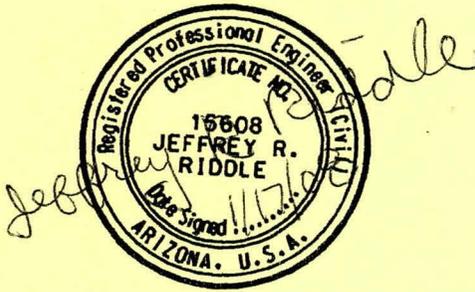


#19

CONSTRUCTION DOCUMENTS

FOR

CONTRACT 2005C018
REEMS ROAD CHANNEL AND BASIN PROJECT
PCN 470.12.31



(Engineer's Seal)

Prepared By

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2801 West Durango Street
Phoenix, Arizona 85009

Recommended for Construction by: Barbara Ohler Date: 1-17-08
Barbara A. Ohler, P.E.
Project Manager

Recommended by: Edward A. Raleigh Date: 1/22/08
Edward A. Raleigh, P.E.
Manager Engineering Division

Issued for Public Bidding by: Timothy S. Phillips Date: 1/23/08
Timothy S. Phillips, P.E.
Chief Engineer and General Manager

SUPPLEMENTARY TO MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM
STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION EDITION OF 1998
AND REVISIONS AND SUPPLEMENTS THROUGH 2005.

AGENDA ITEM C-69-06-059-5-00

ATTENTION
ALL PROSPECTIVE BIDDERS

A.R.S. § 34-201 requires that construction bid proposals be accompanied by a certified check, cashiers check, or surety bond for ten percent (10%) of the total amount of the bid.

All bonds must be executed solely by a surety company or companies holding a Certificate of Authority to transact surety business in Arizona, issued by the Director of the Arizona Department of Insurance.

Bonds (bid, payment, and performance) executed by an individual surety or sureties are not in compliance with the Arizona Revised Statutes.

Bids received containing bid bonds not in compliance with the Arizona Revised Statutes will be considered as being non-responsive.

The use of Flood Control District of Maricopa County (District) supplied bond forms is required.

Please submit your bids accordingly.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

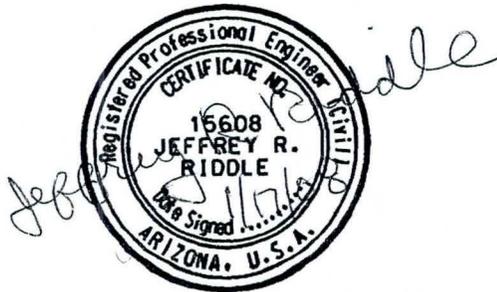
CONTRACT FCD 2005C018

PCN 470.12.31

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(Area to left reserved
for Engineer's Seal)



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

INVITATION FOR BID

BID OPENING DATE: Thursday, February 26, 2008 @ 2:00 P.M.

PROJECT LOCATION: The project is located within the City of Glendale and unincorporated Maricopa County

PROPOSED WORK: The project includes 1 ½ miles of earthen channel, one 50-acre detention basin, 4 reinforced concrete box culverts, one concrete weir structure, one concrete inlet structure, one concrete outlet structure, and 20 concrete grade control structures. The project also includes tall pot planting and hydroseeding.

BIDS:

SEALED BIDS for the proposed work will be received by the Flood Control District of Maricopa County, 2801 West Durango Street, Phoenix, Arizona 85009 until 2:00 PM on **Tuesday, February 26, 2008** and then publicly opened and read at 2801 West Durango Street, Phoenix, Arizona 85009. All bids are to be marked in accordance with Section 102.9 of the MAG Uniform Standard Specifications and addressed to the General Manager, Flood Control District of Maricopa County, 2801 West Durango Street, Phoenix, Arizona 85009. No bids will be received after the time specified for bid opening. All bids must be submitted on proposal forms furnished by the Flood Control District of Maricopa County and included in the Construction Specifications. The Board of Directors reserves the right to reject any and all bids and to waive minor informalities in any bid received if advantageous to the Flood Control District of Maricopa County.

ELIGIBILITY OF CONTRACTOR:

The bidder shall be required to certify that it has the appropriate "A" Contractor's license in the State of Arizona to perform the above referenced type of work. Certification shall be on the form provided herein.

The bidder may be required to furnish an affidavit as evidence of previous satisfactory performance in the above referenced type of work.

PRE-BID CONFERENCE:

MANDATORY SITE VISIT AND PRE-BID:

A **MANDATORY** Site Visit and Pre-Bid conference will be held on Thursday, February 14, 2008 at 8:30 A.M. (MST) at the Job Site located at the N/W Corner of Reems Road and Olive Avenue. All potential contractors **MUST** attend this site visit/pre-bid conference for their bid to be considered. Attendees should be prepared at that time to submit in writing and discuss any comments concerning this solicitation. Potential subcontractors are encouraged to attend.

QUESTIONS AND CLARIFICATIONS:

Questions or items for clarification may be addressed to the Contracts Branch Manager, in writing, at least five (5) working days prior to bid opening date. Questions received after this deadline may not be accepted. Responses to all questions submitted will be sent to all planholders by addenda. Verbal

interpretations, unless specifically addressed by an addendum, shall not be binding nor have any legal effect.

CONTRACT TIME:

All work on this contract is to be completed within three hundred sixty five (365) calendar days, **plus** one hundred twenty (120) calendar days for the landscape maintenance period, for a total of four hundred eighty five (485) calendar days, beginning with the date specified in the Notice to Proceed.

PROJECT PLANS, SPECIAL PROVISIONS AND CONTRACT DOCUMENTS:

Paper Plans and Construction Documents for the cost of \$136.00 or *CD of Plans and paper Construction Documents (Optional) for the cost of \$23.00 may be obtained from the Flood Control District of Maricopa County, 2801 West Durango Street, Phoenix, Arizona 85009 upon payment by cash, check, or postal money order payable to the FLOOD CONTROL DISTRICT OF MARICOPA COUNTY. Mail orders for project documents must include an additional \$18.50 for first class U.S. postage and handling. The first class U.S. postage and handling will not be refunded. Bid documents are refundable if returned to the District in good condition within **ten (10) calendar days** after the bid opening. **NOTE:** Regardless of circumstances, we cannot guarantee mail delivery.

***WARNING:** The CD option is for bidding purposes only. The construction of this project will be built in accordance with the paper Plans and Specifications.

Each bid must be accompanied by a Bid Bond executed on the District-supplied bond form, cashier's or certified check or postal money order equal to ten percent (10%) of the bid, made payable to the FLOOD CONTROL DISTRICT OF MARICOPA COUNTY as a guarantee that if the work is awarded to the bidder, the bidder will within ten (10) days of receipt of the Proposal Acceptance, enter into proper contract and bond condition for the faithful performance of the work otherwise, said amount may be forfeited to the said BOARD OF DIRECTORS.

BID PREPARATION

It shall be the responsibility of the prospective bidder to determine, prior to the submittal of its bid, if any addendum to the project have been issued by the FCDMC. All addenda issued, if not already bound in the Supplementary General Conditions (SGC) or Special Provisions (SP), shall be submitted by the bidder with its bid and noted in the Bid section.

Bids which do not reflect the appropriate changes to the bidding schedule, do not have all issued addenda attached and noted in the Bid section of the Contract, may be rejected by the FCDMC.

Prospective bidders may contact the Contracts Branch of the Flood Control District of Maricopa County to ascertain if addenda have been issued for this project.

ALL BIDS SUBMITTED MUST BE BOUND IN ITS ENTIRETY. FAILURE TO DO SO MAY RESULT IN THE BID BEING REJECTED.

Bidder shall submit the entire Construction Bid Document manual and shall complete and submit the following documents with its bid:

1. Bid Form – appropriate section of the form must be filled out, addendum listed, if any, and signed.

2. Bidding Schedule – must include all unit costs, amounts per bid item, and total bid amount. Addendum changes, if any must be listed. All notations in the bidding schedule must be legible and in pen or ink. All changes to the bidding schedule must be initialed.

3. Subcontractor List – must be completed and signed. If no subcontractors will be used, indicate “None” on the form.

4. Surety Bond – Bids must be accompanied by a surety bond, certified check, or cashier’s check for an amount equal to ten percent (10%) of the total amount bid.

5. No Collusion Affidavit – form must be filled out, signed and notarized.

6. Certification of License – form must be filled out, dated and signed.

7. All addenda issued by FCDMC for the specific project must be included with the bid in their entirety and acknowledged on the bid form.

Note: Failure by the bidder to comply with the bid submittal requirements may result in rejection of the bid.

Other Forms – Execution of the Contract, submittal of the Performance/Payment Bond and the Certificate of Insurance are not required at the time of bid submittal. These documents must be submitted to FCDMC by the successful bidder at time of contract execution.

PRINCIPLE ITEMS AND APPROXIMATE QUANTITIES

QUANTITY	UNIT	DESCRIPTION
437,800	CY	Basin Excavation
147,318	CY	Channel Excavation
4	EA	Reinforced concrete box culverts
20	EA	Reinforced concrete grade control structures
1	EA	Reinforced concrete weir structure
1	EA	Reinforced concrete inlet structure
1	EA	Reinforced concrete outlet structure
193	LF	30-inch RGRCP
19,483	CY	Rip Rap
39,966	SY	4-inch ABC Maintenance Road

BID

TO THE BOARD OF DIRECTORS
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PHOENIX, ARIZONA

Gentlemen:

The following Bid is made for Contract **FCD 2005C018, Reems Road Channel and Basin Project** in the County of Maricopa, State of Arizona.

The following Bid is made on behalf of

and no others. Evidence of authority to submit the bid is herewith furnished. The bid is in all respects fair and is made without collusion on the part of any person, firm, or corporation mentioned above, and no member or employee of the Flood Control District of Maricopa County Board of Directors is personally or financially interested, directly or indirectly, in the bid, or in any purchase or sale of any materials or supplies for the work in which it relates, or in any portion of the profits thereof.

The Undersigned certifies that the approved Plans, Supplementary General Conditions, Special Provisions, Forms of Contract, Bonds, and Sureties authorized by the Board of Directors and constituting essential parts of the bid, have been carefully examined and also that the work site has been personally inspected.

The Undersigned declares that the amount and nature of the work to be done is understood and that at no time will misunderstanding of the Plans, Construction Specifications, Special Provisions, Supplementary General Conditions, or conditions to be overcome, be pled. On the basis of the Plans, Construction Specifications, Special Provisions, Supplementary General Conditions, the Forms of Contract, Bonds, and Sureties proposed for use, the Undersigned proposes to furnish all the necessary machinery, equipment, tools, apparatus, and other means of construction, to do all the work and to furnish all the materials in the manner specified and to finish the entire project within the time hereinafter proposed and to accept, as full compensation therefore, the sum of various products obtained by multiplying each unit price, herein bid for the work or materials, by the quantity thereof actually incorporated in the complete project, as determined by the Engineer or Architect.

The Undersigned understands that the quantities mentioned herein are approximate only and are subject to increase or decrease and hereby proposes to perform all quantities of work, as either increased or decreased, in accordance with the provisions of the Specifications, at the unit price bid in the Bidding Schedule.

The Undersigned further proposes to perform all extra work that may be required on the basis provided in the Specifications and to give such work personal attention and to secure economical performance.

The Undersigned further proposes to execute the Contract Agreement and furnish satisfactory Bonds and Sureties within ten (10) days of receipt of Notice of Bid acceptance, **TIME BEING OF THE ESSENCE**. The Undersigned further proposes to begin work as specified in the contract attached hereto, and to complete the work within three hundred sixty-five (365) calendar days, **plus** one hundred twenty (120) calendar days for the landscape maintenance period, for a total of four hundred eighty five (485)

calendar days, from the effective date specified in the Notice to Proceed, and maintain at all times a Payment and Performance Bond, approved by the Board of Directors, each in an amount equal to one hundred percent (100%) of the contract amount. This Bond shall serve not only to guarantee the completion of the work on the part of the Undersigned, but also to guarantee the excellence of both workmanship and material and the payment of all obligations incurred, said Bonds and Sureties to be in full force and effect until the work is finally accepted and the provisions of the Plans, Specifications, and Special Provisions fulfilled.

A bid bond in the amount and character named in the Invitation to Bid, and amounting to not less than ten percent (10%) of the total bid, is enclosed. The bid bond is submitted as a guaranty of good faith that the Bidder will enter into a written contract to do the work, as provided, if successful in securing the award thereof. It is therefore agreed that if the Undersigned withdraws its bid at any time except as herein provided, or if the bid is accepted and the Undersigned fails to execute the contract and furnish satisfactory Bonds and Sureties as herein provided, the Flood Control District of Maricopa County shall be entitled and is hereby given the right to retain the said Bid Bond as liquidated damages.

The Undersigned acknowledges receipt of the following addenda, has attached these to the bid package, and has included their provisions in the bid:

Addendum No. _____	Dated _____

The Undersigned has enclosed the required bid security to the Bid.

BID SCHEDULE

ITEM NO.	DESCRIPTION	UNIT	PROJECT QUANTITY	UNIT COST NUMBERS	EXTENDED AMOUNT
105-1	Partnering Allowance	LS	1	\$ 15,000.00	\$ 15,000.00
105-2	BNSF Contractor Support Allowance	LS	1	\$ 25,000.00	\$ 25,000.00
105-3	BNSF Remove/Replace Track Allowance	LS	1	\$ 25,000.00	\$ 25,000.00
105-4	BNSF Flagman Allowance	LS	1	\$ 25,000.00	\$ 25,000.00
107-1	AZPDES / SWPPP Permits	LS	1		
107-2	Public Information and Notification Allowance	LS	1	\$ 15,000.00	\$ 15,000.00
107-3	Project Signs Allowance	LS	1	\$ 5,000.00	\$ 5,000.00
107-4	Water Management	LS	1		
201-1	Clearing and Grubbing	LS	1		
202-1	Mobilization	LS	1		
211-1	Final Aesthetic Grading	LS	1		
215-1	Channel Excavation	CY	147,318		
215-2	Basin Excavation	CY	437,800		
220-1	Plain Riprap	CY	19,483		
310-1	4-Inch Aggregate Base Course Maintenance Road	SY	39,966		
336-1	Pavement Replacement (T-Top)	SY	330		
336-2	Pavement Connections (not T-Top)	SY	944		
350-1	Remove Concrete Lined Ditch	LF	2,597		
350-2	Removal and Disposal of Inert Material Allowance	TON	600		
350-3	Removal and Disposal of Non-Inert Material Allowance	TON	200		
401-1	Traffic Control	LS	1		
421-1	4 Strand Smooth Wire Fence	LF	16,108		
421-2	Install Gate	EA	16		
430-1	Native Seed Mix A (Top Area)	SY	127,390		

430-2	Native Seed Mix B (Side Slopes)	SY	115,349		
430-3	Native Seed Mix C (Channel Bottom Area)	SY	28,227		
430-4	Native Seed Mix D (Basin Bottom Area)	SY	76,393		
430-5	Blue Palo Verde Planting	EA	492		
430-6	Foothills Palo Verde Planting	EA	114		
430-7	Ironwood Planting	EA	182		
430-8	Velvet Mesquite Planting	EA	389		
430-9	Desert Willow Planting	EA	43		
505-1	Box Culvert Type A (2 BBL 10' x 6')	LF	377		
505-2	Box Culvert Type B (1 BBL 10' x 6') (Auxiliary for 30' fill load)	LF	415		
505-3	Box Culvert Type C (1 BBL 10' x 6' Precast)	LF	112		
505-4	Box Culvert Type D (2 BBL 10' x 6') (for 30' fill load)	LF	524		
505-5	Concrete Retaining Walls	EA	10		
505-6	Concrete Retaining Walls at Olive Avenue	EA	4		
505-7	South Concrete Retaining Walls	EA	2		
505-8	Concrete Grade Control Structure	EA	20		
505-9	Concrete Inlet Structure	EA	1		
505-10	Concrete Outlet Structure	EA	1		
505-11	Concrete Weir Structure	EA	1		
505-12	Concrete Lined Irrigation Ditch	LF	149		
505-13	Concrete Channel Lining	SY	500		
505-14	Concrete Headwall (MAG 501-4)	EA	2		
505-15	20 Mil PVC Sheet Vinyl Waterproofing	SF	3,837		
505-16	Concrete Pipe Plug (MAG DET 427)	EA	4		
505-17	Concrete Test Panels	EA	3		
515-1	30-Inch Flapgate	EA	1		
515-2	Access Barrier Box Culvert	EA	4		
515-3	Access Barrier 30-inch Pipe	EA	1		
520-1	Steel Handrails	LF	1,410		

618-1	24-Inch Pipe	LF	48		
618-2	30-Inch Pipe	LF	193		

TOTAL BID AMOUNT IN WRITTEN NUMBERS:

TOTAL BID AMOUNT IN WRITTEN WORDS:

SUBMITTING FIRM (Please Print):

IF BY AN INDIVIDUAL:

By:

(Printed Name) (Title) (Address)

(Signature) (Date) (Telephone Number) (Fax Number)

(e-mail address)

IF BY A FIRM, PARTNERSHIP OR L.L.C. (LIMITED LIABILITY CORPORATION):

(Firm Name) (Firm Address)

(Signature - Title) (Date) (Telephone Number) (Fax Number)

(e-mail address)

**Name and Address of each Member, or each Manager of L.L.C. per Operating Agreement

**The name and post office address of each Member of the Firm or Partnership must be shown, or of each Manager of an L.L.C., also address of the registered office of the L.L.C.

IF BY A CORPORATION:

(Corporate Name) (Corporation Address)

(Printed Name) (Title) (Telephone Number) (Fax Number)

By:

(Signature) (Date) (e-mail address)

*Incorporated under the Laws of the State of _____ and Names and Addresses of Officers:

(President) (Address)

(Secretary) (Address)

(Treasurer) (Address)

*The name of the State under which the Laws of the Corporation was Chartered, and the name, title, and business address of the President, Secretary, and Treasurer must be shown.

SUBCONTRACTOR LISTING

As required in Section 102.6 of the Supplementary General Conditions, the following is a listing of Subcontractors and material suppliers (including any minority and women-owned business enterprises participation) that are to be used in the event the undersigned should enter into contract with the Owner. Although this list will not be considered as final commitment on the part of the successful proposer, any Subcontractor changes from those listed must have Owner's written approval prior to commencement of Subcontractor work on site.

(Signature)

SURETY BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as Principal, (hereinafter called the Principal), and the _____, a corporation duly organized under the laws of the State of _____, as Surety, (hereinafter called the Surety), are held and firmly bound unto the Flood Control District of Maricopa County (hereinafter called the Obligee), in the sum of **ten percent (10%)** of the total amount of the bid of Principal, submitted by him to the Obligee, for the work described below, for the payment of which sum, well and truly to be made, the said Principal and the said Surety, bind themselves, their heirs, executors, and administrators, successors and assigns, jointly and severally, firmly by these presents, and in conformance with the Arizona Revised Statutes.

WHEREAS, the said Principal is herewith submitting its proposal for **Contract FCD 2005C018, Reems Road Channel and Basin Project.**

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 give 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 material 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 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.

Signed and sealed this _____ day of _____, A.D., 200_____.

Agent of Record, State of Arizona

Agent Address and Phone Number:

Principal

By: _____
(Printed Name)

(Signature)

(Title)

Surety Name

Bond Number: _____

By: _____
(Printed Name)

By: _____
(Signature)

ATTACH SURETY POWER OF ATTORNEY

(Title)

NO COLLUSION AFFIDAVIT

AFFIDAVIT BY CONTRACTOR CERTIFYING THAT THERE WAS NO COLLUSION IN BIDDING FOR CONTRACT

STATE OF _____)
)§
County of _____)

_____ being first duly sworn, deposes and says:

That he/she is _____ of _____

bidding on Contract FCD 2005C018 for Reems Road Channel and Basin Project, in the County of Maricopa, State of Arizona.

That, in connection with the above-referenced project, neither he/she, nor anyone associated with the aforesaid business, has, directly or indirectly, participated in any collusion, entered into any contract, combination, conspiracy or other act in restraint of trade or commerce in violation of the provisions of Arizona Revised Statutes, Title 34, Chapter 2, Article 4, as amended.

(Signature of Affiant)

Subscribed and sworn to before me this _____ day of _____, 200__.

(Notary Public)

My Commission Expires

CERTIFICATION OF LICENSE

Pursuant to A.R.S. Section 32-1169, I hereby state that I hold a current contractor's license, duly issued by the office of the Registrar of Contractors for the State of Arizona, said license has not been revoked, that the license number is _____ that my privilege license number (as required by A.R.S. Section 42-5005) is _____; and that, if any exemption to the above licensing requirements is claimed;

1. The basis for the claimed exemption is _____ and;
2. The name(s) and license number(s) of any general, mechanical, electrical, or plumbing contractor(s) to be employed on the work are:

IT IS UNDERSTOOD THAT THE FILING OF AN APPLICATION CONTAINING FALSE OR INCORRECT INFORMATION CONCERNING AN APPLICANT'S CONTRACTOR'S LICENSE OR PRIVILEGE LICENSE WITH THE INTENT TO VOID SUCH LICENSING REQUIREMENTS IS UNSWORN FALSIFICATION PUNISHABLE ACCORDING TO A.R.S. SECTION 13-2704.

Signature of Licensee

Date: _____

Company: _____

CONTRACT AGREEMENT

THIS AGREEMENT, made and entered into **this** _____ **day of** _____ by and between the Flood Control District of Maricopa County, hereinafter called the Owner, acting by and through its BOARD OF DIRECTORS, and _____, hereinafter called the Contractor.

WITNESSETH: That the said Contractor, for and in the consideration of the sum of _____ (\$ _____) to be paid to him by the Owner, in the manner and at the times hereinafter provided, and of the other covenants and agreements herein contained, hereby agrees for himself, heirs, executors, administrators, successors, and assigns as follows:

ARTICLE I – SCOPE OF WORK: The Contractor shall construct, and complete in a workmanlike and substantial manner and to the satisfaction of the Owner, a project for the Flood Control District of Maricopa County, designated as **Contract FCD 2005C018, Reems Road Channel and Basin Project**, and furnish at its own cost and expense all necessary machinery, equipment, tools, apparatus, materials, and labor to complete the work in the most substantial and workmanlike manner according to the Plans and Construction Specifications on file with the Flood Control District of Maricopa County, 2801 West Durango Street, Phoenix, Arizona 85009, and such modifications of the same and other directions that may be made by the Flood Control District of Maricopa County, as provided herein.

ARTICLE II – CONTRACT DOCUMENTS: The Construction Documents, i.e., Invitation to Bid, Plans, Standard Specifications and Details, Supplementary General Conditions, Special Provisions, Addenda, if any, Proposal, Affidavits, Performance Bond, Payment Bond, Indemnification, Insurance Requirements, Certificates of Insurance, and Change Orders, if any, are by this reference made a part of this contract and shall have the same effect as though all of the same were fully inserted herein.

ARTICLE III – TIME OF COMPLETION: The Contractor further covenants and agrees at its own proper cost and expense, to do all work as aforesaid for the construction of said improvements and to completely construct the same and install the material therein, as called for by this agreement free and clear of all claims, liens, and charges whatsoever, in the manner and under the conditions specified within three hundred sixty-five (365) calendar days, **plus** one hundred twenty (120) calendar days for the landscape maintenance period, for a total of four hundred eighty five (485) calendar days, following notice to proceed.

ARTICLE IV – PAYMENTS: For and in consideration of the faithful performance of the work herein embraced as set forth in the contract documents, which are a part hereof and in accordance with the directions of the Owner, through its Engineer and to its satisfaction, the Owner agrees to pay the said Contractor the amount earned, computed from actual quantities of work performed and accepted or materials furnished at the unit bid price on the Proposal made a part hereof, and to make such payment in accordance with the requirements of A.R.S. Section 34-221, as amended. The Contractor agrees to discharge its obligations and make payments to its subcontractors and suppliers in accordance with A.R.S. Section 34-221.

With each request for payment, the Contractor shall complete and provide the “Maricopa County Small Business Enterprise Program Participation Reporting Form” which is included with this contract document.

ARTICLE V – TERMINATION: The Owner hereby gives notice that pursuant to A.R.S. Section 38-511(A) this contract may be canceled without penalty or further obligation within three (3) years after execution if any person significantly involved in initiation, negotiation, securing, drafting or creating a contract on behalf of the Owner is, at any time while the contract or any extension of the contract is in effect, an employee or agent of any other party to the contract in any capacity or a consultant to any other party of the contract with respect to the subject matter of the contract. Cancellation under this section shall be effective when written notice from the Chief Engineer and General Manager of the Owner is received by all of the parties to the contract. In addition, the Owner may recoup any fee for commission paid or due to any person significantly involved in initiation, negotiation, securing, drafting or creating the contract on behalf of the Owner from any other party to the contract arising as a result of the contract.

ARTICLE VI – NEGOTIATION CLAUSE: Recovery of damages related to expenses incurred by the Contractor for a delay for which the Owner is responsible, which is unreasonable under the circumstances and which was not within the contemplation of the parties to the contract, shall be negotiated between the Contractor and the Owner. This provision shall be construed so as to give full effect to any provision in the contract which requires notice of delays, provides for arbitration or other procedure for settlement or provides for liquidated damages.

ARTICLE VII – COMPLIANCE WITH LAWS: The Contractor is required to comply with all Federal, State and local ordinances and regulations. The Contractor's signature on this contract certifies compliance with the provisions of the I-9 requirements of the Immigration Reform Control Act of 1986 for all personnel that the Contractor and any subcontractors employ to complete this project. It is understood that the Owner shall conduct itself in accordance with the provisions of the Maricopa County Procurement Code.

ARTICLE VIII – ANTI-DISCRIMINATION PROVISION: The Contractor agrees not to discriminate against any employee or applicant for employment because of race, religion, gender, age, disability, or national origin and further agrees not to engage in any unlawful employment practices. The Contractor further agrees to insert the foregoing provision in all subcontracts hereunder.

ARTICLE IX – SMALL BUSINESS ENTERPRISE (SBE) PROGRAM: The Maricopa County Small Business Enterprise (SBE) Program is incorporated by reference. It is Maricopa County's policy to provide small businesses the opportunity to participate in the County's solicitation process and to be considered to fulfill the requirement for various commodities and services. No specific SBE participation percentage goal or dollar amount has been established for this contract.

IN WITNESS WHEREOF: Five (5) identical counterparts of this contract, each of which shall for all purposes be deemed an original thereof, have been duly executed by the parties hereinabove named, on the date and year first above written.

FIRM NAME

Party of the First Part

Signature

Printed Name of Signatory

Title of Signatory

Date of Signing

Tax Identification Number

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PARTY OF THE SECOND PART

RECOMMENDED BY:

Chief Engineer and General Manager Date
Flood Control District of Maricopa County

APPROVED BY:

By: _____
Chairman, Board of Directors Date

ATTEST:

Clerk of the Board Date

LEGAL REVIEW

Approved as to form and within the powers and authority granted under the laws of the State of Arizona to the Flood Control District of Maricopa County.

Deputy County Attorney Date

**STATUTORY PAYMENT BOND PURSUANT TO TITLE 34
CHAPTER 2, ARTICLE 2, OF THE ARIZONA REVISED STATUTES
(Penalty of this bond must be 100% of the Contract amount)**

KNOW ALL MEN BY THESE PRESENTS:

That, _____ (hereinafter called the 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 Flood Control District of Maricopa County, in the County of Maricopa, State of Arizona (hereinafter called the Obligee), in the amount of _____ (\$ _____), 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 _____, 200__ for the **Contract FCD 2005C018, Reems Road Channel and Basin Project**, 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 the Title 34, Chapter 2, Article 2, of the 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 it was 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** _____, 200__.

Agent of Record, State of Arizona

Agent Address and Phone Number:

Bond Number: _____

ATTACH SURETY POWER OF ATTORNEY

Principal

Signature

By: _____
Printed Name

Title: _____

Surety Seal

Signature

By: _____
Printed Name

**STATUTORY PERFORMANCE BOND PURSUANT TO TITLE 34
CHAPTER 2, ARTICLE 2, OF THE ARIZONA REVISED STATUTES
(Penalty of this bond must be 100% of the Contract amount)**

KNOW ALL MEN BY THESE PRESENTS:

That, _____ (hereinafter called the 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 Flood Control District of Maricopa County, in the County of Maricopa, State of Arizona, (hereinafter called the Obligee) in the amount of _____ (\$ _____), 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 _____, 200__ the **Contract FCD 2005C018, Reems Road Channel and Basin Project**, 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 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 the Title 34, Chapter 2, Article 2, of the 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 extent as if it was 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 _____, 200__.

