCE LINES OR SIGHT VISIBILITY TRIANGLES. SEE KEY NOTE FOR QUANTITIES OF EXISTING PLANT MATERIAL. ALL RESTORATION SHALL BE IN ACCORDANCE WITH PROJECT PLANS, DETAILS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL RECONNECT, REROUTE, OR REPLACE THE EXISTING PRIVATE IRRIGATION SYSTEM TO ALL NEW AND EXISTING PLANT MATERIAL. CONTRACTOR SHALL ADD ANY EQUIPMENT NECESSARY TO GUARANTEE 100% WATER COVERAGE TO ALL PLANT MATERIAL. PRIOR TO ANY CONSTRUCTION ACTIVITIES, THE GENERAL CONTRACTOR SHALL STAKE AREAS THAT ARE DESIGNATED TO BE DISTURBED. THE GENERAL CONTRACTOR ALONG WITH THE CITY OF AVONDALE FIELD ENGINEER SHALL MEET WITH EACH INDIVIDUAL PROPERTY OWNER OR DESIGNATED REPRESENTATIVE FOR EACH PARCEL ADJACENT TO THE PROJECT AND DESIGNATED TO BE DISTURBED TO DETERMINE WHERE THE EXISTING AND FUNCTIONING IRRIGATION SYSTEM IS LOCATED AND HOW IT IS OPERATED. IF THE IRRIGATION SYSTEM IS DEEMED FAULTY OR INSUFFICIENT, A MEETING ON SITE WITH CITY STAFF, THE CONTRACTOR AND THE RESPONSIBLE PARTY WILL BE HELD TO EVALUATE THE SPECIFIC CONDITION. THE GENERAL CONTRACTOR SHALL BE REQUIRED TO REPAIR AND OR REPLACE ALL DISTURBED OR DAMAGED IRRIGATION COMPONENTS RETURNING THEIR OPERATION TO 100%. GENERAL CONTRACTOR SHALL ENSURE THAT ALL RECONNECTIONS (WATER & POWER) HAVE BEEN TESTED AND APPROVED BY THE CITY OF AVONDALE PRIOR TO BACKFILLING. PRIOR TO FINAL ACCEPTANCE AND DURING THE MAINTENANCE PERIOD SPECIFIED THE GENERAL CONTRACTOR AND CITY OF AVONDALE FIELD ENGINEER SHALL MEET AGAIN WITH EACH PROPERTY OWNER OR DESIGNATED REPRESENTATIVE TO ENGAGE EACH AND EVERY IRRIGATION SYSTEM THAT HAS BEEN DISTURBED OR THAT IS ADJACENT TO THIS PROJECT. THE GENERAL CONTRACTOR SHALL ENSURE THAT EACH SYSTEM HAS BEEN RETURNED TO A FULLY OPERATIONAL AND FUNCTIONAL SYSTEM AND THAT ANY DEFICIENCIES HAVE BEEN CORRECTED. ALL WORK SHALL COMPLY WITH THESE PLANS AND SPECIAL PROVISIONS.

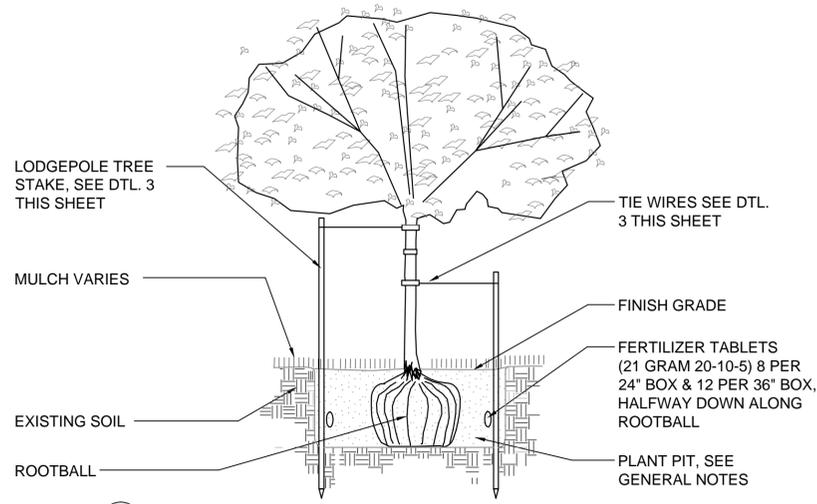
LANDSCAPE SCHEDULE

TREES						
SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QTY	REMARKS	CALIPER
	Acacia salicina	Willow Acacia	36" Box	20	Standard	2" - 2.5"
	Parkinsonia hybrid	Hybrid Palo Verde	36" Box	18	Standard	2" - 2.25"
SHRUBS						
SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QTY	REMARKS	
	Calliandra californica	Baja Fairy Duster	5 Gal	3	Container Full	
	Leucophyllum frutescens 'Green Cloud'	Green Cloud Sage	5 Ga	11	Container Full	
	Eremophila glabra 'Mingenew Gold'	Outback Sunrise Emu	5 Gal	10	Container Full	
GROUNDCOVERS						
SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QTY	REMARKS	
	Lantana sp.	New Gold Lantana	5 Gal	68	Container Full	
	Rosmarinus officinalis	'Huntington Carpet' Trailing Rosemary	5 Gal	44	Container Full	
ACCENTS						
SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QTY	REMARKS	
	Aloe X 'Blue Elf'	'Blue Elf' Aloe	5 Gal	145	Container Full	
	Hesperaloe parviflora 'Perpa' Brakelights	'Perpa' Brakelights Red Yucca	3 Gal	157	Container Full	
	Dasylirion wheeleri	Desert Spoon	5 Gal.	12	Container Full	
	Yucca pallida	Pale Leaf Yucca	5 Gal	14	Container Full	
MATERIALS LEGEND						
	DECOMPOSED GRANITE SIZE: 3/4" MINUS COLOR: AUTUMN RED QUANTITY: 35,124 SF		DECOMPOSED GRANITE SIZE: 1 1/2" MINUS COLOR: AUTUMN RED QUANTITY: 37,494 SF			
	LANDSCAPE RESTORATION AREA QUANTITY: 7,439 SF		MEDIAN PAVERS, COLOR: BRICK RED PATTERN: HERRINGBONE PER CITY OF AVONDALE DETAIL A1221 QUANTITY: 87 SY			

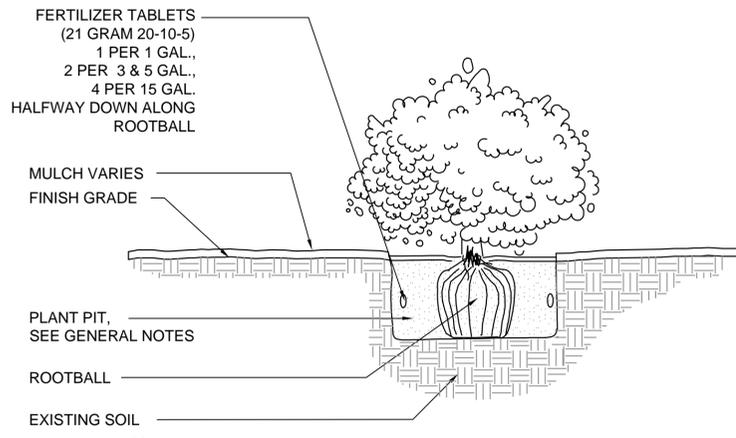
PROJECT TYPE	CAPITAL IMPROVEMENT PROJECT
PROJECT NAME	THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
PROJECT NUMBER	ST1306 (EN17-020)
SEAL	
ORIGINAL PLAN DATE	
LATEST REVISION DATE	08/12/2016
SHEET NUMBER	26 OF 40
PROJECT NUMBER	ST1306

AVONDALE
ENGINEERING AND ENVIRONMENTAL DESIGN, LLC
4648 EAST CANTON GIL LOOP, SUITE B2
PHOENIX, ARIZONA 85040
PHONE: 602.438.2221
WEB: WWW.A2DESIGN.US
P2 PROJECT # 15-0828





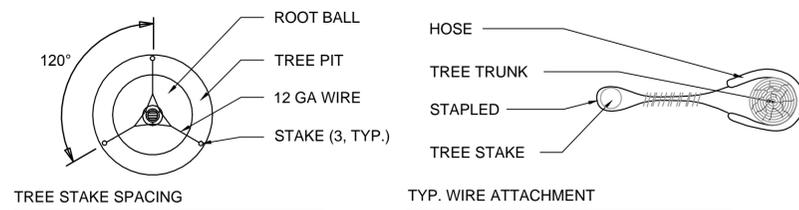
1 TREE PLANTING
NTS



2 SHRUB PLANTING
NTS

GENERAL NOTES TO CONTRACTOR:

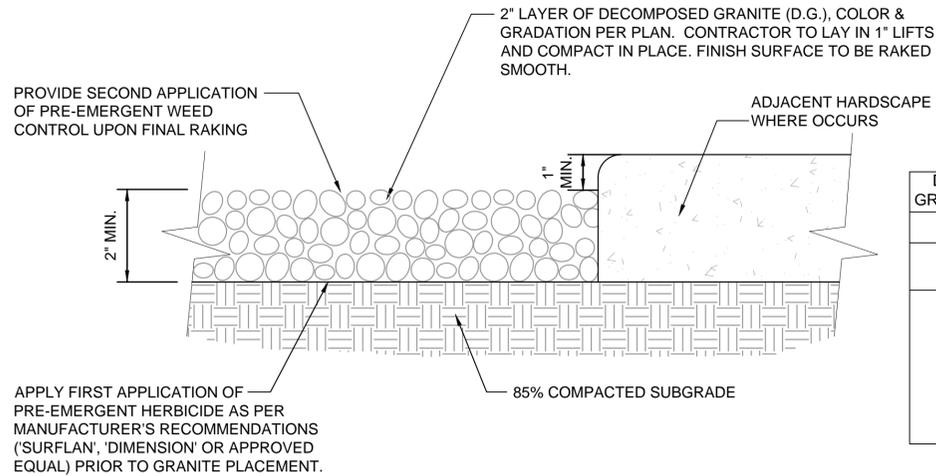
1. PLANTS DELIVERED WITH CRACKED OR BROKEN CONTAINERS WILL BE REJECTED.
2. SEE SPECIFICATIONS FOR PLANT BACKFILL MIX.
3. MINIMUM PLANT PIT IS 2-1/2 TIMES THE DIAMETER OF ROOTBALL, AND NO DEEPER THAN DEPTH OF THE ROOTBALL.
4. ROOTBALL CROWN TO BE 1/2" HIGHER THAN ADJACENT FINISH GRADE.



NOTE:
TIE WIRES, 2 STRAND TWISTED 12 GA. WIRE RUN THRU 1" DIA. MULTI-PLY RUBBER HOSE, END OF WIRE STAPLED TO STAKE. PLACE TOP TIE FOR MAXIMUM SUPPORT ABOVE LOWEST SCAFFOLD BRANCHES. BOTTOM TIE PLACED HALFWAY BETWEEN TOP TIE AND GRADE, OR AS DIRECTED BY CITY REPRESENTATIVE

LODGE POLE TREE STAKES TO BE 2" DIA. BY LENGTH VARIES. DRIVEN MINIMUM OF 12" INTO UNDISTURBED SOIL AT OUTER FACE OF PLANTING PIT. LODGE POLE TO BE CUT OFF AT 6" ABOVE TOP WIRE.

3 TREE STAKING DETAIL
NTS



NOTES:

1. ALL D.G. SLOPES IN EXCESS OF 6:1 SHALL BE COMPACTED BY WATER & ROLLING.
2. CONTRACTOR TO PROVIDE PROPOSED D.G. SAMPLE TO CITY FOR APPROVAL PRIOR TO ORDERING AND INSTALLATION.
3. THIRD APPLICATION OF PRE-EMERGENT SHALL BE APPLIED 30 DAYS BEFORE FINAL ACCEPTANCE OF PROJECT OR AS DIRECTED BY THE CITY REPRESENTATIVE.

4 DECOMPOSED GRANITE
NTS

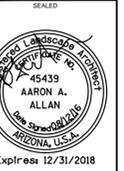
DECOMPOSED GRANITE GRADATION REQUIREMENTS 3/4" MINUS		DECOMPOSED GRANITE GRADATION REQUIREMENTS 1 1/4" MINUS	
PASSING SIEVE	%	PASSING SIEVE	%
4"	100	1 1/4"	100
1 1/4"	100	3/4"	60 - 80
1"	84 - 82	1/2"	45 - 65
3/4"	40 - 38	#40	5 - 20
1/2"	4 - 2		
#4	2 - 0.5		



12 engineering and environmental design, llc
4649 east cotton gin loop, suite 102
phoenix, arizona 85040
phone: 602.438.2221
web: www.2designus.com
P2 project #: 15.0828



CAPITAL IMPROVEMENT PROJECT
THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
ST1306 (EN17-020)



ORIGINAL PLAN DATE
LATEST REVISION DATE
08/12/2016
SHEET NUMBER
27 OF 40
PROJECT NUMBER
ST1306

IRRIGATION GENERAL NOTES:

- PRIOR TO SUBMITTING A BID FOR THE IRRIGATION WORK THE CONTRACTOR SHALL VISIT THE SITE TO VERIFY ALL INSTALLATION CONDITIONS.
- THE CONTRACTOR SHALL READ THOROUGHLY AND BECOME FAMILIAR WITH THE PLANS, SPECIFICATIONS AND INSTALLATION DETAILS FOR THIS AND RELATED WORK PRIOR TO CONSTRUCTION.
- QUANTITIES OF IRRIGATION COMPONENTS NOTED ON THE PLANS, DETAILS OR SPECIFICATIONS ARE FOR CONVENIENCE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS REQUIRED TO PROVIDE A COMPLETE WORKING IRRIGATION SYSTEM AS DESIGNED, AND SHALL PROVIDE OWN MATERIAL TAKE OFF QUANTITIES.
- IRRIGATION COMPONENTS CALLED OUT BY MANUFACTURER AND MODEL NUMBER DESIGNATE A TYPE OF MATERIAL, SIZE AND LEVEL OF PERFORMANCE. THE CONTRACTOR MAY SUBSTITUTE ALTERNATE COMPONENTS AS EQUAL WITH WRITTEN APPROVAL FROM DESIGNER OR TOWN'S PROJECT ENGINEER.
- BEFORE STARTING ANY WORK THE CONTRACTOR SHALL CONTACT BLUE STAKE TO VERIFY LOCATIONS AND DEPTHS OF UNDERGROUND UTILITIES THAT MAY BE AFFECTED BY THEIR WORK, AND THEY SHALL BE RESPONSIBLE FOR DAMAGES TO SUCH UTILITIES CAUSED AS A RESULT OF THEIR IRRIGATION INSTALLATION.
- THE CONTRACTOR SHALL NOT PROCEED WITH THE INSTALLATION OF THE IRRIGATION SYSTEM WHEN IT IS OBVIOUS IN THE FIELD THAT OBSTRUCTIONS OR GRADE DIFFERENCES EXIST THAT MIGHT NOT HAVE BEEN CONSIDERED IN THE ENGINEERING, OR IF DISCREPANCIES IN CONSTRUCTION DETAILS, LEGENDS, NOTES, OR SPECIFICATIONS ARE DISCOVERED. BRING ALL SUCH OBSTRUCTIONS OR DISCREPANCIES TO THE ATTENTION OF THE ENGINEER IN WRITING PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPENSATING THE OWNER AND/ OR THE OWNER'S REPRESENTATIVE FOR ANY DESIGN CHANGES MADE AS A RESULT OF DEVIATION BY THE CONTRACTOR FROM PLANS, DETAILS AND SPECIFICATIONS OR DUE TO ERRORS, FAULTY MATERIALS OR FAULTY WORKMANSHIP.
- THE MAINLINE PIPE, SUBMAIN, LATERAL PIPE, VALVES AND OTHER COMPONENTS ARE SHOWN SCHEMATICALLY AND MAY BE DRAWN OUTSIDE OF PLANTING AREAS FOR GRAPHIC CLARITY. INSTALL ALL COMPONENTS IN LANDSCAPE AREAS WHENEVER POSSIBLE. AVOID CONFLICTS BETWEEN THE IRRIGATION SYSTEM, UTILITIES, PLANT MATERIAL, AND ARCHITECTURAL FEATURES.
- THE IRRIGATION CONTRACTOR IS RESPONSIBLE FOR 100% COVERAGE TO ALL PLANT MATERIAL. COORDINATE IRRIGATION INSTALLATION WITH LANDSCAPE PLANS AND LANDSCAPE CONTRACTOR.
- THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE AND FEDERAL LAWS, CODES, AND REGULATIONS APPLICABLE TO THE IRRIGATION SYSTEM COVERED BY THESE PLANS.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND COMPLYING WITH ALL PERMITS REQUIRED TO COMPLETE THE IRRIGATION WORK COVERED BY THESE PLANS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY TRAFFIC CONTROL REQUIRED AS A RESULT OF THE IRRIGATION SYSTEM INSTALLATION. THE COST OF THE TRAFFIC CONTROL IS TO BE CONSIDERED INCIDENTAL, AND THE COST INCLUDED IN THE ASSOCIATED IRRIGATION SYSTEM WORK. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS AND COMPLY WITH ALL LOCAL MUNICIPAL CODES, REGULATIONS AND PROCEDURES.
- INSTALL ALL ELECTRICAL POWER TO THE IRRIGATION CONTROL SYSTEM IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE AND ALL APPLICABLE LOCAL CODES. ALL ELECTRICAL PRODUCTS UTILIZED ON THE PROJECT SHALL BE UL LISTED. THE IRRIGATION CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE NEW ELECTRICAL SERVICE WITH LOCAL ELECTRICITY PROVIDER AND THE ELECTRICAL CONTRACTOR. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ALL CONDUIT AND CONDUCTORS FROM THE 120 VOLT SOURCE LOCATION SUPPLIED BY THE ELECTRICAL CONTRACTOR.
- ALL BACKFLOW PREVENTERS 2" OR LARGER SHALL BE SCREENED WITH LANDSCAPE MATERIAL LOCATED WITHIN A 6' RADIUS OF THE BACKFLOW PREVENTER. ALL BACKFLOW PREVENTERS SHALL BE PLACED IN A WIRE MESH ENCLOSURE POWDER- COATED TAN OR AS NOTED PER PLANS.
- THE IRRIGATION CONTRACTOR IS RESPONSIBLE FOR ALL IRRIGATION SLEEVING. SLEEVES SHALL BE PROVIDED FOR ALL IRRIGATION PIPING, LOW VOLTAGE (24 VOLT) WIRING, COMMUNICATION CABLE, AND HIGH VOLTAGE (120 VOLT AND GREATER) WIRING REQUIRED FOR THE IRRIGATION SYSTEM. SLEEVING FOR THE HIGH VOLTAGE WIRE SHALL BE SEPARATE FROM THE WATER PIPE, LOW VOLTAGE AND COMMUNICATION SLEEVES. HIGH VOLTAGE WIRING SHALL BE PLACED IN CONDUIT WITHIN IT'S SLEEVE. SEPARATE SLEEVES SHALL BE PROVIDED WITHIN THE PRIMARY SLEEVE FOR LOW VOLTAGE AND COMMUNICATION WIRING WHEN THEY SHARE A SLEEVE WITH THE IRRIGATION PIPING. SLEEVES SHALL BE PROVIDED UNDER ALL PAVING, SIDEWALKS, PATHS, AND THROUGH ALL WALLS. ANY PIPE OR WIRE WHICH PASSES BENEATH EXISTING HARDSCAPE WHERE SLEEVING WAS NOT INSTALLED REQUIRES HORIZONTAL BORING BY THE IRRIGATION CONTRACTOR. SLEEVE SIZES SHALL BE TWICE THE AGGREGATE DIAMETER OF ALL PIPE AND WIRE CONTAINED WITHIN THE SLEEVE.
- THIS SYSTEM IS DESIGNED FOR A MINIMUM STATIC PRESSURE OF 55 POUNDS PER SQUARE INCH (PSI) AT THE POINT OF CONNECTION. CONTRACTOR SHALL VERIFY THE STATIC PRESSURE PRIOR TO STARTING ANY WORK. PROVIDE A WRITTEN RECORD OF THE STATIC PRESSURE TO THE ENGINEER. IF THE PRESSURE IS LESS THAN THE DESIGN PRESSURE CONSULT THE IRRIGATION DESIGNER PRIOR TO STARTING WORK. SHOULD THE PRESSURE EXCEED 95 PSI, INSTALL A WILKINS 500-C-HRL PRESSURE REGULATOR IMMEDIATELY DOWNSTREAM OF THE BACKFLOW PREVENTER AND SET AT 85 PSI.
- THE IRRIGATION POINT OF CONNECTION CAN SAFELY PROVIDE 17 GALLONS PER MINUTE (GPM) TO THE IRRIGATION SYSTEM. VALVE CIRCUITS AND CONTROLLER PROGRAMMING SHALL NOT CREATE A SYSTEM FLOW DEMAND GREATER THAN 13 GPM.
- CROSS ALL SIDEWALKS, CONCRETE, AND HARDSCAPE AT RIGHT ANGLES WHEREVER POSSIBLE. NO LONG LATERAL RUNS WILL BE ALLOWED UNDER COMPACTED AREAS DESIGNATED FOR PAVEMENT.
- THE CONTRACTOR SHALL ARRANGE FOR THE FOLLOWING INSPECTIONS AND MEETINGS DURING THE IRRIGATION SYSTEM INSTALLATION:

- PRE-CONSTRUCTION CONFERENCE
 - LAYOUT OF MAJOR COMPONENTS: BACKFLOW, CONTROLLER, CONTROL VALVES, BALL VALVES, MAINLINE AND WIRE ROUTING.
 - PRESSURE TESTING OF MAINLINE
 - LAYOUT OF EMITTER HEADS
 - COVERAGE TEST OF SPRINKLER, SPRAY, BUBBLER, AND OR EMITTER HEADS
 - FINAL WALK THROUGH/BEGINNING OF MAINTENANCE-WARRANTY PERIOD
 - FINAL ACCEPTANCE/END OF MAINTENANCE-WARRANTY PERIOD.
- THE IRRIGATION MAINLINE SHALL BE TESTED AT 120 PSI FOR NOT LESS THAN FOUR (4) HOURS WITH NO LOSS OF PRESSURE. DO NOT BACKFILL MAINLINE UNTIL AFTER SUCCESSFUL COMPLETION OF MAINLINE TEST. MAINLINE SHALL BE TESTED WITH BALL VALVES AND QUICK COUPLERS INSTALLED, CONTROL VALVE LOCATIONS SHALL BE CAPPED.
 - INSTALL ALL MAINLINES 2" AND SMALLER WITH 18" MINIMUM COVER.
 - INSTALL ALL SLEEVING UNDER PAVEMENT WITH 36" MINIMUM COVER.
 - INSTALL ALL PVC SPRINKLER AND DRIP LATERALS WITH 12" MINIMUM COVER.
 - INSTALL ALL VINYL DISTRIBUTION TUBE WITH 2" MINIMUM COVER BELOW SUBGRADE PRIOR TO GRANITE INSTALLATION.
 - ALL PIPE TO BE INSTALLED PER THE MANUFACTURER'S SPECIFICATIONS AND ASTM STANDARD D-2774.
 - PIPE BEDDING SHALL CONSIST OF CLEAN NATIVE SOIL WITH NO STONE LARGER THAN 1/4" DIAMETER. 3" OF MORTAR SAND PLACED COMPLETELY AROUND THE PIPE IS AN ACCEPTABLE SUBSTITUTE FOR NATIVE SOIL. PIPING 4"-12" SHALL RECEIVE 6" OF BEDDING MATERIAL.
 - TRENCHES THAT CONTAIN MULTIPLE PIPES SHALL MAINTAIN A MINIMUM OF 3" OF SEPARATION BETWEEN PIPES.
 - MAINLINE FITTINGS TO BE SCHEDULE 80. USE TOE (THREADED ONE END) NIPPLES, NO MALE ADAPTERS WILL BE ACCEPTED.
 - SUBMAIN AND LATERAL LINE (NON-PRESSURE) FITTINGS TO BE SCHEDULE 40.
 - ALL PVC SCHEDULE 40 AND SCHEDULE 80 FITTINGS TO BE LASCO OR APPROVED EQUAL.
 - ALL THREADED JOINTS SHALL BE WRAPPED WITH TEFLON TAPE UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER. USE LIQUID TEFLON ON METAL PIPE THREADS ONLY.
 - TREES SHALL BE ON SEPARATE VALVES FROM SHRUBS AND GROUND COVERS. CONTAINER PLANTS SHALL BE ON SEPARATE VALVES. ANNUAL (FLOWER) BEDS SHALL BE ON SEPARATE VALVES.
 - FLUSH ALL LINES PRIOR TO THE INSTALLATION OF SPRINKLERS, BUBBLERS, AND EMITTERS.
 - INSTALL BUBBLERS AND EMITTERS ON THE UPHILL SIDE OF PLANT MATERIAL.
 - INSTALL BUBBLERS AND/OR EMITTERS 8" FROM THE CENTERLINE OF SHRUBS AND 24" FROM TREE CENTERLINES OR AS NOTED PER DETAILS.
 - INSTALL EMITTERS AND SPRINKLERS PER THE IRRIGATION SYSTEM DETAILS AND SPECIFICATIONS.
 - ALL LOW VOLTAGE CONTROL WIRE TO BE #12-1 AWG UF 600 DIRECT BURIAL. COMMON WIRE TO BE #12-1 AWG UF 600 DIRECT BURIAL. CONTROL TO BE RED, COMMON TO BE WHITE. PROVIDE ONE SPARE GREEN #12-1 AWG DIRECT BURIAL WIRES FROM THE CONTROLLER ALONG THE ENTIRE LENGTH OF THE MAINLINE LOOPED INTO EACH VALVE BOX.
 - WIRE CONNECTIONS SHALL BE MADE AT REMOTE CONTROL VALVE BOXES AND IRRIGATION CONTROLLERS. NO SPLICING OF WIRE IS PERMITTED UNLESS THE RUN LENGTH EXCEEDS 2500 FEET. ANY REQUIRED WIRE SPLICES SHALL BE PLACED IN VALVE BOXES OF THE SAME SIZE AS THE REMOTE CONTROL VALVES LABELED "WIRE SPLICE".
 - ALL LOW VOLTAGE WIRE CONNECTIONS SHALL BE MADE WITH DBY-6 DIRECT BURY SPLICE KITS AS MANUFACTURED BY 3M ELECTRICAL PRODUCTS OR APPROVED EQUAL.
 - PLACE BALL VALVES IN ROUND VALVE BOXES AS SHOWN IN THE PROJECT DETAILS.
 - VALVE BOXES SHALL BE TAN COLOR IN DECOMPOSED GRANITE AND GREEN IN TURF.
 - MAINTAIN AS-BUILT PLANS OF IRRIGATION ON A DAILY BASIS, NOTING ALL CHANGES REGARDING INSTALLATION OF SYSTEM THAT DIFFER FROM PLANS. UPON FINAL ACCEPTANCE OF PROJECT BY ENGINEER, CONTRACTOR SHALL TURN IN ALL AS-BUILT PLANS ON A REPRODUCIBLE SET OF MYLAR.
 - SUPPLY THE FOLLOWING MATERIALS TO THE OWNER AT FINAL WALK THROUGH/ BEGINNING OF WARRANTY-MAINTENANCE:
 - TWO OPERATING KEYS FOR BALL VALVES.
 - TWO KEYS FOR EACH IRRIGATION CONTROLLER ENCLOSURE.
 - TWO QUICK COUPLER VALVE KEYS, COVER KEYS, AND HOSE SWIVELS.
 - TEN OF EACH EMITTER TYPE USED.
 - OPERATING/ OWNERS/ PARTS MANUALS FOR CONTROLLERS, BACKFLOWS, MASTER VALVES, FLOW SENSORS, BALL VALVES, REMOTE CONTROL VALVES, QUICK COUPLERS, AND EMITTERS.
 - APPROVED BACKFLOW TEST CERTIFICATION.
 - ALL GEO TEXTILE FABRIC SHALL CONFORM TO MAG SECTION 796.2.2 CLASS 'B'.

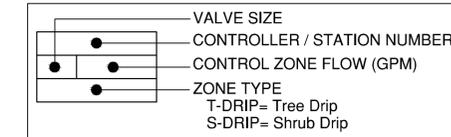
IRRIGATION LEGEND

SYMBOL	DESCRIPTION	QTY
	1" POTABLE WATER METER- PER CIVIL PLANS	1 EA
	IRRIGATION CONTROLLER: HUNTER XC HYBRID 6 STATION SOLAR POWERED CONTROLLER. XCH-600-SS, STAINLESS STEEL ENCLOSURE, XCHSPOLE - STAINLESS STEEL MOUNTING POLE (4"), XCHSPB-STAINLESS STEEL MOUNTING BRACKET (REQUIRED FOR POLE), SPXCH - SOLAR PANEL KIT FOR XC HYBRID.	1 EA
	BACKFLOW PREVENTION DEVICE: 1" WILKINS (#975XLSE) REDUCED PRESSURE BACKFLOW; 1" BRONZE UNION (CxC); TYPE 'K' COPPER HARD TUBE PIPE; GUARDSHACK LIFT-OFF ENCLOSURE (#GS-1) ON POURED-IN-PLACE CONCRETE PAD-POWDER COAT ENCLOSURE 'WOODLAND TAN' COLOR BY MANUFACTURER; INSTALL PER CITY OF AVONDALE STANDARD DETAIL A1326.	1 EA
	BALL VALVE ASSEMBLY: 1" COLONIAL VALVE (LASCO) SLO-CLOSE SERIES FULL BLOCK TRUE UNION PVC BALL VALVE WITH SOCKET CONNECTIONS & EPDM O-RINGS (#V10101N-SC); INSTALL IN CARSON TAN COLOR 10" ROUND VALVE BOX WITH LOCKING T-COVER (#910); PROVIDE TWO LASCO PVC VALVE KEY SETS (#WKEY-1) ASSEMBLED WITH SCH. 40 PVC PIPES TO CITY	2 EA
	DRIP REMOTE CONTROL VALVE ASSEMBLY: 1" RAIN BIRD GLOBE STYLE GLASS-FILLED NYLON BODY CONTROL VALVE (#100-PEB); DC LATCHING SOLENOID; 1" RAIN BIRD QUICK-CHECK BASKET FILTER AND INTEGRATED 40 PSI PRESSURE REGULATOR (#PRB-QKCHK-100) WITH STANDARD 200 MESH SS FILTER SCREEN; 1" SPEARS TRUE UNION 2000 SERIES FULL PORT PVC BALL VALVE PRESSURE RATED TO 235 PSI (SxS); 1" SPEARS 2000 SERIES PVC UNION (SxS); SCH. 80 PVC NIPPLES & FITTINGS; INSTALL IN CARSON TAN COLOR SUPER JUMBO VALVE BOX WITH LOCKING T-COVER (#1324-12)	4 EA
	LATERAL FLUSH END CAP ASSEMBLY: 3/4" AGRIFIM PRODUCTS BALL VALVE WITH 3/4" FPT INLET x 3/4" MHT OUTLET; SCH. 40 PVC FITTINGS; 3/4" PVC FLEX RISER PIPE	8 EA (NPI)
NOT SHOWN	MULTI-PORT EMITTER ASSEMBLY: RAIN BIRD XERIBUG 6-PORT 2 GPH EMITTER WITH 1/2" FPT BASE (#XBT-20-6); SCH. 40 PVC FITTINGS; 3/4" PVC FLEX RISER PIPE; INSTALL IN CARSON 5" ROUND TAN COLOR EMITTER BOX WITH T-COVER (#0510)	76 EA
NOT SHOWN	SINGLE-PORT EMITTER ASSEMBLY: RAIN BIRD XERIBUG EMITTER WITH 1/2" FPT BASE (#XBT-XX); SCH. 40 PVC FITTINGS; 3/4" PVC FLEX RISER PIPE; DIRECT BURY PER DETAIL	464 EA
	MAINLINE PIPE: 1" SCHEDULE 40 SOLVENT WELD PVC PIPE	1,238 LF
	TREE LATERAL PIPE: 3/4" SDR 21 CLASS 200 SOLVENT WELD PVC PIPE	1,437 LF
	SHRUB LATERAL PIPE: 3/4" SDR 21 CLASS 200 SOLVENT WELD PVC PIPE	3,153 LF
	PIPE & WIRE SLEEVES: 4" & 6" SCH. 40 PVC PIPE SLEEVES (PS) AT MAINLINE DEPTH OR 36" MINIMUM DEPTH WHEN UNDER DRIVE SURFACE; 1" SCH. 40 PVC WIRE SLEEVES (WS) INSTALLED WITHIN PIPE SLEEVES	1" = 164 LF 4" = 175 LF 6" = 164 LF

EMITTER SCHEDULE

SYM:	SPECIES:	QUANTITY / TYPE:	PORTS PER VOLUME: EMITTER
TREES-			
	Acacia salicina Willow Acacia	2 / MULTI	4 / 2 GPH
	Parkinsonia hybrid Hybrid Palo Verde	2 / MULTI	4 / 2 GPH
SHRUBS / GROUNDCOVER / ACCENTS-			
	Calliandra californica Baja Fairy Duster	1 / SINGLE	1 / 2 GPH
	Leucophyllum frutescens 'Green Cloud' Green Cloud Sage	1 / SINGLE	1 / 2 GPH
	Eremophila glabra 'Mingenew Gold' Outback Sunrise Emu	1 / SINGLE	1 / 2 GPH
	Lantana sp. New Gold Lantana	1 / SINGLE	1 / 2 GPH
	Rosmarinus officinalis 'Huntington Carpet' Trailing Rosemary	1 / SINGLE	1 / 2 GPH
	Aloe X 'Blue Elf' 'Blue Elf' Aloe	1 / SINGLE	1 / 1 GPH
	Hesperaloe parviflora 'Perpa' Breaklights 'Perpa' Breaklights Red Yucca	1 / SINGLE	1 / 1 GPH
	Dasylirion wheeleri Desert Spoon	1 / SINGLE	1 / 1 GPH
	Yucca pallida Pale Leaf Yucca	1 / SINGLE	1 / 1 GPH

VALVE KEY



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P2 project #: 15.0828

2

Avondale

PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT
PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
PROJECT NUMBER: ST1306 (EN17-020)

SEAL

ORIGINAL PLAN DATE

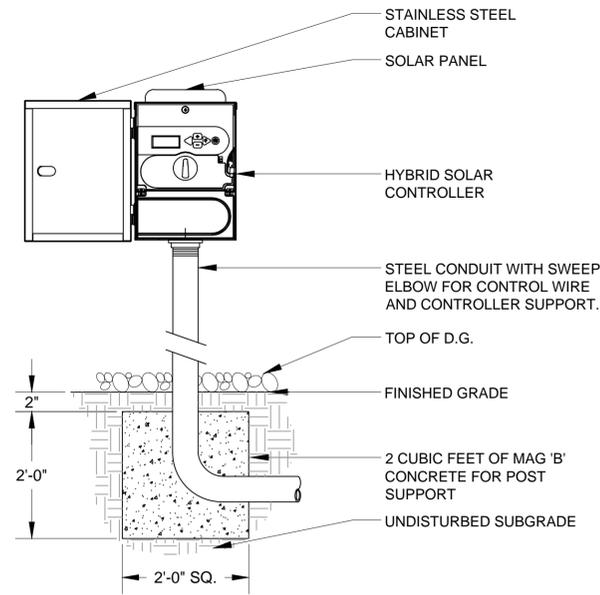
LATEST REVISION DATE

08/12/2016

SHEET NUMBER
28 OF **40**

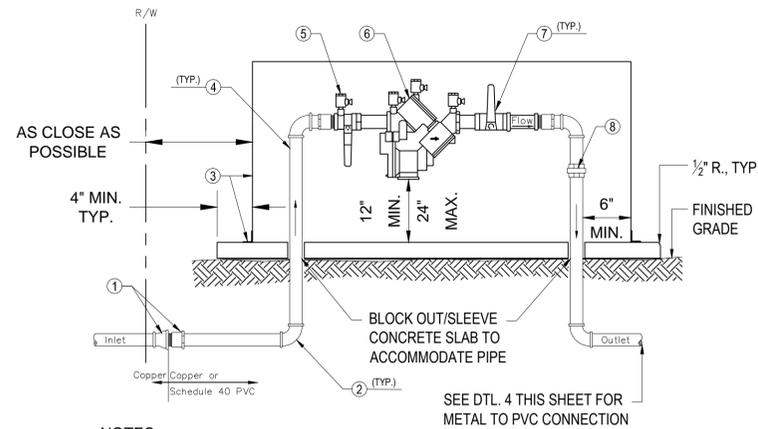
PROJECT NUMBER
ST1306

Call us least two full working days before your next meeting.
ARIZONA 811
Dig Safe System, Inc.
Hd Q-4 or 1-800-475-4747 (toll-free)
In Maricopa County: (602) 285-1100



- NOTES:
1. MOUNT CONTROLLER WITH LCD SCREEN AT EYE LEVEL.
 2. MOUNT CONTROLLER ON STEEL MOUNTING POLE.
 3. MOUNT SOLAR PANEL TO THE TOP OF THE STAINLESS STEEL CABINET AND THE WIRE FED INSIDE THE CABINET VIA DRILLING OF A SMALL OPENING THROUGH THE STAINLESS STEEL.
 4. ONLY USE DC-LATCHING SOLENOIDS ON DRIP VALVES WITH THIS CONTROLLER.
 5. CONTRACTOR TO INCLUDE CHARGING UNIT WITH CONTROLLER.

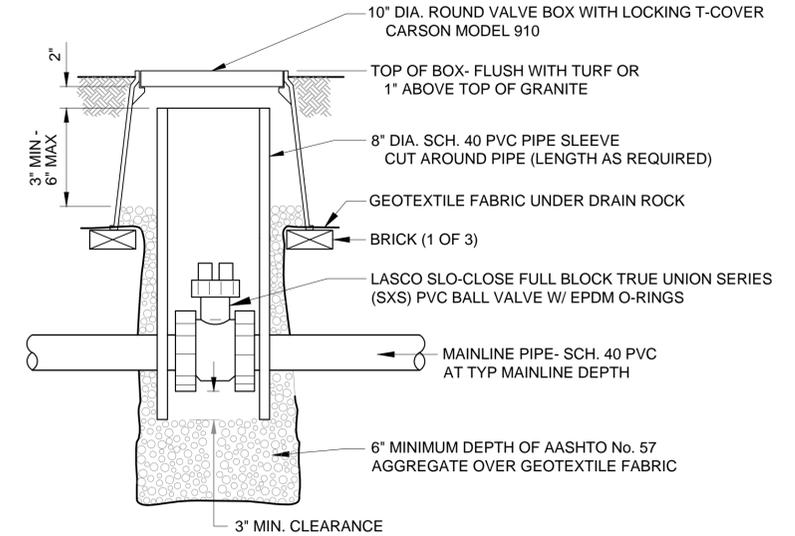
1 SOLAR CONTROLLER ON PEDESTAL
SCALE: N.T.S.



- NOTES:
1. APPROVAL BACKFLOW ASSEMBLIES MUST HAVE SEAL OF APPROVAL FROM THE UNIVERSITY OF SOUTHERN CALIFORNIA FOUNDATION FOR CROSS CONNECTION CONTROL AND HYDRAULIC RESEARCH. BACKFLOW ASSEMBLIES INSTALLED ON FIRE SUPPRESSION SYSTEMS MUST ALSO HAVE APPROVAL FROM UNDERWRITERS LABORATORIES AND/OR FACTORY MUTUAL RESEARCH CORPORATION.
 2. ALL MATERIAL TO BE COPPER, BRASS, OR SCHEDULE 40 PVC. ALL SCHEDULE 40 PIPE AND APPURTENANCES MUST UTILIZE A CITY APPROVED UV PROTECTION WHEN INSTALLED ABOVE GRADE.
 3. COPPER FITTINGS SHALL BE CONNECTED WITH LEAD FREE SOLDER JOINTS.
 4. PVC FITTINGS SHALL BE SOLVENT WELDED.
 5. THE BACKFLOW MECHANISM AND ALL VALVES SHALL BE THREADED.
 6. FINISHED GRADE UNDERNEATH THE BACKFLOW PREVENTION ASSEMBLY SHALL BE AT 95% COMPACTION.
 7. ALL PIPE NIPPLES TO BE COPPER, BRASS, OR SCHEDULE 80 PVC.
 8. ALL PIPING IN THE CITY RIGHT OF WAY MUST BE TYPE "K" COPPER FROM THE METER THROUGH THE BACKFLOW PRIOR TO TRANSITIONING TO PVC MAINLINE.
 9. CALL FOR UNDERGROUND INSPECTION BEFORE BACKFILLING TRENCH.
 10. VERTICAL INSTALLATIONS OF ASSEMBLIES ON FIRE SPRINKLER SYSTEMS ARE ALLOWED USING ASSEMBLIES APPROVED FOR USE IN THE VERTICAL POSITION ON FIRE SYSTEMS.
 11. BACKFLOW ASSEMBLIES MUST BE TESTED BY A CERTIFIED TESTER THAT IS RECOGNIZED BY THE CITY OF AVONDALE.

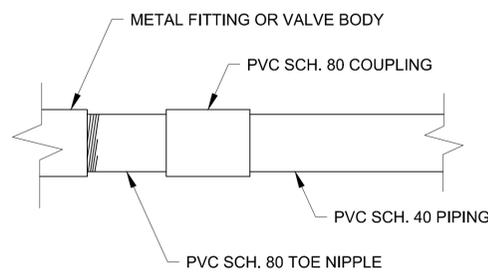
2 REDUCED PRESSURE BACKFLOW PREVENTION UNIT
SCALE: N.T.S. (MODIFIED C.O.A. STANDARD DETAIL # A1326)

- LIST OF MATERIALS
1. THREADED FEMALE COPPER TRANSITION COUPLING TO THREADED MALE SCHEDULE 40 PVC COUPLING/ADAPTER (ONLY IF USING SCHEDULE 40 PVC ON THE ASSEMBLY, OTHERWISE OMIT).
 2. 90° ELBOW
 3. INSTALL 4" MAG 'B' CONCRETE PAD, ENCLOSURE, AND HARDWARE. ENCLOSURE SHALL BE "GUARDSHACK, GS-M1" OR APPROVED EQUAL.
 4. PIPE RISER
 5. TEST COCKS WITH BRASS PLUGS OR ADAPTORS WITH CAPS INSTALLED. (4 REQUIRED)
 6. APPROVED REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY (SEE NOTE 1 BELOW).
 7. THREADED BRASS BALL VALVES
 8. PIPE UNION



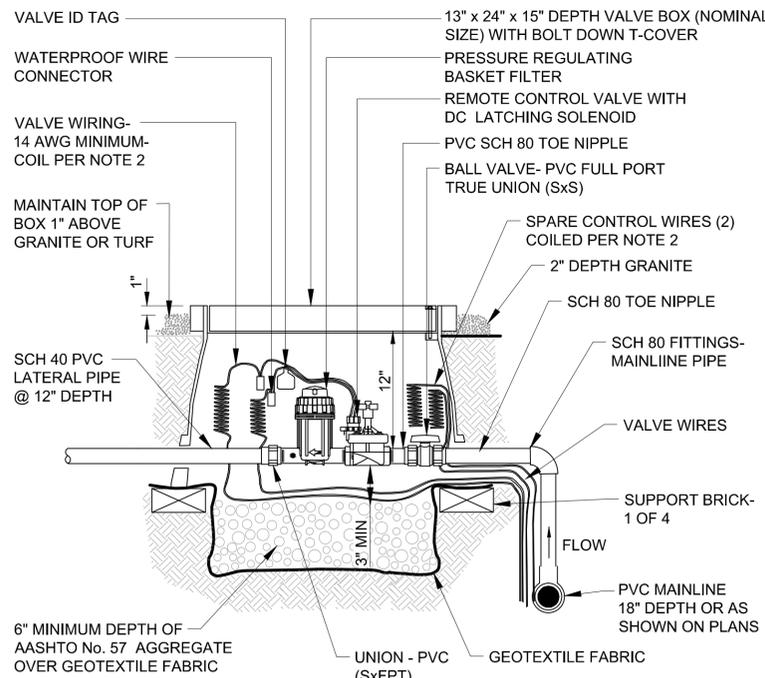
- NOTES:
1. NOMINAL SIZE OF BALL VALVE TO MATCH MAINLINE SIZE.
 2. VALVE BOX TO INCLUDE STAINLESS STEEL BOLT AND WASHER.
 3. SET VALVE BOX 1" ABOVE FINISH GRADE IN DG AND TURF AREAS.
 4. EMBOSS COVER WITH "B.V." IN 1" HIGH STENCIL LETTERS USING STYLUS TIP TORCH.
 5. CONTRACTOR SHALL SUPPLY FOUR (4) SPRINKLER KEYS TO TOWN FOR OPERATION OF BALL VALVE.

3 BALL VALVE
SCALE: N.T.S.



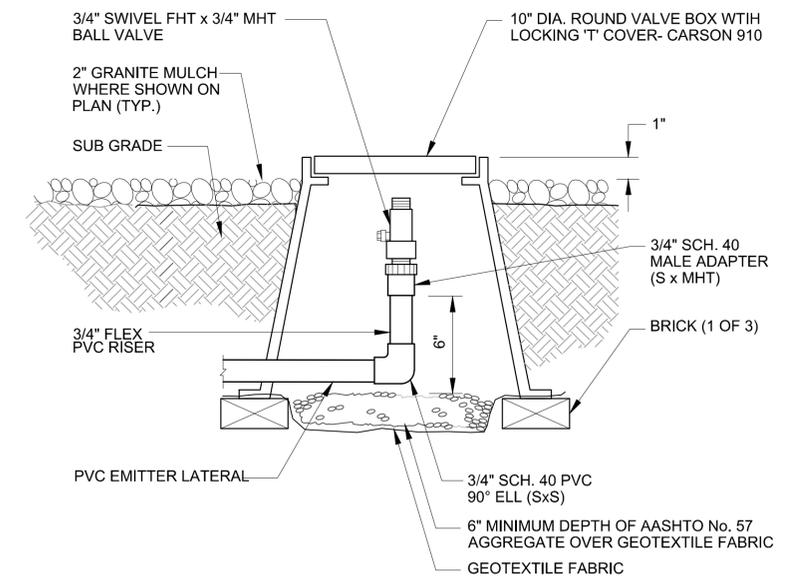
NOTE:
THIS DETAIL APPLIES TO ALL PVC-TO-METAL CONNECTIONS THROUGHOUT THE PROJECT.

4 METAL TO PVC CONNECTION
SCALE: N.T.S.



- NOTES:
1. INSTALL 40 PSI PRESSURE REGULATING FILTER WITH DEBRIS INDICATOR- 200 MESH SCREEN.
 2. PROVIDE EXPANSION COILS AT EACH WIRE CONNECTION IN VALVE BOX (WRAP AROUND 1/2" PIPE 15 TIMES).
 3. EMBOSS COVER OF REMOTE CONTROL VALVE BOX WITH 1" NUMBERS OF THE CONTROLLER LETTER AND VALVE STATION.
 4. VALVE BOX TO BE TAN IN GRANITE, GREEN IN TURF, OR PURPLE WHEN USED FOR RECLAIMED WATER.

5 DRIP REMOTE CONTROL VALVE ASSEMBLY
SCALE: N.T.S.



- NOTES:
1. DO NOT INSTALL FLUSH END CAP WITHIN MATURE CANOPY OF ANY GROUND COVER OR ACCENT PLANT.
 2. VALVE BOX WITH LETTERS "F.V." EMBOSSED IN COVER USING 1" HIGH STENCIL LETTERS STYLUS TIP TORCH.
 3. NON PAY ITEM, COST IS CONSIDERED INCLUDED IN OTHER ITEMS OF WORK.

6 LATERAL FLUSH END CAP ASSEMBLY (NPI)
SCALE: N.T.S.

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P2 project # 15.0628

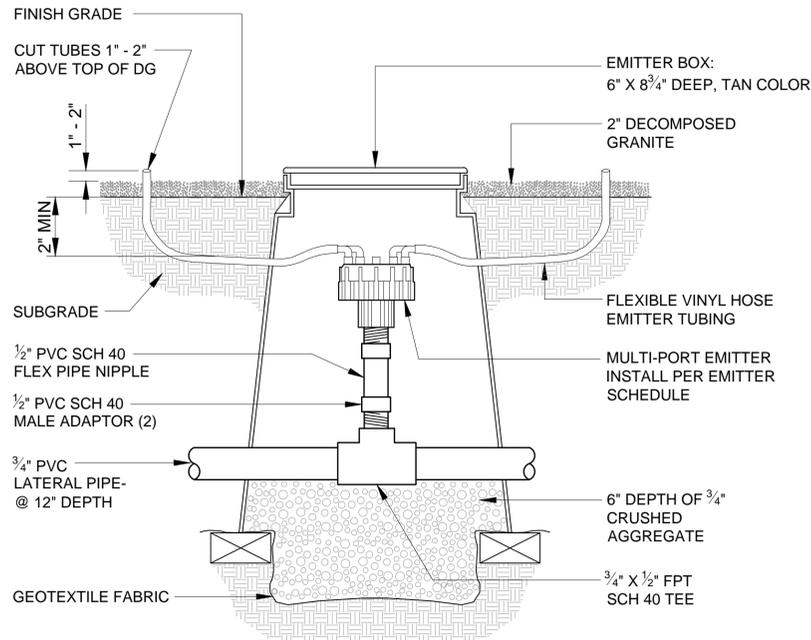


CAPITAL IMPROVEMENT PROJECT
THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
ST1306 (EN17-020)



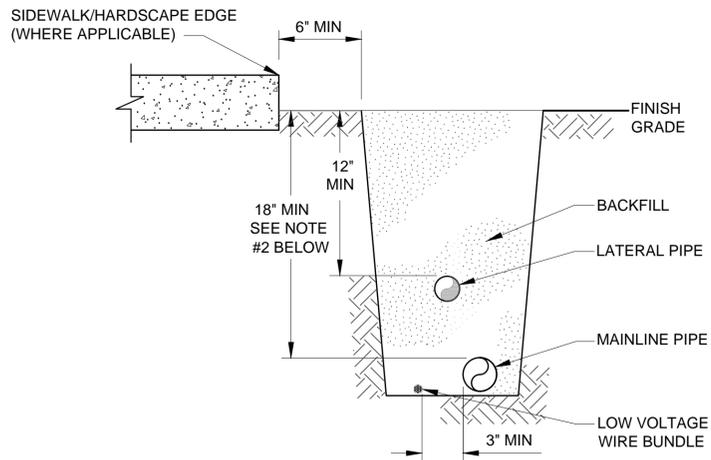
DATE: 08/12/2016
SHEET NUMBER: 29 OF 40
PROJECT NUMBER: ST1306





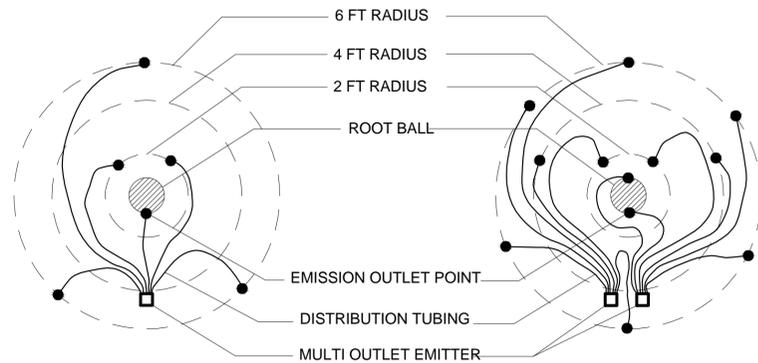
- NOTES:
1. SEE 'EMITTER SCHEDULE' FOR QUANTITY OF EMITTERS, VOLUME, AND NUMBER OF EMITTER TUBES FOR EACH TREE.
 2. BURY ALL DISTRIBUTION TUBE 2" BELOW SUBGRADE PRIOR TO GRANITE INSTALLATION.

7 MULTI-PORT EMITTER ASSEMBLY
SCALE: N.T.S.



- NOTES:
1. ALL PIPE INSTALLATION, TRENCHING, EXCAVATION, BACKFILL AND COMPACTION SHALL CONFORM WITH MAG SECTIONS 440 AND 610.
 2. MAINLINE DEPTH TO TOP OF PIPE FROM FINISH GRADE AS FOLLOWS:
2 1/2" AND SMALLER PIPE = 18" MINIMUM COVER
3" AND LARGER PIPE = 24" MINIMUM COVER
 3. TAPE WIRE BUNDLE TOGETHER AT 10'-0" INTERVALS. WHERE CONTAINED WITHIN SLEEVING AND CONDUIT, DO NOT TAPE WIRE BUNDLE.
 4. HORIZONTAL SEPARATION BETWEEN ALL PIPE WITHIN COMMON TRENCH - 3" MINIMUM COVER.
 5. SLEEVES UNDER PAVEMENT TO BE AT 36" DEPTH. EXTEND PIPE 12" BEYOND CURB OR SIDEWALK EDGE.

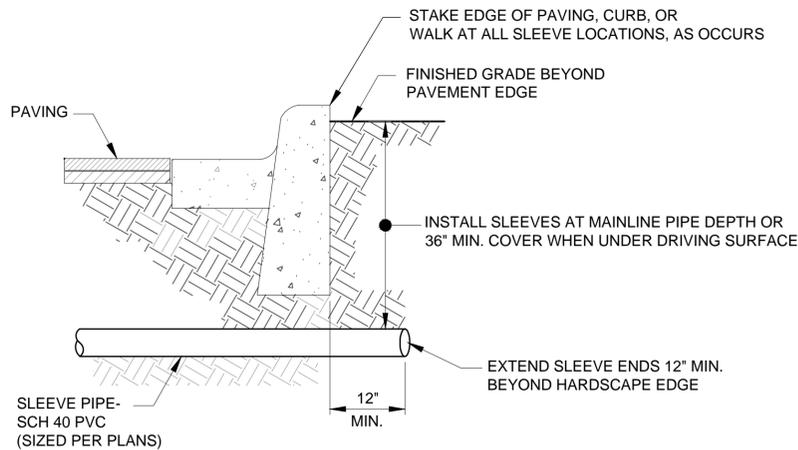
10 TRENCH AND PIPE INSTALLATION DETAIL
SCALE: N.T.S.



SINGLE MULTI OUTLET EMITTER
3-6 EMISSION POINTS

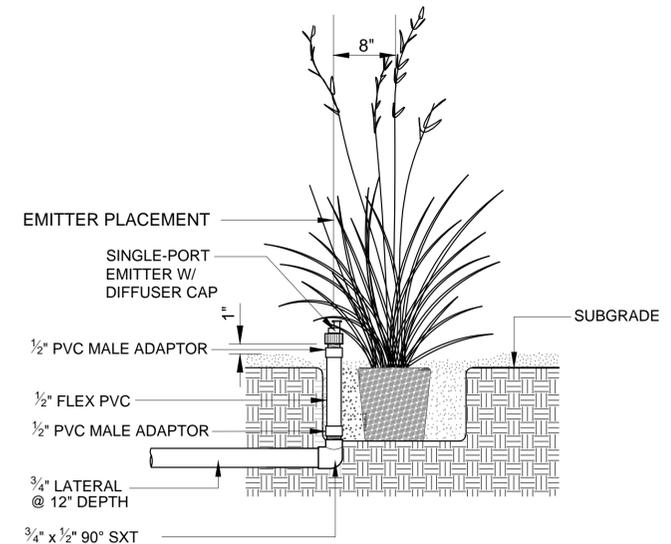
DUAL MULTI OUTLET EMITTERS
7-12 EMISSION POINTS

8 MULTI-PORT EMITTER PLACEMENT
SCALE: N.T.S.



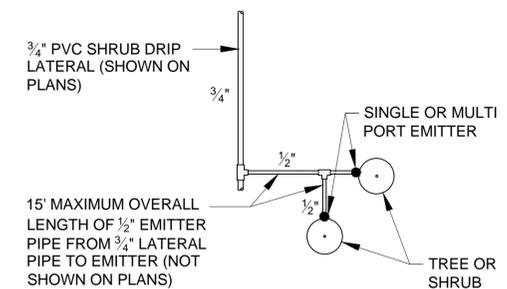
- NOTES:
1. ANY HORIZONTAL BORING AS INDICATED ON PLANS IS CONSIDERED INCIDENTAL TO SLEEVE INSTALLATION.
 2. ANY OPEN TRENCHES ARE TO BE REPAIRED USING MAG STANDARD DETAIL 200-1 "T TOP" TRENCH REPAIR.
 3. REPAIR AND REPLACE CONCRETE SIDEWALK PER MAG STANDARD DETAIL 230.
 4. REPAIR AND REPLACE VERTICAL CURB & GUTTER PER MAG STANDARD DETAIL 220-1 TYPE A.

11 SLEEVE DETAIL
SCALE: N.T.S.



- NOTES:
1. EMITTER MUST BE INSTALLED 1" ABOVE TOP OF DG AND NO FURTHER THAN 8" FROM CENTER OF PLANT ROOTBALL. EMITTER MUST BE VISIBLE UNDER PLANT CANOPY.
 2. ALWAYS INSTALL EMITTERS ON UPHILL SIDE OF ANY SLOPE.
 3. DO NOT SUBSTITUTE SINGLE-OUTLET EMITTERS FOR MULTI-OUTLET EMITTERS WITHOUT PRIOR APPROVAL BY LANDSCAPE ARCHITECT & CITY.

9 SINGLE-PORT EMITTER ASSEMBLY
SCALE: N.T.S.



NOTE:
NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR 1/2" CLASS 200 PVC PIPE, THE COST OF WHICH IS CONSIDERED INCLUDED IN THE 3/4" PVC PRICE.

12 PLAN VIEW - EMITTER INSTALLATION
SCALE: N.T.S.

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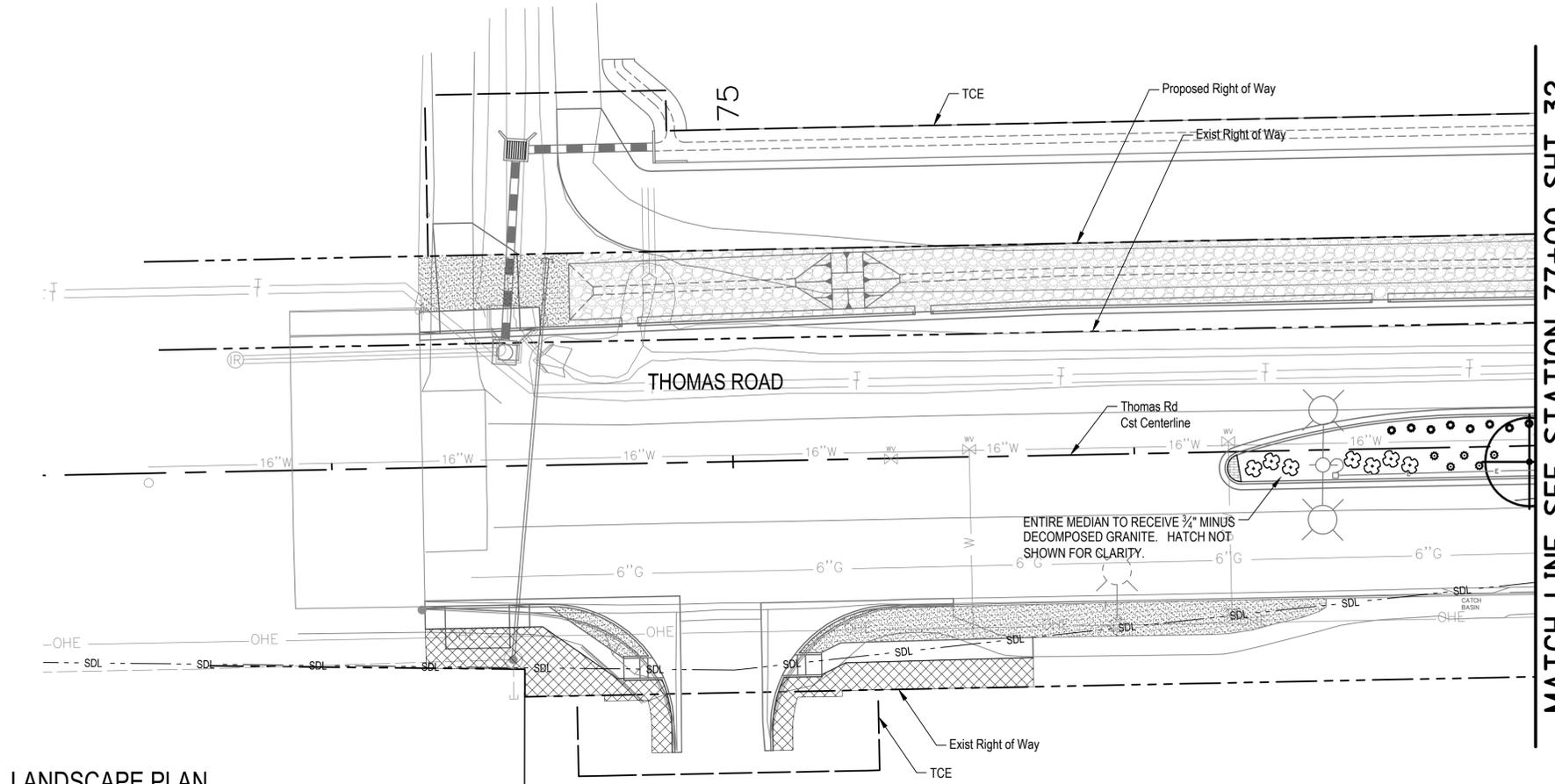


CAPITAL IMPROVEMENT PROJECT
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PROJECT NUMBER
ST1306 (EN17-020)

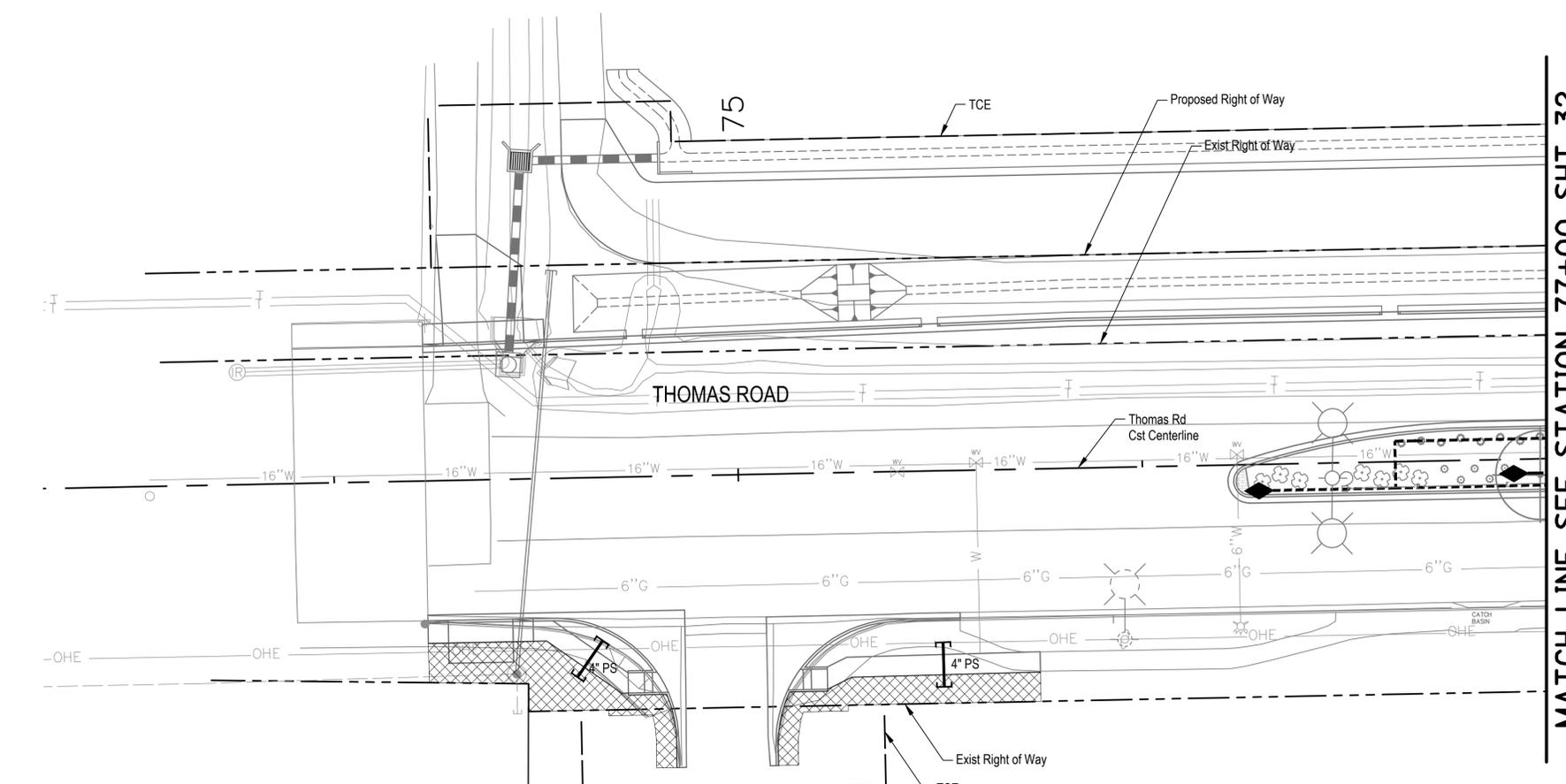


ORIGINAL PLAN DATE
LATEST REVISION DATE
08/12/2016
SHEET NUMBER
30 OF 40
PROJECT NUMBER
ST1306





LANDSCAPE PLAN



IRRIGATION PLAN

MATCH LINE SEE STATION 77+00 SHT 32

MATCH LINE SEE STATION 77+00 SHT 32

LANDSCAPE SCHEDULE

TREES		COMMON NAME
SYMBOL	BOTANICAL NAME	
	Acacia salicina	Willow Acacia
	Parkinsonia hybrid	Hybrid Palo Verde

SHRUBS		COMMON NAME
SYMBOL	BOTANICAL NAME	
	Calliandra californica	Baja Fairy Duster
	Leucophyllum frutescens 'Green Cloud'	Green Cloud Sage
	Eremophila glabra 'Mingenew Gold'	Outback Sunrise Emu

GROUNDCOVERS		COMMON NAME
SYMBOL	BOTANICAL NAME	
	Lantana sp.	New Gold Lantana
	Rosmarinus officinalis	'Huntington Carpet' Trailing Rosemary

ACCENTS		COMMON NAME
SYMBOL	BOTANICAL NAME	
	Aloe X 'Blue Elf'	'Blue Elf' Aloe
	Hesperaloe parviflora 'Perpa' Brakelights	'Perpa' Brakelights Red Yucca
	Dasylirion wheeleri	Desert Spoon
	Yucca pallida	Pale Leaf Yucca

MATERIALS LEGEND - Decomposed Granite

	3/4" MINUS DECOMPOSED GRANITE		1 1/2" MINUS DECOMPOSED GRANITE
	LANDSCAPE & IRRIGATION RESTORATION AREA. SEE SHT. 26 FOR NOTES		MEDIAN PAVERS

- NOTES:**
1. SDL- SIGHT DISTANCE LINES PER CITY OF AVONDALE STANDARD DETAILS A1020
 2. TRUNKS OF TREES SHALL BE 6'-0" CLEAR AND SHRUB CANOPIES TO BE 2'-0" CLEAR ON EITHER SIDE OF EXISTING WATERLINE. TYP.
 3. TREE CANOPIES TO BE A MIN. 30'-0" FROM ALL LIGHT POLES. TYP.
 4. ALL TRUNKS OF TREES SHALL BE 4'-0" AND SHRUB CANOPIES SHALL BE 1'-6" FROM FACE OF CURBS.