Agent of Record, State of Arizona

Agent Address and Phone Number:

Bond Number: _____

ATTACH SURETY POWER OF ATTORNEY

Principal

Signature

By: _____

Printed Name

Title: _____

Surety Seal

Signature

By: _____

Printed Name

INDEMNIFICATION

To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Flood Control District of Maricopa County, Maricopa County, Maricopa County Department of Transportation, Luke Air Force Base, and their agents, representatives, officers, directors, officials, and employees from and against all claims, damages, losses, and expenses including, but not limited to, attorney fees, court costs, expert witness fees, and the cost of appellate proceedings, relating to, arising out of, or alleged to have resulted from the negligent acts, errors, omissions or mistakes relating to the performance of this Contract. The Contractor's duty to defend, indemnify, and hold harmless the Flood Control District of Maricopa County, Maricopa County, Maricopa County Department of Transportation, Luke Air Force Base, and their agents, representatives, officers, directors, officials, and employees shall arise in connection with any claim, damage, loss or expense that is attributable to bodily injury, sickness, disease, death, or injury to, impairment, or destruction of property, including loss of use resulting therefrom, caused by any negligent acts, errors, omissions, or mistakes in the performance of this Contract including any person for whose negligent acts, errors, omissions, or mistakes the Contractor may be legally liable.

The amount and type of insurance coverage requirements set forth herein will in no way be construed as limiting the scope of the indemnity in this paragraph.

INSURANCE REQUIREMENTS

The Contractor, at the Contractor's own expense, shall purchase and maintain the herein stipulated minimum insurance from a company or companies duly licensed by the State of Arizona and possessing a current A.M. Best, Inc. rating of B++6. In lieu of State of Arizona licensing, the stipulated insurance may be purchased from a company or companies, which are authorized to do business in the State of Arizona, provided that said insurance companies meet the approval of the Flood Control District of Maricopa County. The form of any insurance policies and forms must be acceptable to the Flood Control District of Maricopa County.

All insurance required herein shall be maintained in full force and effect until all work or service required to be performed under the terms of the Contract is satisfactorily completed and formally accepted with the submittal of the Certificate of Performance. Failure to do so may, at the sole discretion of the Flood Control District of Maricopa County, constitute a material breach of this Contract.

The Contractor's insurance shall be primary insurance as respects the Flood Control District of Maricopa County and Maricopa County, and any insurance or self-insurance maintained by the Flood Control District of Maricopa County or Maricopa County shall not contribute to it.

Any failure to comply with the claim reporting provisions of the insurance policies or any breach of an insurance policy warranty shall not affect the Flood Control District of Maricopa County's right to coverage afforded under the insurance policies.

The insurance policies may provide coverage that contains deductibles or self-insured retentions. Such deductible and/or self-insured retentions shall not be applicable with respect to the coverage provided to the Flood Control District of Maricopa County under such policies. The Contractor shall be solely responsible for the deductible and/or self-insured retention and the Flood Control District of Maricopa County, at its option, may require the Contractor to secure payment of such deductibles or self-insured retentions by a surety bond or an irrevocable and unconditional letter of credit.

The Flood Control District of Maricopa County reserves the right to request and to receive, within ten (10) working days, certified copies of any or all of the herein required insurance policies and/or endorsements. The Flood Control District of Maricopa County shall not be obligated, however, to review such policies and/or endorsements or to advise the Contractor of any deficiencies in such policies and endorsements, and such receipt shall not relieve the Contractor from, or be deemed a waiver of the Flood Control District of Maricopa County's right to insist on strict fulfillment of the Contractor's obligations under this Contract.

The insurance policies required by this Contract, except Workers' Compensation and Errors and Omissions, shall name the Flood Control District of Maricopa County, Maricopa County, and their agents, representatives, officers, directors, officials, and employees as Additional Insureds'.

The policies required hereunder, except Workers' Compensation and Errors and Omissions, shall contain a waiver of transfer of rights of recovery (subrogation) against the Flood Control District of Maricopa County, Maricopa County and their agents, representatives, officers, directors, officials, and employees for any claims arising out of the Contractor's work or service.

REQUIRED COVERAGES

Commercial General Liability.

Commercial General Liability insurance and, when necessary, Commercial Umbrella insurance with a limit of not less than \$1,000,000 for each occurrence, \$2,000,000 Products/Completed Operations Aggregate, and \$2,000,000 General Aggregate Limit. The policy shall include coverage for bodily injury, broad form property damage, personal injury, products, and completed operations and blanket contractual coverage, and shall not contain any provision that would serve to limit third party action over claims. There shall be no endorsement or modification of the CGL limiting the scope of coverage for liability arising from explosion, collapse, or underground property damage.

Automobile Liability.

Commercial/Business Automobile Liability insurance and, if necessary, Commercial Umbrella insurance with a combined single limit for bodily injury and property damage of not less than \$1,000,000 each occurrence with respect to any of the Contractor's owned, hired, and non-owned vehicles assigned to or used in performance of the Contractor's work or services under this Contract.

Workers' Compensation.

Workers' Compensation insurance to cover obligations imposed by federal and state statutes having jurisdiction of the Contractor's employees engaged in the performance of the work or services under this Contract; and Employer's Liability insurance of not less than \$1,000,000 for each accident, \$1,000,000 disease for each employee, and \$1,000,000 disease policy limit.

The Contractor waives all rights against the Flood Control District of Maricopa County, Maricopa County, and their agents, officers, directors, and employees for recovery of damages to the extent these damages are covered by the Workers' Compensation and Employer's Liability or commercial umbrella liability insurance obtained by the Contractor pursuant to this contract.

Builder's Risk (Property) Insurance.

The Contractor shall purchase and maintain, on a replacement cost basis, Builders' Risk insurance and, when necessary, Commercial Umbrella insurance in the amount of the initial Contract amount as well as subsequent modifications thereto for the entire work at the site. Such Builders' Risk insurance shall be maintained until the submittal of the Certificate of Performance and final payment has been made or until

no person or entity other than the Flood Control District of Maricopa County has an insurable interest in the property required to be covered, whichever is earlier. This insurance shall include the interests of the Flood Control District of Maricopa County, the Contractor, and all subcontractors, and sub-subcontractors in the work during the life of the Contract and course of construction, and shall continue until the work is completed and accepted by the Flood Control District of Maricopa County. For new construction projects, the Contractor agrees to assume full responsibility for loss or damage to the work being performed and to the structures under construction. For renovation construction projects, the Contractor agrees to assume responsibility for loss or damage to the work being performed at least up to the full Contract amount, unless otherwise required by the Contract documents or amendments thereto.

Builders' Risk insurance shall be on a special form and shall also cover false work and temporary buildings and shall insure against risk of direct physical loss or damage from external causes including debris removal, demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for architect's service and expenses required as a result of such insured loss and other "soft costs" as required by the Contract.

Builders' Risk insurance must provide coverage from the time any covered property comes under the Contractor's control and/or responsibility, and continue without interruption during construction, renovation, installation, landscape/plant maintenance period, including any time during which the covered property is being transported to the construction installation site, and while on the construction or installation site awaiting installation. The policy will provide coverage while the covered premises or any part thereof are occupied. Builders' Risk insurance shall be primary and not contributory.

If the Contract requires testing of equipment or other similar operations, at the option of the Flood Control District of Maricopa County, the Contractor will be responsible for providing property insurance for these exposures under a Boiler Machinery insurance policy.

Certificates of Insurance

Prior to commencing work or services under this Contract, the Contractor shall furnish the Flood Control District of Maricopa County with Certificates of Insurance in a form acceptable to the Flood Control District of Maricopa County, or formal endorsements as required by the Contract in the form provided by the Flood Control District of Maricopa County, issued by the Contractor's insurer(s), as evidence that policies providing the required coverage's, conditions, and limits required by this Contract are in full force and effect. Such certificates shall identify this contract number and contract title.

In the event any insurance policy(ies) required by this contract is(are) written on a "claims made" basis, coverage shall extend for two (2) years past completion and acceptance of the Contractor's work or services and as evidenced by annual Certificates of Insurance.

If a policy does expire during the life of the Contract, a renewal certificate must be sent to the Flood Control District of Maricopa County fifteen (15) days prior to the expiration date.

Cancellation and Expiration Notice

Insurance required herein shall not expire, be canceled, or materially changed without thirty (30) days prior written notice to the Flood Control District of Maricopa County.

**Flood Control District of Maricopa County
CERTIFICATE OF INSURANCE**

CONTRACT FCD 2005C018

PROJECT TITLE: Reems Road Channel and Basin Project

NAME AND ADDRESS OF INSURANCE AGENCY:	Company Letter	A	*COMPANIES AFFORDING COVERAGES:
	Company Letter	B	
	Company Letter	C	
	Company Letter	D	
	Company Letter	E	
	Company Letter	F	

This certificate of insurance certifies that policies of insurance listed below have been issued to the insured named above and are in full force at this time.

*CO. LTR.	TYPE OF INSURANCE	POLICY NUMBER	EFFECTIVE DATE (MM/DD/YY)	EXPIRATION DATE (MM/DD/YY)	LIMITS	
	GENERAL LIABILITY: <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> Claims Made <input type="checkbox"/> Occur <input checked="" type="checkbox"/> PREMISES OPERATIONS <input checked="" type="checkbox"/> BLANKET CONTRACTURAL <input checked="" type="checkbox"/> BROAD FORM PROPERTY DAMAGE <input checked="" type="checkbox"/> PERSONAL INJURY <input checked="" type="checkbox"/> PRODUCTS AND COMPLETED OPERATIONS HAZARD <input checked="" type="checkbox"/> XCU HAZARDS <input checked="" type="checkbox"/> INDEPENDENT CONTRACTORS <input checked="" type="checkbox"/> OWNER'S AND CONTRACTOR'S PROTECTIVE LIABILITY				GENERAL AGGREGATE \$2,000,000 PRODUCTS/COMPLETED OPERATIONS AGGREGATE \$2,000,000 EACH OCCURRENCE \$1,000,000	
	AUTOMOBILE LIABILITY: <input checked="" type="checkbox"/> ANY AUTO <input checked="" type="checkbox"/> ALL OWNED AND NON-OWNED AUTOS				Combined Single Limit \$1,000,000 Bodily Injury \$1,000,000 Property Damage \$1,000,000 Per person/Per accident \$1,000,000	
	<input type="checkbox"/> EXCESS LIABILITY <input type="checkbox"/> Umbrella Form <input type="checkbox"/> Other than Umbrella Form				Each occurrence \$ Aggregate \$	
	<input checked="" type="checkbox"/> WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY LIMITS AND EMPLOYER'S LIABILITY: EACH ACCIDENT \$1,000,000 DISEASE: EACH EMPLOYEE \$1,000,000 DISEASE: POLICY LIMIT \$1,000,000	
	<input checked="" type="checkbox"/> BUILDERS' RISK ALL-RISK FORM				REPLACEMENT COSTS	
	<input checked="" type="checkbox"/> OTHER:	Except for Workers' Compensation and Professional Liability Insurance, the Flood Control District of Maricopa County, Maricopa County, Maricopa County Department of Transportation, and Luke Air Force Base, their agents, representatives, officers, Directors, Officials, and employees are named as Additional Insured's.				

Except for Workers' Compensation and Professional Liability Insurance, the Flood Control District of Maricopa County (District), Maricopa County, Maricopa County Department of Transportation, and Luke Air Force Base, their agents, representatives, officers, Directors, Officials, and employees are named as Additional Insured's on those types of policies described herein which are required to be furnished by this contract entered into between the insured and the District. To the extent provided in this, insured shall hold harmless the District from liability arising out of any services provided or duty performed by insured as required by statute, law, purchase order or otherwise required, with the exception of liability for loss or damage resulting from the sole negligence of the District, its agents, employees, or indemnities. It is agreed that any insurance available to the named insured shall be primary of other sources that may be available. It is further agreed that no policy shall expire, be cancelled, or materially changed to affect the coverage available to the District without thirty (30) days written notice to the District. **THIS CERTIFICATE IS NOT VALID UNLESS COUNTERSIGNED BY AN AUTHORIZED REPRESENTATIVE OF THE INSURANCE COMPANY.**

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 2801 WEST DURANGO STREET PHOENIX, ARIZONA 85009	DATE ISSUED: _____ _____ AUTHORIZED REPRESENTATIVE
--------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------

**CERTIFICATE OF PERFORMANCE
OF CONSTRUCTION CONTRACT AND PAYMENT OF ALL CLAIMS**

_____ hereby certifies to the Flood Control District of Maricopa
(Name of Signer)
County (District) that all lawful claims for labor, rental of equipment, material used, and any other claims
by _____ (Firm) or its
subcontractors and suppliers in connection with performance on **FCD 2005C018** for **Reems Road
Channel and Basin Project** have been duly discharged as required by Arizona Revised Statutes, Section
34-221 and Maricopa Association of Governments Uniform Standard Specifications for Public Works
Construction (MAG), Section 109.7.

(Firm) understands that with receipt of payment for previously invoiced amounts plus any retained funds
and/or release of escrow funds, that this is a settlement of all claims of every nature and kind against the
District arising out of the performance of the District's Contract **FCD 2005C018** relating to the material,
equipment, and work covered in and required by this contract.

The undersigned hereby certifies that to his/her knowledge no contractual disputes exist in regard to this
contract, and that he/she has no knowledge of any pending or potential claim in regard to this contract.

Upon submission of this Certificate of Performance and an invoice for any applicable retained funds, the
District will process final payment and release applicable escrow funds in accordance with the Contract
and MAG requirements.

State of Arizona)
)§
County of Maricopa)

Signed this _____ day of _____, 200__.

Signature

Title

SUBSCRIBED AND SWORN TO before me this _____ day of _____, 200__.

Notary Public

My Commission Expires: _____



Maricopa County Small Business Enterprise Program Participation Reporting Form

This form is to be submitted with each pay application or invoice. Any pay application or invoice without this form attached is subject to rejection as not being a completed pay application or invoice pursuant to the terms of the contract.

Name of Prime Consultant/Contractor

Contract No.

Contact Person

Project No.

Street Address

\$ _____
Amount of this Pay Application/Invoice

City, State ZIP

Complete below with information on the SBE firms utilized as subconsultants/subcontractors for this pay application/invoice. If work was self-performed and your firm, as the prime, is an SBE firm pursuant to A.R.S. § 41-1001, et seq., then you may list your firm as the SBE firm.

SBE Firm Name	SBE Firm Address	Type of Work Performed	\$ Pd to SBE this App/Inv
			\$
			\$
			\$
			\$
			\$
			\$
			\$
			\$
			\$
			\$
			\$
			\$

A mark in this box certifies that no SBE firms were utilized as the prime, subconsultant or subcontractor with respect to this pay application/invoice.

Date: _____

Signature



SUPPLEMENTARY GENERAL CONDITIONS

CONTRACT FCD 2005C018

REEMS ROAD CHANNEL AND BASIN PROJECT

PCN: 470-12-31

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
REEMS ROAD CHANNEL AND BASIN
CONTRACT NO. FCD 2005C018
PCN 470-12-31**

SUPPLEMENTARY GENERAL CONDITIONS

SPECIFICATIONS

Except as otherwise amended in these Supplementary General Conditions and the Construction Special Provisions, this project shall be constructed in accordance with all applicable Maricopa Association of Governments (MAG) Uniform Standard Specifications and Uniform Standard Details, dated 1998 including all revisions through 2005.

PRECEDENCE OF CONTRACT DOCUMENTS

This Contract and its designated documents, whether taken separately or together, are to be interpreted according to full intent, meaning, and spirit, and shall be deemed to mutually explain each other and to be descriptive of any materials to be furnished and the work to be performed under this Contract. In cases of any difference or discrepancy between the Contract documents, the order of precedence shall be a) Addendum to the Invitation for Bids, b) the Contract form, c) Supplementary General Conditions, d) Construction Special Provisions, e) Project Plans, f) MAG Uniform Standard Specifications and Uniform Standard Details, and g) ADOT Standard Specifications for Road and Bridge Construction.

Subsection 101.2 - Definitions and Terms:

1. Change the definition of the phrase "Board of Supervisors" to being the Board of Directors acting under the authority of the laws of the State of Arizona and in their capacity of the Board of Directors of the Flood Control District of Maricopa County.
2. Change the definition of the phrase "Budget Project" to being a project financed by funds set aside in the annual budget or otherwise approved by the Flood Control District of Maricopa County Board of Directors.
3. Add to the definition of the phrase "Contract Documents," the phrase "Supplementary General Conditions."
4. Change the definition of the term "Engineer" to being the person appointed by the Flood Control District of Maricopa County Board of Directors to the office of Chief Engineer and General Manager of the Flood Control District of Maricopa County acting directly or through its authorized representative, the Chief of the Flood Control District of Maricopa County Planning and Project Management Division.
5. Change the definition for the phrase "Notice of Award" to a letter from the Flood Control District of Maricopa County advising Contractor that it is the successful bidder and the Flood Control District of Maricopa County has accepted its proposal.
6. Change the definition of the term "Owner" to the Flood Control District of Maricopa County, acting through it's legally constituted officials, officers, or employees.
7. Whenever the word "District" is used in these Specifications, it shall mean the Flood Control District of Maricopa County.

8. Add the definition for the Maricopa County Small Business Enterprise Program as being the Program adopted by the Board of Supervisors effective December, 2006.

Subsection 102.4 - Examination of the Plans, Special Provisions, and Site Work:

Add the following:

The Geotechnical Report including soil boring logs and groundwater conditions is in Appendix A of these SGC's. Existing moisture conditions shall be no basis for claim for additional money or time extensions. The Contractor shall manipulate the existing soil as required to achieve stable soil conditions and the required densities, as well as safe and stable side slopes during construction activities.

There is the possibility that seepage of groundwater and/or perched water may be encountered during excavation. The Contractor should be prepared to deal with nuisance groundwater and surface water.

Subsection 102.5 - Preparation of Proposal:

Add the following:

Proposals, including the Bidding Schedule, must be legibly written in ink or typed, with all prices given in numerals. In case of a conflict between the unit bid price and the extension, the unit bid price will govern.

It shall be the responsibility of prospective bidders to determine, prior to submission of a bid, if any addenda have been issued by the Flood Control District. This may be accomplished by calling 602-506-1501. Any addendum issued, if not already bound into the Special Provisions, **must be attached and included as part of the Specifications** and any quantities on the Bidding Schedule requiring change shall be adjusted to the new figure by pen and ink. The bidder's Arizona State Contractor's License number and the classification under which it proposes to perform the work shall be shown on the proposal. An "A" General Engineering License is required for this contract.

Allowances as shown on the Bid Schedule shall cover the cost of the materials, handling, equipment, labor costs, permits, and fees to complete the disposal of the items. The Contractor's taxes, bonds, insurance, overhead, profit, and other expenses contemplated for the original Allowance amount shall be included in the Base Bid, and not in the Allowance. Whenever the costs are more than or less than the Allowance, the Contract Sum shall be adjusted accordingly by Change Order, the amount of which will recognize proportionate changes, if any, in handling costs on the site, labor, installation costs, taxes, bonds, insurance, overhead, profit, and other expenses. Contractor's Application for Payment shall include supporting documentation of Allowance funds.

Subsection 102.6 - Subcontractors' List:

Add the following:

A list of subcontractors to be employed on the project shall be submitted with the bid, on the form provided in the Proposal. Following Notice of Award, no change of the subcontractors named therein will be made unless first approved in writing by Owner.

Subsection 102.7 - Irregular Proposals:

Add the following:

- (G) If any addenda are not acknowledged and attached.
- (H) If the entire book of Construction Documents (less the plans) is not returned.

Subsection 103.6 - Contractor's Insurance:

Add the following:

Concurrently with the execution of the contract, Contractor shall furnish a Certificate of Insurance, using the included Certificate that names the additional insureds as set out in the Certificate. The Certificate

shall also name the additional insureds as Certificate Holders. The types of insurance and the limits of liability shall be as indicated on the included form

Subsection 103.6.1(D) - Contractor's Insurance:

Add the following:

Include additional insureds as indicated on the included Certificate of Insurance. The Contractor expressly agrees to name the Maricopa County Department of Transportation (MCDOT) and Luke Air Force Base (LAFB) as additional insureds on such insurance policies as required by the Contract and the District.

Subsection 103.6.2 – Indemnification of the Contracting Agency against Liability:

Add the following:

Additionally, Contractor shall execute the Indemnification found in the Contract Documents. The Contractor expressly agrees to hold MCDOT and LAFB harmless under same terms and conditions as District. The Contractor expressly agrees that MCDOT and LAFB are express third party beneficiaries of the construction contract and shall be entitled to assert against the Contractor all of the District's claims, rights, warranties, and privileges under the construction contract.

Subsection 104.1 - Work to be Done:

Add the following to 104.1.1:

All water for construction purposes, drinking water, lighting, temporary electric power, heat and telephone service shall be arranged and provided for as per requirements of the work by Contractor at his expense.

All construction activities will occur in an area that is subject to flooding. Flows can occur at any time. The Contractor will remove all equipment from the construction area whenever flows could occur that would inundate the equipment or equipment storage areas. Protection from flooding of Contractor's equipment and construction items to be furnished by the Contractor is the Contractor's responsibility.

The major facilities to be constructed include the 40 acre basin construction, 1 ½ miles of channel construction, four concrete box culverts, one concrete weir structure (and concrete lining for channel adjacent to weir structure), twenty (20) concrete grade control structures, one concrete inlet structure, one concrete outlet structure, drainage pipes, native seeding, tall pot planting, removal and replacement of irrigation ditches, and maintenance roads and ramps.

The Contractor is required to salvage the top eight (8) inches of topsoil from the basin and channel, per Special Provisions Section 215. The Contractor is required to use some of the excavated materials to shape land forms within the basin area, and for structural backfill.

All utilities near the site are to be protected in place. All existing water and sewer lines in the Project area will be maintained in operating condition during construction.

The Contractor will be required to coordinate with other Contractors working in the area. The box culvert at Peoria Avenue just west of Reems Road may be under construction at the time this contract is awarded. The Contractor shall maintain access to all farms, private homes, and businesses in the area.

The Contractor shall be responsible for all water management and diversions needed for construction of the Project. The Contractor shall submit his plans for diversion of irrigation water to the Engineer and to Maricopa Water Conservation District No. 1 (MWD) for review, prior to diversion of the water. Plastic-lined ditches will not be acceptable for diversions; the Contractor shall construct either shotcrete-lined diversions or use plastic pipe for diversions. Payment for management of all water for the Project, including diversion of farm irrigation delivery ditches, relocation and/or diversion of tailwater ditches,

diversion of drainage from adjacent developments, and diversion of flood water and nuisance water, including labor, equipment, pumps, electricity, diversion ditches and pipes, removal and/or backfill of diversion ditches, and materials needed for diversion, is made on the basis of the lump sum price bid for such water management and diversion, see Supplementary General Conditions (SGC) Section 107.10 and Bid Item 107-4.

All birds, except pigeons, house sparrows, European starlings, doves and quail, are protected by the Migratory Bird Treaty Act (16 U.S.C. 703-712; Chapter 128; as amended). It is especially important to avoid disturbing active bird nests (those with eggs or hatchlings present) during Arizona's breeding bird season (roughly February through June in Maricopa County, however an individual nest is only active for 30-45 days). Additionally, burrowing owls are present in many project sites where vegetation is sparse. The District in advance of construction has had a biologist assess the potential impact of the project on bird species, and where necessary, has taken action to minimize the impact. However, it is the responsibility of the Contractor to be aware of the existence of nesting birds and burrowing owls, and to notify the Engineer immediately if they are found within the project limits. The Contractor will also notify the Engineer in advance of any planned removal of vegetation where such birds or owls may be present.

Most wildlife species are able to move away from on-coming construction activity, although some incidental loss of underground-dwelling small mammals and reptiles can be expected. However, two species are of concern in the state, the Gila monster, and the desert tortoise. Because the presence of these two species is not always obvious during a biological assessment, the Arizona Game and Fish Department has guidelines for handling these two species when encountered at construction projects, and those guidelines will be provided to the Contractor prior to the start of the project.

Inspection and Testing:

The Contractor will be responsible for all quality control for the project and will provide the Engineer with copies of the results of all tests performed by the Contractor Quality Control. The Owner and Engineer will provide quality assurance for the project.

104.2.3 - Changes:

The Owner may at any time, by written order, and without notice to the sureties, if any, make changes within the general scope of this contract in any one or more of the following:

- A) Drawings, designs, or specifications;
- B) Method or manner of performance of the work;
- C) Owner-furnished facilities, equipment, materials, services, or site;
- D) Directing acceleration in the performance of the work.

Any other written or oral order from the Owner that causes a change shall be treated as a change order under this section provided that the Contractor gives the Owner written notification within two working days after receipt of such direction stating:

- A) The date, nature, and circumstances of the conduct regarded as a change;
- B) The particular elements of the contract performance for which the Contractor is seeking an equitable adjustment under this section, including any price or schedule adjustments;
- C) The Contractor's estimate of the time by which the Owner must respond to the Contractor's notice to minimize cost, delay, or disruption of performance.

The Contractor shall diligently continue performance of this contract to the maximum extent possible in accordance with its provisions. Except as provided in this section, no order, statement, or conduct of the Owner shall be treated as a change or entitle the Contractor to an equitable adjustment. If any change under this section causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, the Owner shall make an equitable adjustment

and modify the contract in writing. The equitable adjustment shall not include increased costs or time extensions for delay resulting from the Contractor's failure to provide notice or to diligently continue performance. No proposal for the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

Subsection 104.2.4 - Cost Estimates or Price Proposals:

The Contractor and any lower-tier subcontractors shall submit itemized cost estimates or price proposals for any owner-directed change order or Contractor-initiated claim.

Cost estimates or pricing proposals shall be itemized to include direct labor by man-hours, individual craft, hourly wage rate and verifiable labor burden. Other direct costs shall include rental and operator rates for rented or owned equipment, material trucking expenses and other costs clearly identified and directly allocable to contract performance. Material costs shall be itemized by item description, quantity for each item, unit price per item, including applicable sales tax markup, and extended total price per item. The Contractor shall provide copies of material supplier quote sheets, invoices or purchase orders, as appropriate.

Lump sum cost estimates or price proposals shall be rejected and returned to the Contractor for itemization as described above. Failure of the Contractor to submit properly itemized cost estimates or price proposals shall not constitute an excusable delay and will result in a change order being unilaterally priced at the Owner's fair estimated price.

Subsection 104.2.6 - Value Engineering:

A) **General.** The Contractor is encouraged to voluntarily develop, prepare, and submit value engineering change proposals (VECPs). The Contractor shall share in any instant contract savings realized from accepted VECPs, in accordance with paragraph (f) below. The Owner reserves the right to make alterations to the contract, in accordance with procedures elsewhere within this contract. Such alterations will not be eligible for inclusion in any VECP.

B) **Definitions.**

Contractor's development and implementation costs means those costs the Contractor incurs on a VECP in developing, testing, preparing, and submitting the VECP as well as those costs incurred by the Contractor to make the changes required by the Owner's acceptance of the VECP.

Owner costs means those owner costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistical support. The term does not include the normal administrative costs of processing the VECP.

Instant contract savings means the estimated reduction in Contract cost of performance resulting from acceptance of the VECP, minus the allowable Contractor's development and implementation costs, minus subcontractors' development and implementation costs (see paragraph (g) below).

Value engineering change proposal (VECP) means a proposal that (1) requires a change to the contract; (2) results in reducing the contract price or estimated cost without impairing essential functions or characteristics; and (3) does not involve a change in deliverable end item quantities, schedule, or a change to the contract type.

C) **VECP Preparation.** As a minimum, the Contractor shall include in each VECP the information described in subparagraphs (1) through (7) below. If the proposed change affects contractually required schedule and cost reporting, it shall be revised to incorporate proposed VECP modifications. The VECP shall include the following:

- (1) A description of the difference between the existing contract requirement and that proposed, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effects of the change on the end item's performance. All design changes must be submitted on 24"x 36" standard drawing sheets along with supporting calculations. Each drawing sheet and at least the content sheet of the calculations shall be sealed by an Engineer registered in the State of Arizona.
- (2) A list and analysis of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revision.
- (3) A separate, detailed cost estimate for the affected portions of the existing contract requirements and the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under paragraph (G) below.
- (4) A description and estimate of costs the Owner may incur implementing the VECP, such as test and evaluation and operating and support costs. This is an estimate based only on the Contractor's understanding of additional efforts to be expended by the Owner, should the VECP be accepted. The final cost will be determined by the Owner.
- (5) A prediction of any effects the proposed change would have on collateral costs to the agency, i.e., costs of operation or maintenance.
- (6) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.
- (7) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved and previous Owner actions, if known.

D) **Submission.** The Contractor shall submit VECPs to the Owner's Engineer.

E) **Owner Action.**

- (1) The Owner shall notify the Contractor of the status of the VECP within 15 calendar days after receipt from the Contractor. If additional time is required, the Owner shall notify the Contractor within the 15-day period and provide the reason for the delay and the expected date of the decision. The Owner will process VECPs expeditiously; however, it shall not be liable for any delay in acting upon a VECP.
- (2) If the VECP is not accepted, the Owner shall notify the Contractor in writing, explaining the reasons for rejection.
- (3) The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Owner.
- (4) Any VECP may be accepted, in whole or in part, by the Owner's award of a change order to this contract, citing this subsection. The Owner may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a change order incorporates a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The Owner's decision to accept or reject all or any part of any VECP shall be final and not subject to disputes or otherwise subject to litigation.

F) **Cost Sharing.**

- (1) **Rates.** The Owner's share of savings is determined by subtracting the Owner's costs from instant contract savings and multiplying the result by 50 percent. The Contractor's share shall be the remaining 50 percent.
- (2) **Payment.** Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a change order to this contract to accept the VECP, reduce the contract price or

estimated cost by the amount of instant contract savings, and provide the Contractor's share of savings by adding the amount calculated to the contract price.

- G) **Subcontracts.** The Contractor may include an appropriate value engineering clause in any subcontract. In computing any adjustment in this contract's price under paragraph (f) above, the Contractor's allowable development and implementation costs shall include any subcontractor's allowable development and implementation costs clearly resulting from a VECP accepted by the Owner under this contract, but shall exclude any value engineering incentive payments; provided that these payments shall not reduce the Owner's share of the savings resulting from the VECP.

Subsection 105.1 - Authority of Engineer:

Add the following:

105.1.1 - Engineer's Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to subsections 105.3.1 and 106.4. Engineer will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized without Engineer's prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any "or-equal" or substitute. Engineer will record time required by Engineer and Engineer's Consultants in evaluating substitutes proposed or submitted by Contractor pursuant to subparagraphs 105.3.1 and 106.4(B) and in making changes in the Contract Documents (or in the provisions of any other direct contract with Owner for work on the project) occasioned thereby. Whether or not Engineer accepts a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer and Engineer's Consultants for evaluating each such proposed substitute item.

Subsection 105.2.1 - Plans and Shop Drawings:

Add the following:

- A) Shop drawings means drawings, submitted to the Engineer by the Contractor pursuant to the contract, showing in detail (i) the proposed fabrication and assembly of structural elements and (ii) the installation (i.e., form, fit and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract.

Product Data is information on manufactured items, either stock or modified, and includes descriptive literature, operating data, performance curves, certified dimensional drawings, wiring or schematic control diagrams, piping, instrumentation, parts lists, and operating, maintenance and lubrication manuals.

Subsection 105.3 - Conformity with Plans and Specifications:

Add the following:

105.3.1 - Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence or procedure of construction is shown or indicated and expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence or procedure of construction acceptable to Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by Engineer will be similar to that provided in subparagraph 106.4(B).

Subsection 105.5 - Cooperation of Contractor:

Add the following:

105.5.1 - Partnering

The Owner intends to encourage the foundation of a partnering relationship with the Contractor and its subcontractors. This partnering relationship will be structured to draw on the strength of each organization to identify and achieve reciprocal goals. The objectives are effective and efficient contract performance, intended to achieve completion within budget, on schedule, and in accordance with plans and specifications.

This partnering relationship will be bilateral in makeup. Any cost associated with effectuating partnering will be covered by the Bid Item. The initial partnering workshop shall be scheduled after award of the contract, and prior to the Notice to Proceed, and shall be facilitated by a third party competent in the fundamentals of partnering, and mutually acceptable to Contractor and Owner. The Contractor shall be responsible for scheduling, coordinating, and hiring the third party facilitator, and planning all of the partnering meetings in consultation with the Engineer. The Owner will be responsible to notify and coordinate attendance at the partnering meetings by other agencies. To achieve the desired partnering relationships, the Contractor will need to encourage attendance by its major subcontractors on the project. Follow-up workshops will be held periodically throughout the duration of the contract as agreed to by the Contractor and Owner.

An integral aspect of partnering is the resolution of disputes in a timely, professional, and non-adversarial manner. Alternative dispute resolution (ADR) methodologies will be encouraged in place of the more formal dispute resolution procedures. ADR will assist in promoting and maintaining an amicable working relationship to preserve the partnering relationship. ADR in this context is intended to be a voluntary, non-binding procedure available for use by the parties to this contract to resolve any dispute that may arise during performance.

Payment for the Partnering Allowance will be made on the basis of invoices of actual costs, and will be for a total amount not to exceed the amount shown in the bid schedule for the item.

ITEM 105-1 – PARTNERING ALLOWANCE

105.5.2 – Pre-Construction Meeting

Add the following:

After award of the contract, a pre-construction meeting shall be scheduled at a location and time (prior to mobilization and start of construction) to be agreed upon between the Owner and the Contractor. The Contractor shall make all necessary arrangements to have key personnel of his company and of his principal subcontractors present at the meeting. Each representative shall have authority to make commitments and act for his firm. The purpose of the pre-construction meeting is to discuss any specific concerns or potential problems that the Contractor is aware of, to provide general information appropriate to the contract, to identify responsible individuals for various functions within each organization, and to develop tentative dates for the start of construction.

The Contractor shall submit to the Engineer during the pre-construction meeting the following documents:

1. Material data safety sheets
2. Manufacturers certificates for all materials
3. Shop drawings
4. Preliminary survey layout, staking and excavation plans
5. Preliminary work schedule
6. Preliminary traffic control plan
7. Emergency telephone numbers

8. Signing authority letter
9. Name and telephone number of the certified safety professional
10. Any other documents specified in the SGC's and SP's
11. Preliminary water diversion plan
12. Proposed pavement mix design composition
13. Contractor's bid item cost breakdown as noted in the SP's.

The pre-construction meeting will cover topics such as critical elements of the work schedule, payment application and processing of invoices. Additionally, a scheduled start date for the work shall be determined.

The Contractor shall be responsible to take minutes of the pre-construction meeting and distribute copies to all meeting participants. The meeting minutes shall be distributed within 48 hours of the meeting. At the subsequent construction progress meeting, the minutes will be attested or revised, as appropriate. The cost for attendance at the pre-construction meeting, and preparation and distribution of meeting minutes shall be incidental to the project and no extra payment will be made.

105.5.3 –Construction Progress Meetings

Construction progress meetings shall be scheduled weekly, or as considered necessary by the Owner. The Contractor shall make all arrangements to have key personnel of his company and of his principal subcontractors present at all progress meetings; representatives shall have authority to make commitments and act for their firms. The Contractor shall assume full responsibility to act for and commit any subcontractor employed by the Contractor, whether or not such subcontractor is represented at the meeting.

During the construction progress meeting the Owner's representative will act as chairman and will advise the Contractor of any administrative matters connected with the contract. The Contractor shall submit for review his two-week rolling schedule. The Contractor's representative at these meetings shall be prepared to discuss and resolve construction problems and concerns, material delivery and vendor data submittals status, construction progress as measured against the Contractor's approved construction schedule and the Contractor's short range construction activities as provided on his two-week rolling schedule. The Contractor shall not be relieved of his responsibility to fulfill all of the terms of the contract as a result of any inferences drawn or suggestions made available at these meetings.

The Contractor shall be responsible to take minutes of the construction progress meetings and distribute copies to all meeting participants. The meeting minutes shall be distributed within 48 hours of the meeting. At the subsequent construction progress meeting, the minutes will be attested or revised, as appropriate. The cost for attendance at meetings, and preparation and distribution of meeting minutes shall be incidental to the project and no extra payment will be made.

Subsection 105.6 - Cooperation with Utilities:

Add the following:

An attempt has been made to determine the location of all underground utilities, drainage pipes, and structures; however, it shall be the Contractor's responsibility to cooperate with the pertinent utility companies so that any obstructing utility installation(s) may be adjusted. The location of the underground and overhead utilities as shown on the plans is based on the best available information. The Contractor shall not assume that this represents an exact location of the line. No guarantee is made to the accuracy of the location shown on the plans. The Contractor shall determine for himself the exact location of all utilities. Should Contractor's operations result in damage to any utility, he shall assume full responsibility for such damage. There also exists the strong likelihood that other abandoned older and undocumented underground utility and irrigation lines exist within the project area. Contractor shall contact Arizona

Blue Stake (telephone number 602 263-1100) a minimum of two (2) working days before beginning any underground work. In addition, Blue Stake notification(s) shall be maintained on a current basis.

The following phone numbers should put the Contractor in contact with the proper personnel:

APS Mr. Bobby Garza	(602) 371-7989
Burlington Northern Santa Fe Railroad Mr. Walter Arend, Roadmaster	(602) 382-5803
Cox Communications, Inc. Mr. Terran Guterrez	(623) 328-3514
Falcon Dunes Golf Club Mr. Chris Bowles	(623) 535-8355
City of Glendale – Development Services Ms. Jaime E. Chapin, P.E.	(623) 930-3197
Luke Air Force Base Mr. Zane Hoit	(623) 856-7634
Maricopa Municipal Water Conservation District No. 1 Ms. Carol Uraine	(623) 546-8266
Qwest Communications Mr. Matt Phillips	(602) 630-1393

It shall be the responsibility of the Contractor to verify the location of all utilities prior to any construction activities in a particular area where such facilities may exist. All existing overhead and underground utilities shall be Protected-in-Place (P.I.P.) unless noted otherwise on the plans, these Supplementary General Conditions, and the Special Provisions.

At all times during construction, the Contractor shall comply with all laws, ordinances, rules, regulations, and safety requirements, including but not limited to the National Electric Safety Code, and the Occupational Safety and Health Standards for General Industry when working in the vicinity of utilities.

NOTE: The cost for the repair of any damage to utilities, and any loss of revenue due to the loss of service of a utility that is in any way caused by the Contractor's actions shall be the sole responsibility of the Contractor at no cost to the project.

Cox Communications: - Cox has two cable lines that run east-west along Olive Avenue, and these lines have been relocated to go under the future box culvert. The Contractor shall protect these lines in place. Cox has also abandoned cable lines in Olive Avenue, and the Contractor shall remove these lines.

Luke Air Force Base (LAFB): - The Contractor shall obtain passes for any employee or sub's employee that will be accessing the LAFB rights-of-way, prior to doing any work within these rights-of-way.

Maricopa Municipal Water Conservation District No. 1 (MWD): The Contractor shall submit his water diversion plans to MWD and the Engineer for review and approval, prior to doing any work on the MWD delivery ditches. This includes the siphon work at Olive Avenue and the delivery ditch removal and reconstruction at Box Culvert No. 1. The Contractor shall coordinate with MWD to install and remove his diversion facilities during an MWD water dry-up period.

Subsection 105.6.2 - Work Within a Railroad Right-of-way:

Add the following:

Burlington Northern Santa Fe (BNSF) owns the BNSF spur track that will be crossed by the Olive Avenue box culvert. The District has applied for a permit from BNSF that will allow the box culvert to be installed. The Contractor will be required to obtain a Right-of-Entry (ROE) agreement with the BNSF as a condition of the License agreement as defined in Section 107.2. Owner must receive a copy of the executed agreement from the BNSF before Contractor ROE application can be submitted and any construction is commenced within the BNSF Right-of-Way. The Contractor shall delay making application for the ROE permit until notification is received from the Owner that the License agreement has been approved. The Contractor shall prepare the bid assuming that construction will not proceed on the Olive Avenue box culvert open-cut crossings of the track, as described in the following specifications, until after May 1, 2008. Construction will either proceed after May 1, 2008, or the Owner may further delay or cancel the BNSF bid items depending upon the status of the License.

The Contractor shall prepare detailed shop drawings for the Olive Avenue box culvert (Box Culvert Number 3), and submit the drawings and supporting calculations to the District and BNSF for review and approval, prior to commencing any work on Box Culvert Number 3. All design components for the part of the box culvert within the railroad easement, including bedding and bedding foundation, must be in accordance with American Railway Engineering and Maintenance Association (AREMA) requirements. The box culvert must support E-80 railroad loading requirements within the entire 50-foot railroad easement. The design must include details of joints and specifications for joint filler. The design must include mechanical heavy duty bolted connections between the box sections. Please note that BNSF does not typically accept dry cast unless the precaster has testing and data to show air entrainment.

The Olive Avenue box culvert crossing of the railroad includes Bid Item 505.3. By prior agreement between the BNSF and the Owner, the Contractor will have 72 hours to install the box culvert across the track R/W as shown on the plans. The 72 hours does not include the time that the BNSF requires to remove the track before installation of the box culvert and to replace the track after the installation.

The Contractor shall provide labor, equipment, and materials to assist the BNSF in operations to remove and replace the track. These activities include providing equipment, operators and riggers to lift the track and to remove and replace ballast material under the track in accordance with these specifications. Equipment and operators to be provided, as a minimum, are a track hoe(1), front-end loader(1) and grader(1). The Contractor shall assist the BNSF during track and ballast removal (1-2 hours duration), and ballast and track replacement (6-8 hours duration). The Contractor will dispose of all material removed. There will be no salvage. The BNSF will remove, and the Contractor shall assist in removing, two 39-foot long sections of track to allow the open-cut installations. The BNSF will supply track replacement material, including such items as ballast, rail, plates, ties and spikes.

BNSF Standard Plan Drawing No. 1000, Sheet 3, is included in the plans and this drawing shows the required subgrade, sub-ballast, and ballast cross-sections (thickness, limits, slopes, etc.) applicable for the railroad construction.

The Contractor shall coordinate with the BNSF Trainmaster, Mr. Brent Conlin, to schedule the time period that train operations will cease to allow installation of the Olive Avenue box culvert precast

sections. The Contractor shall coordinate with and assist, as required, the BNSF Roadmaster, Mr. Walter Arend, for track work coordination. A preconstruction meeting shall be held at least 45 days prior to the date that the Contractor plans to install the railroad crossings to arrange for the 72 hour shut-down. The dates for the 72 hour shut-down of the railroad must be approved by all parties at least 30 days in advance of the construction. **All Olive Avenue box culvert precast sections shall be installed in one 72-hour period.** Completion of pre-cast box culverts within the 72-hour window shall include installation of the pre-cast box culverts, all backfilling and compaction of the box culverts, and completion of subgrade and sub-ballast construction.

The Contractor may be required by BNSF to have flagging services. The BNSF will supply the flagging services, as required, at rate of approximately \$1,000 per day. Flagging is generally required whenever the Contractor is working within 25 feet of the track centerline. The Contractor shall notify the Engineer and the BNSF at least 48 hours in advance of any time the Contractor will have equipment or personnel working within 25 feet of the track. NOTE: Any construction crews performing work within BNSF rights-of-way will need to complete BNSF Contractor Orientation training. This training can be completed on-line and will inform the Contractor's crews on safe work practices adjacent to BNSF tracks.

If the Contractor obtains a temporary crossing permit, flagging will normally be required when the Contractor vehicles and equipment are crossing the track. The BNSF has indicated that it may close the track during the day when the trains are not operating, and therefore flagging would not be required. The flagging allowance, Item 105-4, is based upon flagging services not normally being required except when the Contractor is actually working within 25 feet of the track.

NOTE: Any loss of service or revenue to the BNSF beyond that covered by these Specifications that is in any way caused by the Contractor actions shall be the sole responsibility of the Contractor at no cost to the project. This includes, but is not limited to the Contractor not completing all construction activities and required installations of the Olive Avenue box culvert precast sections by open-cut methods within the allotted 72-hour time period.

All Contractor costs for coordination with the BNSF and work within the BNSF right-of-way, including provision of labor, equipment, materials, flagging services, and others, shall be paid for as allowances.

Payment for providing Contractor support to the BNSF for the removal and replacement of track and ballast shall be made according to the allowance in the Bidding Schedule, with payment to be made based on actual invoices for time, material, labor, and equipment for such removal and replacement activities as required by the BNSF.

ITEM 105-2 - BNSF CONTRACTOR SUPPORT ALLOWANCE

Payment for labor, equipment and materials provided by the BNSF for the removal and replacement of track shall be made according to the allowance in the Bidding Schedule, with payment to be made based on actual invoices from the BNSF for time, material, labor, and equipment for such removal and replacement activities as required by the BNSF.

ITEM 105-3 - BNSF REMOVE/REPLACE TRACK ALLOWANCE

Payment for the BNSF Flagman shall be made according to the allowance in the Bidding Schedule, with payment based on Flagman usage as required only by the BNSF and as approved by the Engineer, and based on actual invoices from the BNSF for such Flagman usage.

ITEM 105-4 - BNSF FLAGMAN ALLOWANCE

Subsection 105.6.3 – Work within Luke Air Force Base Property:

Any person who will be working within the Luke Air Force Base Property is required to obtain written permission from Luke Air Force Base prior to any work within their property.

APS Power Distribution:

APS has overhead and underground electric distribution facilities along Reems Road, Olive Avenue, and Peoria Avenue, that are in close proximity to the project. These are to be protected in place and the Contractor shall use caution in the adjacent areas.

At all times during construction, the Contractor shall comply with all laws, ordinances, rules, regulations, and safety requirements, including but not limited to the National Electric Safety Code, and the Occupational Safety and Health Standards for General Industry when working in the vicinity of electrical lines.

NOTE: The cost for the repair of any damage to these facilities, and any loss of revenue by APS due to the loss of service of the overhead or underground electric cables that is in any way caused by the Contractor's actions shall be the sole responsibility of the Contractor at no cost to the project.

Qwest Communications:

Qwest maintains facilities on both the north and south sides of Olive Avenue. There is an existing 25 pair aerial cable on the south side on joint use power poles with APS. On the north side of Olive Avenue Qwest has a 50 pair buried cable located approximately 25-feet north of the centerline that will be relocated to an appropriate depth below the proposed box culvert, by others. Qwest requires a minimum vertical and horizontal clearance of 12-inches between their facilities and other structures.

Subsection 105.6.4 – Irrigation Facilities:

Add the following Subsection:

Maricopa County Municipal Water Conservation District Number One (MWD) provides irrigation water to several farmers in the Project area. The Contractor shall construct ditches and other facilities as shown on the plans, and diversions as required and approved, in order to maintain the irrigation water supplies and tailwater drainage at all times during construction.

NOTE: The Contractor shall exercise caution and care when working around these facilities. The costs for the repair and any damage to neighboring property and any loss of water conveyance or revenue by MWD that is in any way caused by the Contractor's actions shall be the sole responsibility of the Contractor and shall be corrected to the satisfaction of the MWD solely at the Contractor's expense and at no cost to the Project.

Subsection 105.6.5 – Coordination with Farmers:

Add the following Subsection:

Farming activities adjacent to the Project area will continue throughout construction of the Project. Certain Project features will cut through farm fields, and the Contractor shall maintain the farmer's access, irrigation delivery, and tailwater flows during construction. This will require construction of irrigation facilities as shown on the plans, and temporary diversions. The Contractor shall ensure that all Project activities occur within the Project right-of-way as shown on the plans, and the Contractor shall not disturb the adjacent farming activities outside Project rights-of-way.

Subsection 105.6.6 – Construction Water:

Add the following:

Possible sources of construction water in the area are privately owned agricultural wells and MWD. If the Contractor wishes to use these sources of water for construction purposes, it will be his responsibility to contact the private owners and/or MWD regarding availability, cost and permitting requirements. All costs associated with obtaining construction water and associated permits are incidental to the Project and no extra payment will be made.

Subsection 105.7 – Cooperation Between Contractors:

Add the following:

The Contractor will be required to coordinate with other Contractors working in the area. A box culvert at Peoria Avenue and west of Reems Road may be under construction, or may be starting construction, during this Project, and the Contractor shall coordinate access with the box culvert contractor. The Contractor shall maintain access through the Project, especially at the Hatcher Road alignment and at farm roads.

Subsection 105.8 - Construction Stakes, Lines, and Grades:

Add the following:

- A) The Engineer will furnish a Benchmark that the Contractor will use to set line and grade for all construction. All other surveying required for the project shall be the Contractor's responsibility. The Engineer will not set any construction stakes.
- B) Before any construction work is started, the Contractor shall perform all base surveys and cross sections of existing conditions that may be required as a basis for quantity determination.
- C) The Contractor shall submit original construction surveyor's notes duly signed by a Registered Land Surveyor to the Engineer at the end of the project. Copies of the survey notes shall be submitted to the Engineer during construction as and when requested.
- D) Record Drawings shall be prepared by the Engineer of Record utilizing red-line working drawings maintained on the project site by the Contractor. The paper red-line working drawings shall be maintained by the Contractor in a current condition at all times, and updated at least weekly until completion of the work and shall be available for review by the Engineer and the Engineer of Record at all times. The final red-line working drawings shall be provided by the Contractor to the Engineer prior to project close out and prior to the final contract payment. Final contract payment may be delayed if it is found that the red-line working drawings are incomplete or inaccurate, and until appropriate corrections are made by the Contractor to the red-line working drawings.

Subsection 106.1 - Source of Materials and Quality:

Add the following:

Select Material, Aggregate Base, Mineral Aggregate, concrete, steel products and pipe shall be obtained from commercial sources. Contractor shall pay all royalties, or any other charges or expenses, incurred in connection with the securing and hauling of the material. Contractor will be required to furnish Engineer with a list of its proposed commercial sources prior to use, and shall present certificates stating that the material produced from any commercial sources is in accordance with the Uniform Standard Specifications and these Supplementary General Conditions.

Subsection 106.4 - Trade Names and Substitutions:

Replace with the following:

Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function and quantity required. Unless the specification or description contains or is followed by words reading that no like, equivalent or "or-equal" item or no substitution is permitted, other items of material or equipment of other Suppliers may be accepted by Engineer under the following circumstances:

- A) "Or-Equal": If in the Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for acceptance of proposed substitute items.
- B) Substitute Items: If in Engineer's sole discretion an item does not qualify as an "or-equal" item under subparagraph 106.4 (A), it will be considered a proposed substitute item. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefore. The procedure for review by Engineer will include the following and may be supplemented in the Special Provisions and as Engineer may decide is appropriate under the circumstances. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor. If Contractor wishes to furnish or use a substitute item of material or equipment, Contractor shall first make written application to Engineer for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as that specified. The application will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice Contractor's achievement of completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for work on the project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other Contractors affected by the resulting change, all of which will be considered by Engineer in evaluating the proposed substitute. Engineer may require Contractor to furnish additional data about the proposed substitute.
- C) Contractor's Expense: All data to be provided by Contractor in support of any proposed "or-equal" or substitute item will be at Contractor's expense.
- D) If the final placement of a product will remain the property of the municipality or utility and/or owned by the municipality or utility, that entity is responsible for issuing written approval for any equivalent or "or-equal" products. The Contractor or Supplier will submit to that entity the request and documentation for written approval of a product substitution. The Contractor will provide the entity's written approval to the Engineer at the Pre-Construction Meeting.

Subsection 106.5 - Contractors Marshaling Yards:

Add the following:

The Contractor may establish a Contractor Work Area (CWA) within the Project right-of-way. If the Contractor wishes to establish a CWA at the site, he must submit his plans for use of the site to the Engineer for approval.

The Contractor shall obtain approval of the Engineer when using property outside of the CWA, or outside of the Project limits, to park and service equipment and store materials for use. The Contractor shall obtain prior written approval of the property owner for use of property outside of Project limits, and submit a copy of the approval to the Engineer prior to use of the property.

The Contractor understands that use of Project property or private property for a CWA is solely at his own risk. No compensation will be made to the Contractor for any damage to or loss of equipment within the CWA.

The Contractor will monitor on a daily basis all activities in the CWA that may result in the leakage of oils, fluids, fuels, etc. that may contaminate soils, and promptly report any suspected leaks to the Engineer.

The Contractor shall grade all construction yards, easements and limits of construction which are disturbed by construction or construction related activities to the lines and grades shown on the plans; or as a minimum, where no line or grade is shown, to a condition similar to or better than the pre-existing condition.

Subsection 107.2 - Permits:

Replace with the following:

Contractor shall obtain all permits and licenses, including those required by the City of Glendale, City of Surprise, Maricopa Water District, BNSF, Maricopa County, or any other local or federal agency, and shall pay all charges, fees, taxes, and provide all notices necessary and incidental to the due and lawful prosecution of the work.

Subsection 107.2.1 - AZPDES Permit Requirements:

Add the following:

- A. This project is subject to the Arizona Pollutant Discharge Elimination System (AZPDES) storm water requirements for construction sites under the Arizona Department of Environmental Quality's (ADEQ's) General Permit for Arizona. Under provisions of that permit, the Contractor shall be designated as permittee, and shall take all necessary measures to assure compliance with the AZPDES General Permit for Arizona as well as all other applicable Federal, State and local laws, ordinances, statutes, rules and regulations pertaining to Storm water discharge. As the permittee, the Contractor is responsible for preparing, in a manner acceptable to the ADEQ, all documents required by this regulation, including but not necessarily limited to:
 1. Storm water Pollution Prevention Plan (SWPPP) for the project, including certification of compliance form. Contractor shall be required to develop, implement, update and revise the SWPPP, as necessary, in order to assure compliance with the ADEQ permit requirements. The SWPPP shall be retained on the project site at all times during construction.
 2. Notice of Intent (NOI) to assure compliance with the AZPDES General Permit for Arizona, including certification of signatures.
 3. Notice of Termination (NOT) of coverage under AZPDES General Permit for Arizona.
- B. Preliminary copies of the NOI and the SWPPP shall be submitted to Owner during the pre-construction meeting and shall be subject to review by Owner prior to implementation.
- C. Contractor shall submit the completed and duly signed NOI forms no later than forty-eight (48) hours under most circumstances (however, if the discharge is to an Impaired or Unique Water or is in or near endangered species habitat as identified by ADEQ's smart NOI permitting system, applicants are not authorized under this permit for a minimum of 32 business days following the receipt of the NOI and SWPPP. ADEQ may notify operators within this timeframe that there is cause for SWPPP amendment, or denial of coverage as specified in Parts 1.D.5 and 1.D.6. of the general permit) prior to the initial start of construction on the project to the following agencies:

Arizona Department of Environmental Quality
Water Permits Section/Stormwater NOI (5415B-3)
1110 W. Washington Street
Phoenix, Arizona 85007
or fax to (602) 771-4674

If the facility has the potential to discharge to a municipal separate storm sewer system (MS4), the applicant must also forward a copy of the completed NOI to the owner/operator of the MS4 system at the time it is submitted to the Department.

Storm Water Management Engineer
City of Phoenix
200 West Washington Street, 5th Floor
Phoenix, AZ 85003
(602) 495-5326

Failure by the Contractor (or Subcontractors of any tier) to submit NOI's within the mandated time frame shall result in delay of the construction start date, and no claim for extension of time will be granted for such delay. A copy of the completed NOI shall be posted at the construction site and a copy of the general permit and SWPPP should be on-site at all times.

- D. Inspections of all Storm water pollution control devices on the project shall be performed by Contractor every 7 days or at least once every 14 calendar days, and also within 24 hours of the end of a storm event of 0.50 inches or greater as required under provisions of the AZPDES General Permit for Arizona. A reduced inspection frequency may be used provided the conditions in Part IV.H.2. of the general permit have been met. Contractor shall prepare reports on such inspections and retain the reports for a period of three years after permit coverage expires or is terminated. Inspection reports shall be submitted monthly to Owner along with progress payment requests. Additionally, Contractor shall maintain all Storm water pollution control devices on the project in proper working order, which shall include cleaning and/or repair during the duration of the project.
- E. Contractor warrants that its employees and Subcontractors of any tier and their employees shall at all times comply with all applicable laws, ordinances, statutes, rules and regulations set forth by all federal, state and local governments and the ADEQ in connection with AZPDES Permitting requirements and laws and regulations pertaining to air, groundwater and surface water quality.

Fines and penalties imposed by the ADEQ against Owner or the Contractor for Contractor's failure to comply with any of the requirements of AZPDES General Permit of Arizona shall be borne by the Contractor.