IRRIGATION EQUIPMENT LEGEND

SYMBOL	DESCRIPTION
	1" POTABLE WATER METER- PER CIVIL PLANS
	IRRIGATION CONTROLLER: HUNTER XC HYBRID SOLAR POWERED CONTROLLER
	1" BACKFLOW PREVENTION DEVICE WITH ENCLOSURE
	1" BALL VALVE ASSEMBLY
	1" DRIP REMOTE CONTROL VALVE ASSEMBLY
	LATERAL FLUSH END CAP ASSEMBLY
NOT SHOWN	MULTI-PORT EMITTER ASSEMBLY
NOT SHOWN	SINGLE-PORT EMITTER ASSEMBLY
	MAINLINE PIPE: 1" SCHEDULE 40 PVC
	TREE LATERAL PIPE: 3/4" SDR 21 CLASS 200 PVC
	SHRUB LATERAL PIPE: 3/4" SDR 21 CLASS 200 PVC
	PIPE & WIRE SLEEVES: 4" & 6" SCH. 40 PVC PIPE SLEEVES (PS) AT MAINLINE DEPTH OR 36" MINIMUM DEPTH WHEN UNDER DRIVE SURFACE; 1" SCH. 40 PVC WIRE SLEEVES (WS) INSTALLED WITHIN PIPE SLEEVES

SCALE: 1"=20'

PROJECT NUMBER: **ST1306**

ORIGINAL PLAN DATE: _____

 LATEST REVISION DATE: **08/12/2016**

SHEET NUMBER: **31** OF **40**

 PROJECT NUMBER: **ST1306**

Call at least two full working days before final construction.

ARIZONA 811

Call 811 or 1-800-478-8111 (TODAY) or 1-800-478-8111 (TODAY) in Maricopa County (602) 253-1100

PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT

 PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE

 PROJECT NUMBER: ST1306 (EN17-020)

12 engineering and environmental design, llc

 4649 east cotton gin loop, suite b2

 phoenix, arizona 85040

 phone: 602.438.2221

 web: www.2designus.com

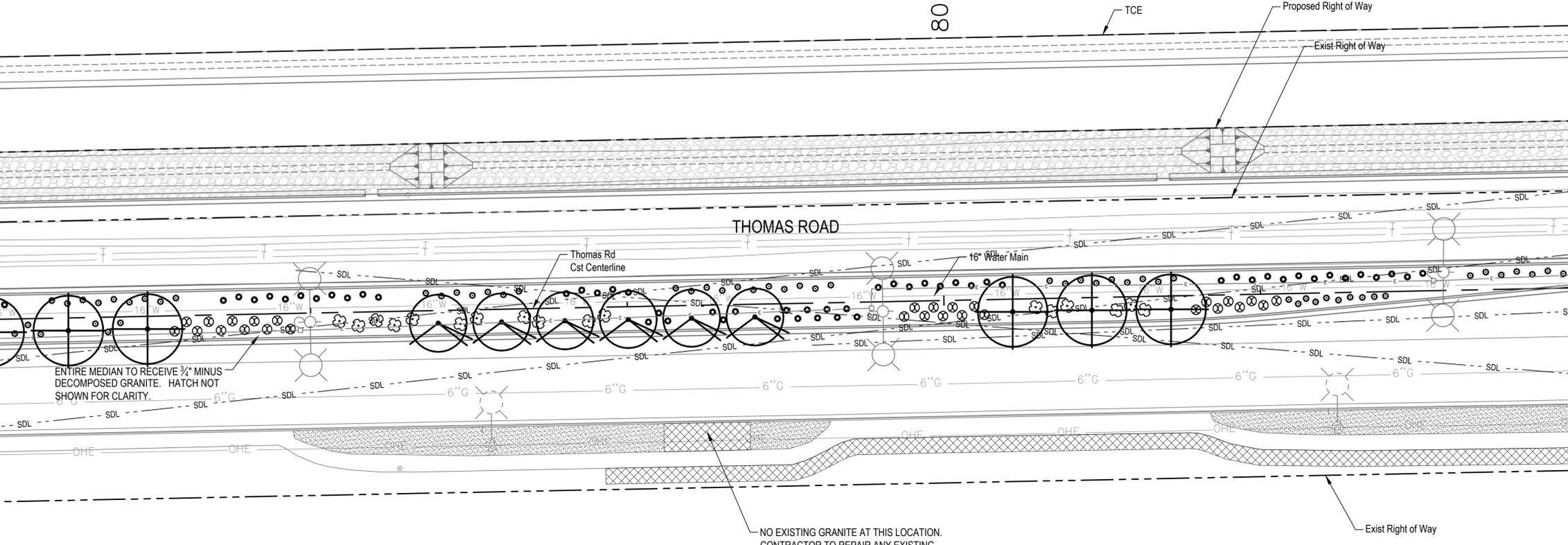
 project # 15.0828

MATCH LINE SEE STATION 77+00 SHT 31

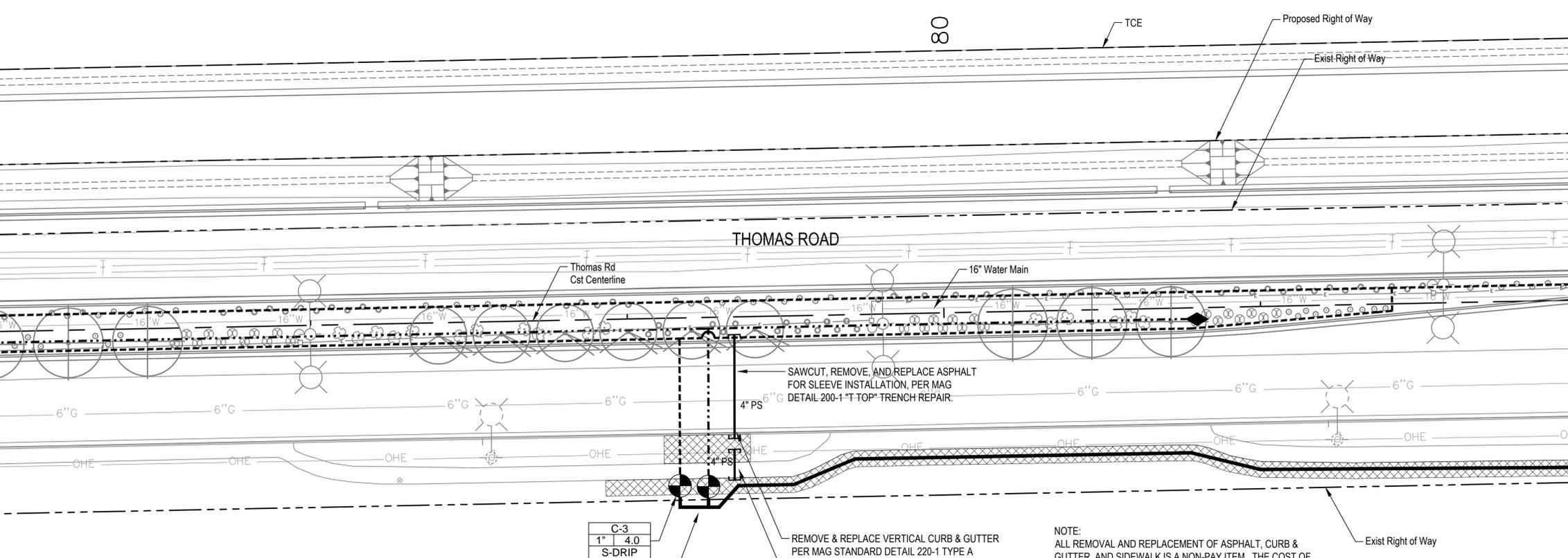
MATCH LINE SEE STATION 77+00 SHT 31

MATCH LINE SEE STATION 82+00 SHT 33

MATCH LINE SEE STATION 82+00 SHT 33



LANDSCAPE PLAN



IRRIGATION PLAN

LANDSCAPE SCHEDULE

TREES		COMMON NAME
SYMBOL	BOTANICAL NAME	
	Acacia salicina	Willow Acacia
	Parkinsonia hybrid	Hybrid Palo Verde

SHRUBS		COMMON NAME
SYMBOL	BOTANICAL NAME	
	Calliandra californica	Baja Fairy Duster
	Leucophyllum frutescens	Green Cloud Sage
	Eremophila glabra	Outback Sunrise Emu

GROUNDCOVERS		COMMON NAME
SYMBOL	BOTANICAL NAME	
	Lantana sp.	New Gold Lantana
	Rosmarinus officinalis	'Huntington Carpet' Trailing Rosemary

ACCENTS		COMMON NAME
SYMBOL	BOTANICAL NAME	
	Aloe X 'Blue Elf'	'Blue Elf' Aloe
	Hesperaloe parviflora	'Perpa' Brakelights
	Dasylirion wheeleri	Red Yucca
	Yucca pallida	Desert Spoon
	Yucca pallida	Pale Leaf Yucca

MATERIALS LEGEND - Decomposed Granite

3/4" MINUS DECOMPOSED GRANITE	1 1/2" MINUS DECOMPOSED GRANITE

- NOTES:**
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IRRIGATION EQUIPMENT LEGEND

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	IRRIGATION CONTROLLER: HUNTER XC HYBRID SOLAR POWERED CONTROLLER
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SCALE: 1"=20'

12 engineering and environmental design, llc
 4649 east cotton gin loop, suite 12
 phoenix, arizona 85040
 phone: 602.438.2221
 web: www.2designus.com
 project # 15.0828



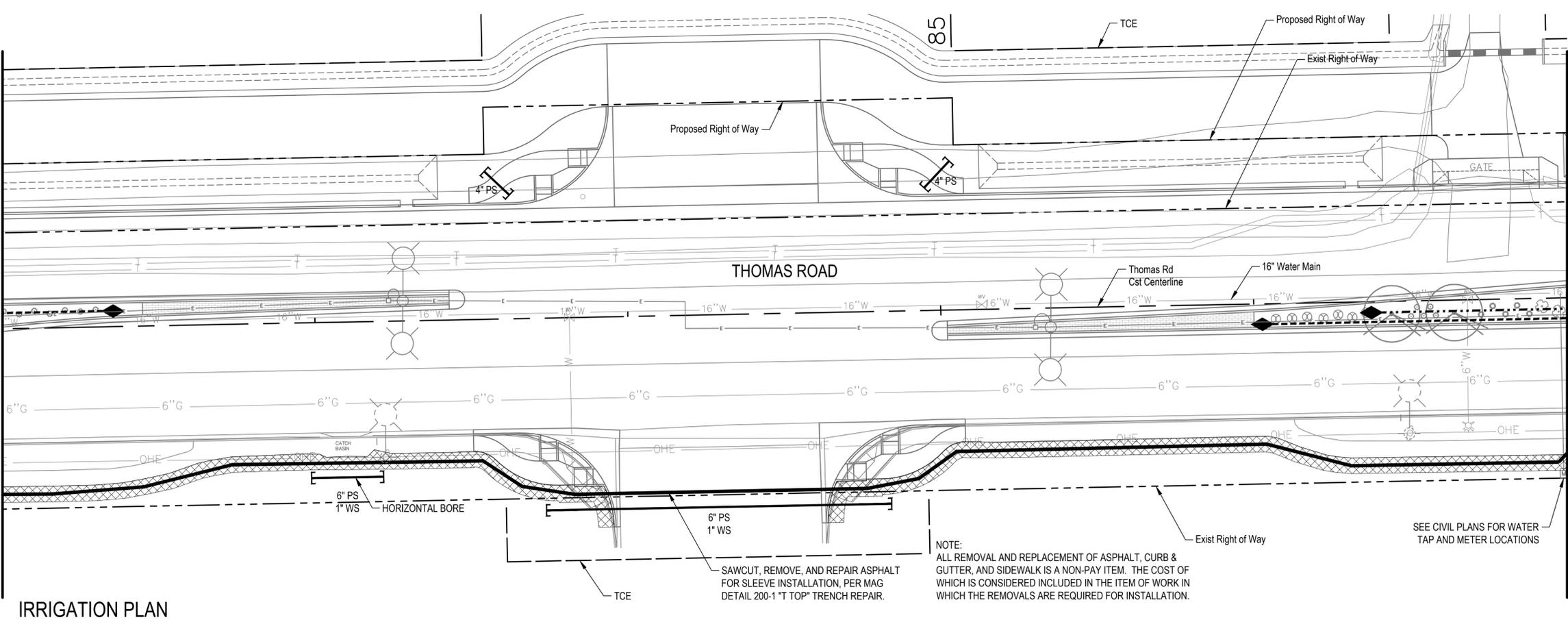
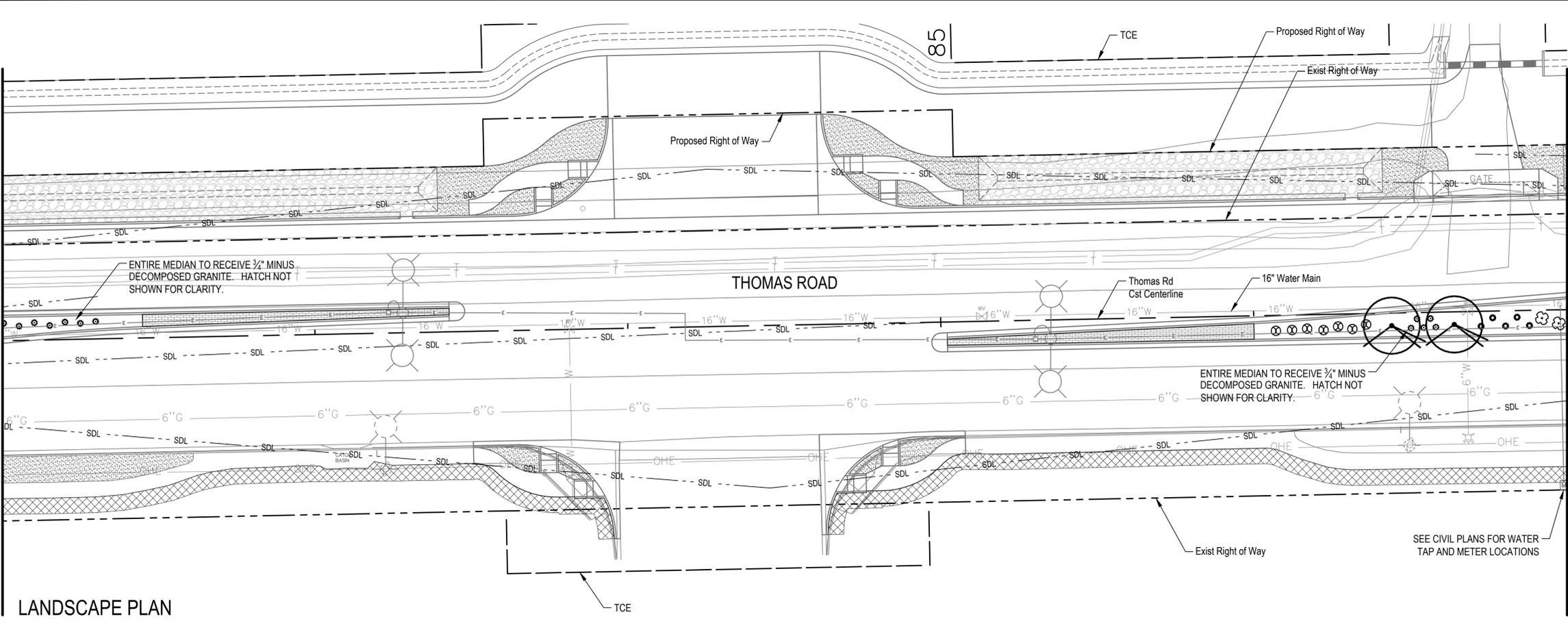
CAPITAL IMPROVEMENT PROJECT
 THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
 PROJECT NUMBER: ST1306 (EN17-020)



ORIGINAL PLAN DATE
 LATEST REVISION DATE
08/12/2016
 SHEET NUMBER
32 OF 40
 PROJECT NUMBER
ST1306

MATCH LINE SEE STATION 82+00 SHT 32

MATCH LINE SEE STATION 82+00 SHT 32



LANDSCAPE SCHEDULE

TREES		COMMON NAME
SYMBOL	BOTANICAL NAME	
	Acacia salicina	Willow Acacia
	Parkinsonia hybrid	Hybrid Palo Verde
SHRUBS		
SYMBOL	BOTANICAL NAME	COMMON NAME
	Calliandra californica	Baja Fairy Duster
	Leucophyllum frutescens 'Green Cloud'	Green Cloud Sage
	Eremophila glabra 'Mingenew Gold'	Outback Sunrise Emu
GROUNDCOVERS		
SYMBOL	BOTANICAL NAME	COMMON NAME
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	Rosmarinus officinalis	'Huntington Carpet' Trailing Rosemary
ACCENTS		
SYMBOL	BOTANICAL NAME	COMMON NAME
	Aloe X 'Blue Elf'	'Blue Elf' Aloe
	Hesperaloe parviflora 'Perpa' Brakelights	'Perpa' Brakelights Red Yucca
	Dasyliiron wheeleri	Desert Spoon
	Yucca pallida	Pale Leaf Yucca
MATERIALS LEGEND - Decomposed Granite		
	3/4" MINUS DECOMPOSED GRANITE	
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	LANDSCAPE & IRRIGATION RESTORATION AREA. SEE SHT. 26 FOR NOTES	
	MEDIAN PAVERS	

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Scale: 1"=20'

North Arrow

ARIZONA 811 logo

Call at least two full working days before you begin any excavation in Maricopa County (602) 255-1100

PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT

PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE

PROJECT NUMBER: ST1306 (EN17-020)

SEAL: [Professional Engineer Seal for Aaron A. Allan, License # 45439, Expire 12/31/2018]

ORIGINAL PLAN DATE: [Blank]

LATEST REVISION DATE: 08/12/2016

SHEET NUMBER: 33 OF 40

PROJECT NUMBER: ST1306

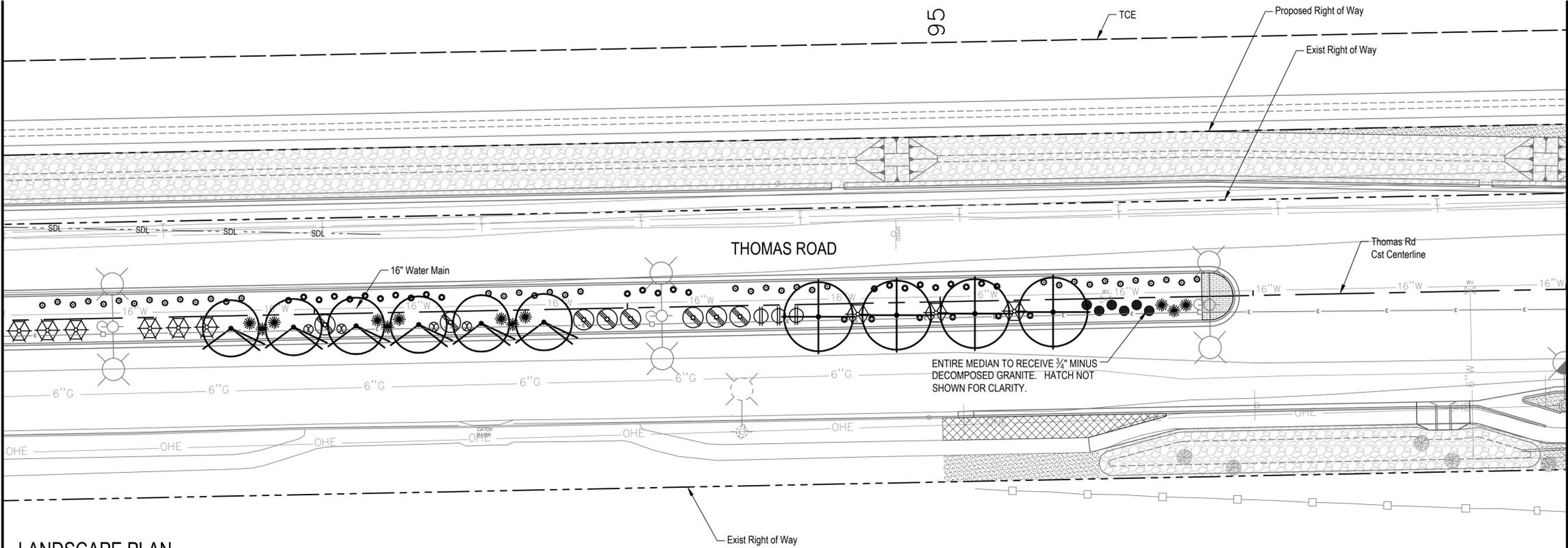
12 engineering and environmental design, llc
4648 east cotton gin loop, suite 102
phoenix, arizona 85040
phone: 602.438.2221
web: www.2designus.com
project # 15.0828

2

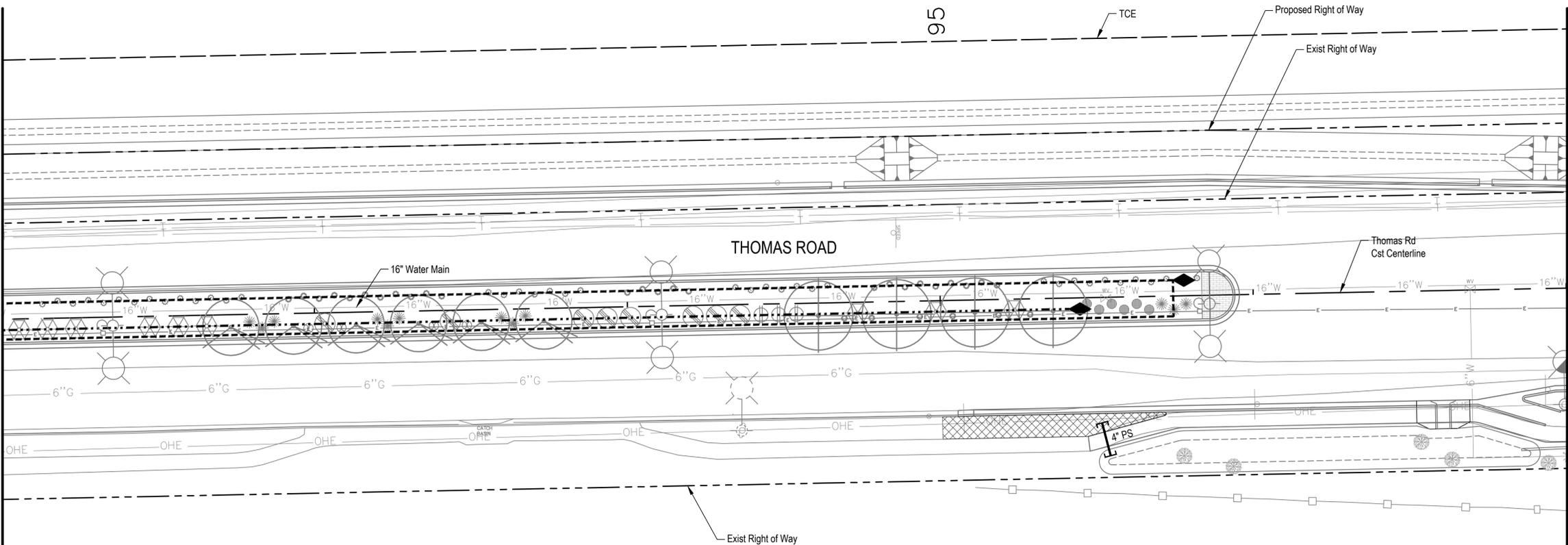


MATCH LINE SEE STATION 92+00 SHT 34

MATCH LINE SEE STATION 92+00 SHT 34



LANDSCAPE PLAN



IRRIGATION PLAN

MATCH LINE SEE STATION 97+00 SHT 36

MATCH LINE SEE STATION 97+00 SHT 36

LANDSCAPE SCHEDULE

TREES		COMMON NAME	
SYMBOL	BOTANICAL NAME		
	Acacia salicina	Willow Acacia	
	Parkinsonia hybrid	Hybrid Palo Verde	
SHRUBS			
SYMBOL	BOTANICAL NAME	COMMON NAME	
	Calliandra californica	Baja Fairy Duster	
	Leucophyllum frutescens 'Green Cloud'	Green Cloud Sage	
	Eremophila glabra 'Mingenew Gold'	Outback Sunrise Emu	
GROUNDCOVERS			
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SYMBOL	BOTANICAL NAME	COMMON NAME	
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MATERIALS LEGEND - Decomposed Granite			
	3/4" MINUS DECOMPOSED GRANITE		1 1/2" MINUS DECOMPOSED GRANITE
	LANDSCAPE & IRRIGATION RESTORATION AREA. SEE SHT. 26 FOR NOTES		MEDIAN PAVERS

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ARIZONA 811

Call at least two full working days before you begin excavation.

800-488-8111 or 1-800-488-8111 (Toll-Free)

In Maricopa County: (602) 255-1100

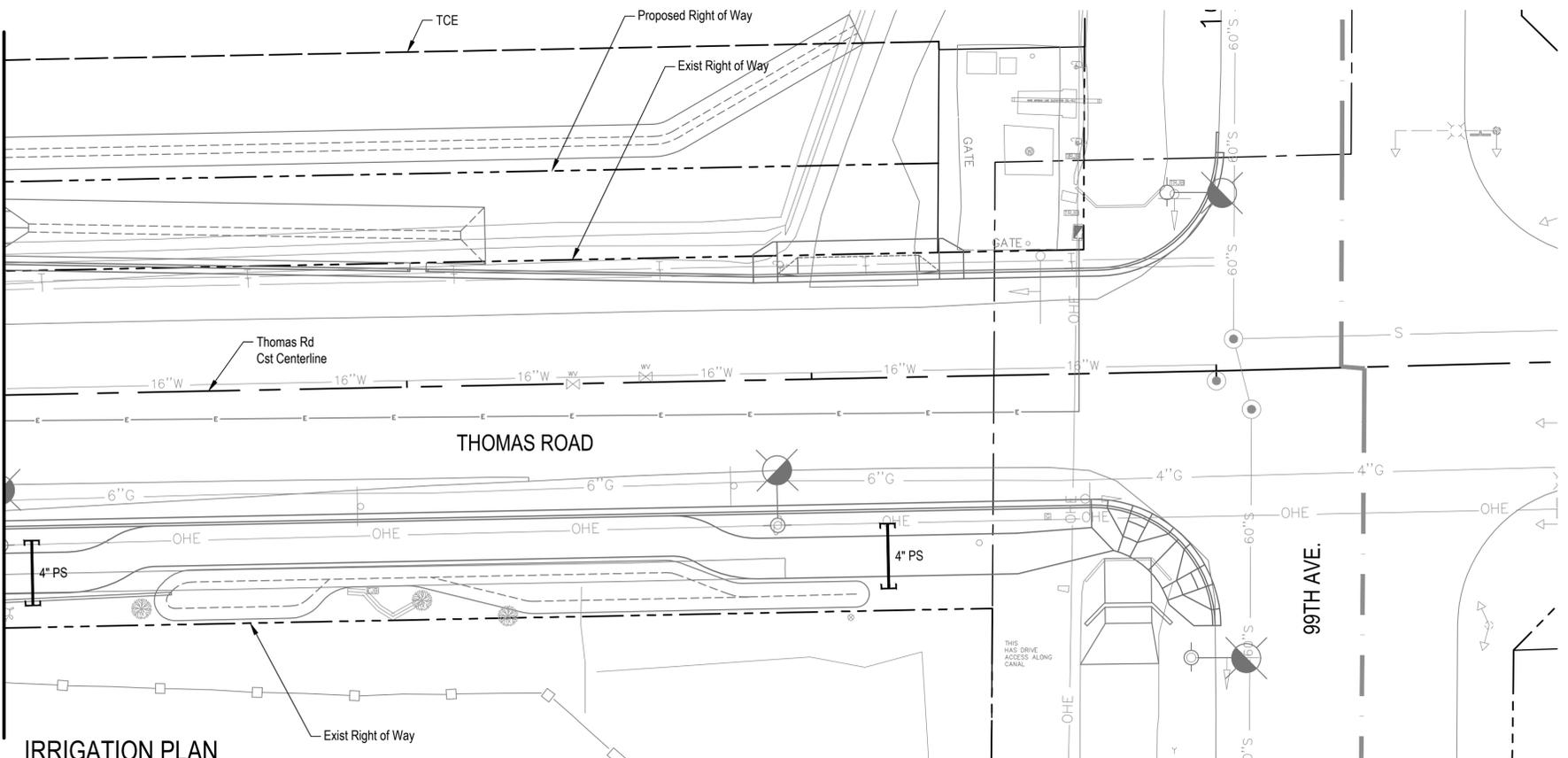
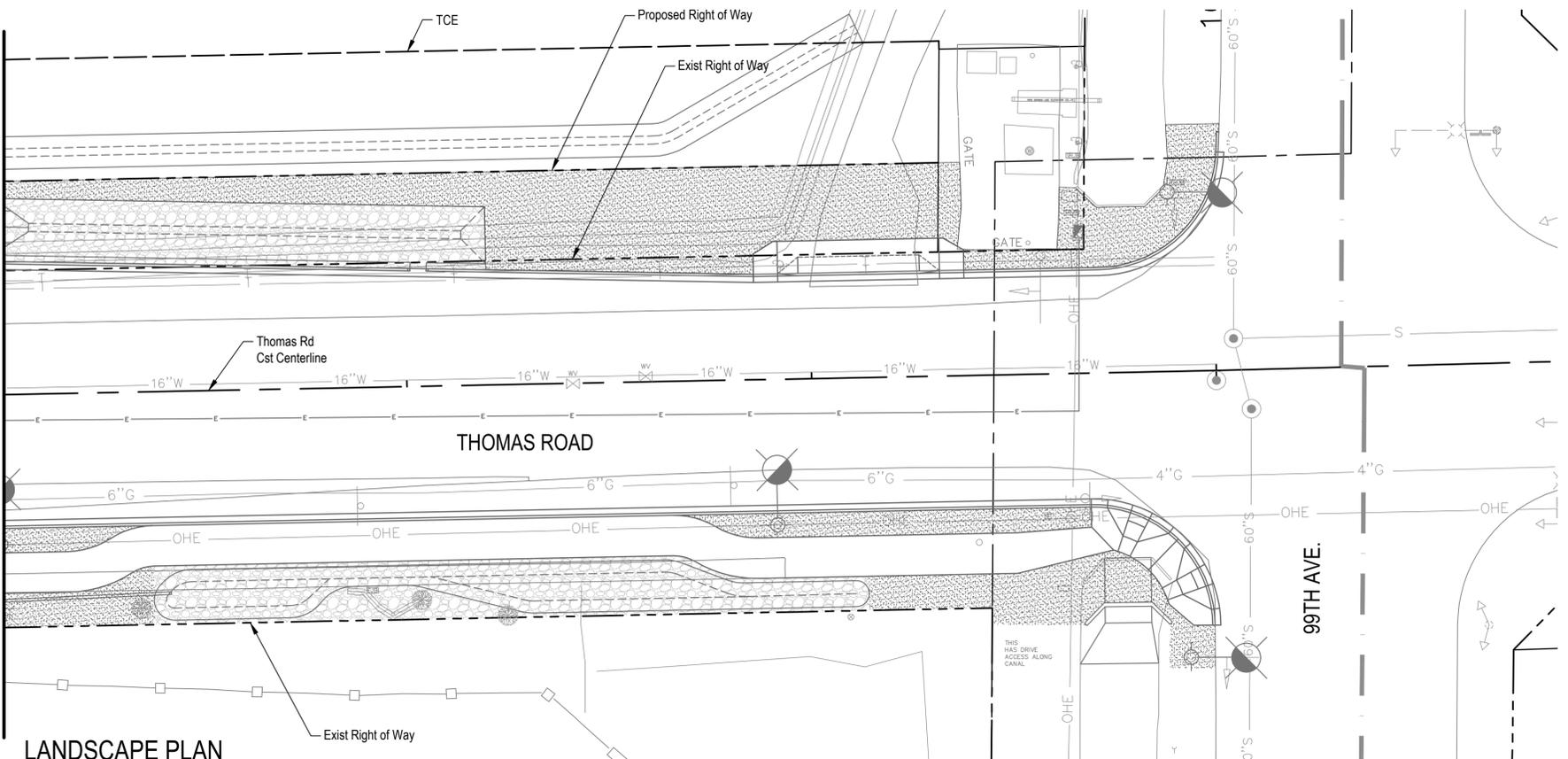
PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT
 PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
 PROJECT NUMBER: ST1306 (EN17-020)
 SEAL: [Professional Engineer Seal]
 ORIGINAL PLAN DATE: 08/12/2016
 LATEST REVISION DATE: 08/12/2016
 SHEET NUMBER: 35 OF 40
 PROJECT NUMBER: ST1306

12 engineering and environmental design, llc
 4649 east cotton gin loop, suite 102
 phoenix, arizona 85040
 phone: 602.438.2221
 web: www.2designus.com
 project #: 15.0628



MATCH LINE SEE STATION 97+00 SHT 35

MATCH LINE SEE STATION 97+00 SHT 35



LANDSCAPE SCHEDULE

TREES		COMMON NAME
SYMBOL	BOTANICAL NAME	
	Acacia salicina	Willow Acacia
	Parkinsonia hybrid	Hybrid Palo Verde