- F. Upon project completion, acceptance and demobilization, Contractor shall submit its completed, duly executed NOI form to the ADEQ at the address listed in Section (C) above, thereby terminating all AZPDES permit coverage for the project. Contractor shall then surrender to Owner copies of the SWPPP, inspection information and all other documents prepared and maintained by the Contractor in compliance of the AZPDES General Permit. Contractor shall retain the originals of such documents for a period of three (3) years following the completion of the project.
- G. The Lump Sum price for the SWPPP shall include all material, labor, and all other costs relating to the preparation, installation and maintenance of the SWPPP during project construction, including assuring proper operation of the pollution control devices installed, and all maintenance, cleaning, and disposal costs associated with clean-up and repair following storm events, runoff or releases on the Project. The Lump Sum price for the SWPPP shall be inclusive of all costs, and no additional claims shall be made by Contractor under any other specification provision of these documents, including Changed Conditions. Payment of fifty percent (50%) for this bid item shall be made at the beginning of the Project, and the remaining payment made upon final completion and acceptance of the Project, as per MAG Section 109.1.

H. Copies of all required forms and guidance for preparing the SWPPP are available in the "Drainage Design Manual for Maricopa County, Volume III Erosion Control." The manual is available at the Flood Control District, 2801 West Durango Street, Phoenix, Arizona 85009.

No payment shall be made for all licenses, permits, except for the AZPDES/SWPPP permit. Payment for all other licenses, permits, and fees shall be included in payment for other items of work. Payment for AZPDES/SWPPP permit requirements shall be made on the basis of lump sum for all work described in Subsection 107.2 .1 for:

ITEM 107-1 - AZPDES/SWPPP PERMITS

Subsection 107.4 - Archeological Reports:

Add the following:

Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the Contractor, or any person working on his behalf, shall be immediately reported to the Engineer. The Contractor shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Engineer. An evaluation of the discovery will be made by authorized personnel and the Engineer to determine appropriate actions to prevent the loss of significant cultural or scientific resources. The Contractor shall prevent his employees from trespassing on, removing, or otherwise disturbing, such resources.

Subsection 107.5:

Add the following:

The entire construction site shall be considered a "Hard Hat Area" and all personnel in the area will be required to wear a hard hat.

Subsection 107.5.3 - Compliance with the Arizona Communication Standard:

Add the following:

Owner will provide Contractor with Material Safety Data Sheets (MSDS) for any products known to exist on the site that are deemed health hazards. Contractor will provide a copy of Owner-provided MSDS to all Subcontractors.

Contractor will provide Owner and all Subcontractors with MSDS for any products that have or are deemed health hazards that will be brought onto the site or created on the site either by Contractor or by any Subcontractors.

Contractor will provide Owner with a statement certifying that all personnel (Contractor and Subcontractor) employed by Contractor or by a Subcontractor on the job site have received the required Hazard Communication Standard training.

Subsection 107.6.3 - Public Information and Notification:

Add the following:

The Contractor shall employ a specialty public information service as a subcontractor to provide the community relations program for the project as described herein. Contractor shall work closely with his subcontractor in developing and carrying out the community relations program. Contractor shall submit a history of the subcontractor's qualifications and experience in public information services at the pre-construction conference for acceptance by the Engineer. The community relations program shall be designed to run the full length of calendar days in the contract for this project. The program will include but not be limited to:

1. Distributing a pre-construction information letter to all residents, business, etc. within a one-half mile radius of the PROJECT, in all directions. All printed materials must be in both English and Spanish.

2. Printing and distribution of public notices and/or newsletters.
3. All public involvement activities will be in accordance with the Owner's "Public Involvement and Public Information Guidelines, Latest Edition (August 2004)", a copy of which can be obtained from the Flood Control District Public Information Office at 602 506-2983.

The Contractor will use these or other means to inform the local citizens of necessary operations which create high noise levels, street closures, limited access, detour locations, haul route and material delivery routes, hours of construction and disruption of bus, trash, school bus and other delivery/pick-up routes.

The Contractor will be required to furnish a private line telephone to be used solely for receiving incoming calls from local citizens with questions or complaints concerning construction operations or procedures. The Contractor shall publish this phone number and maintain a 24-hour answering service. The answering service shall be operated by Contractor personnel during all hours that work is being performed on the job site. The Contractor shall maintain a log of incoming calls, responses, and action taken which shall be submitted to the Engineer weekly and/or upon request.

Prior to the start of work, the Contractor shall notify, by letter, all affected businesses and residents of construction plans and schedules within the geographic area identified above. In addition, all schools and emergency services which serve the geographic area will also be notified even though they may be located outside the geographic area described above. The letter shall contain, as a minimum, the following information:

1. Name of Contractor
2. 24-hour telephone complaint number
3. Brief description of the project
4. Name of Contractor Project Superintendent
5. Name of Engineer
6. Name of Area Supervisor
7. Construction schedule including anticipated work hours
8. Traffic regulations including lane restrictions

The Contractor shall submit a Public Information and Notification Plan to the Engineer at the pre-construction meeting. No payments shall be made for this item until the Engineer approves the plan.

The plan and work which is eligible for reimbursement shall include: meetings with impacted businesses, schools, emergency services, residents, etc.; scheduling; preparation and distribution of newsletter at least monthly; and maintaining a 24-hour telephone hot line for complaints.

The Contractor shall submit a final report/evaluation of the Public Information and Notification process performed for this project. This report shall be submitted before the Contractor receives final payment.

Payment will be based on invoices, and will be for a total amount not to exceed the amount shown in the bid schedule for the item, PUBLIC INFORMATION AND NOTIFICATION ALLOWANCE, for work performed in notifying and coordinating with the local population impacted by this project. To cover the cost for administration and supervision, the General Contractor may add an amount equal to not more than 5 percent of the accumulated total invoiced billing for actual public information services provided by a Subcontractor. This cost for administration and supervision will be considered included in the PUBLIC INFORMATION AND NOTIFICATION ALLOWANCE.

ITEM 107-2 - PUBLIC INFORMATION AND NOTIFICATION ALLOWANCE

Subsection 107.6.4 - Project Signs:

Add the following:

Contractor shall provide and install three project information signs, at locations to be determined by the Engineer, before beginning construction to inform the public of the forthcoming project and construction dates. Project signs shall include the names of all agencies participating in the project. The signs shall be in English and Spanish and include the 24-hour hot line complaint telephone number. Signs shall be constructed in accordance with the Project Sign Information drawing to be provided to the Contractor at the pre-construction meeting. The signs shall be installed at the location(s) approved by the Engineer. The Contractor shall maintain the signs as necessary, and update the information as requested by the Engineer. Payment shall be made according to the allowance in the Bidding Schedule in installments of 50% upon installation, and the remaining 50% upon final payment for the work.

ITEM 107-3 - PROJECT SIGNS ALLOWANCE

Subsection 107.8 – Use of Explosives:

Delete in its entirety and replace with the following:

Because of the proximity to residential and commercial areas as well as major utilities, the use of explosives will NOT be permitted for any construction activities on the project.

Subsection 107.9 - Protection and Restoration of Property:

Add the following:

The Contractor shall protect-in-place all existing structures and other features as identified on the plans, including but not limited to irrigation facilities, utilities, roadways, railroad tracks and signals, fencing, signs, and other structures and features near construction activities.

The Contractor shall limit all construction activities to the right-of-way limits shown on the plans including dedicated street right-of-way, and shall not disturb any areas other than as required for construction as shown on the plans. The Contractor shall avoid the pump station and not disturb or damage the fencing around the pump station.

The Contractor will grade all Temporary Construction and Permanent Easement areas, and project areas which are disturbed during construction to the lines and grades shown on the plans, or as a minimum, where no lines and grades are shown, to a condition similar to or better than the pre-existing condition.

Subsection 107.10 - Contractor's Responsibility for Work:

Add the following:

- A) Contractor is advised that the work area will be subject to flows of water of varying amounts. Owner assumes no responsibility for notifying Contractor of any anticipated flows, nor for any damages incurred by Contractor to its equipment or to any of the Contractor's work as a result of any flows of water.
- B) It is the Contractor's responsibility to divert any water flows from overland flow, groundwater, storm drains and tailwater/irrigation facilities as required to perform the work items included in this project. The Contractor shall coordinate installation and removal of diversion facilities with Maricopa Water Conservation District No. 1 (MWD). The Contractor shall submit his diversion plans to the Engineer and to MWD for their review and approval, prior to installation of any diversion facilities. Plastic-lined ditches will not be acceptable for diversions; the Contractor shall construct either shotcrete-lined diversions or use plastic pipe for diversions. Payment for management of all water for the Project, including water from farm irrigation delivery ditches, tailwater ditches, drainage from adjacent properties, and diversion of irrigation water, floodwater and nuisance water, including labor, pumps, electricity, diversion plans, ditches and pipes, ditch linings, backfill or removal of diversion ditches

and pipes and linings, and materials needed for diversion, is made on the basis of the lump sum price bid for such water management and diversion.

ITEM 107-4 – WATER MANAGEMENT

- C) No payment will be made for providing excavation protective works for such things as dewatering. The cost thereof shall be included in the bid price for the construction or installation of the items to which said excavation protective works are incidental or appurtenant.
- D) The Contractor shall take all necessary action to protect the public from the construction work area.
- E) The Contractor shall notify the Engineer of any unauthorized personnel in the Project area including the presence of the general public.
- F) The Contractor shall coordinate with BNSF for construction of the box culvert at Olive Avenue.
- G) The Contractor shall coordinate with MWD for construction impacting their facilities.
- H) The Contractor shall coordinate with other contractors working in or near the Project rights-of-way. A contractor will be constructing a box culvert at Peoria Avenue west of Reems Road, that ties into the north end of the Project channel, and this construction may be underway at the beginning of this contract.

Subsection 108.1 - Notice to Proceed:

Delete Paragraph (A) and replace with the following:

- (A) Contractor shall commence work within seven (7) calendar days after the Notice to Proceed and complete all work within **three hundred sixty five (365)** calendar days, plus **one hundred twenty (120)** calendar days for the landscape maintenance period, for a total of **four hundred eighty five (485)** calendar days, beginning with the date specified in the Notice to Proceed.

Subsection 108.2 - Subletting of Contract:

Add the following:

For this project, Contractor shall perform, with its own organization, work amounting to 50 percent or more of the total contract cost.

Subsection 108.4 - Contractor's Construction Schedule:

Delete in its entirety and replace with the following:

Contractor shall submit a proposed work schedule to Engineer for review before starting work using the Primavera or other similar software program that is acceptable to the Engineer. Weekly updates shall be submitted to Owner's Inspector at the weekly coordination meeting.

Contractor shall be solely responsible for the planning, scheduling, and execution of the work to assure timely completion of the project.

Subsection 108.4.1 - Contractor's Billing Schedule:

The Contractor shall furnish the Engineer an Estimated Billing Schedule that shall include the estimated amount of each billing for the total project at the pre-construction conference, and thereafter at monthly intervals as agreed to between the Contractor and Engineer.

Subsection 108.5 - Limitation of Operations:

Add the following:

The normal workweek shall be 40 hours, Monday through Friday, and the work hours will be determined at the pre-construction meeting. This does not imply that this contract can be completed on time utilizing normal working hours. The Contractor shall furnish sufficient forces and shall work such hours including night shifts and overtime operations as necessary to ensure the completion of the work within the time required. To work other than normal working hours, for other than emergency situations, the Contractor shall give the Engineer at least 24 hours advance written notification and receive written approval before

working. The notification shall include: the working hours, the type of work to be performed, and the name of and a phone number for the person in charge. Should the Contractor elect to perform any work after regular working hours, on weekends, or legal holidays, any charges incurred by the Owner for inspection of the work, surveys or tests of materials will be deducted from monies due or to become due to the Contractor.

Subsection 108.9 - Failure to Complete on Time:

Add the following:

The actual cost per calendar day incurred by the District for Administrative and Inspection Services on this project will be added to the daily charges as indicated by MAG TABLE 108, LIQUIDATED DAMAGES, and will be deducted from money due or to become due to the Contractor for each and every calendar day that work shall remain incomplete after the time specified for the completion of the work in the proposal, or as adjusted by the Engineer. Nothing contained in this provision shall prohibit the Owner from deducting from money due or to become due to the Contractor for any other costs incurred by the Owner directly attributable to the delay in completing this contract.

If the Contractor does not complete the work on Box Culvert No. 1 within the 30-day time period allotted for the Reems Road closure, liquidated damages will be assessed on a daily basis, per MAG 108.9, for Box Culvert No. 1. If the Contractor does not complete the work on Box Culvert No. 3 within the 30-day time period allotted for the Olive Avenue closure, liquidated damages will be assessed on a daily basis, per MAG 108.9, for Box Culvert No. 3.

If the Contractor does not complete the work on the pre-cast section of Box Culvert No. 3 within the 72-hour time period allotted for the railroad and Olive Avenue closure, liquidated damages will be assessed based on direct damages to the railroad, as determined by the BNSF Railroad Company.

Any loss of service or revenue to the BNSF beyond that covered by these Specifications that is in any way caused by the Contractor actions shall be the sole responsibility of the Contractor at no cost to the project. This includes, but is not limited to the Contractor not completing all construction activities and required installations of the Olive Avenue box culvert precast sections by open-cut methods within the allotted 72-hour time period.

Subsection 109.2 - Scope of Payment:

Add the following:

In addition to the contained provisions, the work under this section shall consist of preparatory work and operations, including but not limited to, the movement of personnel, equipment, supplies and incidentals to the project site; the establishment of all offices, buildings and other facilities necessary for work on the project, and for all other work operations that must be performed and costs incurred prior to beginning work on the various items on the project site.

The "complete-in-place" rate shall include but not necessarily be limited to all labor, material and equipment costs for preparation, installation, construction, modification, alteration or adjustment of the items, which shall include all costs for salaries and wages, all payroll additives to cover employee benefits, allowances for vacation and sick leave, company portion of employee insurance, social and retirement benefits, all payroll taxes, contribution and benefits imposed by any applicable law or regulation and any other direct or indirect payroll-related costs. The rate shall also include but not necessarily be limited to all costs for indirect charges or overhead, mileage, travel time, subsistence, materials, freight charges for material to Contractor's facility or project site, equipment rental, consumables, tools, insurance to the levels specified in Section 103.6 CONTRACTOR'S INSURANCE, all applicable taxes, as well as Contractor's fee and profit. This rate shall further include all site clean-up costs and hauling of construction debris to disposal sites designated by the Engineer.

Payment will be made for only items listed in the proposal and will not be made in accordance with the measurement and payment provisions of the MAG Standard Specifications where this differs from the items listed in the proposal. All materials and work necessary for completion of this project are included in proposal items. Any work or materials not specifically referred to in these items are considered incidental to the item and are included in the unit price. **Payment shall not be made for unused materials**, except for the additional paint that the Contractor will provide the Engineer, per these specifications.

It is the responsibility of the bidders to contact all municipalities in the area to determine if they will charge Contractor sales taxes or any fees for work on this project. Any such taxes or fees shall be paid by the Contractor.

Subsection 109.7 - Payment for Bond Issue and Budget Projects:

(A) To third paragraph, add:

Payment or release of retained funds shall be made to the Contractor within thirty (30) days following final payment to the Contractor [reference (B) following], and Contractor furnishing to Engineer satisfactory receipts for all labor and material billed and waivers of liens from any and all persons and Subcontractors holding claims against the work. Additionally, Contractor shall furnish completed and sealed As-Built plans and a completed Certificate of Performance to Engineer evidencing it has satisfactorily discharged all its duties in connection with the work to be performed under this Contract. The Certificate of Performance shall be provided to the Contractor by the Engineer.

(B) Add the following:

The final payment will be made to Contractor by Owner within thirty (30) days following receipt of the As-Built plans, Certificate of Performance, Engineer's final estimate and receipt by Owner of Consent of Contractor's Surety to said final payment. If payment will be longer than thirty (30) days as aforesaid, Owner will provide Contractor specific written findings for reasons justifying the delay in payment.

(C) Contractor's monthly pay estimates will be processed by Owner's Construction Branch during the last week of the month.

Subsection 110 – Notification of Changed Conditions and Dispute Resolution:

Delete in its entirety and replace with the following:

The Contractor and Owner will follow the established rules of the Maricopa County Procurement Code.



SPECIAL PROVISIONS

CONTRACT FCD 2005C018

REEMS ROAD CHANNEL AND BASIN PROJECT

PCN: 470-12-31

REEMS ROAD CHANNEL AND BASIN PROJECT

**CONSTRUCTION SPECIAL PROVISIONS
CONTRACT NO. FCD 2005C018**

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- B. Heating & Cooling - Adequate electrically powered equipment to maintain an ambient air temperature of 72 degrees F plus or minus 8 degrees.
- C. Telephone, answering, and FAX machine – Two separate outside telephone lines for the exclusive use of the Engineer. The Contractor will pay for the cost of the line and local calling charges. The District will pay for long distance charges made on this line.
- D. Toilet - A commode and wash sink in a separately enclosed room within the building or mobile trailer, properly ventilated and complying with applicable sanitary codes. Contractor shall provide water service.
- E. Maintenance - The contractor shall maintain all facilities and furnished equipment in good working condition.
- F. Fire Extinguisher - Two non-toxic, dry chemical, fire extinguishers meeting Underwriters Laboratories, Inc. approval for Class A, Class B, and Class C fires with a minimum rating of 2A: 2B: 10C.
- G. Electricity - Contractor shall provide electric power and pay for all electric services.
- H. Furnishings - Two office desks with drawers, five office chairs (padded, swivel type), one drafting table (adjustable height 3 feet by 6 feet), three 8 foot conference tables, twelve folding chairs, one draftsman's stool, and two four drawer legal file cabinets. All furnishings shall be in good working order.
- I. Copier - Copier for 8-½ inch by 11 inch and 11 inch by 17-inch paper with minimum 10 copy capacity.
- J. Potable Water Supply – Contractor shall provide a potable water supply and pay for all water service.
- K. A high-speed/broad band internet connection will be provided for the use of FCD personnel. All costs and equipment (i.e. modem) associated with this service will be born by the Contractor.

The office shall be fully equipped and made available for the Engineer's use and occupancy prior to the start of any Contract work and not later than 10 days after the date of notice to proceed. The Engineer will notify the Contractor, in writing, of the acceptability of the Field Office provided. The Contractor shall maintain the field office in operating condition until seven (7) days after acceptance of the Contract work.

The Contractor shall maintain all facilities in good operating condition and appearance for the designated period, after which all portable buildings or trailers, fencing, surfacing, and utilities shall be removed from the site, the areas cleaned and seeded if required and left in a neat and acceptable condition.

Subsection 202.1 - Payment

Add the following subsection:

Payment shall be made on the basis of the lump sum price bid. This price shall be full compensation for supplying and furnishing all materials, facilities, and services and performing all work involved as specified herein. The lump sum price bid shall not exceed three (3) percent of the total project bid amount exclusive of mobilization. No additional payment will be made for occupancy and services during periods of contract extension of time due to engineering changes. Payment of the mobilization bid line item will be at the discretion of the Engineer.

ITEM 202-1 - MOBILIZATION

SECTION 206 - STRUCTURE EXCAVATION AND BACKFILL

Structure excavation and backfill shall conform to Section 206 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 206.2 - Foundation Material Treatment

Add the following to this subsection:

Foundation bearing surfaces shall be free of debris and water softened materials prior to placing concrete and reinforcing steel. Any loose or disturbed zones should be removed and replaced with compacted fill or lean concrete.

Subsection 206.4 - Structure Backfill

Add the following to this subsection:

Compaction of structure backfill soils against embedded footings, walls, and headwall structures shall be accomplished to a minimum 95 percent of the maximum ASTM D698 density.

Compaction against wing walls or within 3 feet of the walls shall be accomplished using non-wheeled, hand operated compaction equipment only.

Backfill behind subsurface walls designed to support utilities, pavement, channels, or other facilities should be compacted to density criteria from Section 211. Backfill shall consist of free draining granular soils that exhibit low expansive potentials. The material shall be free of vegetation, debris, organic contaminants, and fragments larger than 4 inches in size.

Compaction operations shall be accomplished by mechanical methods. Water settling or jetting shall not be permitted.

On-site soils may be used in structural fills or backfill except for high plasticity on-site soils (P.I. > 12) that may not be used in structure fills or backfill. Imported soil used for fills under pavements, or channels, backfill around structures should be granular soils conforming to the following requirements:

Sieve Size	Percent Passing
3"	100
3/4"	60-80
#8	35-80
#200	0-12

(Arizona Test Method 201)

Note: Maximum size may be reduced at the Engineer's direction to satisfy trenching and landscape requirements, etc.

Subsection 206.5 - Payment

Replace this subsection with the following:

No payment will be made for structure excavation and backfill as such. The cost thereof shall be included in the bid price for the construction or installation of the items to which such excavation and backfill is incidental or appurtenant.

SECTION 211 – FINAL AESTHETIC GRADING

Fill construction shall conform to Section 211 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 211.1 - Description

Add the following to this subsection:

Work under this item shall consist of constructing landscape mounds and finish grading as shown on the landscaping plans. Landscape mounds shall be placed outside the channel prism (top of bank to top of bank) and outside the basin top of bank perimeter. Finish grading shall be constructed within 0.10 foot as

indicated on the landscape plans. The material excavated from the channel construction is suitable material for this operation.

Subsection 211.3 – Compacting

Add the following to this subsection:

Compaction of exposed site soil, backfill, fill, and base course materials shall be accomplished to the following density criteria:

<u>Material</u>	<u>Minimum Percent Compaction (ASTM D698)</u>
Subgrade Soil:	
Below structural elements	95
Railroad Subgrade	95
Below Pavement	95
All other locations (Including landscape mounds)	85
Backfill:	
Restoration of channel bank	95
Against structures	95
All other locations	85

On site undisturbed soils or compacted soils subsequently disturbed or removed by construction operations shall be replaced with materials compacted as specified above. Saturated soil shall be removed and replaced with materials compacted as specified above.

Subsection 211.5 - Measurement

Replace this Subsection with the following:

No field measurement for fill will be made for fill material.

Subsection 211.6 - Payment

Replace this Subsection with the following:

Payment for final aesthetic grading per drawings LP0 to LP8 including landscape mounds and final finish grading, shall be made at the lump sum price bid and includes all equipment, labor, and material required to achieve final grades as shown on the plans.

ITEM 211-1 FINAL AESTHETIC GRADING

SECTION 215 - EARTHWORK FOR OPEN CHANNEL AND BASIN

Earthwork for open channels and basin shall conform to Section 215 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 215.1 - Description

Replace this subsection with the following:

The work in this section consists of excavation, grading, and disposal of excavated and removed material for the construction of the channel and the basin as shown on the plans.

All material excavated and not used as fill elsewhere on the project shall become property of the Contractor. It shall be the Contractor's responsibility to dispose of any excess or unsuitable material in an appropriate and acceptable manner.

Subsection 215.3 - Excavation

Add the following to this subsection:

The Contractor is encouraged to make a field visit and review the soil boring logs and geotechnical report

included in **Appendix A** of the Supplementary General Conditions. Existing ground conditions may be different from that represented in the plans. The plans and bid quantities reflect the ground conditions as they existed as of October, 2007. Some advance grading by others may have occurred. The Contractor will be required to have these limits resurveyed in order to determine excavation quantities for the basis of payment. Difference in quantities will not be reason to renegotiate the unit price as specified in MAG Section 109.4.

Contractor shall provide dust control as required to meet all local and federal requirements.

The top eight (8) inches of soil shall be removed and salvaged for topsoil for this Project. The contractor shall overexcavate the channel and basin by eight (8) inches and backfill the overexcavated areas with the salvaged topsoil to final gradelines. The Contractor shall propose his plan for temporary stockpiling of the topsoil to the Engineer for review and approval.

Finished channel and basin surfaces shall be graded to drain.

Subsection 215.7 - Measurement

Replace this subsection with the following:

Replace with the following:

Measurement for payment for excavation of the channel will be made according to the quantity of material excavated from natural ground to finished grade as shown in the plans and computed using the average end area method as follows:

- A. Contractor shall obtain cross sections after clearing and grubbing and prior to any excavation.
- B. Cross sections shall be taken at a minimum spacing sufficient to accurately represent the volume of material removed and with a sufficient number of points to describe the existing ground surface.
- C. Cross sections shall be taken at a minimum of 50-foot stations for the channels, at angle points and at the beginning and ending of curves.
- D. After excavation the Contractor shall obtain new cross sections at the same locations as the existing ground cross sections were taken.
- E. The Contractor shall plot the cross sections where taken as described above showing both the original and final grades, and shall provide volumetric calculations.
- F. The Contractor shall submit the cross sections in electronic format, in either .dgn or .dxf format, and in hard copy form sealed by a Registered Land Surveyor.

Grading and subgrade excavation required for O&M access roads and access ramps, and for riprap placement will be considered incidental to the roads and ramps as per Section 301 and 310, and riprap per Section 220. The Engineer will verify the quantities for excavation.

Subsection 215.8 - Payment

Replace this subsection with the following:

Payment for excavation of material for the channel and basin will be made on the basis of the price bid per cubic yard of excavation. Payment shall include excavation, backfill, unsuitable material removal and backfill, fill work which is required for and incidental to the channel and basin construction, salvage and stockpile of topsoil, over excavation of basin and channel for the topsoil, and backfill to final grade with topsoil, compaction, grading (except for final aesthetic grading as paid for in Section 211), hauling, removal, additional survey as required, dust control, disposal of excess material, and all other miscellaneous items necessary to accomplish the work in conformance with the plans.

ITEM 215-1 - CHANNEL EXCAVATION

ITEM 215-2 - BASIN EXCAVATION

SECTION 220 - RIPRAP CONSTRUCTION

Riprap construction shall conform to Section 220 of the MAG Uniform Standard Specifications except as modified herein:

Subsection 220.1 - Description

Replace this subsection with the following:

The construction of riprap shall consist of furnishing and placing stone in the bottom of the detention basin, box culvert inlet and outlet locations and at the drop structure locations in the channel.

Subsection 220.4 - Plain Riprap

Replace this subsection with the following:

The construction of plain riprap shall consist of furnishing and placing the stones as shown in the plans and as specified in these special provisions.

Riprap Gradation Table ($D_{50} = 18''$) (ANGULAR)	
Stone Size (in)	Percent Passing
1.5 d_{50}	100
1.2 d_{50}	85
1.0 d_{50}	50
0.4 d_{50}	15

Subsection 220.7- Measurement

Replace this subsection with the following:

Riprap shall be measured by the cubic yard of the rock placed to the depth and neat lines as shown on the plans. No measurement will be made for riprap placed beyond the neat line as shown on the plan unless directed by the Engineer.

Subsection 220.8 - Payment

Replace this subsection with the following:

Payment for plain riprap (angular) shall be made on the basis of the price bid per cubic yard in place; within the limits of dimensions shown on the plans for bid items 220-1. Payment shall include labor, preparation of ground surfaces, excavation, riprap, riprap staining (as noted by Section 530 – Painting), replacement of damaged areas, samples provided for the Engineer's approval and all other miscellaneous items required for riprap construction.

ITEM 220-1 - PLAIN RIPRAP

SECTION 301 - SUBGRADE PREPARATION

Subgrade preparation shall conform to Section 301 of the MAG uniform Standard Specifications except as modified herein.

Subsection 301.8 - Payment

Replace this subsection with the following:

No payment for subgrade preparation shall be made as such; the cost thereof shall be included in the bid price for the construction of the items that subgrade preparation is incidental or appurtenant.

SECTION 310 - UNTREATED BASE

Replace Section 310 of the Standard Specifications with the following:

Subsection 310.1 - Description

Replace this subsection with the following:

Aggregate base course, also referred to as ABC, shall be placed for the maintenance roads and maintenance access ramps, where shown on the construction plans.

Subsection 310.2 - Placement

Replace this subsection with the following:

The ABC may be placed and compacted in a single layer. After distributing, the base material shall first be watered and then immediately bladed to a uniform layer that will net, after rolling, the required thickness. If the materials deposited are not uniformly blended together, the blading operation shall be continued to such extent as may be necessary to eliminate segregation. The quantity of water applied shall be that amount which will assure proper compaction resulting in a relative density of not less than 100 percent as determined under Section 301 of the Standard Specifications. Care shall be exercised in connection with watering operations to avoid wetting the subgrade or any lower base course to detrimental extent.

Upon completion, the base surface shall be true, even and uniform, conforming to the grade and cross-section shown on the design plans.

ABC may vary not more than one-half inch (1/2") above or below required grade and cross-section.

Subsection 310.3 - Measurement

Replace this subsection with the following:

Aggregate base course shall be measured by the square yard, based upon the dimensions shown on the design plans. No allowance is made for spalling or waste beyond those limits.

Subsection 310.4 - Payment

Replace this subsection with the following:

No payment will be made for the aggregate base course used for the asphalt pavement replacement. The cost thereof shall be included in the cost of pavement replacement.

Payment will be made for aggregate base course used for surface treatment at the unit cost bid per square yard. Such payment shall be compensation in full for items including but not limited to materials, transportation, subgrade preparation, miscellaneous earthwork, labor, equipment, placement, watering, and roller compaction.

ITEM 310-1 – 4-INCH AGGREGATE BASE COURSE MAINTENANCE ROAD

SECTION 336 - PAVEMENT MATCHING AND SURFACING REPLACEMENT

Pavement matching and surfacing replacement shall conform to Section 336 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 336.1 – Description

Add the following to this subsection.

This item is for the re-construction of the pavement cuts or construction of pavement connections in Reems Road, Peoria Avenue, and Olive Avenue for the construction of the concrete box culverts and any other project improvements in the roadway.

Subsection 336.2.2 -Pavement to be Removed

Add the following to this subsection.

All pavement to be removed shall first be sawcut.

Subsection 336.3 - Types and Locations of Pavement and Surfacing Replacement

Replace this subsection with the following:

MAG 200 Type "B" with T-Top will be utilized for pavement replacement on Reems Road and Olive Avenue. Pavement connections shall not be T-Top. The pavement replacement shall consist of at least two layers of asphalt pavement over 12" of aggregate base course.

Reems Road and Olive Avenue

The pavement replacement shall be a minimum of 8" (compacted thickness). The base courses of the asphalt pavement shall be lifts not exceeding 3" when compacted of C-3/4 and the surface course shall be 2" of D-1/2 and shall match the grades of the existing pavement.

The materials shall conform to MAG Sections 702 and 710, and the following:

Asphaltic Concrete Type	C-3/4, D-1/2
Mineral Filler	Portland Cement (1-1/2% by weight)
Asphalt Cement	AC-20

Subsection 336.4 - Measurement

Replace this subsection with the following:

Measurement for payment and surfacing replacement will be by the square yard, based upon actual field measurement of the area covered along the finished surface of the ground rounded up to the nearest foot, and shall be computed to the nearest square yard.

Subsection 336.5 - Payment

Replace this subsection with the following:

Payment for pavement replacement will be made on the basis of the unit price bid per square yard. Such payment shall be compensation in full for items including but not limited to saw-cut, removal, and disposal of existing asphalt, asphalt, subgrade preparation, aggregate base course material, transportation, placement, labor, equipment, and roller compaction. Any pavement replacement in excess of this amount shall be considered incidental and included in the cost of the bid item for such work that the work is incidental or appurtenant.

ITEM 336-1 – PAVEMENT REPLACEMENT (T-Top)

ITEM 336-2 – PAVEMENT CONNECTIONS (not T-Top)

SECTION 350 - REMOVAL OF EXISTING IMPROVEMENTS

Removal of existing improvements shall conform to Section 350 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 350.1 - Description

Add the following to this subsection:

The work includes the removal and disposal of any obstacle to construction, including concrete structures, pipes, concrete irrigation ditches, piles of trash and debris encountered within the right-of-way, unless it is specifically called out on the plans to be removed and salvaged or protected in place. Holes, cavities and trenches resulting from the removal of structures shall be backfilled if necessary in accordance with Sections 206 and 211. The disposal of all waste material removed under this item shall be the responsibility of the Contractor. The disposal site shall be approved by the Engineer prior to disposal.

The Contractor is responsible for obtaining a refuse hauling permit from Maricopa County Environmental Services Department (602) 506-0719.

Subsection 350.4 – Payment

Replace this subsection with the following:

No payment shall be made for miscellaneous removals. Any removal items noted on the plans, other than concrete lined ditch, shall be incidental to and paid by the associated contract bid item.

Payment for removal of concrete irrigation ditches shall be made on the basis of the price bid per lineal foot. Such payment shall be full compensation for all construction equipment, labor, materials, disposal, disposal fees, and all incidentals necessary to accomplish the work in conformance to the plans.

ITEM 350-1 – REMOVE CONCRETE LINED DITCH

Payment for the removal and disposal of miscellaneous inert items and materials, such as fences, concrete slabs and rubble, pipes, debris, furniture and appliances, and scrap metal shall be made on the basis of the price bid per ton as an allowance which use shall be approved by the Engineer, and shall include all labor, materials, disposal fees and equipment necessary to remove and dispose of the material. Removal of vegetation including shrubs, trees of all sizes, and other plants and objectionable material is covered under Section 201 – Clearing and Grubbing and will not be included under this item.

ITEM 350-2 – REMOVAL AND DISPOSAL OF INERT MATERIAL ALLOWANCE

Payment for the removal and disposal of non-inert material shall be made on the basis of the price bid per ton as an allowance which use shall be approved by the Engineer, and shall include all labor, materials, disposal fees, and equipment necessary to remove and dispose of the material.

ITEM 350-3 – REMOVAL AND DISPOSAL OF NON-INERT MATERIAL ALLOWANCE

SECTION 401 - TRAFFIC CONTROL

Traffic control shall conform to Section 401 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 401.1 – Description

Add the following to this subsection:

All traffic control shall conform to the Construction Specifications for this project, Part IV of the “Manual On Uniform Traffic Control Devices For Streets And Highways” (U.S. Department of Transportation, Federal Highway Division) and all revisions thereto, and the request of the Engineer.

It shall be the Contractor’s responsibility to provide, erect and maintain, and remove after completion of the work all necessary signs, barricades, barriers, berms, lights, high level warning devices, delineators, and any other required devices, uniformed officers, and flagmen necessary to properly mark and control the construction area for safe and efficient movement of traffic.

Temporary traffic control devices shall be installed as required prior to the start of work. The approval of Contractor’s traffic control method shall not relieve Contractor of his responsibility to protect the work, Contractor’s personnel, or the general public.

Subsection 401.5 – General Traffic Regulations

Add the following to this subsection:

The Contractor shall provide a traffic control plan for review and approval, to the Engineer, and to the Maricopa County Department of Transportation (MCDOT). The traffic control plan shall include proposed haul routes and proposed street detours and/or closures.

A Reems Road closure of thirty (30) calendar days will be permitted for construction of Box Culvert No. 1, and an Olive Avenue closure of thirty (30) calendar days will be permitted for construction of Box Culvert No. 3. A separate 72-hour road closure of Olive Avenue will be permitted for construction of the pre-cast section of Box Culvert No. 3, which crosses the railroad tracks. These closures will not be permitted to occur at the same time. The Contractor shall submit his proposals for the road closures to the District and MCDOT and show how he can accomplish the work in the limited amount of time. It may be necessary to use early high-strength concrete and include extra shifts to accomplish the work during the limited road closures. Such measures would be incidental to the work and at the expense of the Contractor.

If the Contractor does not complete the work on Box Culvert No. 1 within the 30-day time period allotted for the Reems Road closure, liquidated damages will be assessed on a daily basis, per MAG 108.9, for Box Culvert No. 1. If the Contractor does not complete the work on Box Culvert No. 3 within the 30-day time period allotted for the Olive Avenue closure, liquidated damages will be assessed on a daily basis, per MAG 108.9, for Box Culvert No. 3.

If the Contractor does not complete the work on the pre-cast section of Box Culvert No. 3 within the 72-hour time period allotted for the railroad and Olive Avenue closure, liquidated damages will be assessed based on direct damages to the railroad, as determined by the BNSF Railroad Company.

The Contractor shall furnish all signs, cones, and other traffic control devices and all equipment necessary for the control of traffic. The Contractor shall be responsible for maintaining the necessary traffic control devices until the project is complete.

The Contractor shall submit a certification statement signed by the Contractor and the barricade subcontractor stating that they certify and warrant that the barricades will be erected and maintained in compliance with the barricade manual.

The Contractor shall employ a "designated" person who will be responsible for ensuring that all barricades, signs, barricade lights, signals, and other traffic control devices are established and maintained in strict compliance with the "Manual On Uniform Traffic Control Devices For Streets And Highways" The designated person shall:

1. Inspect all barricading and traffic control devices on a regular, recurring basis and submit a daily (including weekends and holidays) report, in writing, to the inspector of such inspections the next workday;
2. Ensure that existing traffic signals do not conflict with barricades and signs or give misleading signals to pedestrians and motorists. He/she shall immediately bring conflicting conditions to the attention of the inspector. The inspector will coordinate with the County's Traffic Signals Group for any required changes to traffic signal sequencing, timing, or outages;
3. Ensure that flagmen, when employed, are trained in accordance with the O.S.H.A. regulations (29 CFR 1926.201 Signaling); and,
4. Immediately respond to all call-outs by the inspector, the Stand-by inspector, or Base Operations; cooperate with Police or Fire Department Investigators; and, on his/her own responsibility, re-establish barricades and traffic control devices, as necessary.

The "designated" person required by this section may be the same as the "competent" person required for trench safety (O.S.H.A. Regulations- 29 CFR 1926.650(i)) provided such person is qualified in accordance

with O.S.H.A. Regulation (29 CFR 1926.21(1)) for these duties.

The Contractor shall certify, by letter, that the designated person has read and will comply with the requirements of the "Manual On Uniform Traffic Control Devices For Streets And Highways". The Safety Certification letter shall be provided to the City at the preconstruction conference. The Safety Certification should include the name of the "designated" person, the name of the "competent" person (if different from the designated person), telephone numbers where they can be reached 24-hours per day, and any restrictions or limitations on their duties and authorities.

Channelization, including "KEEP RIGHT" signs, shall be provided whenever traffic is moved across the street centerline, the existing center line is removed or opposing traffic is maintained in other than the normal traffic lanes.

All temporary traffic control devices shall be ballasted with sandbags or other approved ballast.

Access to all adjacent properties shall be maintained. When access cannot be maintained, Contractor shall notify the adjacent residents at least 48 hours in advance of the access closure. In no case shall the access be closed for more than four (4) hours. Access for fire stations, hospitals, police stations, and schools shall be maintained at all times. The Contractor shall notify Maricopa County Department of Transportation (MCDOT), fire departments, and transit authority of any road closures at least two (2) days in advance of the closure.

Contractor shall maintain or relocate all existing signal indications, warning signs, STOP, YIELD, and street name signs erect, clean and in full view of the intended traffic at all times. Portable signs should be used to supplement blocked or removed signs. In the event the Contractor removes any permanent signing, which will not be reinstalled immediately, the Contractor shall store permanent signs in a secure location at the project site and request removal by City or County forces. Contractor will reset all permanent signing removed or relocated during construction at Contractor's expense. The Contractor is responsible for all costs incurred in replacing lost or damaged traffic control devices.

Rope, flagging, fencing, and woven plastic tape may be used between barricades and channeling devices to provide additional safety.

Contractor shall install deceleration sand berms in the blocked traffic path or at other hazardous sites in order to prevent vehicles from entering the construction and/or hazard areas. The deceleration sand berms shall be constructed of washed sand and shall be approximately five (5) feet high.

Construction shall not commence or proceed without a Traffic Control Plan approved by MCDOT. At the preconstruction conference, the Contractor shall submit for review his plan for the sequence of construction, any planned lane closures, signing for construction, and the traffic flow. A Traffic Control Plan (TCP) covering the signing and staging shall be submitted and approved prior to the start of each stage of construction. The Traffic Control Plans shall address all construction staging and special provision requirements, including any flagging to be used on the project.

At the time of the Pre-Construction conference, the Contractor shall designate an employee, other than the Project Superintendent, who is well qualified and experienced in construction traffic control and safety, to be available on the project site during all periods of construction to set up, maintain and coordinate safe barricading whenever construction restricts traffic. This individual shall be authorized to receive and fulfill instructions from the Engineer and shall supervise and direct the work. Instructions and information given by the Engineer to this individual shall be considered as having been given to the Contractor.

See SGC_105.6.2 for requirements for working within railroad right-of-way.

Subsection 401.7 - Payment

Replace this subsection with the following:

Payment for traffic control including all mobilization, equipment, signage, materials, jersey barriers, flagging operation, and maintenance shall be made on the basis of the lump sum price bid. This price shall be full compensation for all construction equipment, labor, permits, materials, and all incidentals necessary to accomplish the work in conformance to the plans, except for those items paid for under allowances 105-2, 105-3, and 105-4.

ITEM 401-1 – TRAFFIC CONTROL

SECTION 421 - WIRE FENCES

Add this section in its entirety to the MAG Uniform Standard Specifications

Subsection 421.1 - Description

Add the following subsection:

The work under this section shall consist of furnishing all materials and constructing plain wire fence and gates at the location and in accordance with the details shown on the plans. Fence shall be of the type and size shown on the plans and shall be constructed in accordance with the requirements of these specifications.

Subsection 421.2 - Materials

Add the following subsection:

Plain wire shall be 12-1/2 gauge steel wire and shall be either zinc-coated or aluminum coated. Zinc-coated steel wire shall conform to the requirements of ASTM A 121, Class 1 coating. Aluminum-coated steel wire shall conform to the requirements of ASTM A 585, Type 1, Class 1 coating.

Posts, rails, braces, and bars shall conform to the requirements of Section 772.

Portland cement concrete shall conform to the requirements of Section 725.

Subsection 421.3 - Construction

Add the following subsection:

The Contractor shall clear the fence lines of all earth trees, brush, and other obstructions that interfere with the proper construction of the fences. Clearing the fence line shall be along and within the project right-of-way. Disposal of removed material shall be in accordance with the requirements of Section 201.

Fence shall be constructed as shown on the plans.

Fence posts shall be spaced at the intervals and set to the depths shown on the plans.

In determining the post spacing, measurements shall be made parallel to the ground slope, and all posts shall be placed in a vertical position, except in unusual locations where the Engineer may direct that the posts be set perpendicular to the ground surface.

Line posts may be driven into undisturbed earth provided driving does not damage the posts. All voids around the post shall be backfilled and the material thoroughly tamped.

End, corner, pull, posts, and braces shall be set in concrete footings and crowned at the top to shed water.

Any high points that interfere with the placing of fence wire shall be excavated to provide the clearance shown on the plans.

Changes in the horizontal alignment of the fence line where the angle of deflection is fifteen (15) degrees or more shall be considered as corners and a corner post assembly shall be installed. Changes in fence alignment where the angle of deflection is less than fifteen (15) degrees, but more than five (5) degrees shall be considered as alignment angles and diagonal tension wires shall be installed. The diagonal tension wires shall consist of two (2) twisted steel wires and shall be attached to the adjacent posts.

Intermediate post assemblies shall be installed at not more than five hundred (500) foot intervals between other braced posts. After post assemblies have been placed, the wire shall be pulled taut to the satisfaction of the Engineer, and each longitudinal wire shall be cut and securely fastened to the braced post with devices suited for the purpose. Wire shall not be carried past a post assembly, but shall be cut and fastened to the post independently of the adjacent spans. A maximum of two (2) splices of wire will be permitted between post assemblies, but not on the same wire. No splice shall be placed closer than one hundred (100) feet to any post assembly.

After the tensioning of the wire between the post assemblies, all longitudinal wires shall be attached to each intervening line post at the height and spacing as shown on the plans. The distance from the bottom wire to the ground may vary at one point from that shown on the plans four (4) inches plus or minus. Where abrupt changes occur in the fence line grade, intermediate line posts may be required to maintain proper distances between the bottom wire and the ground.

Spacing of the twisted vertical wire stays shall be as shown on the plans for each type of fence. The vertical wire stays shall be woven into every horizontal wire.

At all grade depressions where stresses tend to pull the posts from the ground, the affected fence posts shall be anchored in concrete or the fence wires shall be weighted with concrete sag weights.

The volume of concrete required to anchor the posts shall be not less than one (1) cubic foot. Fence sag weights shall weigh not less than one hundred (100) pounds and shall be made with a wire loop hanger embedded in the concrete. A double strand of wire shall be attached to each horizontal line of wire and tied to the wire loop hanger of the sag weight.

Subsection 421.4 - Measurement

Add the following subsection:

Wire fence shall be measured on the fence line along the top of the completed fence from center of end posts.

Subsection 421.5 - Payment

Add the following subsection:

Payment for wire fence shall be made on the basis of the price bid per lineal foot. This price shall be considered full compensation for furnishing and installing the wire fence as specified, including removal of obstructions and all incidental costs not specifically covered in other items.

ITEM 421-1 – 4 STRAND SMOOTH WIRE FENCE

Payment for gates shall be made on the basis of the price bid per each. This price shall be considered full compensation for furnishing and installing the gate as specified, including removal of obstructions and all incidental costs not specifically covered in other items.

ITEM 421-2 – INSTALL GATE

SECTION 430 - LANDSCAPING AND PLANTING

Landscaping and planting shall conform to Section 430 of the MAG Uniform Standard Specifications.

Subsection 430.1 - Description:

Delete this subsection in its entirety and replace with the following:

This section shall govern the preparation and planting of native seeding areas and tall pot planting, as required in the plans and these special provisions. All materials and products shall conform to the requirements of MAG Specifications Section 795 or as modified herein.

Unless otherwise provided, all native seeding shall be performed after fine grading has been completed to meet the finish grading requirements shown on the plans and indicated in Section 211

Subsection 430.2 - General:

Add the following to this subsection:

Unless approved by the District's Landscape Representative, hydroseeding shall occur between October and March. Water and related electrical costs are the Contractor's responsibility until Final Acceptance.

SUBSECTION 430.5.8 – TALL POT PLANTING:

Add this section to the MAG Standard Specifications:

General

The work under this item consists of furnishing all equipment, materials, and labor necessary to complete the planting operation of tall pot plants, and maintaining the tall pot plants during the establishment period in accordance with plans and these technical specifications.

The Contractor shall be responsible for the transport of plants from the Flood Control District Nursery (2801 West Durango Street, Phoenix, Arizona 85009) to the site. For further information contact Diana Stuart (602-506-4766). Installation to include planting of tall pot plants with DriWATER Irrigation Supplement, and doing all work required to install the tall pot plants in strict compliance with the Plans and Specifications. The Engineer and Flood Control District shall approve all equipment and methods prior to performing the work. It is the contractor's responsibility to assure that the correct equipment to properly perform the work is on site and the properly trained personnel are present to operate that equipment.

The Flood Control District will furnish all tall pot plants. Tall pot plants shall remain at the Flood Control District nursery until twenty-four (24) hours prior to installation. Plants shall be placed by tall pot pit **only** when pit has been properly augured, watered, and approved by Engineer and the Flood Control District. Tall pot material shall not be transported from the Flood Control District nursery prior to tall pot pits being approved. Tall pot containers and racks shall be returned to the Flood Control District Nursery. Contractor is certifying that pit is proper depth and properly watered within last 24 hours if a tree is placed by the hole.

Tall Pot Pit Excavation and Preparation

Tall pot pits shall be sized per the details, unless otherwise indicated in the Plans and Specifications.

Tall pot pit backfill may utilize on-site native soil as long as the soil meets the specifications for Native Planting Backfill Mix.

In rocky site conditions, on-site soils to be used for backfill may be screened to meet the specifications for maximum aggregate content in topsoil. Refer to Section 430.2 for removal of sub-surface conditions impacting the installation or health of plants.

Nested or layered aggregate or other infertile materials located beyond the limits of the plant pit or within the potential root growth zone of the plants shall be considered a subsurface obstruction and removed as specified.

In areas of caliche or in hard dig conditions, tall pot pits shall be over-excavated to a minimum depth of thirty-six (36) inches and a minimum width of forty-eight (48) inches, 20 pounds of gypsum shall be evenly added to the bottom of the pit, and the pit backfilled with native planting backfill mix compacted to between eighty-five (85) percent and ninety (90) percent compaction prior to auguring of tall pot pit. The tall pot pit shall be filled with water and allowed to drain twice prior to installation of tall pot plant. Contractor shall notify Engineer if pit does not drain within 48 hours.

Existing vegetation shall be grubbed and cleared from within the tall pot plant basin to a distance no less than three (3) foot diameter or as indicated on the plans. All pits shall be excavated to the detailed dimensions with the sides of pit roughened or scarified. Prior to installing tall pot plants, the Engineer is to visually inspect the tall pot pits for proper size and depth. The Contractor shall make all necessary arrangements with the Engineer to have the tall pot pits inspected. The Engineer may reject any tall pot pits, which shall be re-excavated/prepared by the Contractor.

In areas of very soft, sandy, or cobble soils where the tall pot pit caves in as the augur is removed, filling the hole with water prior to planting is not necessary. The tall pot pit shall be augured 8"-12" in diameter to the depth dimensioned on the plans and specifications to loosen the soil column. The pit shall then be cleared to the width dimensioned on the plans and specifications, and the tall pot plant placed into the pit. The pit shall then be backfilled with Native Backfill Mix while lifting the tall pot tube and filling the pit with water creating a Native Backfill Mix slurry. The tall pot pit shall be thoroughly soaked at the end of each day's planting session. Where no irrigation system is provided, one (1) quart of DriWATER Irrigation Supplement shall be poured into the bottom of the pit before backfilling, and four (4) quarts of DriWATER Irrigation Supplement shall be installed at grade level per the plans and specifications and the manufacturer's recommendations.

Tall Pot Plant Watering

Tall Pot Plants shall be thoroughly "soak watered" until water drips out the bottom of the tube in the nursery one day prior to delivery to project site, and at the project site just after delivery.

Once the Tall Pot Plant is in the pit and the pit has been back filled, the plant must be "soak watered" to remove all air pockets in the planting pit per the Plans and Specifications. Use of a water sprayer at the base of the plant is NOT acceptable for this step. At the end of each day's planting session, all Tall Pot Pits with Tall Pot Plants installed must be thoroughly soak watered.

It is recommended that tall pot plants be planted between October and February. If they are planted after February, the Contractor shall add four (4) additional quarts of DriWATER Irrigation Supplement to each tree every thirty (30) days, during the maintenance period.

Tall Pot Plant Protection

At the end of each day's planting session, and after final watering, all Tall Pot Plants planted that day must be sprayed with Liquid Fence Deer and Rabbit Repellent per manufacturer's recommendations. In addition chicken wire cages shall be installed during planting. Chicken wire cages shall be two (2) feet in diameter and three (3) feet tall with open tops. Bottom three (3) inches of cages shall be buried below finished grade of Tall Pot Plant Basin. Cages shall be marked with flagging

Tall Pot Plant Root Barriers

A five-foot diameter root barrier shall be provided and installed per the manufacturer's specifications surrounding Tall Pot Plants where shown on the plans on the downstream berm of the retention basin to help prevent piping of water in the embankment due to root growth and degeneration. Root barrier shall be DWS Series: DWS24-20, 90 degree root deflecting ribs connected with root impervious joiner strips, manufactured by Century Products, 1144 North Grove Street, Anaheim, CA 92808, (714) 632-7083, (or equivalent approved

by District).

Root barriers shall be installed prior to installation of the tall pot plants they are surrounding. Connect ends of roll stock material with one root impervious joiner strip and install encircling the root ball. Vertical 90-degree root deflecting ribs are always facing the root ball. Always install the root barriers ½ inch above grade to prevent root penetration above the barrier. Recommended backfill around outside of root barrier for surrounding planting applications is gravel or crushed rock. Avoid backfill less than ¾-inch or greater than 1 ½ inch. Finish to grade. Do not distort barrier during installation.

Tall Pot Plant Inspection

A pre-maintenance inspection will be performed upon substantial completion of all tall pot plant planting work under this contract. The Contractor shall be present at the inspection and a punch list of items requiring remedial work shall be generated. Upon completion of the punch list items and approval by the Engineer, the ninety (90) day maintenance/establishment period will begin.

Final Maintenance Inspection

At the end of the ninety (90) day maintenance/establishment period a final inspection will be performed. If, after this inspection, the Engineer agrees that all planting areas are weed free and plant materials are in satisfactory growing condition, written Notice of Acceptance will be given to the Contractor for tall pot plant installation.

Tall Pot Plant Maintenance

Unless otherwise authorized, the Contractor shall maintain and be responsible for all landscape areas and materials on a continuous basis as installations are completed during the course of work and until final project acceptance.

All existing and new plants shall be kept in a healthy, growing condition by application of DriWATER, liquid fence spraying, weeding, and any other necessary operations or maintenance. Tall pot basins and beds shall be kept free of weeds, and other undesirable vegetation. Plants shall be inspected at least once per 45 days and appropriate maintenance performed including reconstruction of tall pot plant basins.

Maintenance inspections will occur at 45 day intervals. If landscape areas are improperly maintained, if appreciable plant replacement is required, or other corrective work becomes necessary, the Contractor shall continue to maintain the entire site until all items are corrected and accepted at no cost to the Owner.

All corrective work disturbance, repairs, or replacements completed during the ninety (90) day maintenance/establishment period shall be subject to an additional ninety (90) day maintenance/establishment period from the time of acceptance of the corrective work.

It is recommended that tall pot plants be planted between October and February. If they are planted after February, the Contractor shall add four (4) additional quarts of DriWATER Irrigation Supplement to each tree every thirty (30) days, during the maintenance period.

SUBSECTION 430.5.9 – NATIVE PLANT BACKFILL MIX

Add this section to the MAG Standard Specifications:

Native Planting Backfill Mix shall consist of 'native' site topsoil (no caliche in backfill). Remove all inorganic material greater than 1 inch in size. Soil mix shall be water settled without pooling.

SUBSECTION 430.6– HYDROSEED

SUBSECTION 430.6.1– GENERAL

The work under this item consists of furnishing all materials, preparing the soil, applying seed-mulch mixture and maintaining seeded areas during establishment period in accordance with plans and these technical specifications. Areas to be seeded include areas indicated on plans. The Engineer may adjust the schedule and the locations of the seeding operations within the limits of the project. The Engineer shall establish exact dates to commence seeding and reserves the right to postpone seeding until conditions are suitable. Seeding shall be accomplished in two stages. The first stage shall consist of topsoil tillage and applying chemical fertilizer at specified rates. Second shall consist of application of specified seed mixes, wood fiber mulch, and tacking agent.

The Contractor shall provide, upon request to the Engineer, past performance data that indicates the Contractor’s equipment and procedure are suitable or shall demonstrate the Contractor’s performance. The Engineer has final approval as to equipment and procedure.

Hydroseeding of native grass and shrub species is best done during the fall and winter rainy seasons when the seeds are most likely to germinate and come up in spring. Alternatively, summer monsoon rains will help to germinate warm season species, so some cover can be expected to emerge if hydroseeding takes place just prior to monsoon rains. However, all native grass and shrub seeds are able to stay dormant in the soil until optimum conditions are present for germination, so long as the mulch cover is adequate enough to protect the seed bed.

SUBSECTION 430.6.2– MATERIALS

Seed: Seed shall consist of materials, application rates, and quantities as indicated on plans and these special provisions.

		Mix A (Top Area)	Mix B (Side Slope)	Mix C (Channel Bottom)	Mix D (Basin Bottom)
Scientific Name	Common Name	PLS/ Acre	PLS/ Acre	PLS/ Acre	PLS/ Acre
Forbes/Wildflowers					
<i>Baileya multiradiata</i>	Desert Marigold	1	1	0.5	0.5
<i>Escholtzia mexicana</i>	Mexican Gold Poppy	2	2	1	1
<i>Lesquerella gordonii</i>	Gordon Bladder Pod	1	1	0.5	0.5
<i>Orthocarpus purpurascens</i>	Owl Clover	1		0.5	0.5
<i>Phacelia crenulata</i>	Desert Phacelia	1	1	1	1
<i>Sphaeralcea ambigua</i>	Globe Mallow	1	1	1	1
Grasses					
<i>Aristida purpurea</i>	Purple Three-awn	2	2		
<i>Digitaria californica</i>	Arizona Cottontop			0.5	0.5
<i>Sporobolus airoides</i>	Alkali Sacaton			1	1
<i>Sporobolus cryptandrus</i>	Sand Dropseed			1	1
Shrubs/Small Trees					
<i>Acacia constricta</i>	Whitethorn	1.5			2
<i>Acacia greggii</i>	Catclaw Acacia	2			4
<i>Ambrosia deltoidea</i>	Triangle-leaf Bursage	3	3		3
<i>Atriplex canescens</i>	Four-wing Saltbush	2			2

<i>Atriplex polycarpa</i>	Quailbrush	1			1
<i>Celtis pallida</i>	Desert Hackberry				2
<i>Encelia farinose</i>	Brittlebush		1		
<i>Larrea tridentata</i>	Creosote Bush	4.5			
<i>Psilostrophe cooperi</i>	Paper Daisy	1	1		1
Trees					
<i>Cercidium floridum</i>	Blue Palo Verde	3			3
<i>Chilopsis linearis</i>	Desert Willow	1			1
<i>Olneya tesota</i>	Ironwood	1			2
<i>Prosopis velutina</i>	Velvet Mesquite	1			2
Total PLS/Acre		30	13	7	30

Application rates of seed as specified are for Pure Live Seed (PLS). PLS is determined by multiplying the sum of the germination and hard or dormant seed by the purity.