SHRUBS		COMMON NAME
SYMBOL	BOTANICAL NAME	
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	Leucophyllum frutescens 'Green Cloud'	Green Cloud Sage
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MATERIALS LEGEND - Decomposed Granite	
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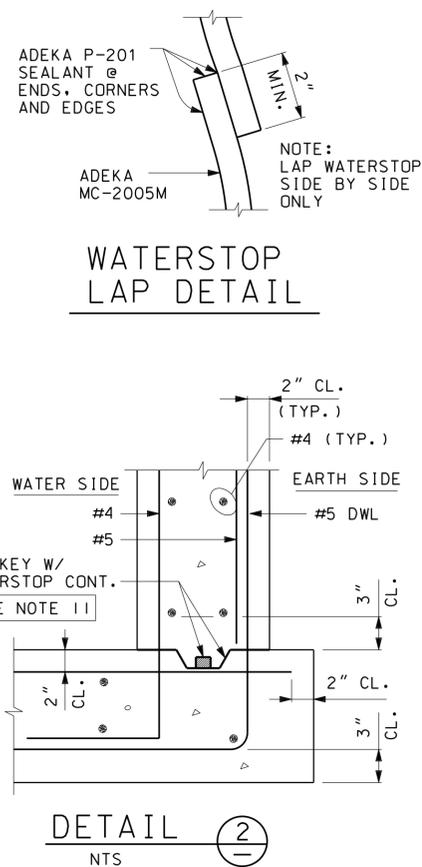
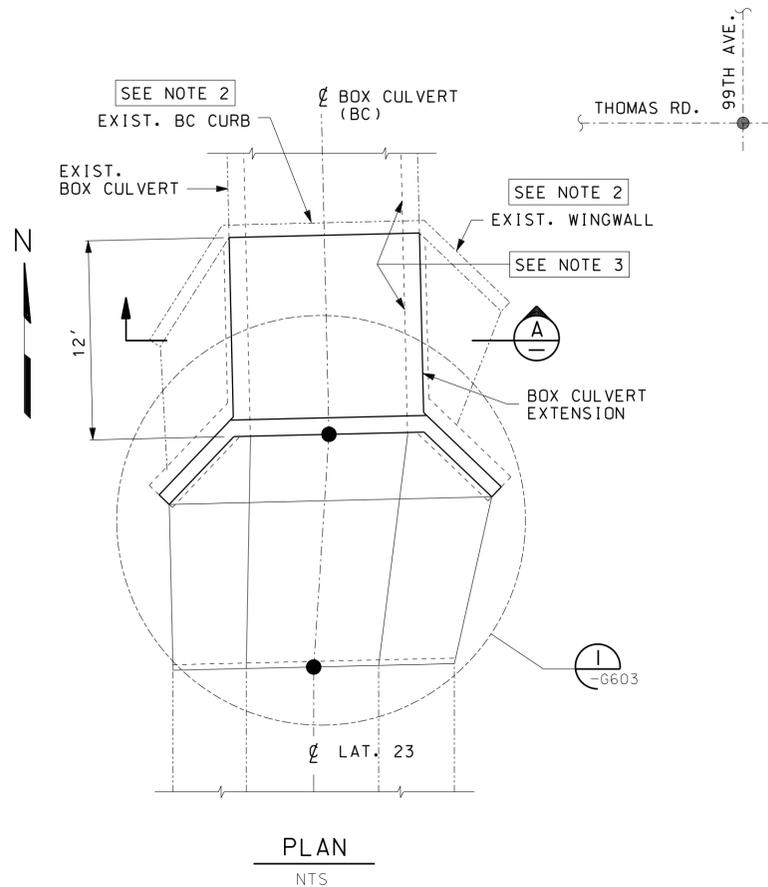
SCALE: 1"=20'

PROJECT NUMBER: **ST1306**

PROJECT TYPE: CAPITAL IMPROVEMENT PROJECT
 PROJECT NAME: THOMAS ROAD FROM 103RD AVENUE TO 99TH AVENUE
 PROJECT NUMBER: ST1306 (EN17-020)

12 engineering and environmental design, llc
 4648 east cotton gin loop, suite b2
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ORIGINAL PLAN DATE: 08/12/2016
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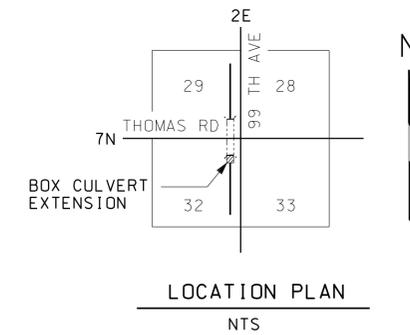


NOTES (CONT.):

11. WATERSTOPS SHALL BE ADEKA MC-2005M WITH ADEKA P-201 ELASTIC SEALANT. SEE WATERSTOP LAP DETAIL.
12. CHAMFER ALL EXPOSED EDGES 3/4".
13. BACKFILL ON TOP OF BOX CULVERT SHALL BE MAG AGGREGATE BASE COURSE (ABC) PER MAG SECTION 702 "BASE MATERIALS" AND SRP STANDARD SPECIFICATION 02230 "AGGREGATE BASE COURSE" SURFACING AND ENGINEERED FILL". ABC SHALL BE COMPACTED TO A MINIMUM DRY DENSITY OF AT LEAST 95% OF THE MAXIMUM DRY DENSITY DETERMINED FROM THE STANDARD PROCTOR (ASTM D698). ABC SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN 3% OF OPTIMUM VALVE. AS ABC TENDS TO RAVEL, MAY WANT TO USE NATIVE CLAY AND CLAYEY SOILS COMPACTED TO MINIMUM DRY DENSITY THAT IS AT LEAST 95% OF THE MAXIMUM VALVE. WITHIN NON-STRUCTURAL AREAS (NO SIDEWALK, NO ASPHALT, ETC.).
14. SHAPE AND COMPACT TRANSITION LINING SUBGRADE FROM HEADWALL TO 36" PAST UNDISTURBED UNLINED DITCH, OR TO UPSTREAM END OF TRANSITION, WHICHEVER IS GREATER.
15. LATERAL LINING SHALL CONFORM TO SRP 03364 "FIBER REINFORCED CONCRETE" FOR CANAL BANK LINING AND SRP STOCK CODE 00-00234 (5 LBS FIBER).

NOTES:

1. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO START OF WORK. CONTACT PROJECT ENGINEER IF ANY DISCREPACIES ARE FOUND.
2. EXISTING WINGWALLS, CURB ON EXISTING BOX CULVERT AND PORTION OF LATERAL BED AND LINING SHALL BE REMOVED. ALSO, MUCK AND UNSUITABLE MATERIAL AT BOTTOM OF BED LINING SHALL BE REMOVED AS NEEDED.
3. INSIDE OF BOX CULVERT EXTENSION MUST ALIGN WITH THE INSIDE OF EXISTING BOX CULVERT AND MATCH ALL SIDES, MATCH WIDTH, ELEVATIONS AND SLOPE OF EXISTING LATERAL AS DIRECTED BY SRP ENGINEERING.
4. COMPACTED SUBGRADE MINIMUM 6 INCH DEPTH. SOILS COMPACTED TO A DRY DENSITY AT 95% OF THE MAXIMUM DRY DENSITY DETERMINED FROM THE STANDARD PROCTOR (ASTM D698) AT A MOISTURE CONTENT WITHIN 1% TO 3% OF THE OPTIMUM MOISTURE CONTENT. ANY WET, LOOSE AND HIGHLY ORGANIC MATERIALS MUST BE REMOVED. PLACE MATERIAL PER SRP SPECIFICATION 02220 "STRUCTURE EXCAVATION AND BACKFILLING" EXCEPT AS NOTED HEREIN.
5. GEOGRID, TENSAR TRIAXGEOGRID TX7 SHALL CONFORM TO SRP SPECIFICATION 02272 "GEOTEXTILES" PLACE DIRECTLY ON COMPACTED SUBGRADE. USE 12 INCH MINIMUM LAP. ENDS TO MATCH ENDS OF ABC FILL.
6. ABC FILL MINIMUM 12 INCH DEPTH. MATERIAL PER SRP SPECIFICATION 02230 "AGGREGATE BASE COURSE, SURFACINGS AND ENGINEERED FILLS" SHALL BE COMPACTED TO A DRY DENSITY THAT IS AT LEAST 95% OF THE MAXIMUM DRY DENSITY DETERMINED FROM THE STANDARD PROCTOR (ASTM D698) AT A MOISTURE CONTENT WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT.
7. REBARS SHALL CONFORM TO ASTM A615, GR 60, PER STANDARD SPECIFICATION FOR REINFORCING STEEL, SRP 03210.
8. CONCRETE SHALL BE MAG AA MIX IN ACCORDANCE WITH MAG SECTION 725 "PORTLAND CEMENT CONCRETE". HAVE COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS. REFER TO SRP 03300 "CONCRETE" MAG AA MIX SRP STOCK CODE 00-00240.
9. CONCRETE PLACEMENT SHALL CONFORM TO SRP 03305. MAXIMUM SLUMP OF CONCRETE SHALL BE 4" ± 1%.
10. EPOXY DOWELS AT EXISTING TOP/BOTTOM SLABS AND WALLS. ALSO ADD ADEKA WATERSTOP AT BOTTOM SLAB AND WALL INTERFACES. (SEE CONTROL JT DETAIL - DWG A-910-G603).



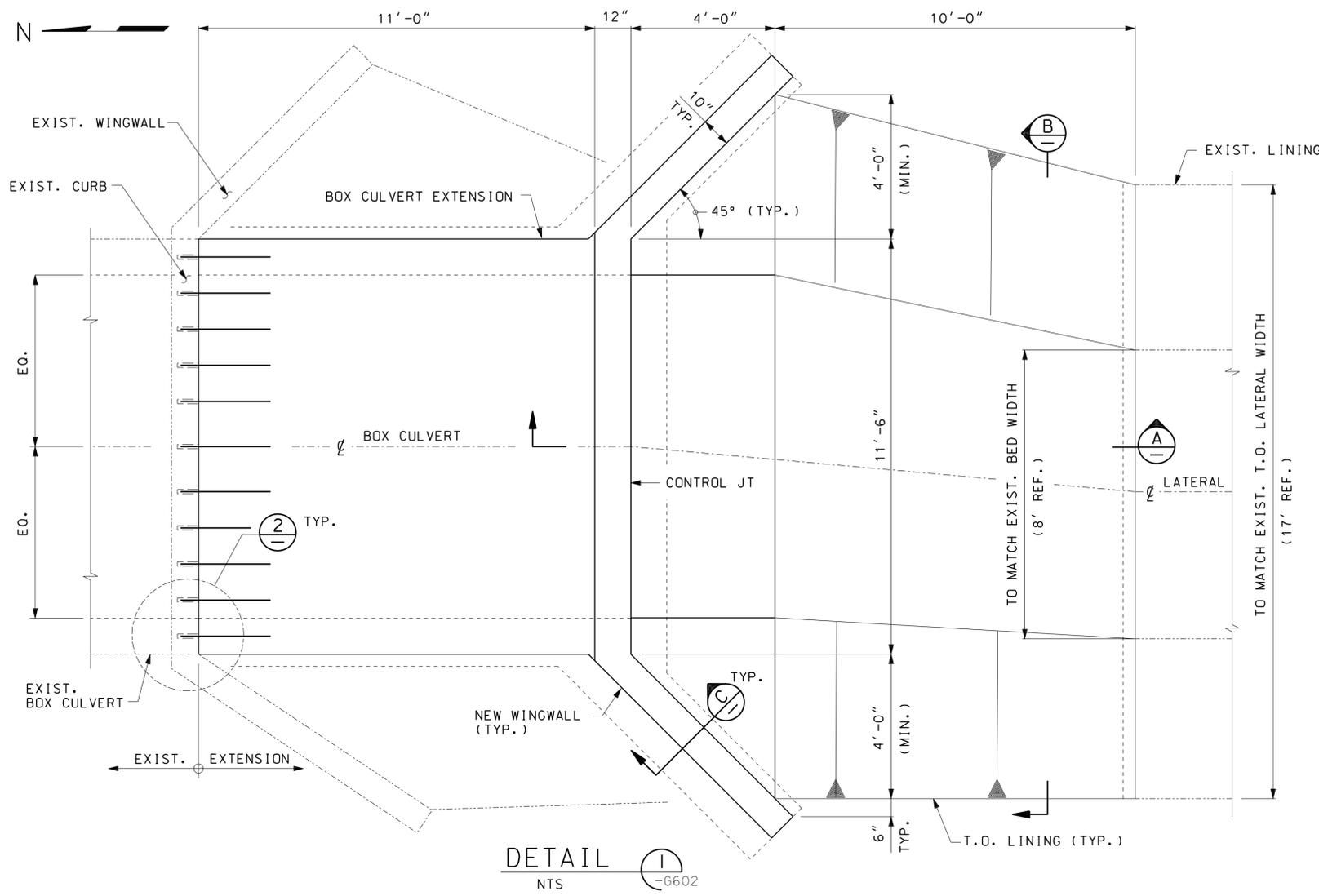
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- STRUCTURE EXCAVATION & BACKFILLING _____ SRP 02220
- GEOTEXTILES _____ SRP 02222
- AGGREGATE BASE COURSE & ENGINEERING FILL _____ SRP 02230
- REINFORCING STEEL SPECIFICATION _____ SRP 03210
- CONCRETE SPECIFICATION _____ SRP 03300
- CONCRETE FORMWORK & PLACEMENT _____ SRP 03305
- FIBER REINFORCED CONCRETE _____ SRP 03364

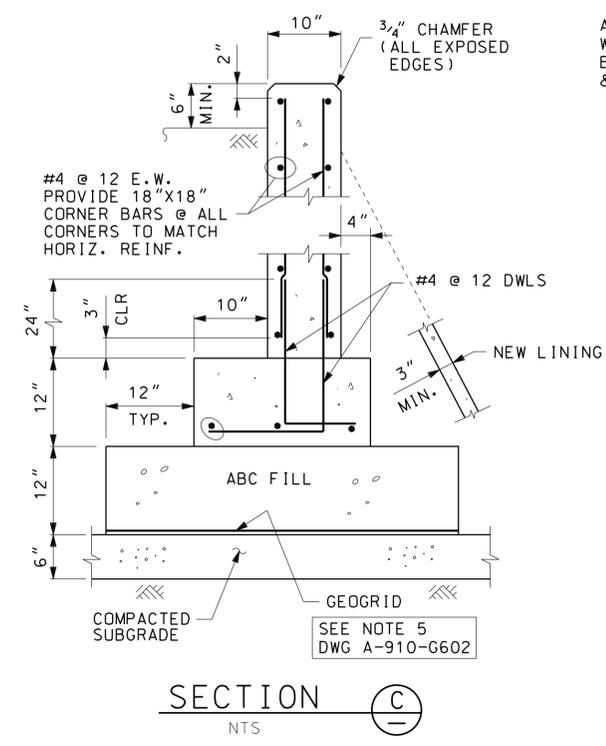
REF. DWG:

- BOX CULVERT EXTENSION WINGWALLS & LINING DETAILS _____ A-910-G603

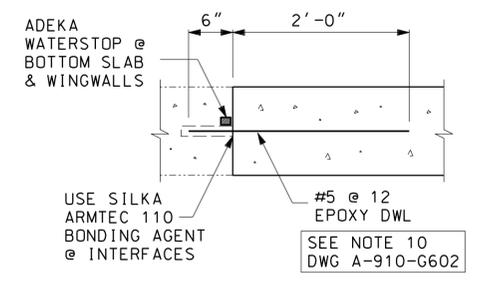
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REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE
GRAND CANAL LATERAL 23.0 SEC 32 T2N R1E BOX CULVERT EXTENSION PLAN, SECTIONS & DETAILS						
SCALE: AS NOTED		FILENAME:			SHEET NO.	
SUBJ CODE	DIST CODE	DWG SIZE	A-910-G602		1	
CV	Y3	22X34				



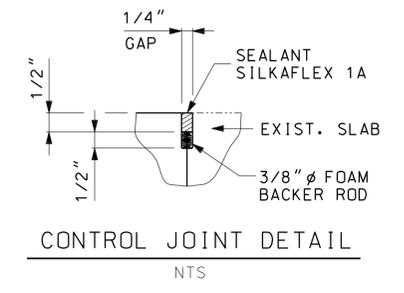
DETAIL 1
NTS
-G602



SECTION C
NTS



DETAIL 2
NTS



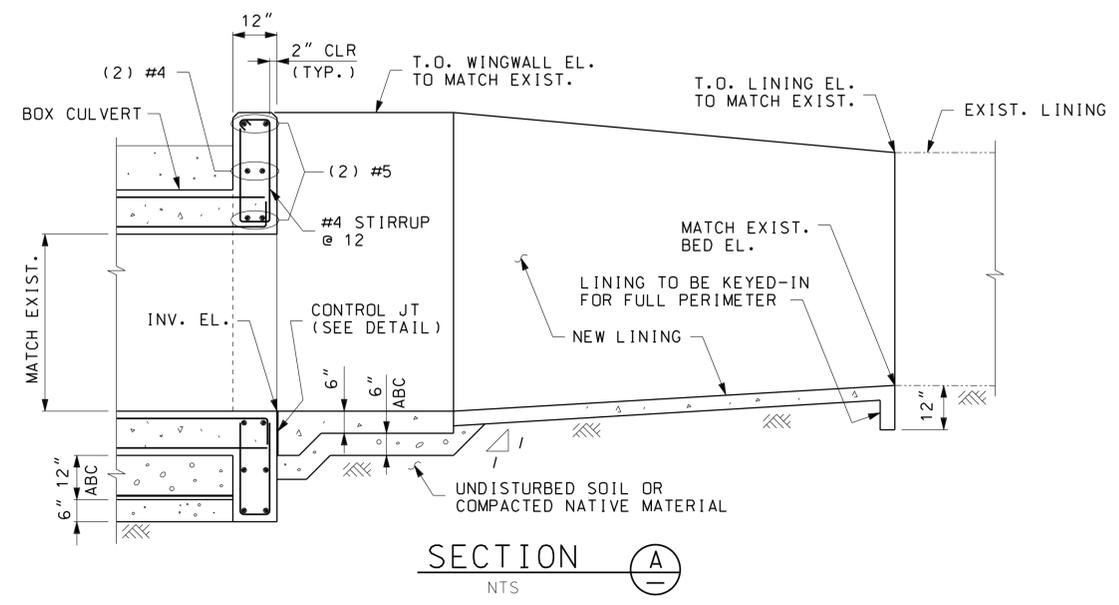
CONTROL JOINT DETAIL
NTS

NOTES:

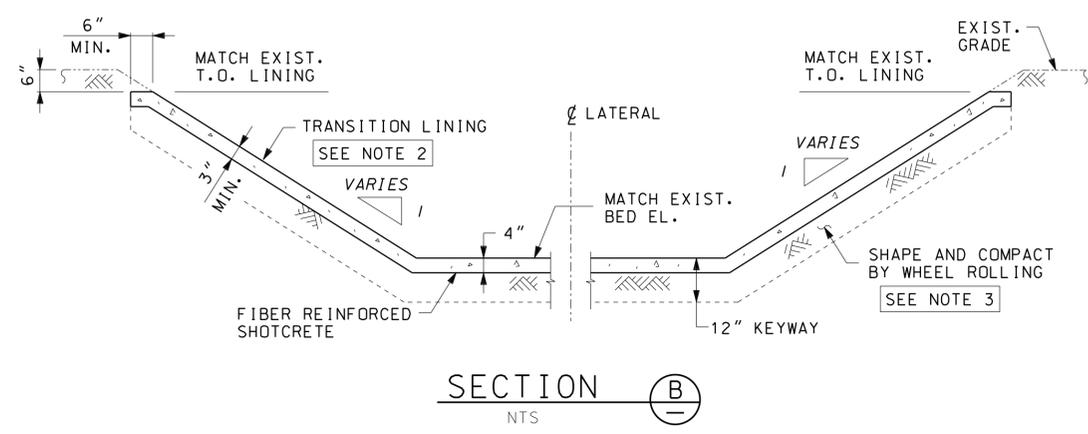
1. SEE DRAWING A-910-G602 FOR ALL NOTES AND SPECIFICATION REFERENCES.
2. REFER TO WATER ENGINEERING STANDARD DRAWING WES-30100-006 FOR CANAL LINING DETAILS.
3. COMPACTION UNDER TRANSITION LINING (SIDE SLOPES) SHALL BE 95% MAXIMUM DRY DENSITY PER ASTM D698.

REF. DWG:

BOX CULVERT EXTENSION PLAN _____ A-910-G602



SECTION A
NTS



SECTION B
NTS

DESIGNED FOR CONSTRUCTION						
0	W1380536	BIA	KLC	KLC	KJT	07/26/16
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE
SALT RIVER PROJECT WATER ENGINEERING ♦ PHOENIX, ARIZONA						
GRAND CANAL LATERAL 23.0 SEC 32 T2N R1E BOX CULVERT EXTENSION WINGWALLS & LINING DETS						
SCALE: AS NOTED		FILENAME:			SHEET NO.	
SUBJ CODE	DIST CODE	DWG SIZE	A-910-G603		2	
CV	Y3	22X34				

CONSTRUCTION DATA FOR HEADWALL WITH TRASHRACK

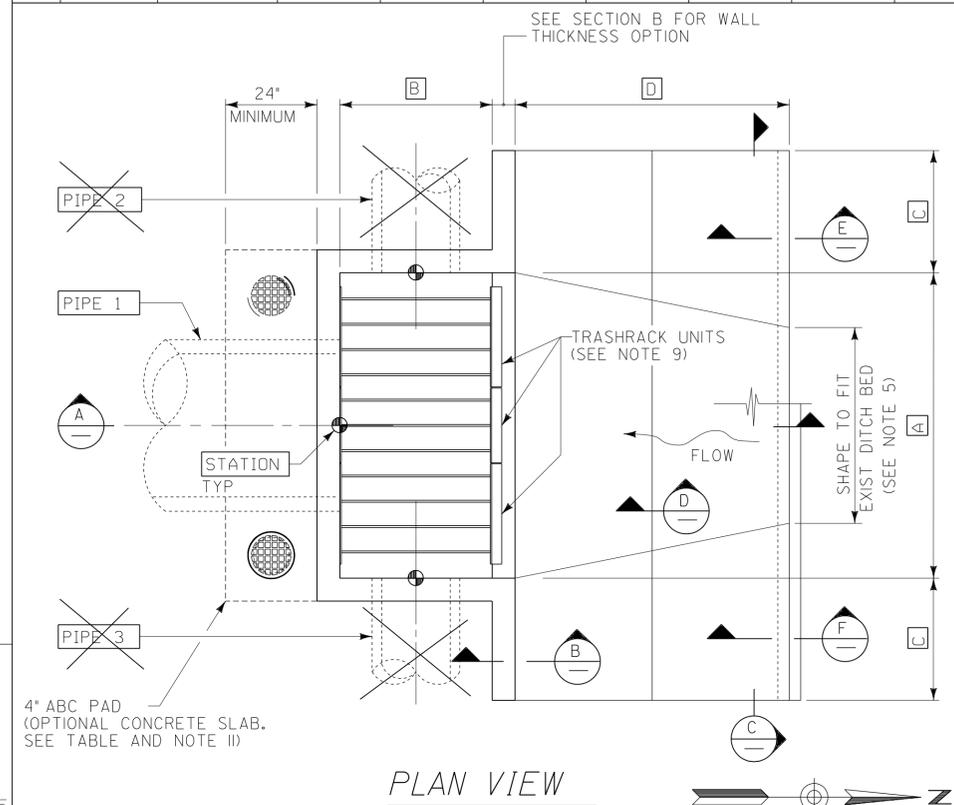
HDWL No.	STATION	PLAN/PROFILE REF DWG	PIPE 1		PIPE 2		PIPE 3		EL.2	EL.3	EL.4	A	B	C	D	E	F	ABC PAD	CONC SLAB	DRAIN LEFT	REQ'D RIGHT	CHECKBOARD REQUIRED	DIM 1A & 1B
			TYPE	EL.1	TYPE	EL.1	TYPE	EL.1															
I	74+46.11	10	24" RGRCP	1017.70	-	-	-	-	1023.20	1018.70	1022.00	5'-0"	4'-0"	2'-6"	3'-0"	6'-3"	2'-6"	X	N/A	NO	NO	NO	N/A

SEE NOTE 12

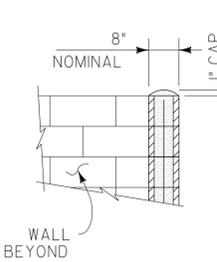
TABLE 1	
SEE WES-CHKBDGDE	
CHECKBOARD REQUIRED	NO
DIM 1A & 1B	N/A

NOTES

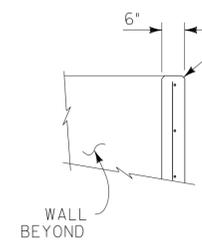
1. SEE PLAN/PROFILE DRAWING(S) FOR ORIENTATION OF HEADWALL(S).
2. UNLESS OTHERWISE NOTED, CONCRETE SHALL BE 3000 PSI (MAG A), SPRAY CONCRETE WITH WHITE CURING COMPOUND.
3. REINFORCING STEEL TO BE ASTM A615 GRADE 60.
4. TOP OF CONCRETE FLOOR TO MATCH THE LOWEST PIPE INVERT (EL. 1).
5. MATCH WIDTH, ELEVATION, AND SLOPE OF EXISTING DITCH, OR AS DIRECTED BY SRP ENGINEERING.
6. SHAPE AND COMPACT TRANSITION LINING SUBGRADE FROM HEADWALL TO 36" PAST UNDISTURBED UNLINED DITCH, OR TO UPSTREAM END OF TRANSITION, WHICHEVER IS GREATER.
7. EXTEND TRANSITION LINING FROM FACE (EL. 4) OF WINGWALLS TO EXISTING DITCH OR CONCRETE LINING BY LENGTH (D), AND MATCH FINISH WITH EXISTING SLIPFORM LINING (IF APPLICABLE).
8. IF TRANSITION LENGTH (D) EXCEEDS 120", TRANSVERSE CONTROL JOINTS ARE REQUIRED AT EQUAL SPACING NOT TO EXCEED 120".
9. TRASHRACKS MAY BE INSTALLED IN ANY SEQUENCE OR ORDER, MAINTAINING THE 6 5/8" SPACING BETWEEN BARS OF ADJACENT UNITS AND EQUAL DISTANCE FROM EACH SIDE OF THE HEADWALL. SEE TRASHRACK REFERENCE DRAWING.
10. INSTALL TRASHRACKS WITH 1/2" DIA. x 3 3/4" EXPANSION ANCHORS, USING THE SLOTTED HOLES AS A TEMPLATE.
11. OPTIONAL CONCRETE SLAB - 4" THICK, MINIMUM 24" WIDE, LENGTH TO MATCH HEADWALL, BROOM FINISH. SLOPE SLAB TO DRAIN AWAY FROM HEADWALL. TOP OF SLAB TO BE LEVEL WITH ADJACENT FINISH GRADE.
12. INSTALL SLAB DRAIN PER STANDARD DRAWING WES-SLABDRAIN.



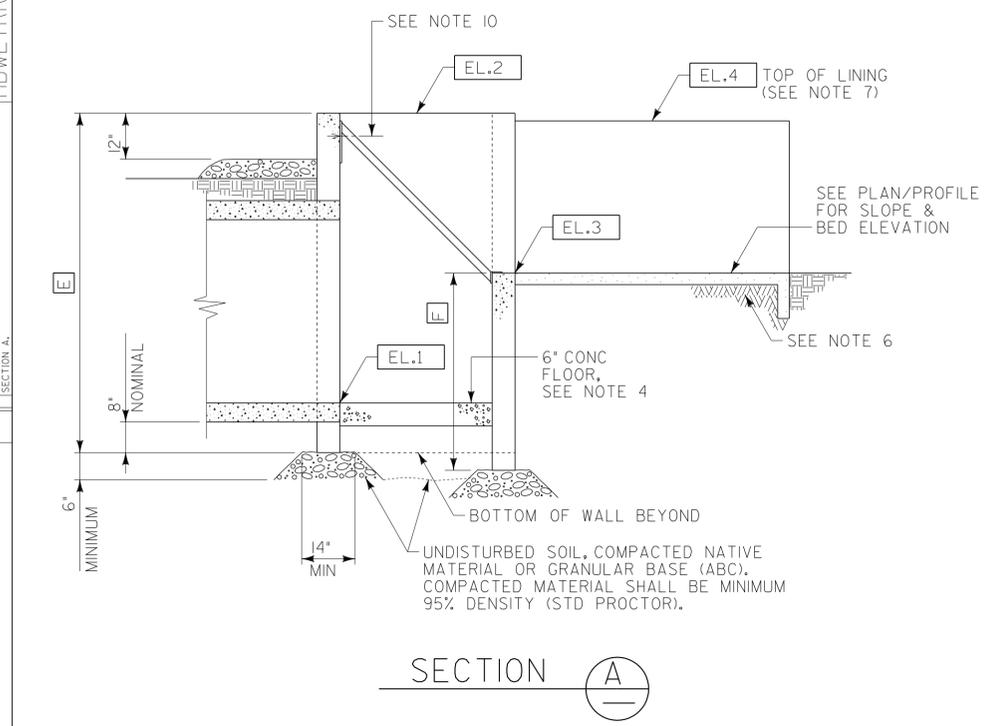
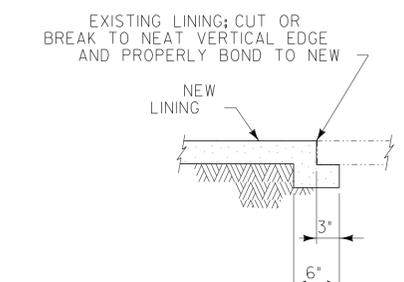
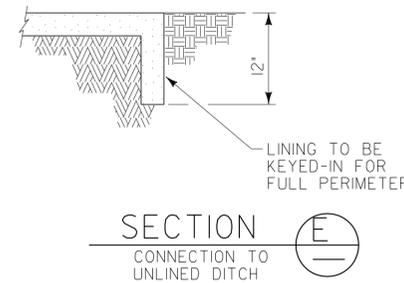
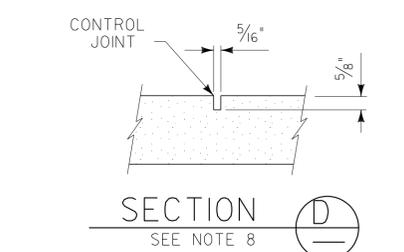
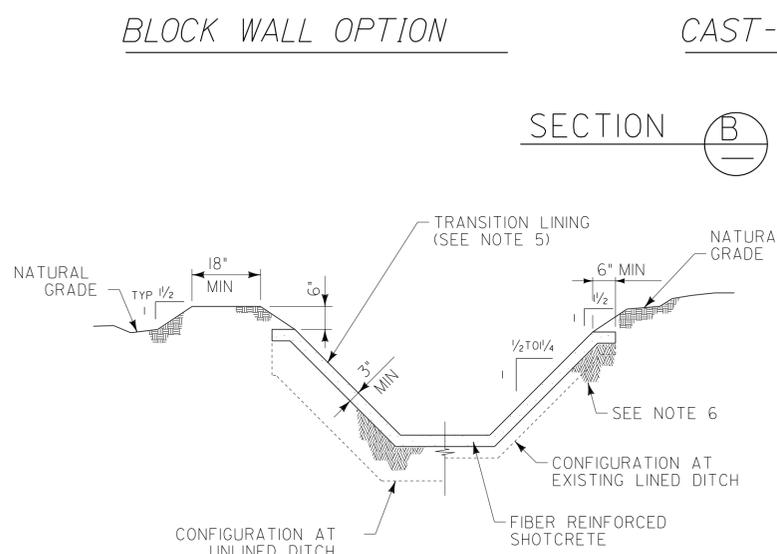
4" ABC PAD (OPTIONAL CONCRETE SLAB. SEE TABLE AND NOTE 11)



BLOCK WALL TO HAVE ONE #4 REINFORCING BAR CENTERED IN EACH CORE FOR FULL HEIGHT AND CORES FILLED WITH CONCRETE OR SAND/CEMENT GROUT (3:1 RATIO). ALL BLOCKS TO BE LAID IN STAGGERED COURSES (COMMON BOND) WITH OR WITHOUT MORTAR JOINTS, PLASTERED ON EXPOSED SURFACES AND INCLUDING A 1" CAP ON TOP OF WALLS.



CAST-IN-PLACE WALL OPTION TO HAVE #4 REBAR @ 12" ON CENTER EACH WAY, CENTERED IN WALL. PROVIDE 18" X 18" CORNER BARS AT ALL CORNERS TO MATCH HORIZONTAL REINFORCING. PROVIDE (2) EXTRA #4 BARS ABOVE, BELOW, AT EACH SIDE OF PIPE AND AT EACH DIAGONAL.



CONTRACTOR NOTE

TRASHRACK(S) MUST BE MANUFACTURED PRIOR TO REQUESTING AN IRRIGATION OUTAGE FOR THIS JOB.

TRASHRACK(S) AND ASSOCIATED HARDWARE CAN BE SUPPLIED BY SRP UPON REQUEST. PLEASE CALL THE MECHANICAL CONSTRUCTION & MAINTENANCE DIVISION OF SRP FOR PRICE QUOTES: (602) 236-4154

REFERENCES

TRASHRACK DETAILS _____ WES-30350-200

0 W1380536 _____ 08/19/16

REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE



STANDARD HEADWALL WITH TRASHRACK

MANHOLE CONSTRUCTION DATA

MANHOLE NUMBER	STATION	REFERENCE DRAWING	TOP EL. ±	BOT. EL.	PIPE 1		PIPE 2 EXISTING		PIPE 3		PIPE 4		MANHOLE DIMENSIONS			MANHOLE LOCATION		WALL LENGTH		REINFORCING STEEL		
					TYPE	INV. EL.	TYPE	INV. EL.	TYPE	INV. EL.	TYPE	INV. EL.	A	B	C	ROADWAY	SIDEWALKS/ LANDSCAPE	PIPE DIAMETER	A OR B			
1	74+43.63	10	1024.56	1015.3	24" RGRCP	1016.70	24" RCP	1016.3+/-					48"	48"	95"	X		36" OR LESS	48"	#4 @ 12" E.W. OR (1) LAYER 6x6-W5.5xW5.5 WWF		
																		42"	56"		#4 @ 12" E.W. OR 6x6-W10xW10 WWF	
																		48"	68"			
																		54" OR 60"	80"			
																			66" OR 72"	92"		
																			78" OR 84"	104"		

DESIGN CRITERIA

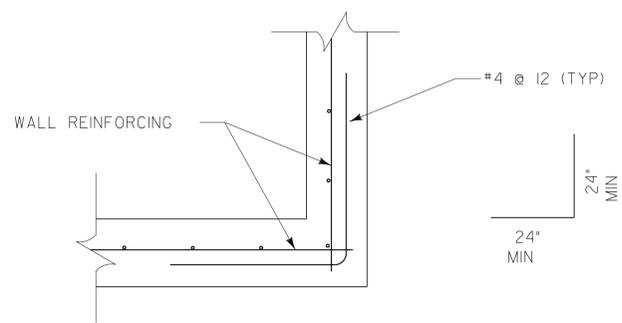
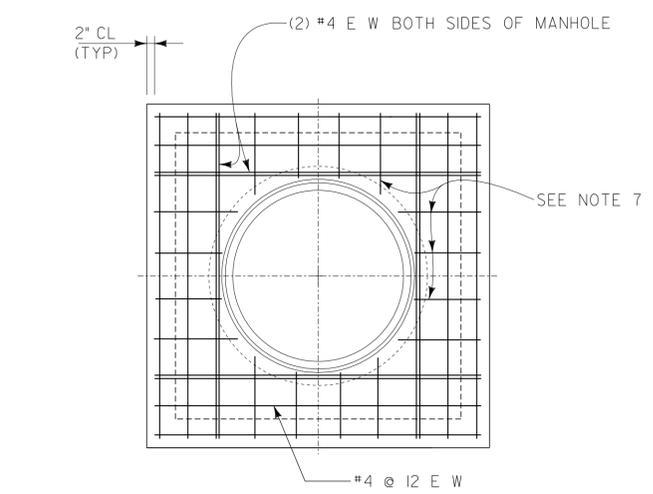
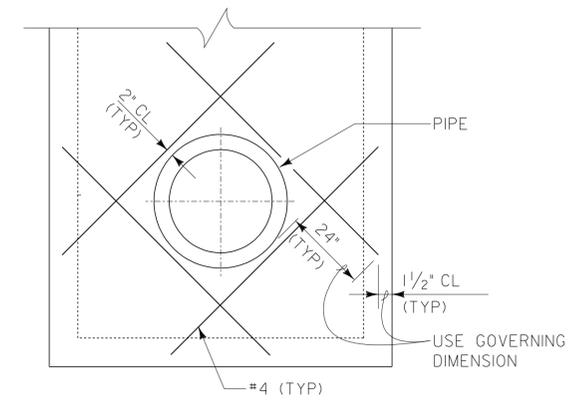
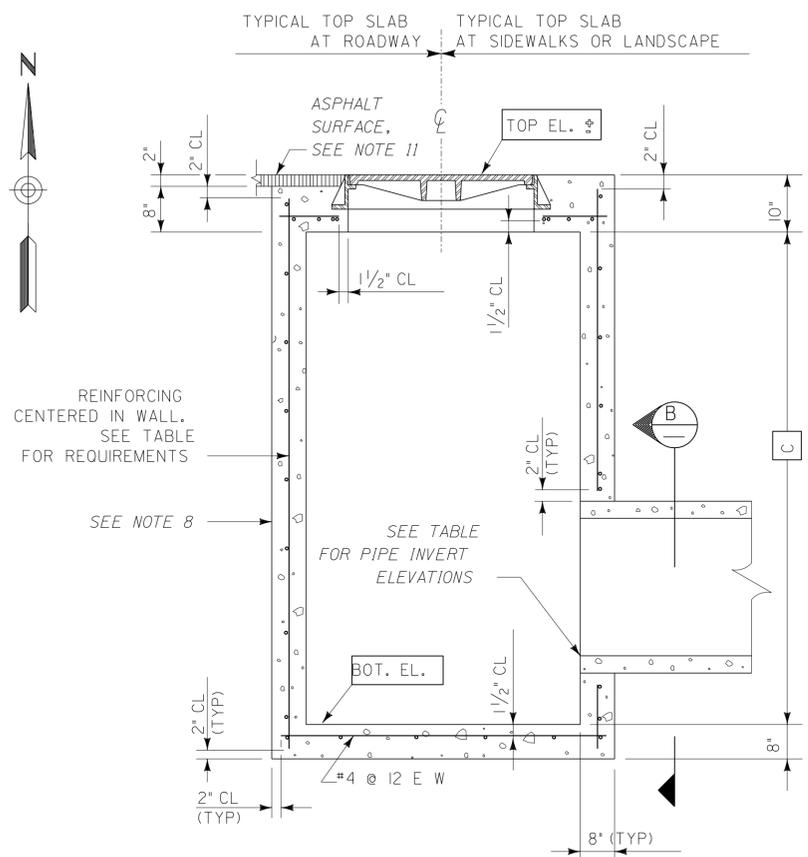
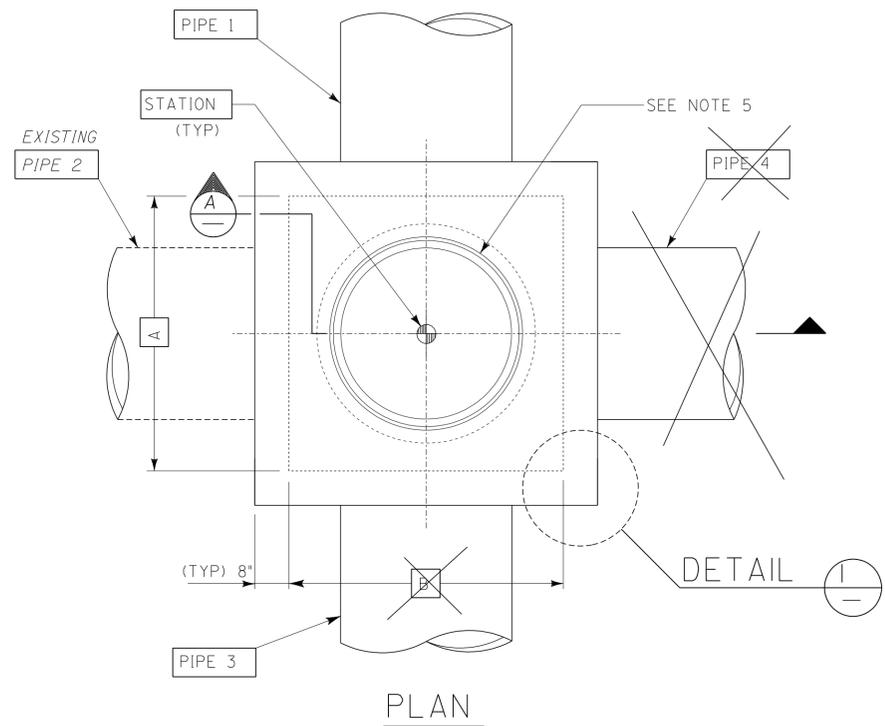
HS20 HIGHWAY LOADING, 32 KIPS ON REAR AXLE (16 KIPS/WHEEL), WHEEL SPACING 6', 30% IMPACT. ONE WHEEL CENTERED ON MANHOLE, OTHER WHEEL ADJACENT TO MANHOLE.

NOTES

1. STRUCTURAL CONCRETE SHALL BE 3000 PSI @ 28 DAYS (MAG A) PER SRP 03300.
2. REINFORCING STEEL SHALL COMPLY WITH REQUIREMENTS OF SRP 03210; BARS SHALL BE ASTM A615 GRADE 60 AND WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
3. CONCRETE PLACEMENT SHALL BE PER GE 03305.
4. SEE PLAN AND PROFILE DRAWING FOR CORRECT ORIENTATION OF MANHOLE.
5. STANDARD SRP 30" CAST IRON MANHOLE FRAME AND COVER (STOCK CODE No. 5011703) CENTERED IN TOP OF MANHOLE. CONTACT SRP INVESTMENT RECOVERY DEPARTMENT AT (602) 236-2908, TO PURCHASE SRP MANHOLE FRAME AND COVER.
6. NOT TO BE USED FOR STAKING. EXACT TOP ELEVATION TO BE SET BY CUSTOMER'S ENGINEER BASED ON CUSTOMER'S PAVING & GRADING PLANS.
7. FIELD CUT REBAR AT MANHOLE.
8. CONCRETE SHALL BE PLACED WITH NO COLD JOINTS. ALL CONCRETE SHALL BE VIBRATED DURING PLACEMENT.
9. DIMENSIONS [A] AND [B] SHALL NOT EXCEED 104", AND DIMENSION [C] SHALL NOT EXCEED 180".
10. FOR PRESSURE MANHOLES, MAXIMUM HEAD SHALL NOT EXCEED 60" ABOVE TOP ELEVATION.
11. PROVIDE ASPHALT SURFACE AS REQUIRED.

REFERENCES

- REINFORCING SPECIFICATION _____ SRP 03210
 CONCRETE SPECIFICATION _____ SRP 03300
 CONCRETE PLACEMENT SPECIFICATION _____ GE 03305



NEWMH-WDF

REV	JOB/LOC	DATE	DFTR	CHGR	ENGR	SUPV	ISSUE	REL
12		01/20/15	JWS					
11		09/26/07	JWS					

FORM NO. WDF-NEWMH

DESIGNED FOR CONSTRUCTION						
0	W1380536				08/19/16	
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE

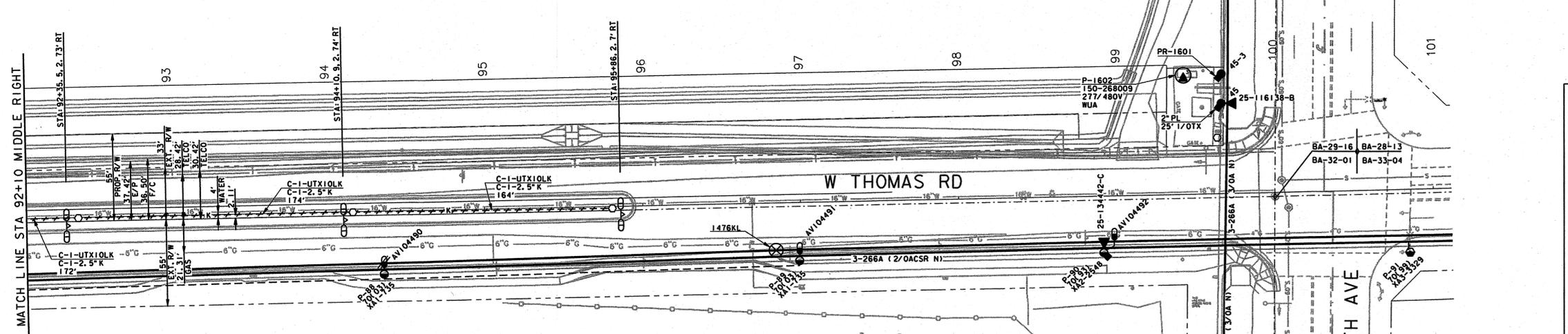
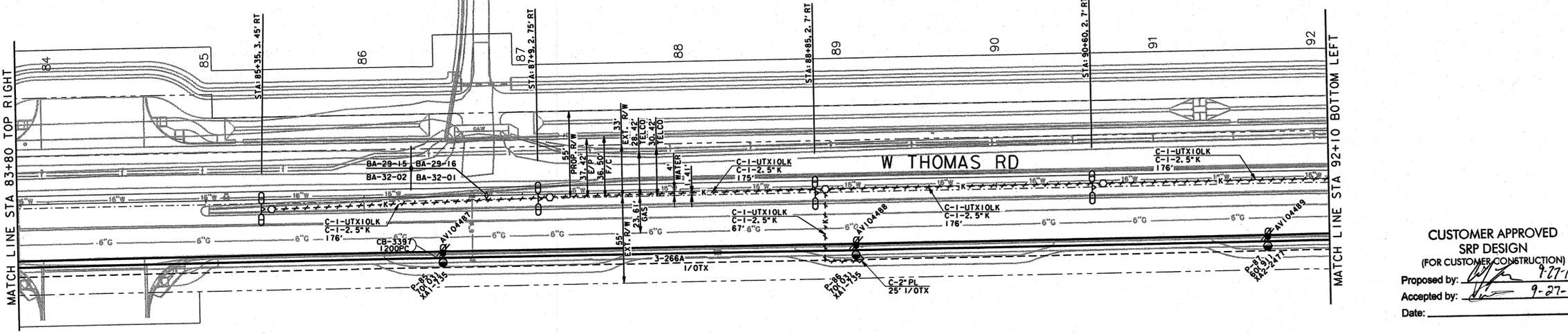
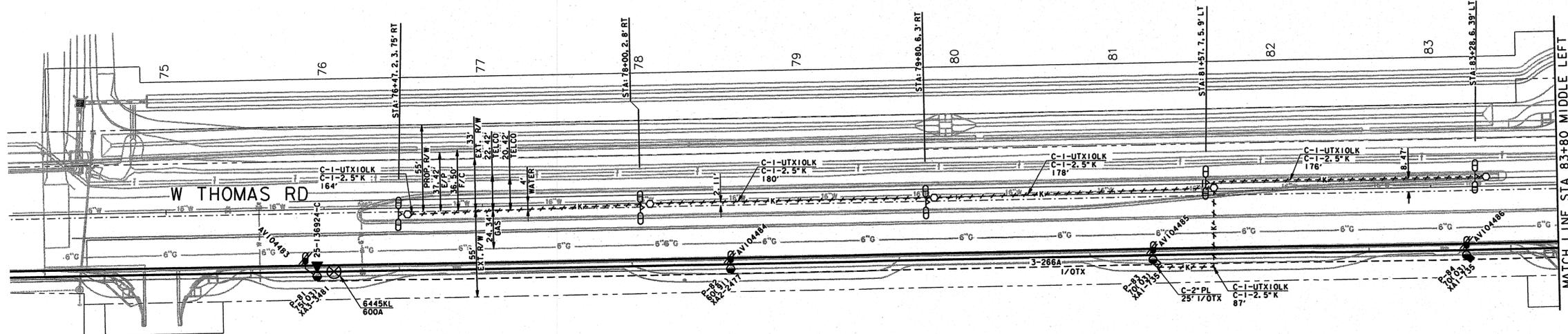


MANHOLE PLANS, SECTIONS AND DETAILS

SCALE: NONE		TEMPORARY -	.DGN	SHEET NO.
SUBJ CODE	DIST CODE	DWG SIZE		
MH	Y3	22X34		4

MAINLINE

SCALE: 1" = 40'



CUSTOMER APPROVED SRP DESIGN
 (FOR CUSTOMER CONSTRUCTION)
 Proposed by: *[Signature]* 9-27-16
 Accepted by: *[Signature]* 9-27-16
 Date: _____

(SHADED SYMBOL INDICATES EXISTING FACILITY)

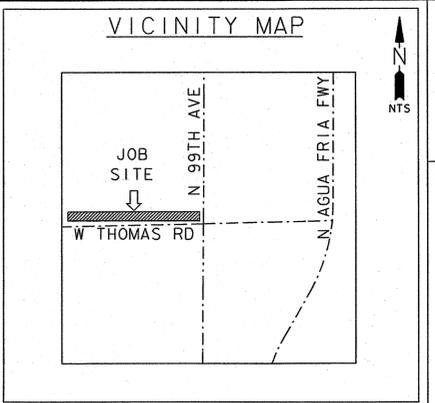
E-ELECTRIC C-COMMUNICATION W-WATER G-GAS SD-STORM S-SEWER
 R - REMOVE
 T - TRANSFER
 A - ABANDON
 F/SW - FRONT OF SIDEWALK
 B/SW - BACK OF SIDEWALK
 F/C - FRONT OF CURB
 B/C - BACK OF CURB
 E/P - EDGE OF PAVEMENT
 L/G - LIP OF GUTTER
 R/W - RIGHT OF WAY

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

⊗ PROPOSED SINGLE-PHASE TRANSFORMER
 ⊕ PROPOSED THREE-PHASE TRANSFORMER
 ⊕ PROPOSED FUSING ENCLOSURE
 ⊕ PROPOSED SWITCHING ENCLOSURE
 ⊕ PROPOSED 1 PHASE PULLING ENCLOSURE
 ⊕ PROPOSED 3 PHASE / FEEDER PULLING ENCLOSURE
 ⊕ PROPOSED 4/0 PRIMARY TAP ENCLOSURE
 ⊕ PROPOSED CAPACITOR BANK
 ⊕ FOR MOST PRIMARY DEVICES OTHER THAN TRANSFORMERS, NO BAR ABOVE THE LETTER INDICATES AN EXIST. FACILITY
 NO BAR IN PAD INDICATES FACILITY IS EXISTING
 BAR INDICATES FRONT OF DEVICE
 A SHADED BAR INDICATES FACILITY IS EXISTING

--- 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
 ⊕ ELECTRONIC MARKER
 --- MATCH POINTS FOR MULTIPLE SHEETS OF DRAWING
 --- CONDUIT
 ⊕ PROPOSED FLUSH-MOUNTED J-BOX
 ⊕ PROPOSED ABOVE-GROUND J-BOX



NOTICE
 THIS JOB ORDER INVOLVES OVERHEAD, UNDERGROUND AND/OR SERVICES
 OH# _____
 UG# _____
 SER# _____

FIELD INSPECTION STAMP

CONTACTS:
 DESIGN CONSULTANT:
 TONY LAWRENCE
 OFFICE: (602) 236-4921
 MOBILE: (602) 748-6687
 PROJECT LEADER:
 KYLE REID
 MOBILE: (602) 733-4141
 INSPECTIONS:
 OFFICE: (602) 236-0436
 CONSTRUCTION CONSULTANT:
 JOHNNY MURILLO
 MOBILE: (602) 769-2728

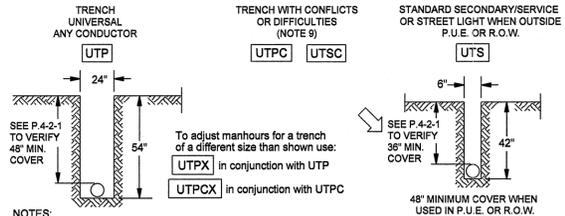
REV	REVISED BY	DATE	REVISION DESCRIPTION
1	VACUEVAS	01/19/16	JOB CREATED

JOB NAME CUS UW STLT AVONDALE IMPRV-THOMAS RD
 FIS JO T2118433 MAP 1/4 SE S 29 T 2N R 1E
 40/ACRE BA-29-16 COORDS 1 7/8E 7 1/16N
 AMP WO T2118433 AMP VERSION _____
 COST CENTER 22640
 ROUTING CODE _____

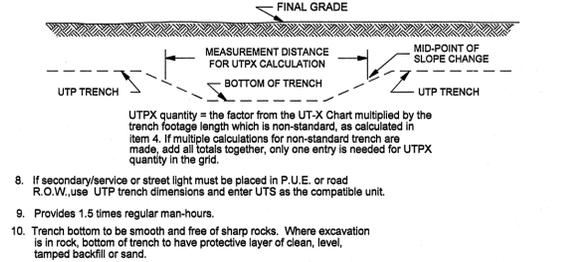
ARIZONA STATE UNIVERSITY
 ARIZONA STATE UNIVERSITY
 ARIZONA STATE UNIVERSITY

SHEET NUMBER | OF 2

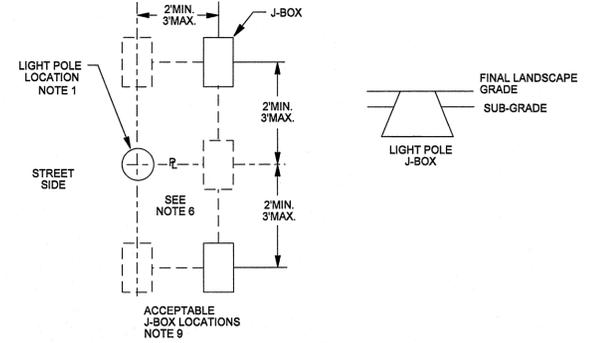
27-SEP-2016 07:51 * S:\E230x Job Order - Files\29515 JobOrder\Customer - Improvements JobOrder\2118433_CUS UW STLT AVONDALE IMPRV-THOMAS RD\2118433_CUS UW STLT AVONDALE IMPRV-THOMAS RD.dgn



- 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.

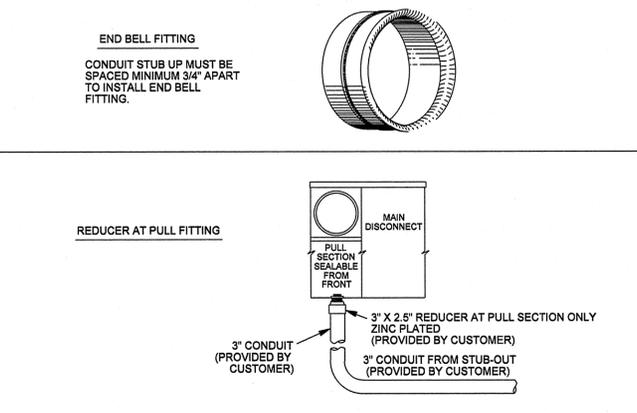
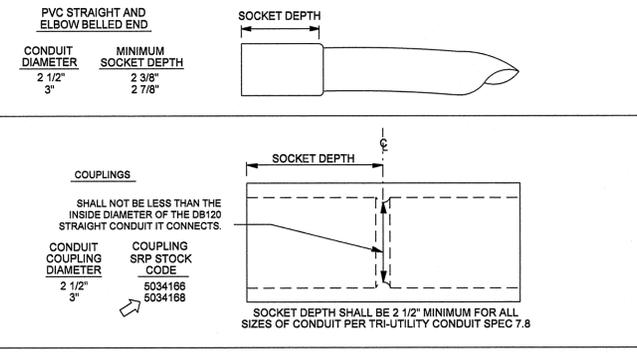


	REV. CORRECTED TRENCH DEPTH TYPO.	Page 1 of 2
	TRENCHING EXCAVATION CODES 6-11-1	ISSUE DATE: 01/15/07 REV. DATE: 03/08/13 APPROVAL: B.PRIEST 8519E136.DGN



- NOTES:**
- CUSTOMER TO STAKE LIGHT LOCATION PER APPROVED MUNICIPAL PLAN.
 - GRADE STAKE TO BE WITHIN 2 FEET OF J-BOX LOCATION. CUSTOMER TO STAKE J-BOX LOCATION. AVOID CONFLICT WITH SIDEWALK, LANDSCAPING, ETC.
 - GROUND ROD TO BE INSTALLED FOR EACH STREET LIGHT LOCATION PER STANDARDS ON PAGE 9-1-1.
 - SEE SONOTUBE INSTALLATION DETAIL, PAGE 9-1-1, IF APPLICABLE.
 - #8 BARE COPPER GROUND WIRE TO BE ATTACHED FROM GROUNDING LUG ON STREET LIGHT POLE TO GROUND ROD IN J-BOX.
 - J-BOX MAY BE POSITIONED BEHIND THE POLE, EXCEPT IN THE CITIES OF CHANDLER AND GILBERT.
 - IF POLE IS IN PROXIMITY OF METALLIC APPARATUS SEE CONSTRUCTION STANDARDS SECTION, LIGHT POLES IN PROXIMITY OF METALLIC APPARATUS, BONDING, ALSO SEE SECTION 3 "ELECTRIC SERVICE REQUIREMENTS NOTE 6".
 - FOR PEDESTAL MOUNTED POLES THE J-BOX IS LOCATED ABOVE THE WATER LINE. SEE POLE PLACEMENT, WATER RETENTION BASIN.
 - SOME CLEARANCE RESTRICTIONS APPLY TO J-BOX LOCATIONS NEAR TRANSFORMERS, SEE DESIGN AND MISCELLANEOUS, CLEAR AREA FOR CUSTOMER EQUIPMENT, ADJACENT TO TRANSFORMER.

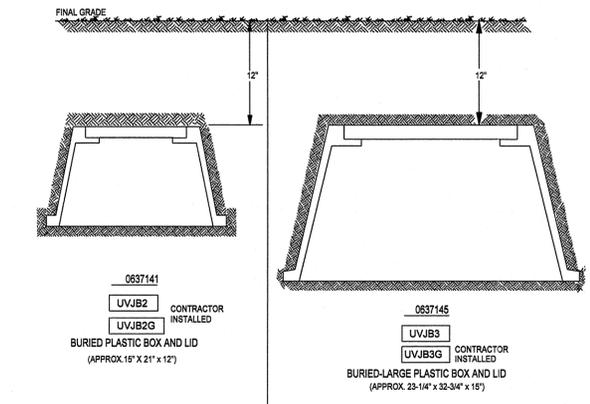
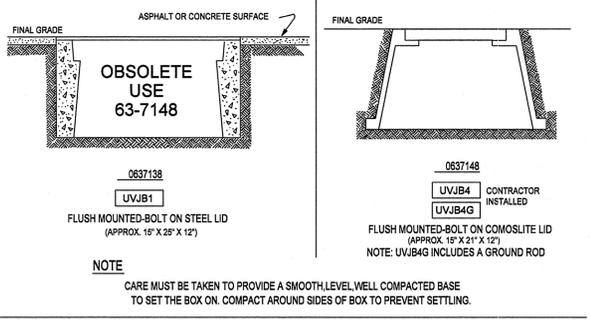
	REV. CHANGED NOTE 8 & 9.	ISSUE DATE: 11/19/01
	DESIGN AND MISCELLANEOUS STREETLIGHT POLE J-BOX LOCATION DETAILS 3-11-1	REV. DATE: 09/17/13 APPROVAL: W.LARAMIE 8518E90.DGN



	REV. UPDATED STOCK CODES.	ISSUE DATE: 03/13/01
	TRENCHING AND CONDUIT SIZES & SPECIFICATIONS BELLED ENDS AND FITTINGS 6-2	REV. DATE: 09/22/13 APPROVAL: WEL 8509E127.DGN

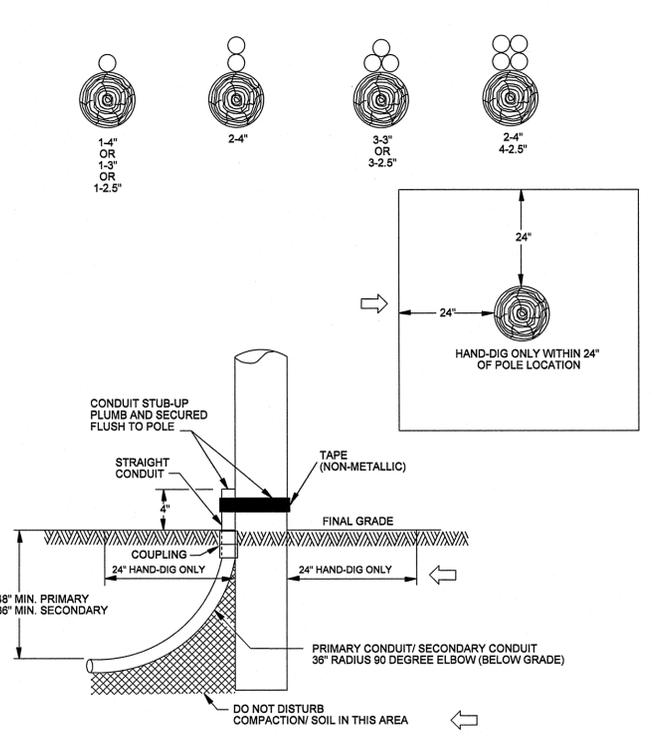
- NOTES:**
- Minimum vertical or horizontal separations between electric conduit systems and communications conduit systems (NESC Rule 320B2):
 - Telco, Cable TV, Pilot Wire, etc.
 - 3" of Concrete, 4" of Masonry, 12" of 85-90% Compacted Earth
 - Minimum clearance between an electric conduit system and other existing underground structures or utilities (note 4):
 - Electric Conduit
 - Min. 12" of 85-90% Compacted Earth
 - Sewers (Sanitary & Storm), Water Lines, Gas Lines or Communications
 - Horizontal clearance for parallel structures (NESC Rule 320B):
 - Utility or Structure
 - 3" of Concrete, 4" of Masonry, 12" of 85-90% Compacted Earth
 - An alternative to 12" of 85-90% compacted earth is a rigid support for the upper structure to prevent it from transferring any direct load to lower structure.
 - Conduit should be installed as far as practical from a water main to protect it from being undermined if the main breaks.
 - Municipals and other utilities may have additional requirements.