The seed source shall be from elevations within 1,000 feet of elevation of project site, and for regulatory mitigation site, shall be from within 50 miles of project site. The seed shall be delivered to the project site in standard, sealed undamaged containers. Each container shall be labeled in accordance with Arizona Revised Statutes and the U.S. Department of Agriculture rules and regulations under the Federal Seed Act. Labels shall indicate the variety or strain of seed, the percentage of germination, purity and weed content and the date of analysis, which shall not be more than nine months prior to the delivery date. Weed content of seed shall not exceed 0.5 percent.

Wood Fiber Mulch: The wood fiber shall be natural wood fiber having the property of dispersing readily in water, heat processed in such a manner so that it does not contain any growth or germination inhibiting factors and shall have no toxic effect when combined with the seed or other materials. The fiber shall be dye free.

Wood fiber shall be delivered in undamaged containers labeled and bearing the name of the manufacturer and showing the air-dry weight content, the maximum being twelve (12) percent plus or minus three (3) percent at the time of the manufacture, and with a pH range of 4.5 to 6.5.

Tackifier: Tackifier shall consist of organic muciloid liquid concentrate diluted with water and a psyllium base containing no agents toxic to seed germination. Addition of fertilizer to the slurry mix shall not change the properties of the tackifier. When applied, tackifier shall form a transparent crust permeable by water and air.

Water: Water shall be free of oil, acid, salts, or other substances harmful to plants. The source shall be approved by the Engineer prior to use.

SUBSECTION 430.6.3-CONSTRUCTION REQUIREMENTS/EXECUTION

Perform seeding work only after other work affecting ground is complete. All **areas intended for native seeding shall not be treated with a pre-emergent control**. Protect existing utilities, walls, paving, irrigation systems, and other facilities from damage caused by seeding operations.

Where equipment can operate, the area to be seeded (that has been disturbed) shall be prepared by disking, harrowing, or by other approved methods of loosening the surface topsoil to a minimum depth of four (4) inches. Remove and dispose of all sticks, roots, rubbish, and other deleterious material. All native rock material, which does not interfere with seeding operations, may remain on ground surface. Finish grade and surface appearance shall attempt to match finish and texture of natural desert areas.

On slopes too steep for equipment to operate, the area shall be prepared by hand raking to a minimum depth of four inches. On sloping areas, all disking, harrowing and raking shall be directional and parallel to the contours of the areas involved. All areas, which are eroded, shall be restored to the specified condition, grade, and slope as directed prior to seeding.

Seeding operations shall also be performed on undisturbed soil outside the clearing and grubbing limits of the project. Seeding operations shall not be performed when wind would prevent uniform applications of materials or would carry seeding materials into areas not to be seeded.

All non-paved, non-roadway areas disturbed by construction operations, which are not designated to receive riprap or other installations, shall receive seed mix.

The homogeneous mixture shall be applied to the seeding area by means of hydraulic-type equipment, which shall provide continuous mixing, and agitation action to the mixture of water, seed, and wood fiber. The mixture shall be applied through a pressure-spray distribution system providing a continuous, non-fluctuating discharge and delivery of the mixture in the prescribed quantities.

Contractor may propose alternative means of applying seed depending on area to be seeded. Alternative method (other than by means of hydraulic equipment) must be approved by Engineer prior to start of operation.

The application rates for seed mix materials shall be applied as specified.

<u>Materials</u>	<u>Pounds Per Acre</u>
Seed Mix	Per plans
Wood cellulose fiber	1500
Tackifier	125
Water	Sufficient amount to form a homogeneous mixture capable of being applied by commercial hydromulching equipment.

Apply fertilizer, seed, mulch, and tackifier in a two-step process.

Mix seed and water. Apply slurry mix of one hundred twenty-five (125) pounds per acre of tackifier, one thousand five hundred (1500) pounds per acre of wood fiber mulch, and water Hydroseed areas designated.

Contractor shall provide maintenance of all seeded areas for a minimum of one hundred twenty (120) days.

The Contractor shall provide protective devices as required to protect seeded areas from traffic for a minimum of one hundred twenty (120) days. Repair and reseed areas damaged by traffic, erosion, or poor germination.

Subsection 430.8 - PLANT GUARANTEE AND MAINTENANCE:

Add the following to this section:

Unless otherwise authorized, the Contractor shall maintain and be responsible for all landscape areas and materials on a continuous basis as installations are completed during the course of work during the plant maintenance period, and until final project acceptance.

All plants shall be kept in a healthy, growing condition by watering, spraying, weeding and any other necessary operations or maintenance. Plant basins and beds shall be kept free of weeds, and other undesirable vegetation. Plants shall be inspected at least once per week and appropriate maintenance performed.

A pre-maintenance inspection will be performed upon substantial completion of all landscape work under this contract. The Contractor shall be present at the inspection and a punch list of items requiring remedial work shall be generated. Upon completion of the punch list items and approval by the Owner, the one hundred twenty (120) day maintenance/establishment period will begin.

Final Maintenance Inspection: At the end of the one hundred twenty (120) day maintenance/establishment period a final inspection will be performed. If, after this inspection, the Owner agrees that all planting areas are weed free and plant materials are in satisfactory growing condition, written Notice of Acceptance will be given to the Contractor for landscape installation.

Maintenance inspections will occur periodically. If landscape areas are improperly maintained, if appreciable plant replacement is required, or other corrective work becomes necessary, the Contractor shall continue to maintain the entire site until all items are corrected and accepted at no cost to the Owner.

Any corrective work disturbance, repairs, or replacements completed during the ninety- (90) day maintenance/establishment period shall be subject to an additional ninety- (90) day maintenance/establishment period from the time of acceptance of the corrective work.

The cost of plant establishment, maintenance, and warranty shall be included in the Hydroseed and Tall Pot Planting Bid Items. Thirty (30) percent landscape retention will be paid at the end of the successful completion of the one hundred twenty (120) day plant establishment period

Subsection 430.10 - Measurement and Payment

Add the following to this subsection:

Payment for native seed mix shall be made on the basis of the unit price of each type bid per square yard. This price shall be full compensation for all labor, materials, equipment, and all other items necessary and incidental to the application of the native seed mix, and the 120-day establishment and maintenance period.

The accepted quantities for Seeding, measured as provided above, will be paid in two phases corresponding to the application stage and the 120 calendar-day maintenance stage.

Upon completion of the application stage tall pot planting, and acceptance by the District, the contractor will be paid 70 percent of the contract bid price for the completed work. Such price will be considered full compensation for furnishing and applying the contract-specified seed mix, planting trees, soil amendments, tillage, mulch materials, and tacking agent, all required testing, and all equipment and labor required to complete the work as specified herein.

Upon completion of the 120 calendar-day maintenance stage, and acceptance by the Engineer, the contractor will be paid 30 percent of the contract bid price for the completed work. Such price will be considered full compensation for seeding maintenance and tree maintenance, including all equipment, labor, and materials required to correct deficiencies in seeded, mulched areas, as specified herein.

No measurement or payment will be made for the mobilizations required to apply and stabilize the seeding for each area or sub-area, as specified herein, the cost being considered as included in the contract price for Seeding.

An adjustment to the contract will be made if a contractor-requested seed substitution is approved as specified in section 430.3.6) above.

Payment for tall pot planting for each tree species shall be made at the unit price bid for each for tall pot

planting, and shall be full compensation for planting and maintaining the tall pot plants per the plans and specifications, including all equipment, labor, and materials, transportation of plants, pots, and racks, loading, unloading, clearing, excavating and preparing pit, planting, watering and/or applying Dri-WATER Irrigation supplement, applying Liquid Fence, and maintaining the planted tall pots throughout the maintenance period, and replacement of plants as needed and returning empty pots and racks to the District nursery at 2801 West Durango Street.

ITEM 430-1 - NATIVE SEED MIX A, (TOP AREA)

ITEM 430-2 - NATIVE SEED MIX B, (SIDE SLOPES)

ITEM 430-3 - NATIVE SEED MIX C, (CHANNEL BOTTOM AREA)

ITEM 430-4 - NATIVE SEED MIX D, (BASIN BOTTOM AREA)

ITEM 430-5 - BLUE PALO VERDE PLANTING

ITEM 430-6 - FOOTHILLS PALO VERDE PLANTING

ITEM 430-7 - IRONWOOD PLANTING

ITEM 430-8 - VELVET MESQUITE PLANTING

ITEM 430-9 - DESERT WILLOW PLANTING

SECTION 505 - CONCRETE STRUCTURES

Concrete structures shall conform to Section 505 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 505.1 - Description

Add the following to this subsection:

The work under this section shall consist of furnishing all labor, materials and equipment for the construction of all cast-in-place and other concrete structures including the concrete box culverts, precast concrete box culvert sections at Olive and Reems, wing walls, headwalls, grade control structure walls, irrigation ditches, and retaining walls as located and indicated on the plans.

Concrete shall conform to the requirements of Section 725 of the MAG Uniform Standard Specifications, and mix designs shall additionally meet the requirements of Chapter 5, Section 5.3 of ACI STANDARD 318-89. The Contractor shall submit mix designs and certifications of conformance with the above requirements for the written approval of the Engineer.

The use of Class F fly ash will be permitted in all concrete mixes, subject to approval of mix design by Engineer.

Transit Concrete mixes used on the project must carry current certification from ADOT or Arizona Rock Products Association.

The reinforcing steel shall conform to Section 727, Grade 60, of the MAG Uniform Standard Specifications.

Shop Drawings shall be submitted for the following:

- Product Data: Admixtures, stains, and patching materials.
- Placement Drawings:
 - a. Concrete, identifying location of each type of construction joint.
 - b. Reinforcing steel.
- Plastic Type Water Stops: Details of splices to be used and method of securing water stop in the forms and supporting water stop so as to maintain proper orientation and location during concrete placement.

Do not backfill against walls until concrete has obtained 28-day compressive strength. Place backfill simultaneously on both sides of wall, where required, to prevent differential pressures.

The plans provide for part pre-cast, part cast-in-place for Box Culvert No. 3 (Olive and Reems). The pre-cast section is required because the BNSF railroad will only allow a 72-hour shut-down of the tracks. The Contractor may propose to extend the precast section, at no cost to the District, and shall submit any revisions with his shop drawing submittal, for review and approval by the Engineer. See SGC section 105.6.2 for restrictions and requirements.

Subsection 505.3 –Forms

Add the Following:

Subsection 505.3.1 - Description

This work consists of furnishing and using elastomeric form liners in accordance with these specifications and the lines, grades and dimensions as shown on the Plans, or established by the Engineer / Landscape Architect. Rigid form liners shall not be considered as an 'or equal.'

Subsection 505.3.2 - Materials

Elastomeric Form liners shall be furnished and installed to achieve the finish detail shown in the Plans and approved by the Engineer / Landscape Architect. Samples shall be submitted by the Contractor for approval by the Engineer / Landscape Architect. The master mold and the subsequent form liners are to be manufactured by Scott System, Inc (303) 373-2500, 10777 East 45th Avenue, Denver, CO 80239, or approved equal. The Contractor shall include in the cost of elastomeric form liners the cost to purchase from the manufacturer of elastomeric form liner panels using each elastomeric master mold, as required to meet the project schedule. The shop drawings for each wall shall identify the locations and use of each panel. The Engineer / Landscape Architect reserves the right to review and relocate the various patterns on each wall during the shop drawing review process.

The elastomeric master molds and or elastomeric form liners created for this project shall remain the property of the Flood Control District. The elastomeric master mold shall remain on file at the facility of manufacture for two years, unless otherwise agreed upon by the manufacturer or the Engineer / Landscape Architect. The elastomeric form liners produced for this project may not be used beyond the scope of work specified in the contract without the permission of the Engineer / Landscape Architect. The manufacturer of the elastomeric form liners shall certify that the design will not be reproduced for any other use without the express permission of the Engineer / Landscape Architect.

Subsection 505.3.3 - Elastomeric Form Liners

The Contractor shall be responsible for coordinating the final aesthetic design of the elastomeric form liner pattern with the Engineer, Landscape Architect, Elastomeric Form Liner Manufacturer, Design Team Representative, and the Project Artist. The cost to perform the coordination for the final design shall be incidental to the cost of the elastomeric form liners.

Fabricate elastomeric form liners as required to reproduced master patterns on the wall surfaces of the project. The number and size of the liners shall be determined by the Contractor. The intent is to have the wall relief conform to the layout of the patterning shown on the Plans. The liners are to be large linear pieces. Patchwork liners will not be accepted. All liner fabrication is to be pre-approved by the Engineer / Landscape Architect.

In areas where elastomeric form liners are to be seamed to accommodate dimensions of the forms or intent of the design, the seam shall be placed in areas that will be less noticeable. Clean, straight cuts are required on all edges. All chamfered edges and cuts are to be replaced. Unless otherwise indicated on the Plans, the Contractor may not seam through a pattern's face unless approved by the Engineer, Landscape Architect, Artist or Design Team Representative.

The Contractor shall comply with the elastomeric form liner manufacturer's Complete Use and Application Guide for the methods of securing liners to supporting formwork and the use of elastomeric form liner releasing agents. All form liners may be re-used multiple times. All joint material, fasteners and care and cleaning of liners shall be per manufacturer's Complete Use and Application Guide.

Elastomeric form liner release shall be Scott 440 Elastomeric Form Release or Cresset Chemical 880 Elastomeric Form release as noted in the manufacturers Complete Use and Application Guide or equal. The Elastomeric form liner release shall be worked into all areas, especially pattern recesses.

The Contractor shall be responsible for replacing, at the Contractor's expense; any elastomeric form liner panels damaged during construction operations.

Subsection 505.3.4 - Construction Methods

As part of this contract, Contractor shall provide a full-sized, cast-in-place, painted mock-up of the area identified on the Plans incorporating graphics on one face of the wall utilizing elastomeric form liners, form-ties, seams, and horizontal and vertical edges. Included in the mock up shall be the painted steel railing. Review as-cast surfaces with the Engineer, Landscape Architect and Design Team Representative for approval. The contractor is responsible for providing a mock up that represents the intent of the drawings. The contractor will be responsible for making adjustments as necessary to conform to the plan intent. Contractor shall account for up to (3) full size mock up panels 10' X 10' in size. A bid item for three test panels (505-17) will be employed. The second and third test panels will be used if the client request changes. Mock-up is to remain in place throughout the term of the project and shall be used as a reference standard for quality. The mock up shall be painted per rusticated headwalls shown in the plans and specifications. The mock up **may not** be considered part of the final construction. Contractor will be required to remove and properly dispose of the mock-up at the completion of construction as directed by the Engineer / Landscape Architect.

Fabricate formwork to support the elastomeric form liners and the related accessories with minimum deflection. Provide method of sealing form joints to prevent loss of water from wet concrete based on manufacturer's Complete Use and Application Guide. Design and fabricate forms to facilitate the placement of concrete and the desired textures. Take necessary steps to insure no damage to joints or cast surfaces occurs during stripping operations.

Concrete shall be deposited and consolidated to minimize air and water pockets per the special provisions of the project.

Handle, clean and store forms and elastomeric form liners for re-use so as not to damage form liner edges or surfaces. Conform to manufacturer's Complete Use and Application Guide.

Notify Engineer if any surface defects are found upon removal of forms. Patch only as directed by the Engineer.

Clean and repair surfaces of forms to be re-used in the work. Split, frayed, delaminated or otherwise damaged form facing materials are not to be re-used. Repair and replace elastomeric form liners as recommended by manufacturer.

The Engineer and Design Team Representative are required to be on the job site for the mock-up and first production use of graphic artwork panels and forms. These representatives shall review the preparation of the graphic art and elastomeric form liners prior to concrete pouring. Their recommendations shall be followed by the Contractor at all times to assure the continued acceptance of the graphic art formed concrete pouring.

Periodic visits by these individuals shall be required to assure compliance with the intent, methodology, use and care of the elastomeric form liners.

As the job progresses, and questions related to the integrity of the elastomeric form liners and attached graphics shall be directed immediately to the Engineer for clarification.

Multiple textures and graphics may occur on a single panel. It shall be the Contractor's responsibility to field verify that all graphics and texturing are included and aligned per the details and elevations prior to wall construction. The texture types shall be Scott System #124 Large Striated, #160 Rock Mountain Flagstone, and #166-1 3/4" Chiseled Limestone or equal. Substitutions shall only be approved in writing by the Engineer/Landscape Architect. A substituted pattern will not be permitted. A substitution must resemble the patterns specified with a tolerance of 5% or less visual and measurable difference in pattern, layout, and/or depth of form liner.

Elastomeric Form liner layout may need to be adjusted to adapt to wall features such as blockouts, etc. If such a condition will impact the alignment of the graphics, the Contractor shall immediately notify the Engineer / Landscape Architect.

Concrete surfaces shall be finished in accordance with the requirements in these specifications, and MAG standards and specifications.

Subsection 505.6 - Placing Concrete

Add the following to this subsection:

Place concrete in accordance with ACI 301-89. Prior to placing concrete, remove loose soil and water from excavation and subgrade and debris and foreign material from forms. Obtain Engineer's approval of subgrade before placing reinforcing steel. Check reinforcing steel for proper placement and correct discrepancies. Before depositing new concrete on old concrete, clean surface using sandblast or bushhammer or other mechanical means to obtain a 1/4-inch rough profile. Maximum vertical drop to final placement shall be 6 feet, when not guided with chutes or other devices to prevent segregation caused by impact with reinforcing. Do not use aluminum pipe or aluminum conveying devices.

Steps performed in preparation for placing concrete shall meet requirements and recommendations of ACI 304R-89 and ACI 301-89, except as modified herein. Ends of chutes, piping, hopper gates, and other points of concrete discharge throughout the conveying, hoisting, pumping, and placing system shall be designed and arranged for concrete to pass without becoming segregated. Do not use chutes longer than 50 feet. The minimum slopes of chutes shall be angled to allow concrete to readily flow without segregation. Conveyor belts shall be approved by Engineer, wiped clean with a device that does not allow mortar to adhere to belt, and conveyor belts and chutes covered. Provide standby pump, conveyor system, crane and concrete bucket, or other system onsite during placing, for adequate redundancy to ensure completion of concrete placement without cold joints in case of a primary placing equipment breakdown. Minimum pump hose (conduit) diameter shall be 4 inches. Replace pumping equipment and hoses (conduits) that are not functioning properly.

Limit size of each placement to allow for strength gain and volume change caused by shrinkage. Minimum time between adjacent placements for construction of the spillway floor slab shall be seven (7) days.

Consolidate concrete with internal vibrators with minimum frequency of 8,000 cycles per minute and amplitude required to consolidate concrete in section being placed. Provide at least one standby vibrator in operable condition at placement site prior to placing concrete. Consolidation equipment and methods shall conform to the requirements of ACI 309R-87. Provide sufficient windows in forms or limit form height to

allow for concrete placement through windows and for visual observation of concrete. Vibration consolidation shall not exceed a distance of 5 feet from point of placement. Vibrate concrete in vicinity of joints to obtain impervious concrete there.

When vibrating concrete, apply approved vibrator at points spaced not farther apart than vibrator's effective radius. Apply close enough to forms to vibrate surface effectively but not damage form surfaces. Vibrate until concrete becomes uniformly plastic. Vibrator must penetrate fresh placed concrete and into previous layer of fresh concrete below.

Subsection 505.6.1 - Joints

Add the following to this subsection:

Construction joints shall be constructed as straight joints and made either vertical or horizontal. Concrete placement shall commence after the joint preparation is complete.

For construction joints, prior to placement of abutting concrete, clean contact surface by removing laitance and spillage from reinforcing steel and dowels. Then roughen surface to a minimum of 1/4-inch amplitude by either sandblasting after the concrete has fully cured, water blasting after the concrete has partially cured, or if the concrete is green, cutting the fresh concrete with high pressure water and hand tools. Perform cleaning so as not to damage water stop, if one is present. Joints for the precast sections shall conform to the manufacturer recommendations.

The Contractor shall provide details for water-proofing joints between the CIP and precast sections in his shop drawings.

Subsection 505.8 - Curing

Add the following to this subsection:

Use one of the following methods as approved by Engineer.

Walls and any other surfaces to be stained shall have only water curing procedures used. Method 1: Leave concrete forms in place and keep entire surfaces of forms and concrete wet for 10 days. Method 2: Continuously sprinkle with water 100 percent of exposed surfaces for 10 days starting immediately after removal of forms.

Slabs shall use one of the following methods: Method 1: Protect surface by water ponding for 10 days; Method 2: Cover with burlap or cotton mats and keep continuously wet for 10 days; Method 3: Cover with 1-inch layer of wet sand, earth, or sawdust, and keep continuously wet for 10 days; or Method 4: Continuously sprinkle exposed surface for 10 days. Other agreed-upon methods that will keep moisture present and uniform at all times on surface of slabs. Curing compounds are not permitted.

Subsection 505.9 - Finishing Concrete

Add the following to this subsection:

All vertical surfaces not receiving form liner shall receive a smooth sandblast finish as specified on plans.

All exposed surfaces of the retaining walls, box culvert, all exposed surfaces of the concrete structures, and the nose and interior of the box culvert piers within (10) ten feet of the inlet/outlets shall be stained with colors per these specifications and plans and as approved by the Engineer. The underside of the box culvert, the interior of the box culvert piers greater than (10) ten feet from the inlet/outlets, and any other structures not specified herein shall not receive any stain.

The colors shall conform to the color requirements with respect to hue, value, and chroma. All color stains

shall be applied to the appropriate form type on the concrete test panel, and all colors will be approved by the engineer prior to use. The cost for the concrete test stain is incidental to the cost of the concrete test panel. Concrete stain remaining after the completion of construction shall be provided to the Flood Control District. At least one 5-gallon container of each color shall be provided to the District by the completion of the contract.

Prior to starting patching work, obtain quantities of color-matched patching material and manufacturer's detailed instructions for use to provide a structural patch with finish to match adjacent surface. Develop patching techniques with epoxy manufacturer on mockup panel. Dress surface of patches that will remain exposed to view to match color and texture of adjacent surfaces. Patching of concrete shall provide a structurally sound surface finish, uniform in appearance or upgrade finish by other means until acceptable to Engineer.

For tops of walls, screed surfaces to true level planes. After initial water has been absorbed, float with wood float and trowel with steel trowel to smooth finish free from trowel marks.

Spray evaporation retardant onto surface of fresh flatwork concrete immediately after screeding to react with surface moisture. Reapply as needed to ensure a continuous moist surface until final finishing is completed.

Subsection 505.9.6 - Finishing and Patching Surfaces

Add the following subsection:

When patching defective areas, remove defective concrete to a depth of sound concrete. Small shallow holes caused by air entrapment at surface of forms shall not be considered defective unless amount is greater than 3/4 inch in diameter or as stipulated by the Engineer. Obtain Engineer's approval of chipping work.

Cut out honeycombed and defective areas. Cut edges perpendicular to surface at least 1 inch deep. Do not feather edges. Soak area with water for 24 hours. Patch with non-shrink grout as specified in Section 776. Finish surfaces to match adjacent concrete. Keep patches damp for a minimum of 7 days.

To patch form tie holes, fill with Category I grout as specified in Section 776. Use only enough water to dry pack. Compact grout using steel hammer and steel tool to drive grout to high density. Cure grout with water. Finish and stain surfaces to match adjacent concrete.

Subsection 505.10 - Payment

Add the following to this subsection:

Payment for concrete box culvert cells shall be made on the basis of the price bid per linear foot. A reduction in the concrete box culvert quantities will not be reason to renegotiate the unit price as specified in MAG Section 109.4. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation, railroad subballast, and backfill, color stain, protective coating, paint, aesthetic treatment, and all other items necessary and incidental to construct the box culvert cells and headwalls, complete in place according to the plans and these Special Provisions.

ITEM 505-1 - CONCRETE BOX CULVERT Type A (2 BBL 10' x 6')

ITEM 505-2 - CONCRETE BOX CULVERT Type B (1 BBL 10' x 6') (AUXILIARY FOR 30' FILL LOAD)

ITEM 505-3 - CONCRETE BOX CULVERT Type C (1 BBL 10' x 6' Precast)

ITEM 505-4 - CONCRETE BOX CULVERT TYPE D (2 BBL 10' X 6' FOR 30' FILL LOAD)

Payment for concrete retaining walls shall be made on the basis of the unit price bid for each. This price shall be full compensation for all labor, materials including bulkheads, reinforcing steel, equipment, excavation and backfill, formwork, color stain, painting, protective coating, formliner and aesthetic treatment, additional

concrete required for form liner as shown on landscape details and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions.

ITEM 505-5 – CONCRETE RETAINING WALLS

ITEM 505-6 – CONCRETE RETAINING WALLS AT OLIVE AVENUE

ITEM 505-7 – SOUTH CONCRETE RETAINING WALLS

Payment for concrete grade control structures shall be made on the basis of the price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color stain, protective coating, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions. Riprap is paid by item 220-1 PLAIN RIPRAP.

ITEM 505-8 – CONCRETE GRADE CONTROL STRUCTURE

Payment for concrete inlet structure and for concrete outlet structure shall be made on the basis of the price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, formwork, color stain, protective coating, painting, formliner and aesthetic treatment, additional concrete required for form liner as shown on landscape details and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions.

ITEM 505-9 – CONCRETE INLET STRUCTURE

ITEM 505-10 – CONCRETE OUTLET STRUCTURE

Payment for concrete weir structure shall be made on the basis of the price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, formwork, color stain, protective coating, painting, Reems Road Channel concrete lining, formliner and aesthetic treatment, additional concrete required for form liner as shown on landscape details, and all other items necessary and incidental to construct the structure complete in place according to the plans and these Special Provisions.

ITEM 505-11 – CONCRETE WEIR STRUCTURE

Payment for concrete lined irrigation ditch shall be made on the basis of the price bid per linear foot. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, protective coating, joints as required by Engineer, and all other items necessary and incidental to construct the ditch complete in place according to the plans and these Special Provisions.

ITEM 505-12 - CONCRETE LINED IRRIGATION DITCH

Payment for concrete channel lining (located on the east side of box culvert adjacent to Falcon Dunes Golf Course) shall be made on the basis of the price bid per square yard. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, protective coating, joints as required by Engineer, aesthetic treatment including painting, additional concrete required for form liner as shown on landscape details, and all other items necessary and incidental to construct the lining complete in place according to the plans and these Special Provisions.

ITEM 505-13 - CONCRETE CHANNEL LINING

Payment for concrete headwall shall be made on the basis of the price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, formwork, , and all other items necessary and incidental to construct the structure complete in place according to the plans and these Special Provisions.

ITEM 505-14 – CONCRETE HEADWALL (MAG DET 501-4)

Payment for 20 MIL PVC sheet vinyl waterproofing shall be made on the basis of the price bid per square foot. This price shall be full compensation for all labor, materials, equipment, and all other items necessary and

incidental to install the PVC waterproofing complete in place according to the plans and these Special Provisions.

ITEM 505-15 – 20 MIL PVC SHEET VINYL WATERPROOFING

Payment for concrete pipe (for 30-inch pipe) plugs shall be made on the basis of the price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, and all other items necessary and incidental to construct the structure complete in place according to the plans and these Special Provisions.

ITEM 505-16 – CONCRETE PIPE PLUG (MAG DET 427)

Payment for concrete test panels shall be made on the basis of the price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, steel handrail, equipment, excavation and backfill, formwork, color stain, protective coating, formliner and aesthetic treatment, additional concrete required for form liner as shown on landscape details, removal and disposal of the test panel upon project completion, and all other items necessary and incidental to construct the test panel complete in place according to the plans and these Special Provisions.

ITEM 505-17 – CONCRETE TEST PANELS

SECTION 515 - STEEL STRUCTURES

Steel Structures shall conform to Section 515 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 515.1 - Description

The work under this section shall consist of supplying and installing Waterman Model F-10 or approved equivalent flapgates and access barriers and associated embedments for the concrete structures according to the plans and these Special Provisions.

All material for the access barrier shall be A36 steel. The access barriers and associated embedments shall be galvanized in accordance with MAG Section 771.

Subsection 515.7 - Payment

Payment for the flapgate shall be made on the basis of the price bid for each item and shall be full compensation for all labor, materials, painting, equipment, and all other items necessary to complete the work in place according to the plans and these Special Provisions.

ITEM 515-1 – 30-INCH-FLAP GATE

Payment shall be made on the basis of the price bid for each type of access barrier and associated embedment angles, and shall be full compensation for all labor, materials, painting, equipment, and all other items necessary to complete the work in place according to the plans and these Special Provisions.