	REV. REFORMAT	ISSUE DATE: 04/15/08
	CLEARANCES UNDERGROUND CONDUIT 5-14	REV. DATE: 10/25/12 APPROVAL: WEL 8509E146.DGN



	REV. REFORMAT	ISSUE DATE: 01/15/07
	VAULTS, MANHOLES AND BOXES JUNCTION BOX INSTALLATION 7-3-1	REV. DATE: 05/10/10 APPROVAL: B.PRIEST 8519E21.DGN

REQUIRED CONDUIT CONFIGURATION TO FIT RISER BOOTS
(THE QUADRANT CONFIGURATION FOR THE POLE RISER WILL BE SPECIFIED BY THE DESIGNER)



	REV. "HAND-DIG ONLY" DETAIL ADDED.	ISSUE DATE: 09/01/09
	TRENCHING AND CONDUIT POLE RISER ELBOW AND LOCATION 6-3	REV. DATE: 10/14/15 APPROVAL: N.SABBAH 8509E310.DGN

CONTACTS:
 DESIGN CONSULTANT:
 TONY LAWRENCE
 OFFICE: (602) 236-4921
 MOBILE: (602) 748-6687
 PROJECT LEADER:
 KYLE REID
 MOBILE: (602) 684-6842
 INSPECTIONS:
 OFFICE: (602) 236-
 CONSTRUCTION CONSULTANT:
 MOBILE: (602) -

FIELD INSPECTION STAMP

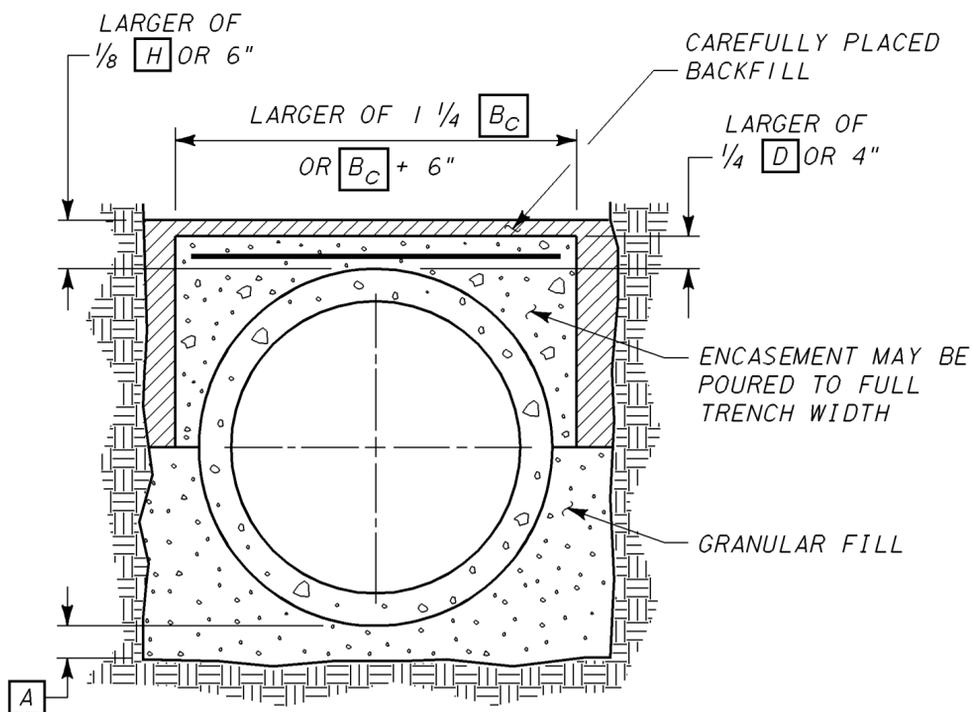
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FIS JO	T2118433
40/ACRE	BA-29-16
AMP WO	T2118433
COST CENTER	22640
ROUTING CODE	
MAP 1/4	SE S 29 T 2N R 1E
COORDS	1 7/8 E 7 1/16 N
AMP VERSION	
SHEET NUMBER	2 OF 2



Thomas Road Improvements – 103rd Avenue to 99th Avenue

EN17-020

Details

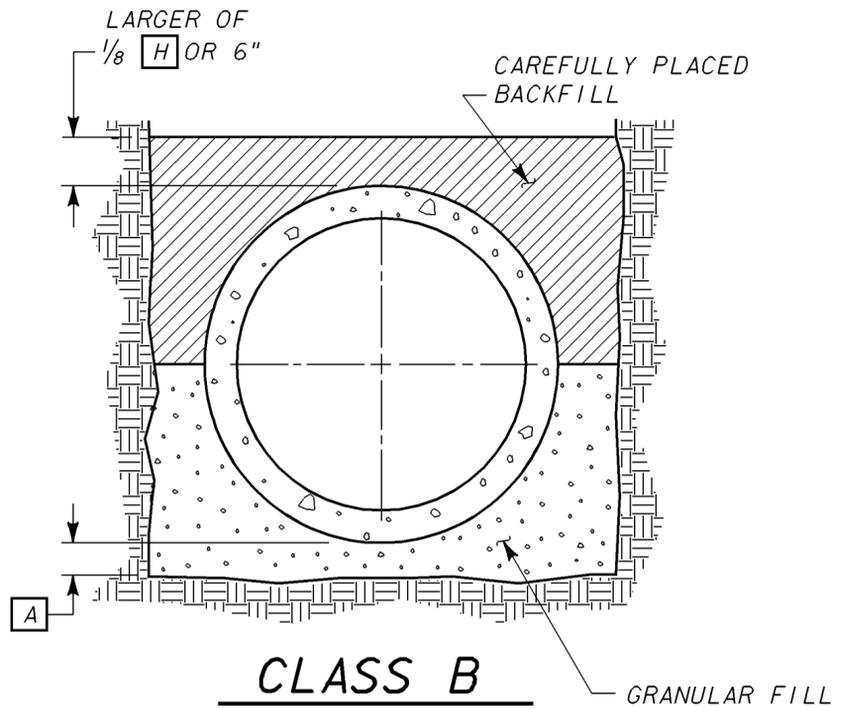


CLASS A
ARCH ENCASEMENT

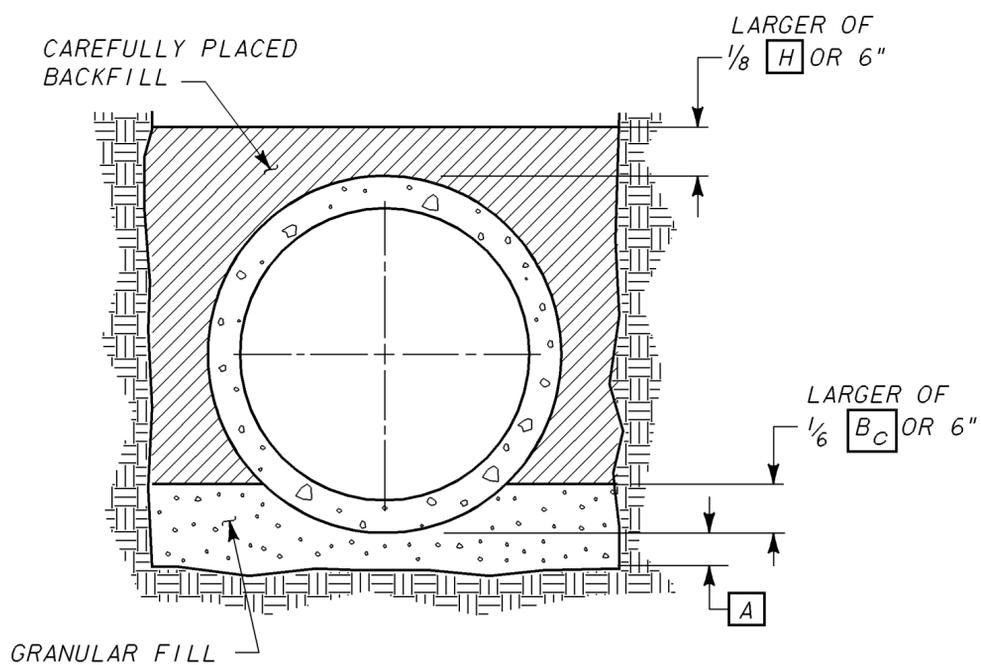
LOAD FACTOR $\left\{ \begin{array}{l} \text{REINFORCED, } A_s = 0.40\% = 3.5 \\ \text{REINFORCED, } A_s = 1.00\% = 4.8 \\ \text{PLAIN} = 2.8 \end{array} \right.$

A_s = PERCENTAGE OF AREA OF TRANSVERSE STEEL IN THE CONCRETE ABOVE CROWN OF PIPE

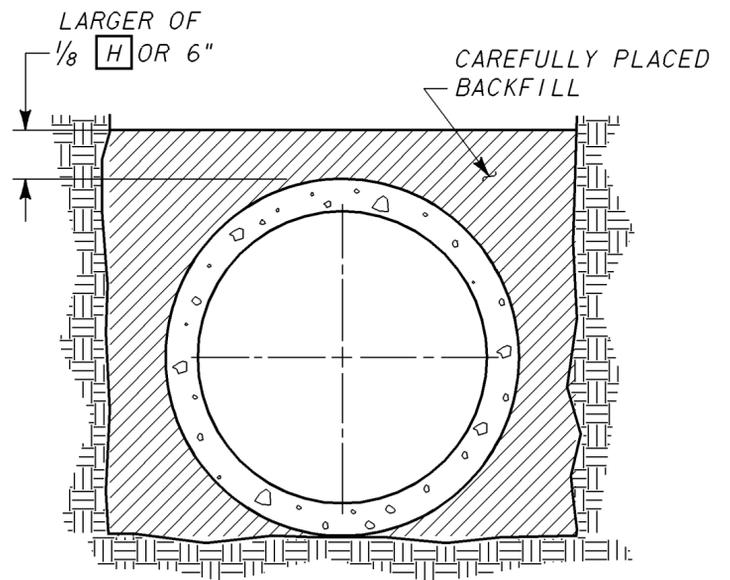
ENCASEMENT SHALL BE 2000 psi CONCRETE (MAG C)



CLASS B
FIRST-CLASS BEDDING
LOAD FACTOR 1.9



CLASS C
ORDINARY BEDDING
LOAD FACTOR 1.5

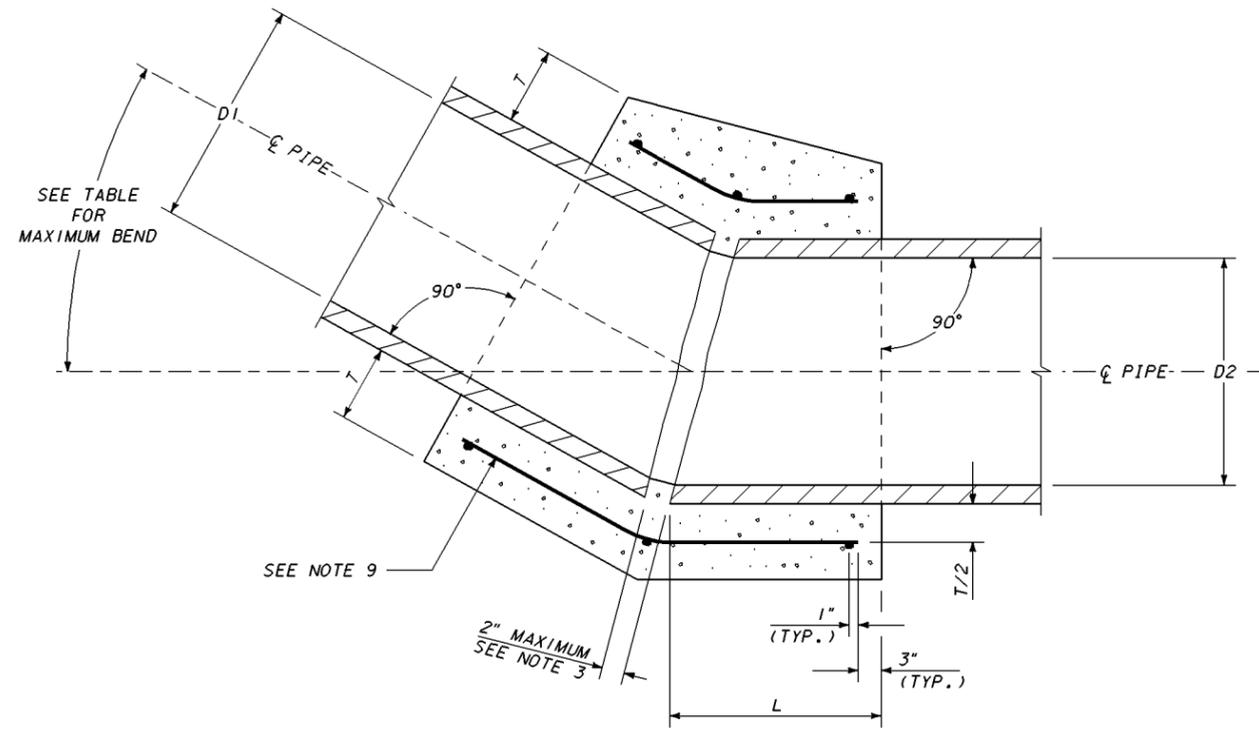


CLASS D
FLAT BOTTOM BEDDING
LOAD FACTOR 1.15

TABLE OF FILL DEPTHS BELOW PIPE	
D DIAMETER	A MINIMUM
36" & SMALLER	4"
OVER 36"	OF B_c

H = DEPTH OF FILL ABOVE TOP OF PIPE
 B_c = OUTSIDE DIMENSION OF PIPE

REFERENCES	REVISIONS	SALT RIVER PROJECT WATER ENGINEERING STANDARDS																						
PRECAST CONCRETE PIPE SPECIFICATION _____ WTR 02614	<table border="1"> <tr> <th>REV NO</th> <th>DATE</th> <th>DFTR</th> <th>CHKR</th> <th>ENGR CHK</th> <th>SUPV APPD</th> <th>ISSUE AUTH</th> </tr> <tr> <td>2</td> <td>10/28/03</td> <td>JWS</td> <td>-</td> <td>CWT</td> <td>-</td> <td>REL</td> </tr> </table>	REV NO	DATE	DFTR	CHKR	ENGR CHK	SUPV APPD	ISSUE AUTH	2	10/28/03	JWS	-	CWT	-	REL	<p align="center">PIPELINE BEDDING/BACKFILL REQUIREMENTS</p>								
	REV NO	DATE	DFTR	CHKR	ENGR CHK	SUPV APPD	ISSUE AUTH																	
	2	10/28/03	JWS	-	CWT	-	REL																	
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	ADDED CONCRETE ENCASEMENT NOTE AND REMOVED METRIC REFERENCES.																							
ADDED METRIC DIMENSIONS.																								
1	4/97	MD	-	CWT	-	REL																		
<table border="1"> <tr> <td colspan="7">INITIAL ISSUE.</td> </tr> <tr> <td>0</td> <td>2/89</td> <td>AK</td> <td>WJC</td> <td>REL</td> <td>AAR</td> <td>TNS</td> </tr> </table>	INITIAL ISSUE.							0	2/89	AK	WJC	REL	AAR	TNS	DWG SIZE									
INITIAL ISSUE.																								
0	2/89	AK	WJC	REL	AAR	TNS																		
	17 x 22	30300001.WES																						
		WES-30300-001																						



PIPE COLLAR DETAIL

MINIMUM REQUIREMENTS

D	L	T	REINFORCING STEEL	MAXIMUM BEND
12"	12"	6"	(3) #4 HOOPS WITH #4 @ 12" OR 6x6-W5.5xW5.5 WWF	22 1/2°
18"				30°
24"				
30"	18"	8"		45°
36"				
42"				
48"				
54"	24"	10"		
60"				
66"				
72"				
78"	30"	12"		
84"				
90"				
96"	36"	14"		
102"				
108"				

D = D1 OR D2, WHICHEVER IS GREATER. (SEE NOTE 4)

NOTES

- NO SUBSTITUTIONS AND/OR CHANGES SHALL BE MADE WITHOUT ENGINEER'S APPROVAL.
- CONCRETE PIPE COLLAR IS REQUIRED TO JOIN TWO PLAIN END PIPES OF DIFFERENT DIAMETERS, MATERIALS, OR PIPES AT CHANGE IN ALIGNMENT OR GRADE.
- PIPE ENDS SHALL BE TRIMMED SUCH THAT THE MAXIMUM DISTANCE BETWEEN PIPES AT ANY POINT IS TWO INCHES.
- MINIMUM PIPE COLLAR SIZE SHALL CORRESPOND TO LARGER OF THE TWO PIPE DIAMETERS.
- CONCRETE COLLARS SHALL BE FINISHED SMOOTH AND FLUSH WITH THE INSIDE SURFACE OF THE PIPE.
- CONCRETE SHALL CONFORM TO REQUIREMENTS OF SRP STANDARD SPECIFICATION FOR CONCRETE (SRP 03300).
- CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI @ 28 DAYS (MAG A) AND SHALL BE CONSOLIDATED BY MECHANICAL VIBRATOR OR EQUIVALENT.
- REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60 AND WELDED WIRE FABRIC SHALL BE ASTM 185.
- THE DIAMETER OF WELDED WIRE FABRIC OR REBAR HOOPS SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS "T". LAP SHALL BE 12".
- ALL FORMS SHALL BE REMOVED PRIOR TO BACKFILLING.
- STANDARD CONCRETE PIPE COLLAR SHALL NOT BE USED UNDER PAVEMENT SURFACES.

REFERENCES

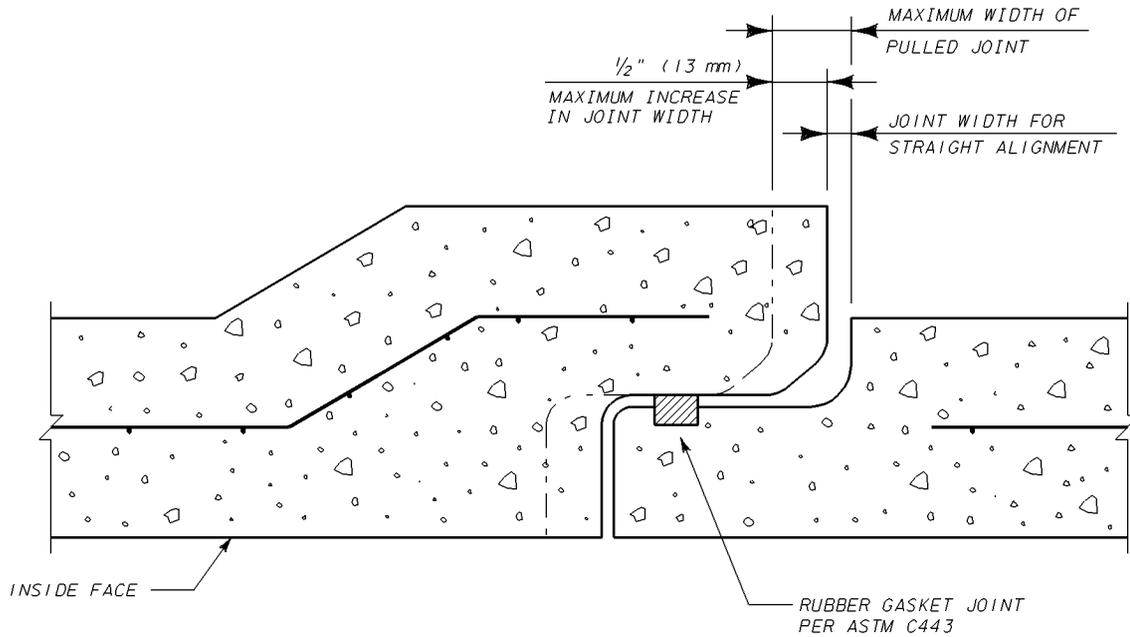
REVISIONS

SALT RIVER PROJECT
WATER ENGINEERING STANDARD

REV NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE
REVISED TABLE (ADDED ANGLES) AND ADDED METRICS.					
3	MD	-	CWT	REL	05/97
	MD	-	CWT	REL	
REVISED DETAIL, NOTES, TABLE (REMOVED METRIC DIMENSIONS) & DRAWING SIZE.					
4	JWS	-	CWT	REL	02/09/01
	JWS	-	CWT	REL	

STANDARD CONCRETE PIPE COLLAR SECTION AND DETAILS

SCALE: NONE
C 1202361 30300003.WES
DWG SIZE: 22X34
WES-30300-003

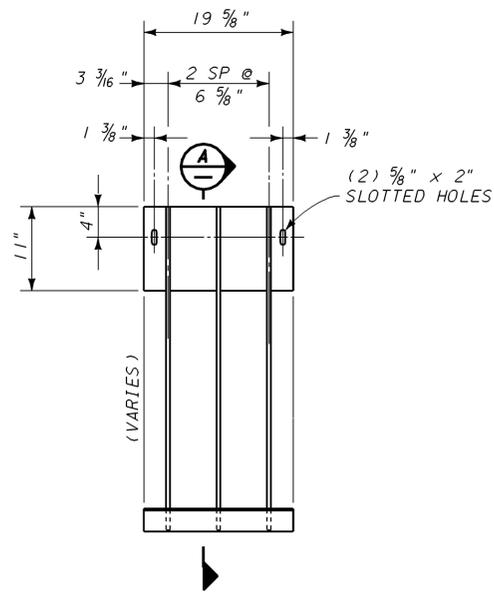


SECTION THRU PIPE JOINT

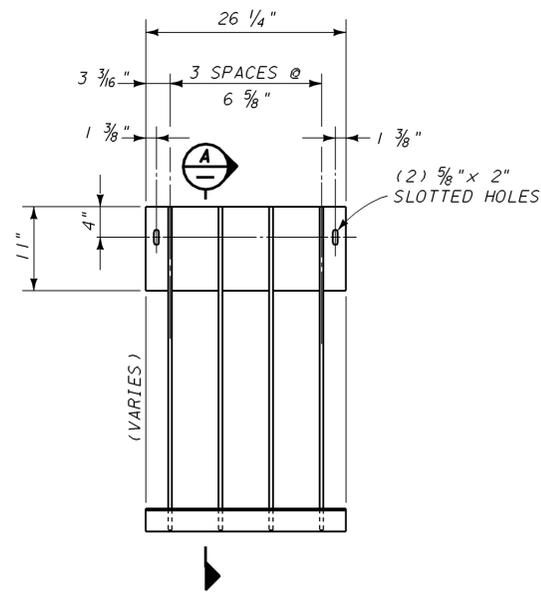
NOTES:

1. THIS DETAIL IS FOR A TYPICAL RUBBER GASKET BELL & SPIGOT ASSEMBLY. FLUSH BELL RUBBER GASKET JOINTS MUST MEET THE SAME SPECIFICATIONS.

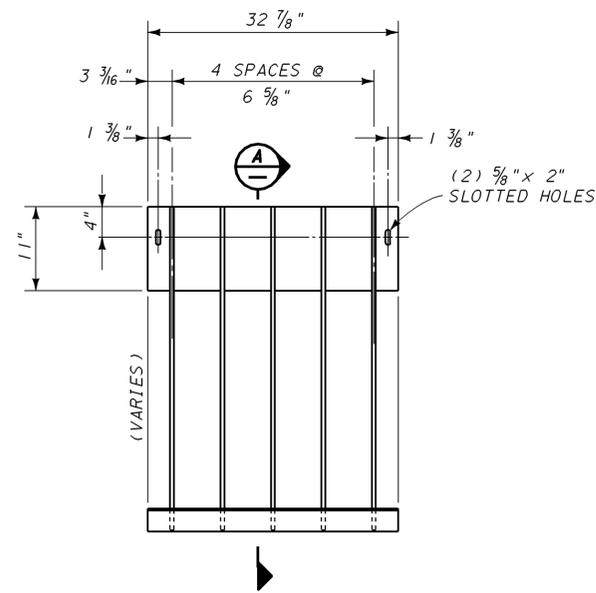
REFERENCES		REVISIONS							SALT RIVER PROJECT WATER ENGINEERING STANDARDS	
PRECAST CONCRETE PIPE SPECIFICATION _____ WTR 02614		REV NO	DATE	DFTR	CHKR	ENGR CHK	SUPV APPD	ISSUE AUTH	RUBBER GASKET JOINTS	
		INITIAL ISSUE								
		0	2/89	AK	WJC	REL	AAR	TNS		
		REVISED TO ASTM C433 STANDARD								
		1	5/97	MD	---	CWT	---	REL	SCALE: NONE	P02: [120, 236] 30300004. WES
									DWG SIZE	WES-30300-004
									17 x 22	



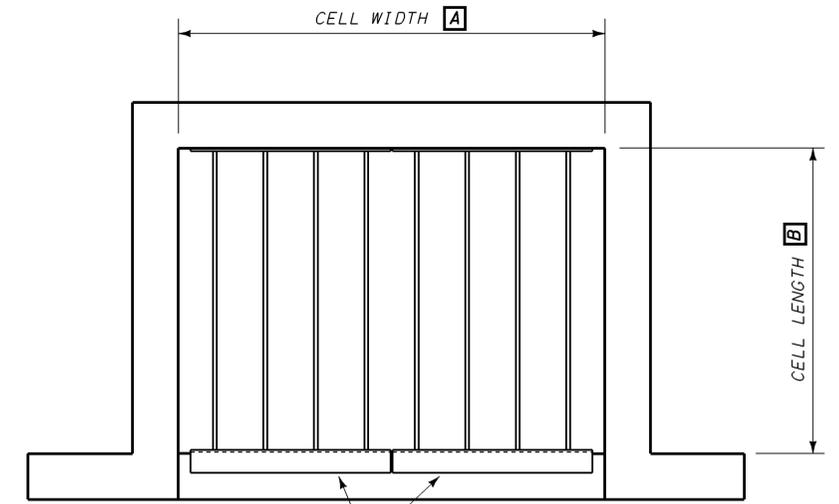
TRASHRACK-TYPE I



TRASHRACK-TYPE II



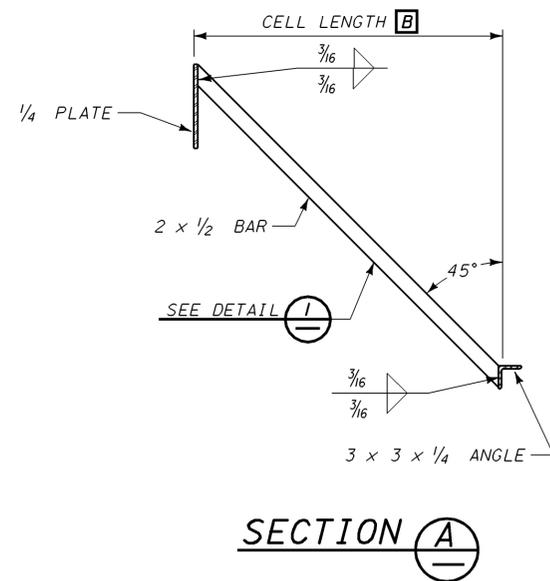
TRASHRACK-TYPE III



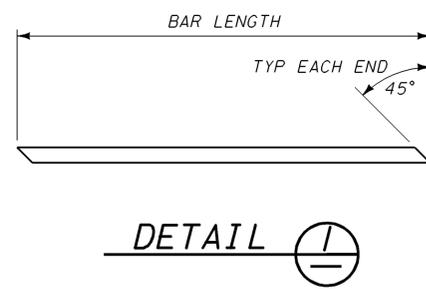
SEE TRASHRACK SCHEDULE FOR NUMBERS AND TYPES OF TRASHRACKS REQUIRED FOR VARYING CELL WIDTHS

HEADWALL KEY PLAN

TRASHRACK SCHEDULE			
HEADWALL CELL WIDTH [A]	NUMBER OF PANELS REQUIRED		
	TYPE I	TYPE II	TYPE III
32"	-	1	-
40"	-	-	1
48"	1	1	-
56"	-	2	-
64"	-	1	1
72"	-	-	2
80"	1	2	-
88"	-	2	1
96"	-	1	2
108"	2	-	2
120"	-	2	2
132"	-	1	3
144"	2	-	3
156"	1	-	4
168"	-	-	5
180"	1	1	4
192"	1	-	5



SECTION A



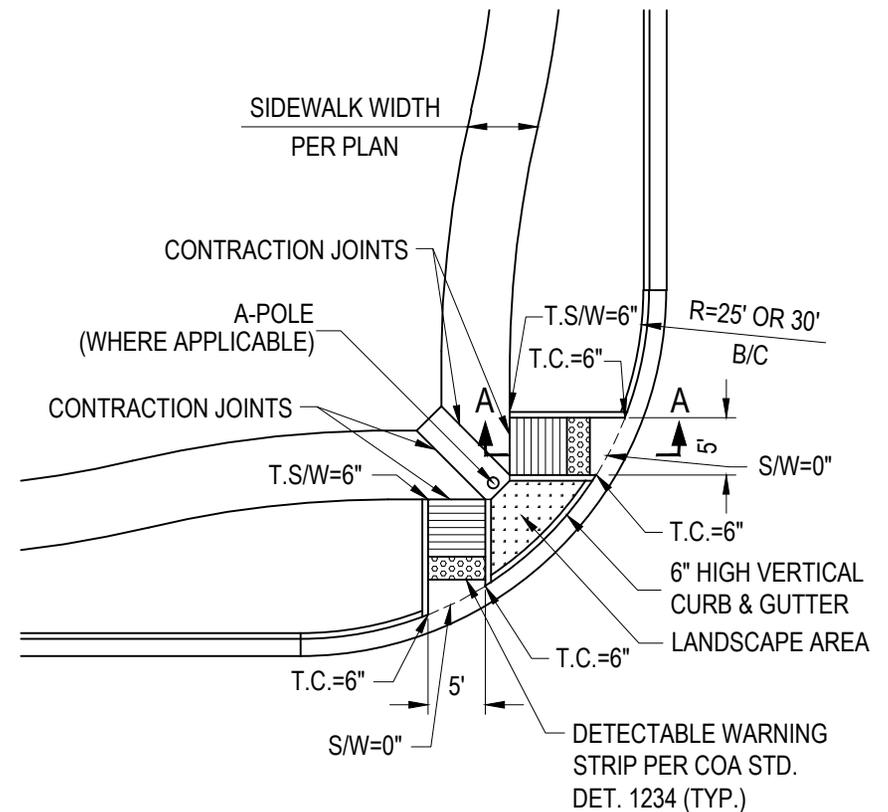
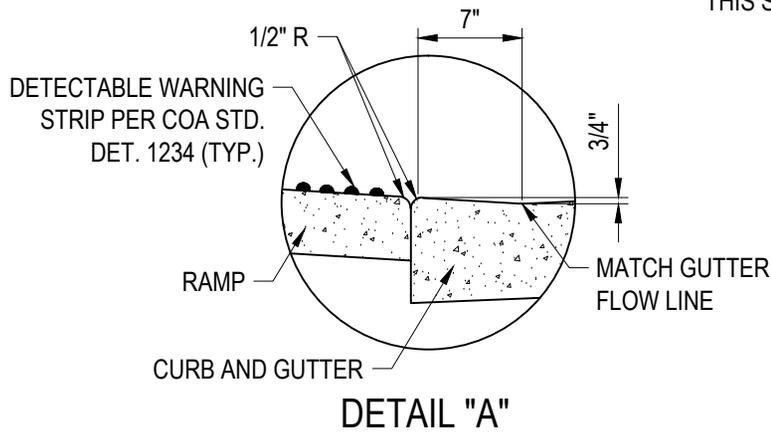
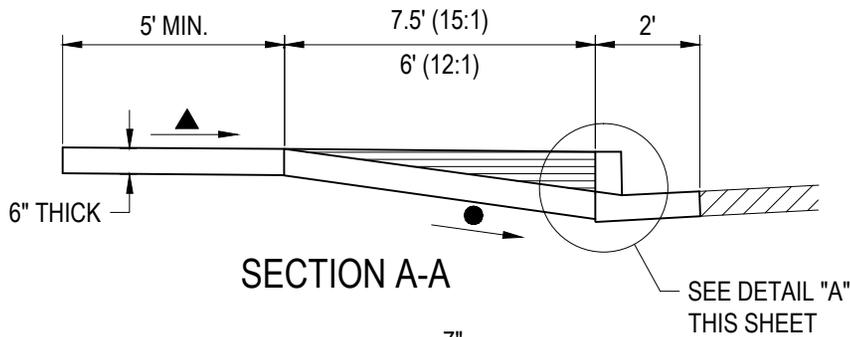
DETAIL I

TRASHRACK BAR LENGTH SCHEDULE	
HEADWALL CELL LENGTH [B]	BAR LENGTH
16"	23 15/16"
24"	35 1/4"
32"	46 9/16"
40"	57 7/8"
48"	69 3/16"
56"	80 1/2"

CONTRACTOR NOTE:
 TRASHRACK(S) MUST BE MANUFACTURED PRIOR TO REQUESTING AN IRRIGATION OUTAGE FOR THIS JOB.
 TRASHRACKS AND ASSOCIATED HARDWARE CAN BE SUPPLIED BY SALT RIVER PROJECT UPON REQUEST. PLEASE CALL THE MECHANICAL CONSTRUCTION & MAINTENANCE DIVISION OF SRP FOR PRICE QUOTES: (602)236-4154.

- NOTES:**
- UNLESS OTHERWISE SPECIFIED, TOLERANCE DIMENSIONS SHALL BE +/- 1/32".
 - ALL STEEL SHALL BE ASTM A36 UNLESS OTHERWISE NOTED.
 - SANDBLAST TO NEAR WHITE AND ZINC METAL SPRAY OR HOT DIP GALVANIZE 5-7 MILS AFTER FABRICATION.

REFERENCES		REVISIONS						SALT RIVER PROJECT WATER ENGINEERING STANDARD	
		REV NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE	45° TRASHRACK FOR PIPELINE HEADWALL SCALE: NONE DWG SIZE: 22X34 WES-30350-200	
REMOVED METRIC DIMENSIONS.									
3	JWS	-	CWT	REL			03/10/05		
INITIAL ISSUE.									
0	MOD	CWT	MLK	REL			02/22/95		



NOTES:

1. CONTROL ELEVATIONS SHOWN ARE IN RELATION TO THE GUTTER AND ARE LOCATED RADIALLY. GUTTER ELEVATION = 0".
2. CONCRETE CURB & GUTTER AT CURB RETURNS WITH RAMPS SHALL BE MAG CLASS A. CONCRETE SIDEWALK AND RAMPS AT CURB RETURNS SHALL BE MAG CLASS A.
3. RAMP CURBS MAY BE POURED MONOLITHIC WITH A CONSTRUCTION JOINT.
4. EXPANSION JOINT FILLER SHALL BE 1/2" BITUMINOUS TYPE PREFORMED EXPANSION JOINT FILLER ASTM D-1751.
5. USE OF 8'-10' LANDING NEAR TRAILS, MAY BE REQUIRED.
6. IF NECESSARY, THE RAMPS MAY BE ROTATED INWARD TOWARD THE CENTER OF RETURN TO LINE UP WITH OPPOSING RAMPS. HOWEVER ALL ROTATIONS NEED TO OCCUR ABOUT THE CENTER POINT OF THE RETURN SUCH THAT THE RAMP REMAINS PERPENDICULAR TO THE BACK OF CURB.

DETAIL NO.

A1235-2

Avondale
STANDARD DETAIL

BI-DIRECTIONAL RAMPS
(25' or 30' RADIUS)

APPROVED BY:

DATE:

Daniel S. Jones
8.24.16

Thomas Road Improvements – 103rd Avenue to 99th Avenue

EN17-020

Geotechnical Report



**PAVEMENT REHABILITATION
GEOTECHNICAL EVALUATION**

DESIGNATION: Thomas Road Evaluation

LOCATION: Thomas Road – RID to 99th Avenue
Avondale, Arizona

CLIENT: City of Avondale – Engineering Division

PROJECT NO: 130209SA

DATE: October 31, 2013

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APPENDIX



1.0 INTRODUCTION

This report presents the results of a Geotechnical Pavement Investigation conducted for roadway improvements on Thomas Road from 99th Avenue to the Roosevelt Irrigation District Canal (RID) in Avondale, Arizona. The roadway improvements may consist of either full reconstruction or another form of rehabilitation as determined by the pavement conditions and traffic loading. The alignment may also include the widening of the northern shoulder to provide for 3 to 4 lanes.

The purpose of this investigation is to determine the existing pavement section and make recommendations for pavement replacement and/or rehabilitation of the roadway as dictated by the available funds for the project and desired life. This investigation involved a visual observation of the surface condition, a limited number of pavement cores to determine the current pavement structure and obtaining samples of the shallow subgrade soils. The scope of our evaluation focused on the ½ mile section of roadway between 99th Avenue and the RID. It is assumed that the pavement structure will be designed for moderate volume of passenger traffic, school busses, and light to moderate heavy truck traffic.

Based on the length of roadway being assessed and the current roadway conditions, a total of 4 areas were cored during the investigation for analysis of the roadway condition. The data from these sample locations was used in the analysis of the subgrade soils for this report. Samples were taken in areas representing various states of distress. The asphalt and aggregate base thickness was measured from each of the core locations and recorded, as shown on the attached boring logs. The borings were located as shown on the attached Project Location Plans.

2.0 GENERAL SITE CONDITIONS

2.1 General Site Conditions

This portion of Thomas Road travels in an east/west direction through a transitional area. To the west of this section of roadway the area primarily consists of residential developments on both the north and south sides, to the east the surrounding area consists mainly of agricultural properties. Within the project limits, the north side of the roadway consists of an agricultural property, with an irrigation canal running along the north shoulder of Thomas. On the south side of Thomas there is a cemetery. The south side of the road contains some improvements, including landscaping, curb and gutter, as well as some sidewalks. The north side of Thomas Road consists mostly of a dirt shoulder and a berm that runs along the irrigation canal and separates the road from the farm properties. At the west end of the project, after Thomas crosses over the canal bridge, the roadway widens to provide for 5 lanes of traffic (2 through lanes in each direction and a center turn lane). Within the project limits, the roadway mostly consists of 2 lanes (1 in each direction) with

limited areas containing a small center lane. In general the east bound lane consists of an extra wide lane (almost double width).