ITEM 515-2 – ACCESS BARRIER BOX CULVERT

ITEM 515-3 – ACCESS BARRIER 30-INCH PIPE

SECTION 520 - STEEL HANDRAILS

Steel handrails shall conform to Section 520 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 520.1 - Description

Add the following to this subsection:

The work under this section shall include providing and erecting steel handrails as shown in the plans.

All steel handrails (non-galvanized) shall be painted in accordance with MAG Section 790. Apply one coat of Benjamin Moore CM33 Polymide Epoxy Metal Primer, or equal, per manufacturer's specifications. The finish coat shall be minimum 2 coats of DunnEdwards Neutral Valley DE6119, applied per manufacturer's specifications.

All independent sections of handrail require grounding.

Subsection 520.5 - Payment

Add the following to this subsection:

Payment for handrails shall be made on the basis of the price bid per linear foot. Payment shall be full compensation for all labor, materials, equipment, and painting, and all other items necessary to complete the work in place according to the plans and these Special Provisions.

ITEM 520-1 - STEEL HANDRAILS

SECTION 530 - PAINTING

Painting shall conform to Section 530 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 530.1 - Description

Add the following to this subsection:

The work under this section shall also include furnishing all materials, equipment and labor necessary for the painting of concrete surfaces, and the application of a penetrating desert varnish stain to rip rap installations, or other surfaces as directed by the Engineer, and in accordance with the requirements of the Standard Specifications and these Special Provisions. The Engineer will determine if any slopes or rock areas require staining once the excavation work is complete.

All exposed surfaces of the retaining walls, wingwalls, handrails, and headwalls of box culverts, and the sideweir, concrete channel section, and inlet/outlet structure, and the nose and interior of the box culvert piers within (10) ten feet of the inlet/outlets shall be painted in accordance with these specifications and the plans. The underside of the box culverts, and the interior of the box culvert piers greater than (10) ten feet from the inlet/outlets, and any other structures not specified herein shall not receive any paint

For the purposes of this project, a freshly exposed rock surface is any non-weathered rock surface that is exposed as the result of the contractor's operations.

The colors selected for this project include DunnEdwards NEUTRAL VALLEY DE6119, DunnEdwards RUSTIC TAUPE DE6129, DunnEdwards STORM CLOUD DE6362, DunnEdwards LAKE LUCERNE DE5808.

Test panels measuring 10' x 10' of each of the selected colors shall be applied by the contractor on the concrete surfaces of each structure for final color approval by the Engineer, and the Flood Control District.

All panels shall have two coats of paint applied. The paint shall be applied using the same methods that will be used to paint the concrete structures.

The contractor shall match the final color(s) selected for each structure and provide final 8" x 10" fully covered paint draw downs; no paint shall be ordered, purchased or applied until the final draw downs and samples for each structure have been approved by the Flood Control District.

Subsection 530.2 – Materials

Add the following to this subsection:

Acrylic emulsion paint shall be applied to the exposed concrete surfaces described by these Special Provisions. Paint shall conform to the requirements of Section 790 MAG Standard Specifications, unless otherwise specified.

Subsection 530.2.1 -Desert Varnish Stain:

Add the following subsection:

(A) General Requirements:

The Desert Varnish Stain material shall meet the requirements specified herein. Prior to application of the stain, the contractor shall provide the Engineer with a Certificate of Analysis in accordance with Subsection 106.05 of the Standard Specifications. Submittal of product data sheets listing the application or use requirements, and the types and proportions of stain constituents, and Materials Safety Data Sheets (MSDS) is required for the stain material supplied. Approval of the stain material will not occur until all required documentation has been received by the Engineer.

The contractor shall prepare sample tests of the selected stains for approval. The contractor shall not acquire the stain materials until written notification of the final color selection from the Engineer has been received.

The desert varnish stain shall be ready-mixed at the manufacturer's plant. The contractor shall submit the name of the manufacturer of the desert varnish stain he proposes to use, along with three sets of the manufacturer's specifications for mixing and application, to the Engineer for written approval.

The stain shall be furnished in new, airtight containers, clearly labeled with the exact title of the stain, Federal Specifications Number when applicable, name and address of the manufacturer and lot or batch number. The containers shall meet the U.S. Department of Transportation Hazardous Materials Shipping Regulations when applicable to the product.

Precautions concerning the handling of the stain shall be shown on the label of the stain containers. Stain shall be stored at temperatures in accordance with the manufacturer's written recommendations and shall not be opened until ready for use.

(B) Physical and Chemical Requirements:

The desert varnish material shall be an aqueous solution containing salts of iron and manganese, built-in oxidizers and other trace elements including copper and zinc. The desert varnish stain shall involve applying a stable one-step or two-step component solution directly to the rock cut surface.

(C) Performance Requirements:

The projected life expectancy of the stain shall be 50 to 100 years. The stain shall develop full coloration within two weeks after the application. The final color of the stain shall be controlled or modified by custom blending of the basic ingredients, application techniques, dilution rate of the color concentrate with water, or a combination of these methods.

Chemical components within the stain shall have no adverse reactions or effects on soils, plants or animals. No corrosive by-products shall be present once the stain has been applied. Only nitrate fertilizer products may be present as soluble residues.

Subsection 530.2.2 -Application

Add the following subsection:

Painting shall be accomplished in a neat and workmanlike manner by an Arizona licensed painting contractor that is acceptable to the paint manufacturer and the Engineer.

Prior to application of the paint, the contractor shall provide the Engineer with three original copies of Certificate of Compliance for each lot or batch of paint supplied, in accordance with Subsection 106.1. The Certificate of Compliance shall certify compliance of the paint with each of the specified physical, chemical, and performance requirements for acrylic emulsion paint listed herein. In addition, product data sheets listing the paint constituents and their proportions as well as materials safety data sheets are required for any paint materials supplied.

Subsection 530.2.3 –Desert Varnish Stain

Add the following subsection:

(A) General Requirements:

The Engineer, in consultation with the Flood Control District, shall select and determine the areas and surfaces to be stained prior to application of any desert varnish stain. Surfaces will include rock rip-rap.

The stain shall be applied by an Arizona licensed painting contractor or manufacturer's representative applicator, which has a minimum of one year of experience in the application of desert varnish stains under similar project conditions, as approved by the Engineer.

The method of application, the rate of application, and the surface temperature range of application shall be in accordance with the manufacturer's written recommendations.

The contractor shall cover or protect all adjacent existing and new surfaces which are to remain unstained, including vegetation, from the application of the stain.

The preliminary stain test panels shall be within the project limits, and the samples shall measure at least 24" x 24" in size. The surfaces shall be aged and textured similar to that to be encountered on the work. The stain shall be applied using the same methods that will be used for the work. For each major rock type, the preliminary test panels shall be approved by the Engineer before further stain application may proceed.

After the preliminary test panel sample has been approved by the Engineer, full-scale test panels shall be prepared. The full-scale test panels shall be 10' x 10' in size, or as directed by the Engineer. The full-scale test panels shall use the same application rates, methods, and dilutions as were approved for the preliminary panels. The test panels shall be prepared as specified herein and shall be located at the project site for the duration of the project. One full-scale test panel shall be provided for each of the major rock types encountered on the project. The full-scale test panels may remain as part of the finished work as approved by the Engineer.

If, in the opinion of the Engineer, the results of any test panel are not satisfactory, the Engineer may require that additional test panels be performed in these or other rock types.

For any given major rock type, the contractor shall not begin full-scale staining until final approval of the products and test panels in that rock type is received from the Engineer.

Shade and tone adjustments shall be made in accordance with aesthetic considerations, and final approval may require such adjustments.

All surfaces to be stained shall be cleaned, prior to the stain applied, in accordance with the manufacturer's written recommendations for the removal of all dirt, dust, blasting residue, scale or other foreign substances that could be detrimental to the stain penetration or color. All surfaces to be stained shall be clean and completely dry at the time of the application of the stain.

completely dry at the time of the application of the stain.

After all surfaces have been prepared for the application of stain, the contractor and a representative of the stain manufacturer shall inspect the surfaces to be stained and, if in agreement, shall notify the Engineer in writing that the surfaces are satisfactory for the stain to be applied. The contractor shall not commence application of the stain without specific direction from the Engineer.

Subsection 530.11 – Measurement and Payment

Add the following to this subsection:

In addition to painting and staining as described above, the Contractor shall provide one (1) five-gallon container of each paint color and varnish to the Engineer. No measurement or payment will be made for painting, staining, staining edges, ledges, crevices, or surface relief in the rock face. This cost of this work is included in the stated bid items of Section 220, Section 505, Section 515, and Section 520.

SECTION 601 - TRENCH EXCAVATION, BACKFILLING AND COMPACTION

Trench excavation, backfilling and compaction shall conform to Section 601 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 601.4.2 – Bedding

Add the following to this subsection:

Bedding material may be 1/2 sack CLSM and shall conform to the requirements set forth in MAG Section 728. CLSM shall have a slump of 7 +/- 1 inch and have a minimum of 50-psi compressive strength and a maximum of 100 psi based on a 28-day test.

CLSM bedding material shall be placed in a uniform manner that will prevent voids in, or segregation of, the bedding material, and will not float or shift the pipe. CLSM bedding material shall be placed from bottom of pipe-to-pipe springline. No backfilling above the CLSM shall be commenced until 24 hours after the cement-treated slurry has been placed.

Bedding material above the springline of the pipe shall be granular material containing no pieces larger than 1-1/2 inches and free of broken concrete, broken pavement, wood or other deleterious material.

No water consolidation will be permitted.

Where mechanical compaction is used, the moisture content shall be such that the specified compaction can be obtained. Bedding lifts shall not exceed 12 inches loose and extreme care will be taken to prevent damage to or movement of the conduit by the compaction equipment.

The Contractor may opt to use cement-treated slurry from the pipe springline to the within one foot from the top of the pipe.

Subsection 601.6 - Payment

Add the following to this subsection:

No payment will be included in the proposal, nor direct payment made for trench excavation, foundation, bedding, backfilling, compaction, or placement of temporary pavement, the cost thereof shall be included in the price for the construction or installation of the items to which such trenching is incidental or appurtenant.

SECTION 618 – STORM DRAIN CONSTRUCTION

The work under this section shall conform to Section 618 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 618.1 – Description

Add the following to this subsection:

The work under this section shall consist of furnishing and installing Rubber Gasket Reinforced Concrete Pipe (RGRCP) or other approved alternate pipe at the locations and to the grades and slopes indicated on the plans.

Subsection 618.2 – Materials

Add the following to this subsection:

Concrete pipe, joints, gaskets, and testing shall be according to MAG Section 735.

Subsection 618.6 – Payment

Replace this subsection with the following:

Payment for storm drain construction shall be made at the unit price bid per linear foot, to the nearest foot for each size of pipe. This price shall be full compensation for furnishing and installing the pipe and fittings complete in place, as specified, including excavation, backfilling, compaction, shoring, sheeting and bracing, testing and all incidental work not specifically covered in other pay items.

ITEM 618-1 - 24-INCH PIPE

ITEM 618-2 - 30-INCH PIPE

SECTION 725 - PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to Section 725 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 725.6 - Admixtures

Add the following to this subsection:

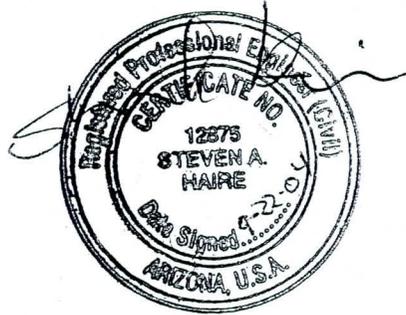
When an air-entraining agent is authorized, the amount used will be limited to the extent that the amount of air by volume shall not be less than 4 percent or more than 6 percent. Air-entraining agents complying with AASHTO M-154 or ASTM C-260 will be permitted as long as strength requirements are met. Any admixture shall be measured accurately by mechanical means into each batch by equipment and in a method approved by the Engineer.

Appendix A
Geotechnical Report
Reems Road Channel and Basin Project

**GEOTECHNICAL REPORT
REEMS ROAD CHANNEL AND BASIN
HALF-MILE SOUTH OF OLIVE AVENUE TO
PEORIA AVENUE
MARICOPA COUNTY, ARIZONA**

Project Number: 47724 (1)

Kleinfelder, Inc.
1335 West Auto Drive
Tempe, Arizona 85284
(480) 763-1200



September 2004

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KLEINFELDER

An employee owned company

September 22, 2004
File No.: 47724 (001)

Mr. Warren Rosebraugh, P.E.
Flood Control District of Maricopa County
2801 West Durango
Phoenix, Arizona 85009

**SUBJECT: Geotechnical Report
Reems Road Channel and Basin
Half-mile South of Olive Avenue to Peoria Avenue
Maricopa County, Arizona**

Dear Mr. Rosebraugh:

Kleinfelder, Inc. (Kleinfelder) is pleased to present this final geotechnical report to Aztec Engineering, Inc. (Aztec) for the proposed construction of the new Reems Road Channel and Basin, which will extend from roughly ½-mile south of Olive Avenue, northward to Peoria Avenue, west of the town of El Mirage, Maricopa County, Arizona. The purpose of our study was to explore and evaluate the subsurface conditions in order to develop geotechnical engineering recommendations for design and construction of the channels, culverts, pipes, and related elements.

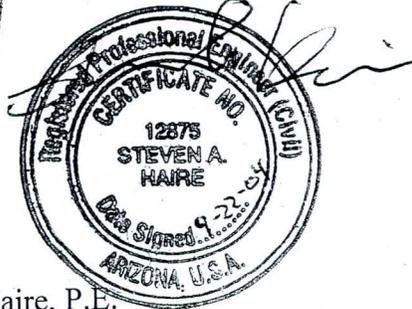
Based on the results of our study, the site may be developed as planned using conventional grading and construction techniques. Recommendations regarding the geotechnical aspects of project design and construction are presented in the following report.

Recommendations provided herein are contingent on the provisions outlined in the "Additional Services" and "Limitations" sections of this report. The project Owner should become familiar with these provisions in order to assess further involvement by Kleinfelder and other potential impacts to the proposed project.

We appreciate the opportunity of providing our services for this project. If you have questions regarding this report or if we may be of further assistance, please contact the undersigned.

Sincerely,

KLEINFELDER, INC.



Steven A. Haire, P.E.
Senior Geotechnical Engineer

Reviewed By:

Charles E. Reynolds, G.I.T.
Geotechnical Department Manager

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FIGURES

Plate 1 Site Plan

APPENDICES

Appendix A – Field Study

Appendix B – Laboratory Testing

1.0 INTRODUCTION

1.1 General

In this report we present the results of our geotechnical study for the proposed Reems Road Channel and Basin, which will extend from roughly 1/2-mile south of Olive Avenue, northward to Peoria Avenue, Maricopa County, Arizona. This site is located west of the town of El Mirage and north of Luke Air Force Base, in the western part of the Phoenix Basin. The project limits are shown on Figure 1. The purpose of the study was to explore and evaluate the subsurface conditions at various locations on the site in order to develop geotechnical engineering recommendations for project design and construction.

Our study included a site reconnaissance, subsurface exploration, representative soil sampling, field and laboratory testing, engineering analyses, and preparation of this report. This report presents recommendations for design and construction of box culverts, stability of channel and basin slopes, earthwork shrink/swell factors, soil corrosivity for pipeline design, and agronomy testing and recommendations for topsoil. The recommendations contained in this report are subject to the limitations presented in the "Limitations" section of this report.

1.2 Project Description

We understand that the proposed construction will include the construction of approximately 7,900 linear feet of trapezoidal open channel and pipe section, along with a retention basin and three box culverts to convey storm water below Peoria Avenue, below Olive Avenue and the adjacent railroad, and below Reems Road at the south end of the project. The preliminary conceptual layout of the project features are shown on the Site Plan, Figure 1.

2.0 FIELD EXPLORATION

The field exploration consisted of drilling test borings to obtain the geotechnical soil profile and excavating by hand at two locations at the edge of the existing Reems Road pavement to observe the existing pavement structure.

2.1 Drilling and Sampling

The drilling and sampling program was performed on August 2 and August 3, 2004, and consisted of drilling ten borings along the project alignment and/or within the retention basin area. The boring locations are shown on the Site Plan, Figure 1. The locations of the borings were estimated by our staff professional based on rough measurements from the limits of existing landmarks; therefore, the locations of the borings shown on the attached Site Plan should be considered approximate. The approximate Latitude and Longitude of each boring was measured in the field using a GPS unit, and coordinates are noted on the test boring logs presented in Appendix A.

The borings were drilled using a truck-mounted drill rig equipped with 6 5/8-inch hollow-stem auger to depths of about 20 feet below the existing ground surface. Geomechanics Southwest Inc. of Phoenix, Arizona was subcontracted to drill these borings. A Kleinfelder, Inc. (Kleinfelder) staff professional observed the drilling operation, classified the encountered soils, prepared boring logs, and collected soil samples for laboratory examination and testing.

Prior to the start of drilling, the Arizona Bluestake Center was contacted to locate existing utilities at the boring locations. Upon completion of the borings, the boreholes were backfilled with soil cuttings.

Relatively undisturbed samples were obtained using a California sampler with a 2.5-inch inside diameter and a 3.0-inch outside diameter. Disturbed samples were obtained using a Standard Penetration/Split-Spoon Sampler (SPT) with a 1.5-inch inside diameter and 2.0-inch outside diameter. The SPT samplers were driven a maximum of 18 inches using a 140-pound hammer

falling 30 inches, and blow counts for successive 6-inch penetration intervals were recorded. California samplers were driven a maximum of 12 inches. Bulk (bag) samples of shallow soils were obtained from the auger cuttings at selected locations.

Soil classifications made in the field from auger cuttings and samples were re-evaluated in the laboratory after further examination and testing. The soils were classified in accordance with the Unified Soil Classification System presented on A-1 in Appendix A. Sample classifications, blow counts recorded during sampling, and other related information was recorded on the soil boring logs, which are presented in Appendix A.

2.2 Pavement Thickness Measurement

The pavement structure Reems Road was measured at two locations along Reems Road by hand excavating at the edge of the existing pavement at two locations, adjacent to borings B-3 and B-6. At both locations, the pavement thickness at the shoulder included 2.5-inches of asphalt concrete over about 6 inches aggregate base.

3.0 LABORATORY TESTING

Laboratory testing performed on selected samples obtained during the field exploration for the project included:

- Moisture Content
- Sieve Analysis
- Plasticity Index
- Direct Shear
- Consolidation
- Density
- pH & Resistivity
- Sulfate & Chloride Content
- R-Value

- Moisture-Density Relationship (Standard Proctor)
- Agronomy Testing for Top Soil

The results of the laboratory testing are presented in Appendix B. Included in the agronomy test results are specific recommendations for soil amendments in lbs / 1000 square feet.

4.0 SITE CONDITIONS

4.1 Geologic Setting

The project site is located in the Basin and Range Physiographic Province (Basin and Range) of central Arizona. The Basin and Range is characterized by isolated fault-bounded mountain ranges of igneous, metamorphic, deformed sedimentary, and volcanic rock separated by broad alluvium-filled valleys. The rock units are generally of Precambrian age, with erosional remnants of Paleozoic age rocks and local Cenozoic age volcanics and sediments. Bedrock is not exposed in the project vicinity.

4.2 Site Surface Conditions

The site is currently cultivated agricultural land, and Reems Road is a two-lane asphalt concrete paved road. The existing ground surface is relatively flat, sloping gently down to the southeast with a slope of about 30 feet per mile.

4.3 Soil Conditions

Soils encountered in the upper 5 to 10 feet at the test boring locations consisted primarily of stratified deposits of low to medium plasticity sandy clays and clayey sands (CL and SC). Underlying soils, below about 5 to 10 feet and extending to the depth explored (about 22 feet), consisted of stratified deposits of non-plastic to low plasticity sands and silty sands (SP, SP-SM, and SM), along with low to medium plasticity sandy clays and clayey sands (CL and SC). Soil consistencies of the clayey and silty soils generally ranged from soft to very firm, while the sands

were generally medium dense. Detailed descriptions of the soils encountered at the boring locations are presented on the boring logs in Appendix A.

4.4 Soil Moisture and Groundwater Conditions

Neither regional nor perched groundwater was encountered within any of the borings drilled (to depths of about 22 feet) at the site. Soil moisture contents at the boring locations were described as slightly moist. It should be noted that soil moisture conditions across the site may vary depending on rainfall and/or runoff conditions and may be affected by irrigation in agricultural areas. Groundwater is expected to be encountered at depths generally ranging from about 400 to 500 feet below existing grade, according to regional well information provided by the Arizona Department of Water Resources.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 General

Based on the results of our study, the site may be developed as planned using conventional grading and construction techniques. Recommendations regarding the geotechnical aspects of project design and construction are presented in the following sections.

5.2 Slopes

5.2.1 General

Excavations in the site soils can most likely be made by conventional earth moving equipment. All excavations must comply with applicable local, state, and federal safety regulations, including the current Occupational Safety Health Association (OSHA) Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the Contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing the information below solely as a service to our client. Under no

circumstances should the information provided be interpreted to mean that Kleinfelder is assuming responsibility for construction site safety or the Contractor's activities; such responsibility is not being implied and should not be inferred.

5.2.2 Permanent Channel Slopes

We recommend that permanent unprotected cut and fill channel slopes subjected to flowing water be constructed at a gradient no steeper than 2.5H:1V (horizontal to vertical). For cut and fill slopes with concrete slope paving, we recommend they be constructed at a gradient no steeper than 2.0H:1V. To reduce the potential for surface erosion, a berm or "V" ditch should be located at the top of slopes subject to significant overland water flows in order to intercept and redirect surface runoff. To minimize erosion of the slope face due to flowing water, vegetation or gravel surfacing should be considered. Consultation with a landscape architect is recommended to establish the design slope for vegetated channels, and slopes as flat as 3H:1V may be desirable to aid in establishing and maintaining plant growth.

5.2.3 Temporary Excavations

Soils encountered at the boring locations consisted predominately sandy clays and clayey sands in the upper 5 to 10 feet. These soils would be considered Type B soil when applying the OSHA regulations. For these soil types, OSHA recommends a maximum slope inclination of 1H:1V or flatter. Steeper cut slopes may be utilized for excavations less than five feet deep depending on the strength, moisture content, and homogeneity of the soils as observed in the field.

Underlying soils, below about 5 to 10 feet and extending to the depth explored (about 22 feet), consisted of stratified deposits of non-plastic to low plasticity sands and silty sands (SP, SP-SM, and SM), along with low to medium plasticity sandy clays and clayey sands (CL and SC). The silty sands and sands would be considered Type C soil when applying the OSHA regulations. For these soil types, OSHA recommends a maximum slope inclination of 1.5H:1V or flatter for excavation less than 20 feet deep.

The Contractor should be aware that slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, and/or federal safety regulations (e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations). Such regulations are strictly enforced and, if they are not followed, the Owner, Contractor, and/or earthwork and utility subcontractors could be liable for substantial penalties.

5.2.4 Construction Considerations

Heavy construction equipment, building materials, excavated soil, and vehicular traffic should not be allowed within $1/3$ the slope height from the top of any excavation. Where the stability of adjoining walls or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning may be required to provide structural stability and to protect personnel working within the excavation. A professional engineer registered in the State of Arizona should design shoring, bracing, or underpinning required for the project (if any).

Earthen berms or other methods should be used to prevent runoff water from entering all excavations. All runoff water should be collected and disposed of outside the construction limits.

5.3 Structural Backfill

Structural backfill should be used against concrete structures designed to resist earth loads, such as box culverts, wingwalls and retaining walls. All structural backfill should meet the material requirements of Section 701.2.1 Crushed Rock, and the gradation requirements for Select Material, Type A or B in Table 702-1, both of the M.A.G. Uniform Standard Specifications.

5.4 Trench and Pipe Bedding Material

Pipe bedding backfill (i.e., material from the bottom of the pipe to the springline of the pipe) should consist of ½ Sack or 1 Sack Controlled Low Strength Material (CLSM) slurry backfill in accordance with M.A.G. Section 728 and placement per M.A.G. Section 604.

Trench zone backfill (i.e., material placed between the pipe springline and finished subgrade) may consist of native soil from areas of on-site excavation. Compaction of trench backfill above the CLSM pipe bedding material shall be in accordance with the requirements of Section 601.4.4 of the M.A.G. Specifications. Within pavement areas, trench backfill should be compacted to at least 100 percent relative compaction within two feet of finished subgrade. Mechanical compaction is recommended; ponding or jetting should not be allowed, especially in areas supporting structural loads or beneath concrete slabs supported-on-grade, pavements, or other improvements.

Recommendations provided above for pipe zone backfill are minimum requirements only. More stringent material specifications may be required to fulfill local codes and/or bedding requirements for specific types of pipes. We recommend the project Civil Engineer develop these material specifications based on planned pipe types, bedding conditions, and other factors beyond the scope of this study.

5.5 Shrink/Swell Earthwork Factors

For soils excavated on-site and then placed in compacted embankment or trench fills, earthwork shrink/swell factors (volume change) were estimated as part of our study. The estimated shrink/swell factors presented below were based primarily on comparison between in-situ densities from driven ring samples and laboratory compaction tests, and engineering judgment based on detailed boring logs. Estimated earthwork factors vary depending on the degree of compaction, as presented below:

Relative Compaction Based on Percentage of AASHTO T-99 (Standard Proctor) Maximum Density	Approximate Earthwork Shrinkage
85%	5% swell
90%	0% shrink
95%	5% shrink
100%	10% shrink

5.6 Corrosion Potential

Corrosion of buried metal is an electrochemical process in which the amount of metal loss due to corrosion is directly proportional to the flow of electrical current (DC) from the metal into the soil. As soil's resistivity decreases, its corrosivity increases. A commonly accepted correlation between soil resistivity and corrosivity towards ferrous metals is provided below:

Resistivity in ohm-centimeters

0 to 1,000
 1,000 to 2,000
 2,000 to 10,000
 Over 10,000

Corrosivity Category

Severely Corrosive
 Corrosive
 Moderately Corrosive
 Mildly Corrosive

Results of the laboratory testing for pH, resistivity, soluble sulfates, and soluble chlorides are presented in the following table:

Location	Depth (ft)	pH	Resistivity (ohm-cm)	Soluble Sulfates (ppm)	Soluble Chlorides (ppm)
B-1	3-10	8.0	903	49	45
B-3	3-10	7.9	1966		
B-5	3-10	8.1	1550	27	13
B-6	3-10	7.9	848		
B-8	3-10	8.0	1074	46	38

Based on laboratory testing, minimum resistivities of between 848 and 1966 ohm-cm indicate that on-site soils would be categorized as corrosive to severely corrosive toward ferrous metals.

Arizona Department of Transportation has established design criteria based on soil resistivity and pH for determining the life of corrugated steel pipe. Based on the resistivity of 848 ohms-cm and a pH of 7.9, a life of 23 years for corrugated 18-gage galvanized steel pipe for dry soil conditions is predicted by the ADOT design criteria. This predicted life will be reduced for moist soil conditions, which may develop due to irrigation and runoff.

Protection from corrosion may be necessary for metallic conduits. While in dry field conditions of our arid environment, these soils may not contribute to significant corrosion; however, increases in soil moisture may result in reduced resistivities, and thus, could increase the potential for corrosion. According to ADOT's MPE&D Manual the following types of culvert pipe may be used for various resistivity ranges:

- For resistivities greater than 2000 ohm-cm, galvanized-coated steel AASHTO M-36, aluminum coated steel AASHTO M-36, aluminum alloy AASHTO M-196 or bituminous-coated AASHTO M-190 pipe should be used.
- For resistivities between 500 and 1999 ohm-cm, aluminum alloy AASHTO M-196 or bituminous-coated AASHTO M-190 pipe should be used.
- For resistivities less than 500 ohm-cm, bituminous coated AASHTO M-190 pipe should be used.

The above-recommended culvert types are applicable for soils with a pH in the range of 5.0 to 9.0.

- Regardless of resistivity, for pH greater than 7.2, bituminous-coated AASHTO M-190 pipe may be used.

Laboratory tests indicate pH values vary between 7.9 and 8.1. Laboratory tests show chloride contents between 13 ppm and 45 ppm, indicating a negligible corrosion potential to concrete reinforcing steel.

Based on laboratory results, sulfate (SO₄) contents vary between 27 ppm and 49 ppm. Therefore, special precautions are not expected to be necessary to protect concrete, and Type II cement may be used for concrete in contact with soil.