Thomas Road serves as a main thoroughfare for residential traffic. A significant amount of traffic uses the roadway as there is direct access to the Loop 101 to the east of the project. Traffic during our investigation consisted of high volumes of personal vehicles (light cars and trucks), and occasional heavy truck traffic. Based on the location of the roadway and the current traffic volumes we assume that this roadway functions as an arterial roadway.

2.2 Pavement Conditions

In general, the majority of the pavement appears to be in a fair to poor condition. The pavement is exhibiting frequent drying shrinkage block cracking typical of aged asphalt pavements. The block cracked pavement has further deteriorated to “alligator” cracking and fatigue cracking and pot holes in several areas indicating overstressing and possible subgrade failure. The failure in the pavement may be a combination of insufficient structural section for the roadway as well as water infiltration into the subgrade. Although the roadway is still serviceable, it will continue to degrade over time. The pavement is also showing signs of significant drying and stripping (loss of surface fines) which is part of the aging process.

There is a significant difference in the roadway condition in the east bound lanes versus the west bound lanes. In general the east bound lanes appear to consist of a slightly newer pavement, possibly the result of a previous half street improvement or partial road widening to the south. The west bound lanes are showing a significant amount of fatigue cracking and it appears that there have been some attempts at patching of potholes or the areas that contain the most damage. In the areas where the roadway contains a center/median lane, the pavement is in a condition somewhere in between the east and west bound lanes. The surface is generally poor showing a significant amount of stripping, but there is slightly less cracking than that of the west bound lanes. Photos of the various conditions are included in the appendix of this report.

A total of four cores were taken within the roadway, two in the east bound direction and two in the west bound direction. The west bound cores were taken generally near the center of the drive lane. The east bound cores were taken toward the north edge of the east bound lane. This was due to the request of Kinder Morgan, as they have a utility that runs in the east bound lanes and requested we stay at least 10 feet away from the utility. The approximate locations are shown on the attached Project Location Plans. The thickness of the asphalt and aggregate base were measured and the subgrade soils were hand augured and probed for general consistency. The results of the cores/borings are on the following table:

Table 2.2.1 Thomas Road Cores

Core Number	Asphalt Concrete	Aggregate Base	General Soil Conditions
C-1 WB	1.25"	4.0"	Below the ABC there was 8" of millings
C-2 WB	1.5"	6.0"	Below the ABC there was 7" of millings
C-3 EB	2.75"	10.0"	Stiff Sandy Lean Clay
C-4 EB	3.0"	12.0"	Firm Sandy Lean Clay

The two cores in the west bound direction appeared to contain asphalt millings below a thin section of aggregate base. The east bound cores revealed a more typical pavement section with a thicker section of aggregate base and a thicker section of asphalt.

2.3 General Subsurface Conditions

The borings indicate fairly consistent subgrade conditions along length of the alignment. The soils in the core locations generally consisted of a sandy clay material. As noted above, the two core locations in the west bound lanes encountered a layer of asphalt millings below the thin upper layer of aggregate base. The cores in the east bound lanes did not encounter such a layer. In all of the core locations, the aggregate base found below the pavement consisted of what appears to be a ‘select’ granular material which contained a significant amount of gravel, including gravel that was in excess of 2 to 3 inches. The hand auguring and sampling was terminated shortly after encountering native soils at depths of up to 2 feet below current street elevation. Detailed information at each coring/boring location along the road can be found on the individual Log of Test Borings in the appendix.

The relative density of the subgrade was generally consistent between all locations and in firm to stiff condition based on probing and hand auguring. The soils did appear to be slightly softer on the north side of the road (west bound lanes). There was noticeably more moisture in core location C-1 and C-2. There is a moderate potential to uncover moist unstable soil conditions along the north side of the road. This may be partially related to the unlined irrigation canal that runs parallel to the roadway. No groundwater was encountered during this investigation. Based on visual and tactile observation, the soils were in a ‘dry to moist’ state at the time of investigation.

Laboratory testing of the upper soils indicates liquid limits on the order of 31 to 33 and plasticity index on the order of 13 to 14. In-situ moisture contents from two of the core locations were on the order of 14 to 19 percent. These moisture contents are close to the plastic limit of the soil. The average amount of soil passing the #200 sieve ranges from 69 to 82 percent. Using Table 202.02-3 in the ADOT design manual to correlate R-values from these laboratory results, the correlated R value for the different samples ranges from 18 to 23. A more detailed analysis is included in the following sections.

3.0 ANALYSIS AND RECOMMENDATIONS

3.1 Analysis

As indicated, the majority of the pavement is in a poor condition with a significant number of failed areas as identified by excessive “alligator” cracking and pot holes. It appears that some attempts at patching and other light surficial repairs have been attempted. These types of repairs do not appear to be lasting very long and the pavement continues to deteriorate. While the east bound lanes appear to be newer and performing significantly better, they are beginning to show some wear and are exhibiting drying shrinkage block cracking, typical of aged asphalt pavements. Block cracking is normal in asphalt pavements. It is usually the result of volume change of the fine aggregate asphalt mixes that have a high content of low penetration asphalt and adsorptive aggregates. As the asphalt oil ages, the mix becomes stiffer (less flexible) to the point where the pavement cannot tolerate the daily shrinkage forces that result from temperature changes. These types of cracks typically do not represent structural failure. However, as the pavement deteriorates, water can enter the subgrade resulting in poor subgrade support and progressive failure as observed in this roadway.

The subgrade soils are in fair condition, however it should be noted that zones of highly moist soils were encountered in several locations (mostly along the north side of the roadway closer to the irrigation canal). It has been our experience that it is not uncommon to uncover moist unstable soil conditions below old roadways. Therefore, if the option to completely remove the existing pavement section is selected, **there is a high possibility to uncover soft, moist, unstable zones.** These areas may need some remediation or additional time to dry prior to placing any new aggregate base or asphalt pavement. This is also a likely scenario for the proposed road widening which may encroach on the existing irrigation canal on the north side of the road. The soils in this area should be expected to be very moist and will likely require time to dry or other remedial methods may be required.

For the proposed road widening portion of this project, analysis of the field and laboratory data indicates that subsoils at the site are generally favorable for the support of the proposed paving project subject to preparatory earthworks. As discussed above, there are concerns with regard to the potential to encounter unstable or overly moist soil conditions in areas where there currently exists an irrigation canal.

If available, a review of the pavement maintenance history of the roadway would be valuable information. Knowledge of previous mill and overlays or other forms of maintenance may result in adjustments to the recommendations made herein. Based on our field observations, it appears that the east bound lanes contain a significantly newer pavement. Due to utility conflicts we were not able to core in the center of this pavement, therefore we could not confirm the as-built thickness. Currently this pavement is

performing adequately, and it may be possible to save on construction costs to leave a portion of this pavement in place, while reconstructing the majority of the rest of the roadway.

For the purposes of this report and our analysis, it is assumed that Thomas Road is considered to be a Major Arterial street. The City of Avondale requires a minimum section of asphalt surface on a minimum section of aggregate base course based on typical street classifications. The current minimums are as follows:

Table 3.1.1 Avondale Pavement Requirements

Street Classification	Asphalt Surface	Aggregate Base Course
Major Arterial	5.0”	12.0”
Industrial Collector	5.0”	12.0”
Collector	4.0”	10.0”
Local	3.0”	8.0”

Review of the cores taken from the investigation and the above assumed street classifications appears to indicate that the roadway was likely designed more as a local or collector roadway. It should be noted that Thomas Road would typically be classified as a Major Arterial as the roadway is at the major 1 mile (section line) interval. However based on available traffic data, the roadway received about ½ the traffic volume of Indian School Road to the north and McDowell Road to the south. This is likely due to the current size of the roadway (2 lane road) in comparison to those roadways (4 lane roads). A more detailed analysis and discussion about roadway traffic loading is included in the following sections.

3.2 Recommendations

As discussed, the pavement is generally in poor condition, with only the east bound lanes being in fair condition. It appears that the east bound lanes may have been reconstructed as part of the developments on the south side of the roadway. Most of the pavement contains a relatively thin section of asphalt concrete surface on a moderate section of aggregate base. Based on the current conditions of the pavement, our primary recommendations are to remove and replace the asphalt surface. Due to the significant amount of cracking/failed areas and the relatively thin section of asphalt in the west bound lanes we would not recommend a traditional mill and overlay as it may not be possible to mill more than 1 inch without destroying the remaining pavement. In addition thin overlays or other surface type repairs will likely show the same signs of distress in a relatively short period. There also appears to possibly be some subgrade failures that are causing the distress in the pavement. A complete removal and replacement will provide the longest life and allow the opportunity to improve any poor drainage or subgrade issues.

As an option to possibly reduce costs by reducing the amount of export or import, a full depth reclamation (FDR) option is also provided. This option is discussed in further detail in the following sections. It may also be possible to consider a combination of options. The east bound lanes are generally in fair condition and at this time may be suitable for a mill and overlay. This would reduce some of the costs associated with full roadway reconstruction, however the added lift of the pavement will be about half that of a fully reconstructed road. The city should determine which option best meets their desires and budget.

Within the area of the proposed road widening, the entire area to be occupied by the new asphalt pavement construction should be stripped of all vegetation, debris, rubble and obviously loose surface soils. Prior to placing structural fill or aggregate base, the exposed grade should be scarified to a depth of 12 inches (Note: Increased depth over M.A.G Std. Spec 301), moisture conditioned to optimum (± 2 percent) and compacted to at least 95 percent of maximum dry density as determined by ASTM D-698. The deeper scarification depth is recommended to compensate for the previous disturbance caused by any previous farming or adjacent site activities. Under sidewalks (if any are planned), the compaction should be limited to 90 percent minimum to 95 percent maximum at a moisture content of at least optimum to 3 percent above.

Construction of the road widening may encroach on the existing irrigation canals. As a result there is a high likelihood of encountering unstable moist soil conditions in the area. There are several options for consideration should wet soils be encountered within the irrigation ditch or elsewhere on the project. The first option would be to remove the unstable soils to a depth on the order of 2 feet below existing grades; deeper excavations may be required if the loose, wet areas extend deeper. The wet soils may be set aside to dry and be re-compacted once they have dried sufficiently, or other local soils may be imported.

As an alternate to complete removal of the soils, the soils can be mixed with either a chemical lime slurry or dry cement. Since using lime or cement is only to dry and stabilize the soils, not part of the structural design, it is recommended to follow M.A.G. 309 for lime stabilization and M.A.G. 311 for cement stabilization. Based on past experience with similar issues, we anticipate that 12 inches of lime treated or cement treated soil will be required. Prior to a final decision on the amount of stabilized soil required, it is recommended to test a 12 inch treated area in one of the worst areas to see if 12 inches is sufficient, after allowing the section to cure for a day or two. Without a mix design, we recommend a minimum of 5% cement/lime for preliminary estimating purposes.

It must be noted that all new asphalt pavements will eventually crack. Cracking in asphalt pavement is typical and should be expected over the life of the pavement. In fact, it has been our experience of late that with the new asphalt binders that are available we are seeing the onset of earlier aging and

cracking. These require routine maintenance to prevent accelerated deterioration. Accordingly, it is highly recommended to establish a maintenance program where the cracks are routinely filled as they appear beginning at about the second year of life. It is also recommended that surface fog seal coats be considered beginning at about year 5 and every 5 years after. This will help preserve the pavements, extending the service life.

3.3 Fill and Backfill

Some minor site grading will likely be required as part of the road widening portion of the project (including possibly filling in irrigation ditch). The native soils are considered suitable for use in general grading fills provided that they are not over-compacted when placed under sidewalk slabs.

If imported common fill for use in site grading is required, it should be examined by a Soils Engineer to ensure that it is of low swell potential and free of organic or otherwise deleterious material. In general, the fill should have 100 percent passing the 3-inch sieve and a combination of percent passing the 200 sieve and plasticity index that would result in a correlated R-value (per ADOT method) of equal to, or better than the 21 value used for this design. It should exhibit less than 1.5 percent swell potential when compacted to 95 percent of maximum dry density (ASTM D-698) at a moisture content of 2 percent below optimum, confined under a 100 psf surcharge, and inundated.

Fill should be placed on subgrade, which has been properly prepared and approved by a Soils Engineer. Fill must be wetted and thoroughly mixed to achieve optimum moisture content, ± 2 percent (optimum to +3 percent for under-slab fill). Fill should be placed in horizontal lifts of 8-inch thickness (or as dictated by compaction equipment) and compacted to the percent of maximum dry density per ASTM D-698 set forth as follows:

A.	Asphalt Pavement Subgrade or Fill	95
B.	Aggregate Base Course	100
C.	Utility Trench Backfill (full depth)	95
D.	Sidewalks	90 min to 95 max

3.4 Pavement Design Parameters

The following data was used for the design of the new pavement sections where applicable as well as to analyze the current capacities of the pavement. Laboratory testing indicated an average percent passing the No. 200 sieve of 76 and an average Plasticity Index of 14 percent. A summary of the laboratory testing is attached. Using the formula in Section 202.02.H of the ADOT Preliminary Engineering and Design Manual to calculate the design M_R results in the following:

Table 3.4.1 R value Calculation

Roadway	R _{DESIGN}	M _R
Thomas Road	21	12,600

The following traffic data and pavement materials structural coefficients were used to determine the requirements for a new pavement section based on the anticipated traffic and the final pavement thickness. The average daily traffic (ADT) counts provided are based on City of Avondale 2011 traffic counts and do not account for any growth factors over time. The percentage of trucks is assumed to be around 6% to 10% based on the road location. If actual truck percentages are available, this would be valuable information as heavy truck traffic will have the largest effect on the roadway life.

Table 3.4.2 Traffic Analysis

Roadway	ADT (2 Direction)	Percentage Trucks	One Way ESALs
Thomas Road	12,710	8%	550

Notes:

1. Percentage of trucks is assumed based on the road classification and location.
2. One way daily ESALs are based on 100% truck traffic in the design lane (based on the number of travel lanes), a 50/50 split between directions and a 20 year time period.
3. Typical heavy truck traffic imparts 1.0 to 1.5 ESALs per pass.
4. ADT is based on City of Avondale 2011 traffic data.

Pavement Materials Structural Coefficients

Asphaltic Concrete	0.39 (< 4")
	0.42 (≥4") (conventional mix)
Aggregate Base	0.12
Cement Treated Base (300 psi)	0.22
Level of Reliability	95%
Serviceability:	P _o = 5.0
	P _t = 2.5
Standard Error:	S _o = 0.40

3.5 New Pavement/Remove and Replace

The primary option for rehabilitation of the roadway should be complete or partial reconstruction. In addition a portion of the project may contain new pavement as part of the proposed road widening. For the option of new pavement using a traditional removal and replacement, it generally appears that there may be sufficient aggregate base material, with approximately 10 inches on average (including the

asphalt millings). As a result, a couple of alternatives for the removal and replacement option have been provided. The complete pavement section (asphalt and aggregate base) can be completely removed. Or just the asphalt surface and possibly some of the aggregate base can be removed (depending of fixed grade points such as curbs and gutters), allowing for a thicker layer of asphalt concrete to be placed back on the existing or slightly thinner section of aggregate base. This secondary option of leaving the existing aggregate base in place will result in a pavement section that does not meet the current City of Avondale pavement requirements for a major arterial.

If the desire is to reuse the in-place aggregate base, the removal and replacement will require complete removal of the existing asphalt surfacing and replacing with a new structural section of asphalt surface on the existing aggregate base. This process will likely disturb the underlying aggregate base course (ABC) and possibly subgrade. **As stated above, there is a potential to uncover wet, unstable subgrade soils, therefore the repairs should include a contingency to remove and replace additional subgrade soils if soft, wet areas are encountered.** If it is not possible to remove the soils and replace with dry soils or allow the soils to dry, other means (such as cement treating the soils, geogrids, etc.) may be used to stabilize. Alternatively it may be possible to use the millings and existing aggregate base to stabilize any areas that require stabilization, provided the asphalt millings are prepared and meet the requirements of M.A.G. Section 702 for ABC. If cement treating is being used, it should be done following the guidelines of M.A.G. Section 311.

Based on our investigation and the current condition of the pavement, there is a high likelihood of this occurring in several areas, especially along the west bound lanes (north side of the road), near the irrigation ditch. After removal of the surface, the exposed base will require fine grading and re-compaction. It is recommended to remove additional aggregate base to provide a thicker section of asphalt concrete surface as necessary. The goal would be to leave as much of the existing aggregate base in place only reducing either the asphalt surface or the aggregate base slightly where there is a need to tie into fixed grades such as curbs and gutters. The exposed aggregate base should be re-compacted to at least 100 percent dry density as determined by ASTM D698.

For construction of a complete new pavement section the existing asphalt concrete and aggregate base should be completely removed along with additional subgrade soils as needed to provide space for the new pavement structural section. As stated above there is a potential to uncover wet, unstable subgrade soils, therefore the repairs should include a contingency to remove and replace additional subgrade soils if soft, wet areas are encountered. Once removal is complete the exposed subgrade should be compacted to at least 95 percent dry density as determined by ASTM D698.

If earthwork in paved areas is carried out to finish subgrade elevation as set forth herein, the subgrade will provide adequate support for the proposed new pavements. The following table provides several pavement sections for consideration. The section capacities are reported as daily ESALs, Equivalent 18 kip Single Axle Loads. Based on the calculations provided in the previous section, the roadway should be designed for approximately 550 Daily ESALs to accommodate the current traffic volumes. This option will provide for a new 20 year pavement design with typical routine maintenance.

Table 3.5.1 Thomas Road New Asphalt Pavement

Option	Daily 18-kip ESALs	Total 18-kip ESALs	AC (In.)	AB (In.)	Total Thickness (in.)
1	250	1,700,000	5.0"	8.0"	13.0"
2	413	3,000,000	5.0"	10.0"	15.0"
3	678	5,000,000	5.0"	12.0"	17.0"

Notes

1. Option 1 represents a section that uses the existing aggregate base, removing additional aggregate base as necessary to provide space for a thicker section of asphalt.
2. Designs are based on AASHTO design equations and ADOT correlated R-values.
3. Full depth asphalt or increased asphalt thickness can be increased by adding 1.0 inch of asphalt for each 3 inches of base course replaced.
4. Estimated Daily ESALs that the pavement will see based on current traffic counts and a 20 year life is **550**
5. Option 3 represents the current minimum pavement section required by City of Avondale.

Based on the estimation of daily traffic volumes and the existing soils conditions, the City of Avondale standard Major Arterial Pavement Section, of 5 inches of asphalt on 12 inches of aggregate base course, will be required to support the traffic loading. The other provided sections will provide adequate support, but for a slightly shorter design life.

These designs assume that all subgrades are prepared in accordance with this report and in accordance with state and local specifications, and paving operations are carried out in a proper manner. If pavement subgrade preparation is not carried out immediately prior to paving, the entire area should be proof-rolled at that time with a heavy pneumatic-tired roller to identify locally unstable areas for repair.

Pavement base course material should be aggregate base per M.A.G. Section 702 Specifications. The new pavement asphalt concrete materials and mix design should conform to M.A.G. 710. It is recommended that a gyratory ¾-inch arterial mix designation be used for heavy traffic pavements. While these mixes may have a somewhat rougher texture, it offers more stability and resistance to scuffing. Depending on which option selected, the pavement may need to be installed in two layers per MAG

specifications. Pavement installation should be carried out under applicable portions of M.A.G. Section 321 and municipality standards. The asphalt supplier should be informed of the pavement use and be required to provide a mix that will provide stability and be aesthetically acceptable. Some of the newer M.A.G. mixes are very coarse and could cause placing and finish problems. A mix design should be submitted for review to determine if it will be acceptable for the intended use.

For sidewalks and other areas not subject to vehicular traffic a 4-inch section of concrete should be used. For concrete aprons or access drives a thicker section of at least 6 inches of concrete is recommended, depending on the loading conditions.

3.6 Full Depth Reclamation

Full depth reclamation would be a suitable alternative option to complete removal and replacement. This option would help provide a new pavement section for the roadways while minimizing importing or exporting the existing material. Full depth reclamation consists of milling/pulverizing the existing pavement (including aggregate base) in place. The material can then be graded as necessary to provide space for the new asphalt surface. This will also allow areas to be re-graded to improve drainage. **Once grades have been determined, the material is then mixed with cement to provide for a cement treated base.** This can then be overlaid with a new asphalt surface.

Our investigation revealed that there is a range of asphalt thickness from slightly more than 1 inch to approximately 3 inches of asphalt surface on at least 10 inches of aggregate base (including the underlying asphalt millings in the west bound lanes). Based on this variation we are assuming that the nominal thickness of cement treated base of approximately 8+ inches can be obtained. This would make it possible to reuse the existing aggregate base and underlying millings. The existing asphalt surface could be milled and stockpiled be used as sub-base along the shoulder for the widening portion of the project.

The following table provides two pavement sections with a minimum of 8 inches of cement treated base material. Based on the roadway classification, we would recommend a minimum of 4 inches of asphalt surface.

Table 3.6.1 Full Depth Reclamation

Area of Placement	Daily 18-kip ESALs	Total 18-kip ESALs	AC (In.)	CTB (In.)	Total Thickness (in.)
Thomas Road	553	4,000,000	4.0''	8.0''	12.0''
	843	6,100,000	4.5''	8.0''	12.5''

Notes

1. Designs are based on AASHTO design equations and ADOT correlated R-values.
2. A structural coefficient of 0.22 was assigned for the Cement Treated Base with a 7 day compressive strength of 300 psi.

A mix design would be required to determine the compressive strength of the stabilized base (a minimum of 300-500 psi at 7 days is recommended). Often a lower strength cement treated base is desired to help reduce the potential for reflective cracking in the surface. Typically the cement will be mixed at a percentage of 4-6% depending on the material mixture. Additional precautions to reduce reflective cracking of the pavement from the cement treated base include placing a thin layer (2-3 inches) of aggregate base material between the cement treated soils and the asphalt surface or micro-cracking the cement treated base with a smooth drum vibratory roller after the CTB has set up.

Asphalt concrete materials and mix design should conform to M.A.G. 710. It is recommended that a ½-inch or ¾-inch gyratory mix designed for high volume roads be used for the pavements. The selection of the mix will be partially dependent on the recommended lift thicknesses and the pavement section selected. The asphalt will likely be required to be placed in two lifts. Pavement installation should be carried out under applicable portions of M.A.G. Section 321 and municipality standards. The asphalt supplier should be informed of the pavement use and be required to provide a mix that will provide stability and be aesthetically acceptable. Some of the newer M.A.G. mixes are very coarse and could cause placing and finish problems. A mix design should be submitted for review to determine if it will be acceptable for the intended use.

3.7 Mill and Overlay

The existing east bound lane appears to be newer pavement and is in a much better condition overall compared to the east bound lane and center lane. This pavement appears to have a slightly thicker asphalt surface, although it does not meet the current standards for City of Avondale based on our coring data. As a cost saving alternative, it may be possible to conduct rehabilitation of this section of roadway as opposed to full reconstruction. This will also allow for minimal disturbance to underground utilities, as Kinder Morgan has a utility line running through this area which requires additional care during construction.

Simply adding another conventional asphalt overlay does not appear to be possible due to the need to meet the current grades of fixed points such as curbs, driveways and sidewalks. This option would be considered an intermediate fix which would probably add about **10 more years** to the roads life depending on maintenance and loading. This option is more part of a continued maintenance in an attempt at extending the life of the pavement with a more economical approach.

If possible, the best option would be to overlay the existing roadway without milling to provide for a slightly thicker pavement section, further extending the life of the pavement. If a standard overlay cannot be completed due to fixed grade points, it is recommended to edge mill the pavement to provide space for the overlay. It is recommended to mill to a depth of 1 inch below the lip of the gutter, feathering to zero inches at a distance of 8 feet away from the gutter. The details for the new pavement in those areas to be replaced should be shown to keep the surface lower by the same 1-inch taper to eliminate the need to remove any new pavement. Due to the condition of the pavement, some pop-out and/or other damage should be expected. The budget and specifications should include allowance to make these repairs prior to pavement of the overlay. Providing this taper will allow for a slightly thicker section of asphalt to be placed back adding to the structural capacity of the roadway.

A simple overlay will eventually result in a similar crack pattern as the old cracks reflect through to the surface. Prior to overlaying, consideration can be given to installing a crack reducing interlayer product. This could consist of a Petromat® 4597 (www.geotextile.com) paving fabric or approved equal. Petromat® is a non-woven polypropylene geofabric that is embedded in an asphalt tack coat on top of the old pavement prior to overlay. When overlaid, the heat of the new asphalt allows the asphalt binder to penetrate the fabric creating a stress absorbing layer that also adds protection against water intrusion through new cracks as they form. Alternates to using a Petromat could include GlasGrid or PavePrep products which have self adhesive and can be placed over the crack to aid in reducing reflective cracking. Without one of the above products, reflective cracking could begin to appear within 1-2 years from placement of the overlay.

Another new product that has been used recently in Arizona is a fiber reinforced asphalt. This is a traditional asphalt material that has Kevlar fibers mixed in which gives the asphalt a stronger tensile strength, slowing the onset of reflective cracking. With fiber reinforced asphalt, it is typically not required to place one of the above products over the crack, just fill/seal the cracks as would be typically done.

If standard asphalt is to be used, replace the pavement with at least 1.5 inch of new hot asphalt concrete. It is recommended that Maricopa Association of Governments (MAG) Standard Specification Section 710 be specified. A ½-inch mix designation should be used for the pavement overlay using the Marshall mix design for high traffic volumes. Pavement should be installed per the quality standard of MAG

Standard Specification Section 322. Deleting the major crack repairs is possible with this option but early reflective cracking should be expected. This will increase maintenance requirements.

As an alternative to the standard asphalt overlay, an asphalt rubber overlay could be considered. The asphalt rubber will be less prone to reflective cracking, but will not perform well in areas that contain sharp turning movements. If selected, the asphalt rubber overlay should be installed in accordance with MAG Standard Specification Sections 322 and MCDOT modified Section 325 for the use of the rubberized asphalt. These should be modified to meet the requirements of this project.

Prior to overlaying, it is recommended to crack seal or fill (depending on width). This will help reduce the severity of reflective cracking. Crack fill/seal procedures are presented below.

3.8 Crack Sealing Procedure

If the option to mill and overlay is selected for the east bound lanes, in order to maintain good performance of the pavement and any remediation it will be necessary to repair the existing cracks prior to placement of a new surface treatment. In order to achieve good performance, it will be necessary to rout out the cracks to the width to depth ratio recommended by the crack filler manufacturer. Clean the crack using high-pressure air, sandblasting, wire brushing, hot air blasting or high-pressure water. This is a key step to crack sealing of filling. If the crack is not thoroughly cleaned, the sealant will not adhere to the sides. Although sandblasting is the best at cleaning, is the most labor intensive. Hot air blasting is done using a hot compressed-air (HCA) lance, or heat lance, connected to an air compressor. This method helps dry the crack and if the sealing operation closely follows the hot air drying, the heated crack surface helps the sealant adhere to the crack. The hot air lance produces super heated air and will burn the crack surface if left in one place too long. If high-pressure water is used, the crack must be thoroughly dried before sealing.

After removing the old sealant and/or cleaning the cracks, check them for width and depth. Cracks less than about 1/2 inch can be filled with an asphalt filler. Generally, if they are over 20 mm (3/4 in.) deep, a backer rod may be used to conserve sealant and provide a better width to depth ratio. The backer rod should be a compressible, non-shrinking, non-absorbent material with a melting point higher than the sealant temperature. The backer rod should be about 25% wider than the crack so it doesn't slip down, or float out after installing the sealant.

Immediately before applying the sealant, inspect the cracks to ensure they are clean, dry and any backer material is properly installed. If the cracks have been left unsealed for any period of time, clean them out with compressed air before sealing them.

The sealant should be applied from the bottom to the top of the crack to prevent air bubbles from forming and creating a weak spot in the sealant. It is desirable to use a sealant kettle that has an

injection wand for the best results. To prevent tracking, the sealant should be left about 3 to 6 mm (1/8 to 1/4 in.) below the top of the crack. Use a squeegee to remove any excess sealant on the pavement surface. For this area, it is recommended to use to Crafcro Polyflex Type 3 or Type 4.

Wider cracks will require some other type of low shrink filler combined with mineral filler. It may require multiple applications (lifts) to accommodate shrinkage. See discussion above about products that may be considered.

4.0 GENERAL

Our analysis of data and the recommendations presented herein are based on the assumption that soil/pavement conditions do not vary significantly from those observed at the surface. Our work has been performed in accordance with generally accepted engineering principles and practice; this warranty is in lieu of all other warranties expressed or implied.

We recommend that a representative of the Geotechnical Engineer observe and test the earthwork and pavement repair portions of this project to ensure compliance to project specifications and the field applicability of subsurface conditions which are the basis of the recommendations presented in this report. If any significant changes are made in the scope of work or type of construction that was assumed in this report, we must review such revised conditions to confirm our findings if the conclusions and recommendations presented herein are to apply.

Respectfully submitted,
SPEEDIE & ASSOCIATES, INC.


Todd B. Hanke, P.E.



Registered Professional Engineer (Civil)
CERTIFICATE NO. 43813
TODD B. HANKE
Date Signed 10/31/13
ARIZONA, U.S.A.
Expires 03/31/15


Gregg A. Creaser, P.E.



Registered Professional Engineer (Civil)
CERTIFICATE NO. 14388
GREGG ALAN CREASER
Date Signed 10/31/13
ARIZONA, U.S.A.
Expires 06/30/14

APPENDIX

FIELD AND LABORATORY INVESTIGATION

PROJECT LOCATION PLANS

SOIL LEGEND

LOG OF TEST BORINGS

TABULATION OF TEST DATA

SITE PHOTOGRAPHS

FIELD AND LABORATORY INVESTIGATION

On May 10, 2013, four pavement core test locations were drilled at the approximate locations shown on the boring Location Plan. All exploration work was carried out under the full-time supervision of our Project Engineer, who recorded the asphalt, aggregate base and subgrade conditions. The sample locations were tested using a steel probe and 4" hand auger.

Laboratory testing consisted of moisture content, grain-size distribution and plasticity (Atterberg Limits) tests for classification and pavement design parameters. Field and laboratory data is presented in this appendix.



SECTION #1

⊕ - APPROXIMATE SOIL BORING LOCATIONS

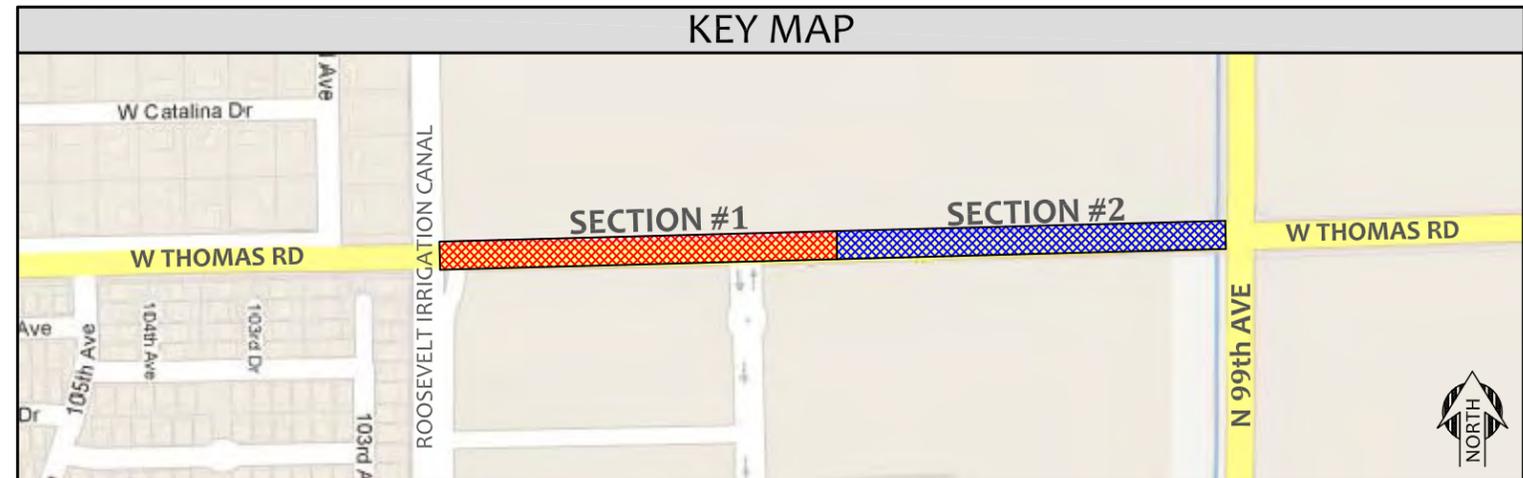


IMAGE COURTESY OF: MARICOPA COUNTY ASSESSOR

PROJECT LOCATION PLAN

THOMAS ROAD EVALUATION
 RID TO 99TH AVENUE
 AVONDALE, ARIZONA

SPEEDIE AND ASSOCIATES
 GEOTECHNICAL/ENVIRONMENTAL/MATERIALS ENGINEERS
 3331 E. WOOD ST. PHOENIX, ARIZONA 85040 (602) 997-6391

DR: TSW	CHK:	REV:	DATE: 05-24-13	PROJECT NO. 130209SA
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SECTION #2

☉ - APPROXIMATE SOIL BORING LOCATIONS

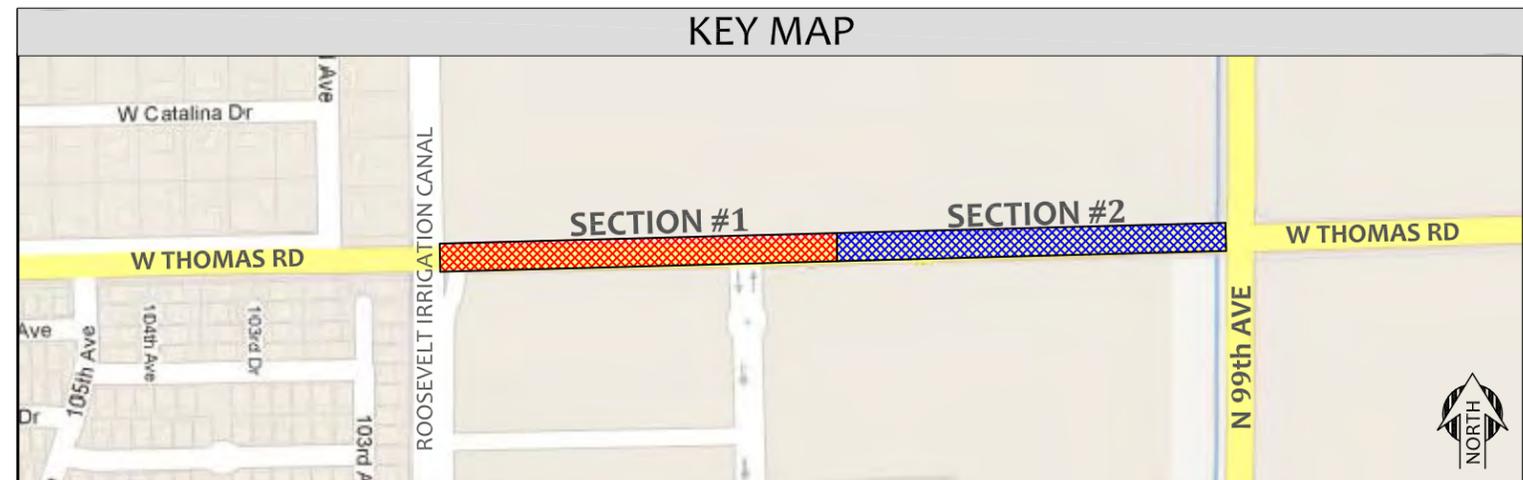
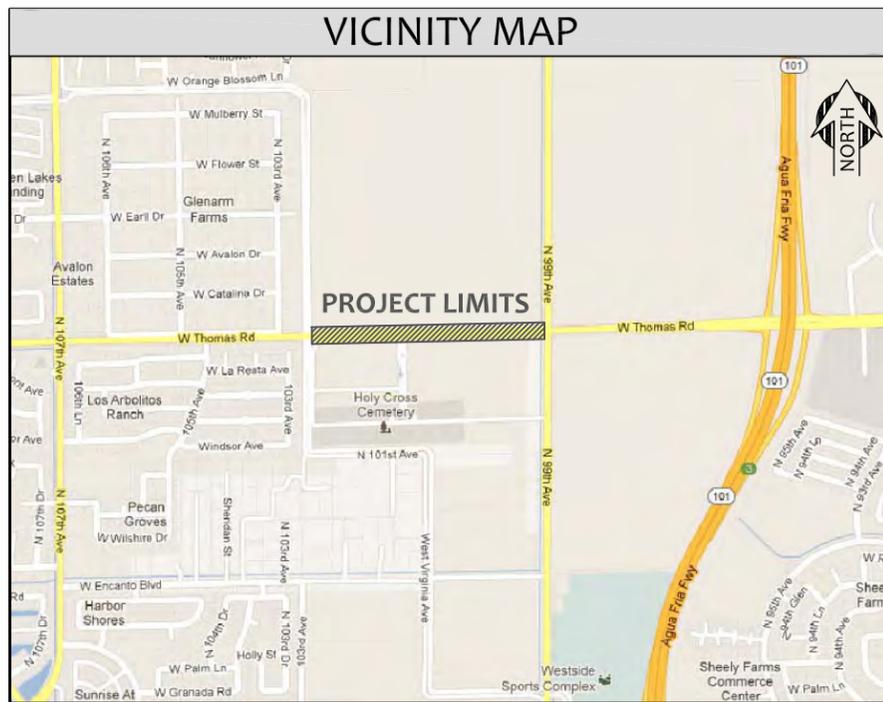


IMAGE COURTESY OF: MARICOPA COUNTY ASSESSOR

PROJECT LOCATION PLAN

THOMAS ROAD EVALUATION
 RID TO 99TH AVENUE
 AVONDALE, ARIZONA

SPEEDIE AND ASSOCIATES
 GEOTECHNICAL/ENVIRONMENTAL/MATERIALS ENGINEERS
 3331 E. WOOD ST. PHOENIX, ARIZONA 85040 (602) 997-6391

DR: TSW | CHK: | REV: | DATE: 05-24-13 | PROJECT NO. 130209SA

SOIL LEGEND

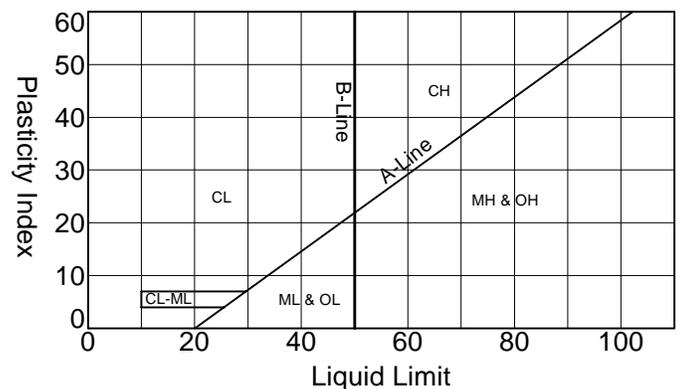
SAMPLE DESIGNATION	DESCRIPTION		
AS	Auger Sample	A grab sample taken directly from auger flights.	
BS	Large Bulk Sample	A grab sample taken from auger spoils or from bucket of backhoe.	
S	Spoon Sample	Standard Penetration Test (ASTM D-1586) Driving a 2.0 inch outside diameter split spoon sampler into undisturbed soil for three successive 6-inch increments by means of a 140 lb. weight free falling through a distance of 30 inches. The cumulative number of blows for the final 12 inches of penetration is the Standard Penetration Resistance.	
RS	Ring Sample	Driving a 3.0 inch outside diameter spoon equipped with a series of 2.42-inch inside diameter, 1-inch long brass rings, into undisturbed soil for one 12-inch increment by the same means of the Spoon Sample. The blows required for the 12 inches of penetration are recorded.	
LS	Liner Sample	Standard Penetration Test driving a 2.0-inch outside diameter split spoon equipped with two 3-inch long, 3/8-inch inside diameter brass liners, separated by a 1-inch long spacer, into undisturbed soil by the same means of the Spoon Sample.	
ST	Shelby Tube	A 3.0-inch outside diameter thin-walled tube continuously pushed into the undisturbed soil by a rapid motion, without impact or twisting (ASTM D-1587).	
--	Continuous Penetration Resistance	Driving a 2.0-inch outside diameter "Bullnose Penetrometer" continuously into undisturbed soil by the same means of the spoon sample. The blows for each successive 12-inch increment are recorded.	

CONSISTENCY			RELATIVE DENSITY	
Clays & Silts	Blows/Foot	Strength (tons/sq ft)	Sands & Gravels	Blows/Foot
Very Soft	0 - 2	0 - 0.25	Very Loose	0 - 4
Soft	2 - 4	0.25 - 0.5	Loose	5 - 10
Firm	5 - 8	0.5 - 1.0	Medium Dense	11 - 30
Stiff	9 - 15	1 - 2	Dense	31 - 50
Very Stiff	16 - 30	2 - 4	Very Dense	> 50
Hard	> 30	> 4		

MAJOR DIVISIONS		SYMBOLS		TYPICAL DESCRIPTIONS
		GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS <small>MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE</small>	CLEAN GRAVELS <small>(LITTLE OR NO FINES)</small>	GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>	GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>	GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	SAND AND SANDY SOILS <small>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE</small>	CLEAN SANDS <small>(LITTLE OR NO FINES)</small>	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>	SM	SILTY SANDS, SAND - SILT MIXTURES
		SANDS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>	SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS <small>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE</small>	SILTS AND CLAYS <small>LIQUID LIMIT LESS THAN 50</small>	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	SILTS AND CLAYS <small>LIQUID LIMIT GREATER THAN 50</small>	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
		CH	INORGANIC CLAYS OF HIGH PLASTICITY	
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HIGHLY ORGANIC SOILS		PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

NOTE: DUAL OR MODIFIED SYMBOLS MAY BE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS OR TO PROVIDE A BETTER GRAPHICAL PRESENTATION OF THE SOIL

MATERIAL SIZE	PARTICLE SIZE				
	Lower Limit		Upper Limit		
	mm	Sieve Size ♦	mm	Sieve Size ♦	
SANDS	Fine	0.075	#200	0.42	#40
	Medium	0.420	#40	2.00	#10
	Coarse	2.000	#10	4.75	#4
GRAVELS	Fine	4.75	#4	19	0.75" x
	Coarse	19	0.75" x	75	3" x
COBBLES	75	3" x	300	12" x	
BOULDERS	300	12" x	900	36" x	
♦U.S. Standard		xClear Square Openings			



Depth (feet)	Graphic Log	Rig Type: Hand Auger	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot
		Boring Type: Hollow Stem Auger					
		Visual Classification					
0		1.25" of Asphalt	0.1				
		4" of Aggregate Base					
		Some large gravel in ABC	0.5				
		8" of Asphalt Millings					
		Firm to Stiff Brown <u>LEAN CLAY</u> with <u>SAND</u> (CL-Dry to Moist)	1.1				
		Easy to moderate probing					
		End of Boring	2.0	AS-1	2.0	19.4	NT
5							

Boring Date: 5-10-13
 Field Engineer/Technician: T. Hanke
 Driller: K. Gravel
 Contractor: Speedie & Associates

Water Level		
Depth	Hour	Date
Free Water was Not Encountered		

NT = Not Tested

SPEEDIE AND ASSOCIATES	
Log of Test Boring Number: C-1	
Thomas Road Evaluation	
Thomas Road - RID to 99th Avenue	
Avondale, Arizona	
Project No.:	130209SA

_SPEEDIE 130209SA.GPJ GENGEO.GDT 5/24/13

Depth (feet)	Graphic Log	Rig Type: Hand Auger Boring Type: Hollow Stem Auger Surface Elevation: N/A			Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot
		Visual Classification							
0		1.5" of Asphalt							
		6" of Aggregate Base Some large gravel in ABC							
		7" of Asphalt Millings							
		Firm to Stiff Brown <u>LEAN CLAY with SAND</u> (CL-Dry to Moist) Easy to moderate probing							
		End of Boring			AS-1	2.0	NT	NT	
5									

Boring Date: **5-10-13**
 Field Engineer/Technician: **T. Hanke**
 Driller: **K. Gravel**
 Contractor: **Speedie & Associates**

Water Level		
Depth	Hour	Date
<i>Free Water was Not Encountered</i>		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **C-2**

Thomas Road Evaluation
Thomas Road - RID to 99th Avenue
Avondale, Arizona

Project No.: **130209SA**

Depth (feet)	Graphic Log	Rig Type: Hand Auger	Visual Classification	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot
		Boring Type: Hollow Stem Auger						
0		2.75" of Asphalt						
		10" of Aggregate Base Some large gravel in ABC	0.2					
		Stiff Brown <u>SANDY LEAN CLAY</u> (CL-Dry to Moist) Moderate probing	1.1					
		End of Boring	2.0	AS-1	2.0	14.4	NT	
5								

Boring Date: 5-10-13
 Field Engineer/Technician: T. Hanke
 Driller: K. Gravel
 Contractor: Speedie & Associates

Water Level		
Depth	Hour	Date
Free Water was Not Encountered		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **C-3**

Thomas Road Evaluation

Thomas Road - RID to 99th Avenue

Avondale, Arizona

Project No.: 130209SA

SPEEDIE 130209SA.GPJ GENCO.GDT 5/24/13

Depth (feet)	Graphic Log	Rig Type: Hand Auger	Visual Classification	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot
		Boring Type: Hollow Stem Auger						
0		3" of Asphalt						
		12" of Aggregate Base Some large gravel in ABC	0.2					
		Firm Brown <u>SANDY LEAN CLAY</u> (CL-Dry to Moist) Moderate probing	1.2					
		End of Boring	2.0	AS-1	2.0	NT	NT	
5								

Boring Date: **5-10-13**
 Field Engineer/Technician: **T. Hanke**
 Driller: **K. Gravel**
 Contractor: **Speedie & Associates**

Water Level		
Depth	Hour	Date
<i>Free Water was Not Encountered</i>		

NT = Not Tested

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: **C-4**

Thomas Road Evaluation

Thomas Road - RID to 99th Avenue

Avondale, Arizona

Project No.: **130209SA**

SPEEDIE 130209SA.GPJ GEN GEO.GDT 5/24/13

TABULATION OF TEST DATA

SOIL BORING or TEST PIT NUMBER	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE INTERVAL (ft)	NATURAL WATER CONTENT (Percent of Dry Weight)	IN-PLACE DRY DENSITY (Pounds Per Cubic Foot)	PARTICLE SIZE DISTRIBUTION (Percent Finer)					ATTERBERG LIMITS			UNIFIED SOIL CLASSIFICATION	SPECIMEN DESCRIPTION
						#200 SIEVE	#40 SIEVE	#10 SIEVE	#4 SIEVE	3" SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
						C-1	AS-1	AS	1.5 - 2.0	19.4	NT	82	96		
C-3	AS-1	AS	1.5 - 2.0	14.4	NT	69	92	98	99	100	31	18	13	CL	SANDY LEAN CLAY

Sieve analysis results do not include material greater than 3". Refer to the actual boring logs for the possibility of cobble and boulder sized materials.

NT=Not Tested
Sheet 1 of 1

Thomas Road Evaluation
Thomas Road - RID to 99th Avenue
Avondale, Arizona
Project No. 130209SA

SPEEDIE
AND ASSOCIATES

Site Condition Photographs



Photo No. 1: West bound lanes near core location C-1 – significant cracking



Photo No. 2: Typical alligator cracking in west bound lanes



Photo No. 3: General view of pavement near core location C-1



Photo No. 4: East bound lanes near core location C-4. Access restricted due to Kinder Morgan



Photo No. 5: Looking west at core location C-4. West bound lanes is significantly worse condition compared to east bound



Photo No. 6: Typical condition of west bound lanes

EXHIBIT B
TO
INVITATION FOR BIDS NO. EN17-020

[Substitution/Equal Request Form]

See following pages.

SUBSTITUTION/EQUAL REQUEST FORM

Thomas Road Improvements – 103rd Avenue to 99th Avenue
EN17-020

Bidder _____ hereby submits for City’s consideration the following product, instead of the specified item, for the above Project.

<u>Section</u>	<u>Page</u>	<u>Paragraph/Line</u>	<u>Specified Item</u>
_____	_____	_____	_____

Proposed Substitution: _____

(NOTE: See Article II – Bid Process; Bid Award, Section 2.4(C), Approval of Substitutions, or Section 2.4(D), Use of Equals, as applicable, for additional criteria concerning prior approval for substitutions or use equals of material and equipment.)

Attach complete product description, drawings, photographs, performance and test data, and other information necessary for evaluation, indicating by highlighting all comparable data between specified item and proposed substitution or equal. Identify specific model numbers, finishes, options, etc.

A. Will changes be required to Project design (architecturally, structurally, mechanically or electrically) in order to properly install proposed substitution? Yes ____ No _____. If Yes, explain:

B. Will the undersigned pay for changes to the Project design, including engineering and drawing costs, caused by requested substitution? Yes ____ No ____

C. List differences between proposed substitution and specified item.

<u>Specified Item</u>	<u>Proposed Substitution</u>
_____	_____
_____	_____

D. Does substitution affect Drawing dimensions? Yes ____ No _____. If Yes, explain:

E. What effect does substitution have on other trades? _____

F. Does manufacturer’s warranty of proposed substitution differ from that specified? Yes ____ No _____. If Yes, explain: _____

G. Will substitution affect progress schedule? Yes ____ No ____ . If Yes, explain:

H. Will substitution require more license fees or royalties than specified product?
Yes ____ No ____ . If Yes, explain: _____

I. Will maintenance and service parts be locally available for substitution?
Yes ____ No ____ . If Yes, explain: _____

J. Will substitution be compatible with all adjacent material and/or applications to or on the
proposed substitution? Yes ____ No ____ . If no, explain what material substitutions will be required to make
your proposed substitution compatible: _____

List materials that will be required to provide compatibility: _____

The undersigned hereby assumes all responsibility for all provisions indicated herein and agrees that, if
adequate comparable information is not provided as required by Section 2.4(C), Approval of Substitutions, or
Section 2.4(D), Use of Equals, as applicable, and this Form, the proposed substitution or equal shall be subject to
rejection.

The undersigned understands and agrees that the substitution requested, including all supporting data, must
be submitted to and be in the possession of the City ten (10) full calendar Days prior to the Bid Deadline, to be
considered, including all supporting data for the substitution. Telegraphic (facsimile) or electronic (email) copies
will not be considered.

Submitted by: _____

Signature

Print Name

Title

Company Name

Address

City, State, Zip Code

Date

Telephone No.

For City's Use Only:

Accepted: _____

Accepted: _____

By: _____ Date: _____

Remarks: _____

EXHIBIT C
TO
INVITATION FOR BIDS NO. EN17-020

[Price Sheet]

See following pages.

PRICE SHEET

Thomas Road Improvements – 99th Avenue to 103rd Avenue
EN17-020

NOTE: All pricing blanks must be filled in. Incomplete or unfilled spaces in the Bid Price Sheet shall result in a determination that a Bid is non-responsive.

Item No.	Description of Materials and/or Services	Quantity	Unit	Unit Price	Extended Amount
105.30010	Preparation of As-Built Plans	1	LS	\$	\$
105.80010	Construction Staking, Surveying and Layout	1	LS	\$	\$
107.02000	AZPDES (NPDES)/SWPPP	1	LS	\$	\$
107.15000	Community Relations (Allowance)	1	LS	\$ 10,000.00	\$ 10,000.00
107.20020	Permit and Development Fee for Landscape Meter (Allowance):	1	LS	\$ 20,000.00	\$ 20,000.00
109.10010	Mobilization/Demobilization	1	LS	\$	\$
109.50010	Miscellaneous Reimbursable (Allowance)	1	LS	\$ 50,000.00	\$ 50,000.00
215.01510	Earthwork for Retention Basins	747	CY	\$	\$
301.01000	Subgrade Preparation	11,092	SY	\$	\$
301.02000	Subgrade Preparation (Farm Road)	2,538	SY	\$	\$
309.01012	Lime Slurry Stabilization, 12" Depth (Contingent Item)	4,100	SY	\$	\$
310.03275	Aggregate Base Course	6,611	TON	\$	\$
317.01000	Mill Existing AC Pavement	5,221	SY	\$	\$
321.01200	Asphaltic Concrete Pavement (12.5 mm Surface Course HV)	1,857	TON	\$	\$
321.01300	Asphaltic Concrete Pavement (19 mm Base Course HV)	1,873	TON	\$	\$
329.02000	Emulsified Bituminous Tack Coat	5.4	TON	\$	\$
332.10200	MAG Type II Slurry Seal Application	2,750	SY	\$	\$
340.01110	6" Vertical Curb and Gutter, MAG Detail 220-1, Type A	7,165	LF	\$	\$
340.01210	Concrete Sidewalk, MAG Detail 230 (4" Thick)	3,827	SF	\$	\$

PRICE SHEET

Thomas Road Improvements – 99th Avenue to 103rd Avenue
EN17-020

Item No.	Description of Materials and/or Services	Quantity	Unit	Unit Price	Extended Amount
340.01304	Pedestrian Ramp, City of Phoenix Detail P1236	1	EA	\$	\$
340.01306	Pedestrian Ramp, COA Detail A1235 (Mod)	6	EA	\$	\$
340.01307	Bike Transition Ramp, Detail C	1	EA	\$	\$
340.01452	Driveway Entrance, COA Detail A1252 (Residential)	2	EA	\$	\$
340.01600	Concrete Valley Gutter and Apron	970	SF	\$	\$
340.04225	Median Nose Transition, COA Detail A1220 (Monolithic Construction)	2	EA	\$	\$
342.01200	Brick Pavers	87	SY	\$	\$
345.01410	Adjust Water Valve Box and Cover to Grade	9	EA	\$	\$
350.01124	Remove Irrigation Pipe, Backfill and Compact, D=24"	68	LF	\$	\$
350.01500	Remove Concrete Headwall	2	EA	\$	\$
350.01600	Remove Concrete Irrigation Structure	1	LS	\$	\$
350.01800	Remove Existing Concrete Curb and Gutter	265	LF	\$	\$
350.01810	Remove Existing Concrete Valley Gutter and Apron	1,476	SF	\$	\$
350.01900	Remove Existing Concrete Sidewalk, Ramp, Driveway and Slab	2,957	SF	\$	\$
350.04000	Remove and Salvage Traffic Sign	6	EA	\$	\$
351.23000	Relocate Existing Gate	1	EA	\$	\$
351.46004	Remove and Salvage Street Light Pole (mast arm and luminaire only)	8	EA	\$	\$
401.01000	Traffic Control	1	LS	\$	\$
401.01100	Uniformed Off-Duty Officer (Allowance)	1	LS	\$ 5,000.00	\$ 5,000.00
430.01002	Landscape Restoration (Allowance)	1	LS	\$ 5,000.00	\$ 5,000.00

PRICE SHEET

Thomas Road Improvements – 99th Avenue to 103rd Avenue
EN17-020

Item No.	Description of Materials and/or Services	Quantity	Unit	Unit Price	Extended Amount
430.01005	Plant - 3 and 5 gallon	464	EA	\$	\$
430.01053	Tree - 36 Inch Box	38	EA	\$	\$
430.30000	2" Decomposed Granite (All Gradations and Colors)	72,618	SF	\$	\$
430.30001	2" Decomposed Granite with Pre-Emergent (Retention Basin)	3,550	SY	\$	\$
440.01101	1" Sleeve (Sch. 40 PVC)	164	LF	\$	\$
440.01104	4" Sleeve (Sch. 40 PVC)	175	LF	\$	\$
440.01106	6" Sleeve (Sch. 40 PVC)	164	LF	\$	\$
440.01109	1" Ball Valve Assembly	2	EA	\$	\$
440.01200	3/4" Drip Lateral Pipe (Class 200 PVC)	4,590	LF	\$	\$
440.01201	1" Mainline Pipe (Sch. 40 PVC)	1,238	LF	\$	\$
440.01400	Irrigation Solar Controller	1	EA	\$	\$
440.03000	Multi-Outlet Emitter	76	EA	\$	\$
440.03001	Single-Outlet Emitter	464	EA	\$	\$
440.50001	Electric Valve 1" (Drip Remote Control Valve Assembly)	4	EA	\$	\$
460.02000	Remove Thermoplastic Stripe	17,746	LF	\$	\$
461.01520	Paint Symbol (Bike Lane Marking Set)	2	EA	\$	\$
461.01600	Paint Median Island	4	LF	\$	\$
461.02100	Remove Thermoplastic Symbol (Bike Lane and Arrow, "ONLY")	1	EA	\$	\$
461.02110	Remove Thermoplastic Arrow (Left and Right Turn)	4	EA	\$	\$
462.01100	4" White Thermoplastic Traffic Stripe	8,599	LF	\$	\$

PRICE SHEET

Thomas Road Improvements – 99th Avenue to 103rd Avenue
EN17-020

Item No.	Description of Materials and/or Services	Quantity	Unit	Unit Price	Extended Amount
462.01200	4" Yellow Thermoplastic Traffic Stripe	3,765	LF	\$	\$
462.01511	Thermoplastic Symbol Left Turn Arrow	4	EA	\$	\$
463.01100	Reflectorized Raised Pavement Marker (Type D, Yellow, 2-Way)	188	EA	\$	\$
463.01200	Reflectorized Raised Pavement Marker (Type G, Clear, 1-Way)	180	EA	\$	\$
463.01400	Reflectorized Raised Pavement Marker (Type 911-A, Blue, 2-Way)	3	EA	\$	\$
464.02000	Perforated Sign Post	47	LF	\$	\$
464.02001	Perforated Sign Post Foundation, MCDOT Detail 2058	4	EA	\$	\$
465.01003	Flat Sheet Aluminum Sign Panel, Diamond Grade	60	SF	\$	\$
470.00020	Remove and Salvage Traffic Signal Poles and Equipment	1	LS	\$	\$
470.00030	Remove Foundations, Pull Boxes and Conductors	1	LS	\$	\$
471.60010	Street Light Junction Box (Avondale Detail A1090)	12	EA	\$	\$
471.60047	No. 7 Pull Box	3	EA	\$	\$
471.61112	Sch. 40 PVC Electrical Conduit, 2" with 1/4" Nylon Pull Rope and #8 Bare Copper Wire (Trench)	116	LF	\$	\$
471.61212	Sch. 40 PVC Electrical Conduit, 2 1/2" with 1/4" Nylon Pull Rope and #8 Bare Copper Wire (Trench)	1,905	LF	\$	\$
471.61213	Sch. 40 PVC Electrical Conduit, 2 1/2" with 1/4" Nylon Pull Rope and #8 Bare Copper Wire (Horizontal Bore)	200	LF	\$	\$
471.61280	Sch. 80 PVC Electrical Conduit, 2 1/2" with 1/4" Nylon Pull Rope and #8 Bare Copper Wire (Trench)	190	LF	\$	\$
472.61500	Pole Foundation, Type PB (Push Button), MCDOT Detail 4720	1	EA	\$	\$
472.61600	Pole Foundation, Type Giraffe Light Pole	1	EA	\$	\$
477.71840	LED Street Light (Pole, Mast Arm, Luminaire and Photocell) and Foundation Complete	12	EA	\$	\$
505.06504	Concrete Scupper and Spillway, COA Detail A1510, S/W=5', Curb Opening = 4'	1	EA	\$	\$

PRICE SHEET

Thomas Road Improvements – 99th Avenue to 103rd Avenue
EN17-020

Item No.	Description of Materials and/or Services	Quantity	Unit	Unit Price	Extended Amount
505.30100	Reinforced Concrete Box Culvert Extension and Headwall, SRP Design (Irrigation) (Contingent Item)	1	LS	\$	\$
523.10124	Concrete Headwall, MAG Detail 501, Straight Type, 24" Pipe	3	EA	\$	\$
523.11124	Concrete Headwall, MAG Detail 501, 'L' Type, 24" Pipe	1	EA	\$	\$
523.20024	Concrete Trash Rack, SRP Detail, 24" Pipe	1	EA	\$	\$
610.10540	New Water Service	1	EA	\$	\$
615.04008	8" PVC Sanitary Sewer SDR 35 with fittings complete in place	154	LF	\$	\$
618.20324	24" RGRCP, Class III	112	LF	\$	\$
625.01101	SRP Manhole with Base, Frame and Cover, per SRP Detail	1	EA	\$	\$
635.04000	Earthen Irrigation Ditch with 2-Foot Bottom, MAG Detail 520	2,411	LF	\$	\$
757.40002	Backflow Prevention Device Smaller Than 3" (With Concrete Pad and Cage)	1	EA	\$	\$
TOTAL CONSTRUCTION COSTS*					\$

*** ALL BIDS ARE PRESUMED TO INCLUDE ALL APPLICABLE TAXES. CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL WORK CONTEMPLATED BY THE PLANS FOR THE PROJECT IS BID ON THE PRICE SHEET.**

EXHIBIT D
TO
INVITATION FOR BIDS NO. EN17-020

[Federal Requirements]

See following page.

Not applicable to this Project.

EXHIBIT E
TO
INVITATION FOR BIDS NO. EN17-020

[Licenses; DBE/WBE Status]

See following page.

LICENSES; DBE/WBE STATUS

Thomas Road Improvements – 103rd Avenue to 99th Avenue
EN17-020

Attach a copy of your Contractor's License to your bid submittal.

Attach a copy of your Business License to your bid submittal.

* Business License must be either a City of Avondale Privilege Tax Business License or an Arizona Transaction Tax (sales) Privilege Tax License

Has your firm been certified by any jurisdiction in Arizona as a minority or woman owned business enterprise? Yes_____, No_____.

If yes, please provide details and documentation of the certification.

EXHIBIT F
TO
INVITATION FOR BIDS NO. EN17-020

[References]

See following pages.

REFERENCES

Thomas Road Improvements – 103rd Avenue to 99th Avenue
EN17-020

Provide the following information for three clients for whom Bidder has successfully completed similar projects as set forth in Section 2.15 within the past 60 months. Failure to provide three accurate and suitable references will result in disqualification. Bidder may also attach another sheet with additional references.

1. Company: _____
 Address _____
 City/State/Zip Code _____
 Contact: _____
 Telephone Number: _____
 Date of Contract Initiation: _____
 Date of Contract Expiration: _____
 Final Project Cost: _____
 Project Description: _____

2. Company: _____
 Address _____
 City/State/Zip Code _____
 Contact: _____
 Telephone Number: _____
 Date of Contract Initiation: _____
 Date of Contract Expiration: _____
 Final Project Cost: _____
 Project Description: _____

3. Company: _____
 Address _____
 City/State/Zip Code _____
 Contact: _____
 Telephone Number: _____
 Date of Contract Initiation: _____
 Date of Contract Expiration: _____
 Final Project Cost: _____
 Project Description: _____

EXHIBIT G
TO
INVITATION FOR BIDS NO. EN17-020

[Bid Bond]

See following page.

BID BOND

Thomas Road Improvements – 103rd Avenue to 99th Avenue
EN17-020

KNOW ALL PERSONS BY THESE PRESENTS:

THAT, _____ (hereinafter called Principal), as Principal, and _____, a corporation organized and existing under the laws of the State of _____ with its principal office in the City of _____, (hereinafter called the Surety), as Surety, are held and firmly bound unto the City of Avondale, (hereinafter called the Obligee) in the penal sum of Ten Percent (10%) of Bid Amount, _____ (Dollars) (\$_____) lawful money of the United States of America, to be paid to the order of the City of Avondale, 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 and in conformance with A.R.S. Section 34-201.

WHEREAS, the Principal has submitted a bid/proposal for:_____.

NOW, THEREFORE, if the Obligee accepts the proposal of the Principal and the Principal enters into a Contract with the Obligee in accordance with the terms of the proposal and gives the 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 the 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.

The prevailing party in a suit on this bond shall recover as part of the judgment reasonable attorney fees that may be fixed by a judge of the Court.

Witness our hands this _____ day of _____ 20____.

Principal Seal

By: _____

Surety Seal

By: _____

Agency of Record

EXHIBIT H
TO
INVITATION FOR BIDS NO. EN17-020

[Key Personnel/Subcontractor Listing]

See following page.

EXHIBIT I
TO
INVITATION FOR BIDS NO. EN17-020

[Safety Plan]

See following pages.

EXHIBIT J
TO
INVITATION FOR BIDS NO. EN17-020

[Performance Bond]

See following page.

PERFORMANCE BOND

Thomas Road Improvements – 103rd Avenue to 99th Avenue
EN17-020

KNOW ALL PERSONS BY THESE PRESENTS:

THAT, _____ (hereinafter called Principal), as Principal, and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ (hereinafter called the Surety), as Surety, are held and firmly bound unto the City of Avondale (hereinafter called the 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 entered into a certain written Contract with the Obligee, dated the _____ day of _____ 20____, for the material, service or construction described as _____ is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Principal faithfully performs and fulfills all of the undertakings, covenants, terms, conditions and agreements of the Contract during the original term of the Contract and any extension of the Contract, with or without notice to the Surety, and during the life of any guaranty required under the Contract, and also performs and fulfills all of the undertakings, covenants, terms, conditions and agreements of all duly authorized modifications of the Contract that may hereafter be made, notice of which modifications to the surety being hereby waived, the above obligation is void. Otherwise it remains in full force and effect.

PROVIDED, however, that this bond is executed pursuant to the provisions of Title 34, Chapter 2, Article 2, Arizona Revised Statutes, and all liabilities on this bond shall be determined in accordance with the provisions of Title 34, Chapter 2, Article 2, Arizona Revised Statutes, to the extent as if it were copied at length in this agreement.

The prevailing party in a suit on this bond shall recover as part of the judgment reasonable attorney fees that may be fixed by a judge of the Court.

Witness our hands this _____ day of _____ 20____.

Principal Seal

By: _____

Surety Seal

By: _____

Agency of Record

EXHIBIT K
TO
INVITATION FOR BIDS NO. EN17-020

[Payment Bond]

See following page.

PAYMENT BOND

Thomas Road Improvements – 103rd Avenue to 99th Avenue
EN17-020

KNOW ALL PERSONS BY THESE PRESENTS:

THAT, _____ (hereinafter called Principal), as Principal, and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ (hereinafter called the Surety), as Surety, are held and firmly bound unto the City of Avondale (hereinafter called the 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 entered into a certain written Contract with the Obligee, dated the _____ day of _____ 20____, for the material, service or construction described as _____ which Contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Principal promptly pays all monies due to all persons supplying labor or materials to the Principal or the Principal's Subcontractors in the prosecution of the Work provided for in the Contract, this obligation is void. Otherwise it remains in full force and effect.

PROVIDED, however, that this bond is executed pursuant to the provisions of Title 34, Chapter 2, Article 2, Arizona Revised Statutes, and all liabilities on this bond shall be determined in accordance with the provisions, conditions and limitations of Title 34, Chapter 2, Article 2, Arizona Revised Statutes, to the same extent as if they were copied at length in this agreement.

The prevailing party in a suit on this bond shall recover as a part of the judgment reasonable attorney fees that may be fixed by a judge of the Court.

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

Principal Seal

By: _____

Surety Seal

By: _____

Agency of Record

EXHIBIT L
TO
INVITATION FOR BIDS NO. EN17-020

[Acknowledgments of Addenda received]

See following page(s).