5.7 Channels and Basins

Site soils are acceptable for placement of conventional concrete linings. Overexcavation recommended for placement of embankment fills is not necessary for concrete channel linings; however, soil near the existing ground surface should be moisture conditioned and compacted in accordance with the Standard Specifications. Cutoffs for channel linings should extend a minimum of 2.0 feet below the top of the channel lining where no overland flow is expected. Where flow is expected to be directed over the top of the lining, cutoffs should extend a minimum of 4.0 feet below the top of the channel lining.

Cutoff walls for inlet structures adjacent to concrete linings should extend a minimum of five feet below the invert elevation of the inlet structure.

5.8 Topsoil Characteristics

The results of the laboratory testing are presented in Appendix B. Included in the agronomy test results are specific recommendations for soil amendments in lbs / 1000 square feet for the growth of grass (turf).

5.9 Box Culverts

As shown on the Site Plan, box culverts will be used to convey storm water below Peoria Avenue, below Olive Avenue and the adjacent railroad, and below Reems Road at the south end of the project. Foundation and earth pressure recommendations are presented in the following sections.

5.9.1 Box Culvert Foundations

For box culverts bearing on undisturbed native soils or compacted structure backfill, an allowable bearing pressure of 2500 pounds per square foot is recommended for pipe or box structures at a depth of three feet or more below finished grade.

5.9.2 Passive Lateral Resistance and Base Friction

A passive soil resistance of 350 psf per foot of depth is recommended against the edges of footings or box culverts in contact with properly compacted structure backfill.

A coefficient of friction of 0.35 is recommended for computing the lateral resistance between the bases of footings and slabs and the soils when analyzing lateral loads. Should a key be utilized beneath the footing, the coefficient of friction can be increased to 0.60.

5.9.3 Earth Pressures Acting on Box Culvert Walls

Rigid foundation elements that will not experience any lateral movement or rotation will be subjected to at-rest earth pressures represented by a triangular hydrostatic diagram of 55 pcf per foot of depth for level backfill. Foundation elements, which are not restrained, will be subjected to active state earth pressures represented by a triangular pressure diagram equivalent to 35 psf per foot of depth for level backfill.

6.0 CLOSURE

6.1 Limitations

The recommendations contained in this report are based on our field explorations, laboratory tests, and our understanding of the proposed construction. The subsurface data used in the preparation of this report were obtained from the borings drilled during the field study. It is anticipated that some variations in the soil conditions will exist between the points explored. The

nature and extent of variations may not be evident until construction occurs. If any conditions are encountered at this site that are different from those described in this report, our firm should be immediately notified so that we may make any necessary revisions to the recommendations contained in this report. In addition, if the scope of the proposed construction changes from that described in this report, our firm should also be notified. This report was prepared in accordance with the generally accepted standard of practice in Arizona at the time the report was written. No warranty, expressed or implied, is made. It is the Client's responsibility to see that all parties to the project including the Designer, Contractor, Subcontractors, etc. are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the Contractor's option and risk.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on- and off-site) or other factors may change over time, and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

6.2 Additional Services

The recommendations provided in this report are based on the assumption that an adequate program of tests and observations will be performed during the construction to verify compliance with these recommendations. These tests and observations should include, but are not necessarily limited to observations and testing during site preparation and earthwork and consultation as may be required during construction.

We also recommend that we review project plans and specifications to verify compatibility with our conclusions and recommendations. Additional information concerning the scope and cost of these services can be obtained from our office.

FIGURES

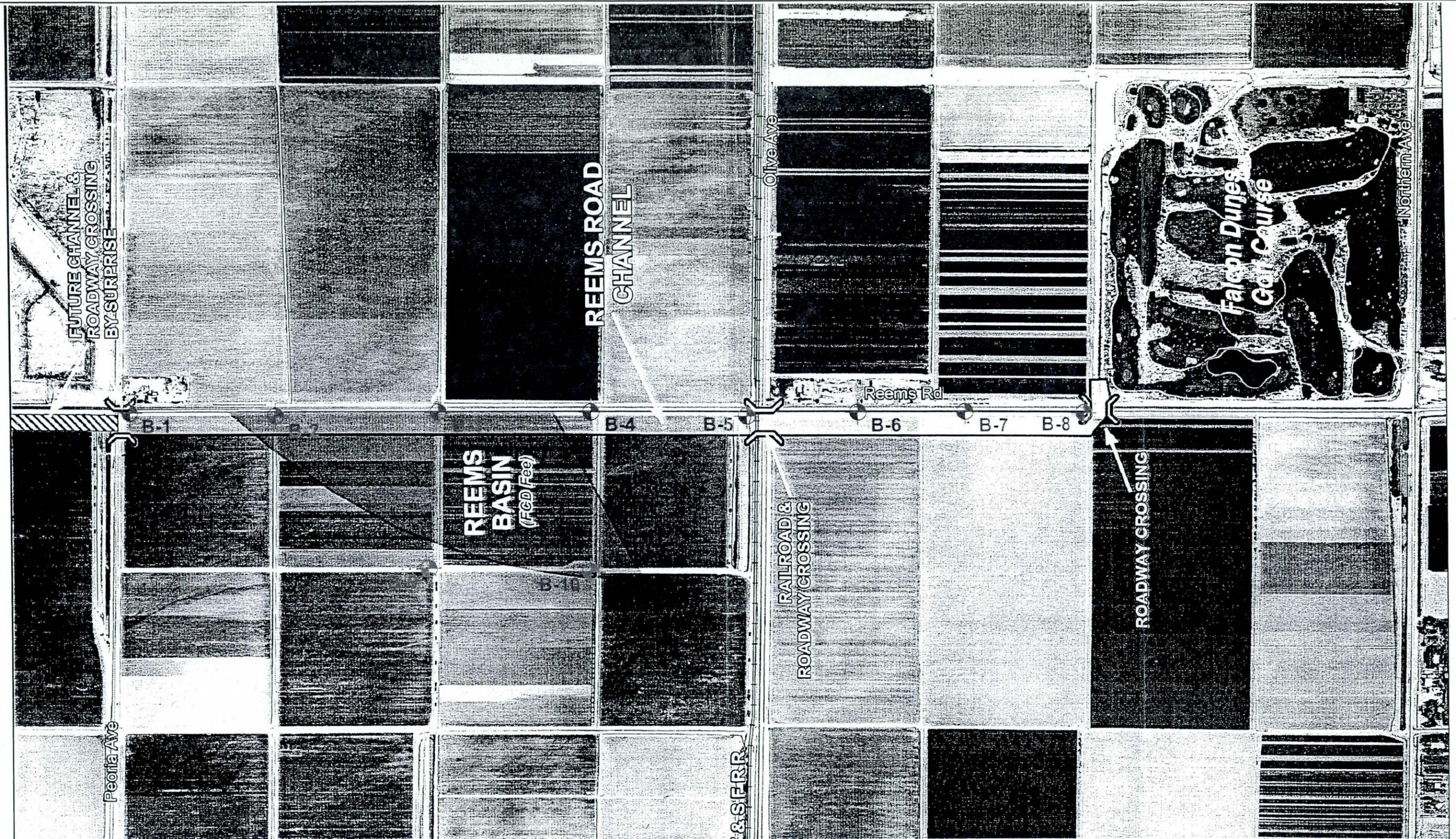
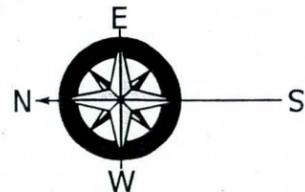


PHOTO DATE: DECEMBER 2002
 PREPARED: 24 FEBRUARY 2004

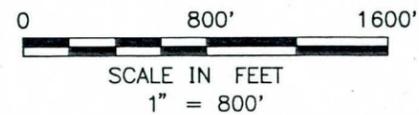


LEGEND

⊙ B-1 = TEST BORING LOCATION

NOTES

BASE PLAN PROVIDED BY
 F.C.D.M.C., SEPTEMBER 2004



F.C.D.M.C.
 REEMS ROAD CHANNEL AND BASIN

PLATE

1

SITE PLAN



KLEINFELDER, Inc.

PROJECT NO. : 47724

SEPTEMBER 2004

APPENDIX A

Field Study

UNIFIED SOIL CLASSIFICATION SYSTEM

	MAJOR DIVISIONS		USCS SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	GRAVELS (More than half of coarse fraction is larger than the #4 sieve)	CLEAN GRAVELS WITH LESS THAN 5% PASSING NO. 200 SIEVE	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GRAVELS WITH OVER 12% PASSING NO. 200 SIEVE	GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GRAVELS WITH OVER 12% PASSING NO. 200 SIEVE	GM	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
		GRAVELS WITH OVER 12% PASSING NO. 200 SIEVE	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS (More than half of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH LESS THAN 5% PASSING NO. 200 SIEVE	SW	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SANDS WITH OVER 12% PASSING NO. 200 SIEVE	SP	POORLY-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SANDS WITH OVER 12% PASSING NO. 200 SIEVE	SM	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
		SANDS WITH OVER 12% PASSING NO. 200 SIEVE	SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES
FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid limit less than 50)	INORGANIC SILTS & VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, CLAYEY SILTS WITH SLIGHT PLASTICITY	ML	INORGANIC SILTS & VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, CLAYEY SILTS WITH SLIGHT PLASTICITY
		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY	OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (Liquid limit greater than 50)	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY	OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY

Note: Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing No. 200 sieve require dual USCS symbols. (See KEY A-3 if provided)



UNIFIED SOIL CLASSIFICATION SYSTEM

Reems Road Channel and Basin
 Flood Control District of Maricopa County
 Half-mile South of Olive Avenue to Peoria Avenue
 Maricopa County, Arizona

KEY

A-1

Drafted By: RGP Project Number: 47724
 Date: September, 2004

LOG SYMBOLS

	BULK / GRAB SAMPLE		NON-STANDARD PENETRATION SPLIT SPOON SAMPLER (1.5-inch O.D. X 0.9-inch I.D.)
	MODIFIED CALIFORNIA SAMPLER (2 inch inside diameter)		BDBGM SIZE CORE BARREL (1.65-inch I.D.)
	RING (PORTER) SAMPLER (2.4 - inch inside diameter)		BW44 SIZE CORE BARREL (1.75-inch I.D.)
	STANDARD PENETRATION SPLIT SPOON SAMPLER (2.0-inch O.D. X 1.4-inch I.D.)		HQ-3 SIZE CORE BARREL (2.4-inch I.D.)
	SHELBY TUBE (3 inch outside diameter)		NON-STANDARD PENETRATION SPLIT SPOON SAMPLER (2.5-inch O.D. X 2.0-inch I.D.)
		WATER LEVEL (level after completion)	
		WATER LEVEL (level where first encountered)	

GENERAL NOTES

1. Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual.
2. No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
3. Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
4. In general, the Unified Soil Classification designations presented on the logs were based on visual classification in the field, modified where appropriate by visual classifications in the office, and/or laboratory gradation and index testing.
5. NA = Not Analyzed

GEO-KEY_A2_LOG_47724.GPJ_09/02/2004



LOG KEY

Reems Road Channel and Basin
Flood Control District of Maricopa County
Half-mile South of Olive Avenue to Peoria Avenue
Maricopa County, Arizona

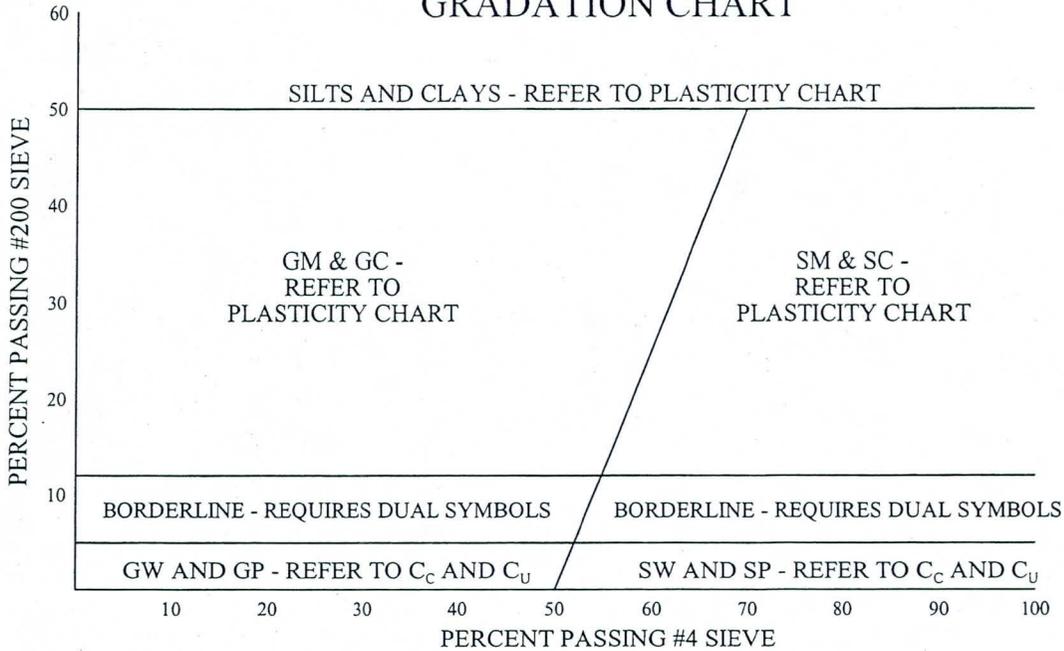
KEY

A-2

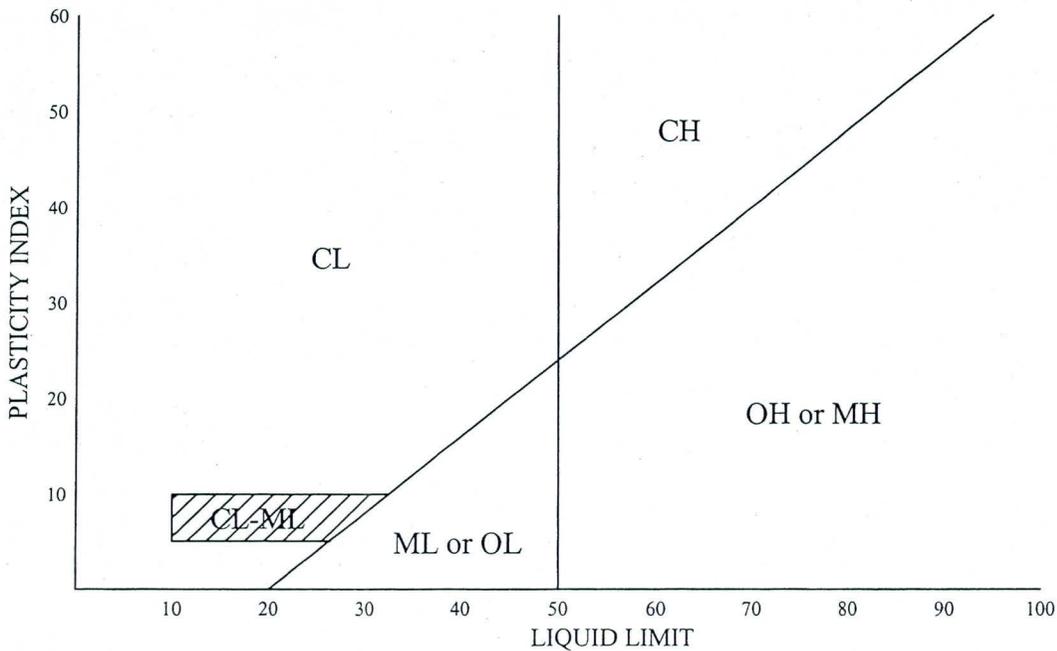
Drafted By: RGP
Date: September, 2004

Project Number:
47724

GRADATION CHART



PLASTICITY CHART



DEFINITIONS OF SOIL FRACTIONS

SOIL FRACTION	PARTICLE SIZE RANGE
Boulders	Greater than 300mm (12in.)
Cobbles	300mm to 75mm (12in. to 3in.)
Coarse Gravel	75mm to 19mm (3in. to 3/4in.)
Fine Gravel	19mm (3/4in.) to No. 4 sieve
Coarse Sand	No. 4 sieve to No. 10 sieve
Medium Sand	No. 10 sieve to No. 40 sieve
Fine Sand	No. 40 sieve to No. 200 sieve
Fines	less than No. 200 sieve



CHARTS & DEFINITIONS

Reems Road Channel and Basin
 Flood Control District of Maricopa County
 Half-mile South of Olive Avenue to Peoria Avenue
 Maricopa County, Arizona

KEY

A-3

Drafted By: RGP
 Date: September, 2004

Project Number:
 47724

**TERMINOLOGY USED ON THE BORING LOGS TO DESCRIBE
THE FIRMNESS, DENSITY, OR CONSISTENCY OF SOILS**

The standard penetration resistance (N) in blows per foot is obtained by the ASTM D1586 procedure using 2" O.D., 1 3/8" I.D. samplers.

1. Terms for description of partially saturated and/or cemented soils including clays, cemented granular materials, silts and silty and clayey granular soils.

N	Relative Firmness
0 - 4	Very soft
5 - 8	soft
9 - 15	Moderately firm
16 - 30	Firm
31 - 50	Very firm
51+	Hard

2. Terms for description of cohesionless, uncemented sands and sand-gravel mixtures.

N	Relative Density
0 - 4	Very loose
5 - 10	Loose
11 - 30	Medium dense
31 - 50	Dense
51+	Very dense

3. Terms for description of clays which are saturated or near saturation.

N	Relative Consistency
0 - 2	Very soft
3 - 4	soft
5 - 8	Moderately stiff
9 - 15	Stiff
16 - 30	Very Stiff
31+	Hard

GEO-KEY_A4_SOIL-TERMINOLOGY 47724.GPJ 09/02/2004



TERMINOLOGY USED TO DESCRIBE SOILS
Reems Road Channel and Basin
Flood Control District of Maricopa County
Half-mile South of Olive Avenue to Peoria Avenue
Maricopa County, Arizona

KEY

Drafted By: RGP
Date: September, 2004

Project Number:
47724

A-4

Northing and Easting: N33 deg. 34.807' W112 deg. 23.629'
 Groundwater (ft): No Free Groundwater Encountered
 Drilling Company: GSI Equipment: CME-75
 Hole Diameter (in): 6 5/8 Drilling Method: Hollow Stem Auger
 Hammer Type: Automatic

Date Started: 8/2/2004
 Date Completed: 8/2/2004
 Logged By: Kevin Brooks
 Total Depth (ft): 21.5

ELEVATION (ft)	DEPTH (ft)	FIELD			LABORATORY					Graphical Log	USCS Classification	DESCRIPTION
		Sample Interval	Blow Counts per 6" Interval	Continuous Pen. Resistance (bpf)	Dry Density (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Passing #4 Sieve (%)			
			7 13 10									0.0 to 21.5 feet
												Surface Condition: Sparse vegetation
	5		31/12		119	9.1						CL Sandy Clay , with gravel, brown, slightly moist, firm, low plasticity, moderate cementation
										pH=8.0 Resistivity=903 ohm-cm		
												SC Clayey Sand , fine grained sand, brown, slightly moist, very firm to firm, low to medium plasticity, moderate to strong cementation
	10		12 11 12									
	15		9 11 10				37	21	98	52		CL Sandy Clay , trace gravel, brown, slightly moist, firm, medium plasticity, moderate cementation
	20		7 7 6									SP-SM Sand , some silt, medium to coarse grained sand, brown, slightly moist, medium dense, nonplastic
												Boring terminated at 21.5 feet Sampling stopped at 21.5 feet Caved to 11.0 feet
	25											

GEO_ADOT_EW/EL 47724.GPJ 09/08/2004



LOG OF BORING B-1
 Reems Road Channel and Basin
 Flood Control District of Maricopa County
 Half-mile South of Olive Avenue to Peoria Avenue
 Maricopa County, Arizona

BORING

B-1

Drafted By: RGP
 Date: September, 2004

Project Number:
 47724

Northing and Easting: N33 deg. 34.629' W112 deg. 23.627'
 Groundwater (ft): No Free Groundwater Encountered
 Drilling Company: GSI Equipment: CME-75
 Hole Diameter (in): 6 5/8 Drilling Method: Hollow Stem Auger
 Hammer Type: Automatic

Date Started: 8/2/2004
 Date Completed: 8/2/2004
 Logged By: Kevin Brooks
 Total Depth (ft): 21.5

ELEVATION (ft)	DEPTH (ft)	FIELD			LABORATORY						Graphical Log	USCS Classification	DESCRIPTION
		Sample Interval	Blow Counts per 6" Interval	Continuous Pen. Resistance (bpf)	Dry Density (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Passing #4 Sieve (%)	Passing #200 Sieve (%)			
	0 to 5	6 8 5										CL	0.0 to 21.5 feet Surface Condition: Sparse vegetation
	5 to 10	10 15 24			112	3.9						SC	Clayey Sand , medium to coarse grained sand, brown, slightly moist, very firm, low plasticity
	10 to 15	33/12			106	5.9				Direct Shear		SP	Sand , trace clay, coarse grained sand, light brown, slightly moist, dense, nonplastic
	15 to 20	14 19 19					22	10	95	17		SC	Clayey Sand , trace gravel, predominately medium grained sand, brown, slightly moist, very firm, low plasticity
	20 to 21.5	12 16 17										CL	Sandy Clay , brown, slightly moist, very firm, low to medium plasticity
	Boring terminated at 21.5 feet Sampling stopped at 21.5 feet Caved to 12.5 feet												

GEO_ADOT_EW/EL 47724.GPJ 09/08/2004



LOG OF BORING B-2
 Reems Road Channel and Basin
 Flood Control District of Maricopa County
 Half-mile South of Olive Avenue to Peoria Avenue
 Maricopa County, Arizona

BORING

B-2

Drafted By: RGP
 Date: September, 2004

Project Number:
 47724

Northing and Easting: N33 deg. 34.418' W112 deg. 23.626'
 Groundwater (ft): No Free Groundwater Encountered
 Drilling Company: GSI Equipment: CME-75
 Hole Diameter (in): 6 5/8 Drilling Method: Hollow Stem Auger
 Hammer Type: Automatic

Date Started: 8/2/2004
 Date Completed: 8/2/2004
 Logged By: Kevin Brooks
 Total Depth (ft): 21.5

ELEVATION (ft)	DEPTH (ft)	FIELD			LABORATORY						Graphical Log	USCS Classification	DESCRIPTION	
		Sample Interval	Blow Counts per 6" Interval	Continuous Pen. Resistance (bpf)	Dry Density (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Passing #4 Sieve (%)	Passing #200 Sieve (%)			Other Tests	0.0 to 21.5 feet
			12 11 9											Surface Condition: Sparse vegetation
	5		4 3 9											<p>Sandy Clay, with gravel, brown, slightly moist, firm to moderately firm, low to medium plasticity</p> <p>Note: same as above except fine grained sand and nonplastic at 5'</p>
	10		13 11 9											<p>Sand, trace clay, with gravel, coarse grained sand, light brown, slightly moist, dense, nonplastic</p>
	15		24/12		125	*	37	19	98	56				<p>Sandy Clay, light brown, slightly moist, firm, low to medium plasticity</p>
	20		9 14 13											
	25													<p>Boring terminated at 21.5 feet Sampling stopped at 21.5 feet Caved to 13.0 feet</p>

pH=7.9
Resistivity=1966 ohm-cm

GEO_ADOT_EW/EL 47724.GPJ 09/08/2004



LOG OF BORING B-3
 Reems Road Channel and Basin
 Flood Control District of Maricopa County
 Half-mile South of Olive Avenue to Peoria Avenue
 Maricopa County, Arizona

Drafted By: RGP Project Number: 47724
 Date: September, 2004

BORING

B-3

Northing and Easting: N33 deg. 33.988' W112 deg. 23.622'
 Groundwater (ft): No Free Groundwater Encountered
 Drilling Company: GSI Equipment: CME-75
 Hole Diameter (in): 6 5/8 Drilling Method: Hollow Stem Auger
 Hammer Type: Automatic

Date Started: 8/2/2004
 Date Completed: 8/2/2004
 Logged By: Kevin Brooks
 Total Depth (ft): 21.5

ELEVATION (ft)	DEPTH (ft)	FIELD			LABORATORY						Graphical Log	USCS Classification	DESCRIPTION	
		Sample Interval	Blow Counts per 6" Interval	Continuous Pen. Resistance (bpf)	Dry Density (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Passing #4 Sieve (%)	Passing #200 Sieve (%)			Other Tests	0.0 to 21.5 feet
	7													
	14													
	16													
	5		5											
			3											
			3											
	10		16/12		115	6.0	NV	NP	81	10				
	15		5											
			6											
			7											
	20		9											
			12											
			15											
	25													

pH=8.1
Resistivity=1550 ohm-cm

Note: no gravel at 5'

SP-SM Sand, some silt, fine to medium grained sand, brown, slightly moist, medium dense, nonplastic

Note: trace gravel and fine to coarse grained sand at 15'

Note: weak cementation at 20'

Boring terminated at 21.5 feet
Sampling stopped at 21.5 feet
Caved to 14.0 feet

GEO_ADOT_EW/EL 47724.GPJ 09/21/2004



LOG OF BORING B-5
 Reems Road Channel and Basin
 Flood Control District of Maricopa County
 Half-mile South of Olive Avenue to Peoria Avenue
 Maricopa County, Arizona

BORING

B-5

Drafted By: RGP
 Date: September, 2004

Project Number:
47724

Northing and Easting: N33 deg. 33.708' W112 deg. 23.622'
 Groundwater (ft): No Free Groundwater Encountered
 Drilling Company: GSI Equipment: CME-75
 Hole Diameter (in): 6 5/8 Drilling Method: Hollow Stem Auger
 Hammer Type: Automatic

Date Started: 8/2/2004
 Date Completed: 8/2/2004
 Logged By: Kevin Brooks
 Total Depth (ft): 21.5

ELEVATION (ft)	DEPTH (ft)	FIELD			LABORATORY					Graphical Log	USCS Classification	DESCRIPTION	
		Sample Interval	Blow Counts per 6" Interval	Continuous Pen. Resistance (bpf)	Dry Density (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Passing #4 Sieve (%)			Passing #200 Sieve (%)	Other Tests
			4 4 9									CL	Surface Condition: Sparse vegetation
	5		3 5 5				38	18	100	64			Sandy Clay , with gravel, light brown, slightly moist, moderately firm to soft, low plasticity
	10		6 6 7										
	15		5 6 8		8.5							SM	Silty Sand , medium to coarse grained sand, brown, slightly moist, moderately firm, low plasticity
	20		6 6 5									SP-SM	Sand , some silt, coarse to medium grained sand, brown, slightly moist, medium dense, nonplastic
	25												Boring terminated at 21.5 feet Sampling stopped at 21.5 feet Caved to 12.0 feet

GEO_ADOT_EW/EL 47724.GPJ 09/08/2004



LOG OF BORING B-7
 Reems Road Channel and Basin
 Flood Control District of Maricopa County
 Half-mile South of Olive Avenue to Peoria Avenue
 Maricopa County, Arizona

BORING

B-7

Drafted By: RGP
 Date: September, 2004

Project Number:
 47724

Northing and Easting: N33 deg. 34.404' W112 deg. 23.839'
 Groundwater (ft): No Free Groundwater Encountered
 Drilling Company: GSI Equipment: CME-75
 Hole Diameter (in): 6 5/8 Drilling Method: Hollow Stem Auger
 Hammer Type: Automatic

Date Started: 8/3/2004
 Date Completed: 8/3/2004
 Logged By: Kevin Brooks
 Total Depth (ft): 21.5

ELEVATION (ft)	DEPTH (ft)	FIELD			LABORATORY						Graphical Log	USCS Classification	DESCRIPTION
		Sample Interval	Blow Counts per 6" Interval	Continuous Pen. Resistance (bpf)	Dry Density (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Passing #4 Sieve (%)	Passing #200 Sieve (%)			Other Tests
	5	5										CL	Sandy Clay , light brown, slightly moist, soft, low plasticity
	5	3											
	5	20/12			109	8.8	28	11	97	47	Direct Shear	SC	Clayey Sand , fine grained sand, brown, slightly moist, firm, low plasticity
	10	7										CL	Sandy Clay , brown, slightly moist, firm, low plasticity
	10	9											
	10	10											
	15	7										SP	Sand , trace clay, predominately fine grained sand, brown, slightly moist, medium dense, nonplastic
	15	9											
	15	10											
	20	5										CL	Sandy Clay , brown, slightly moist, firm, low plasticity
	20	9											
	20	9											
	25												

Boring terminated at 21.5 feet
 Sampling stopped at 21.5 feet
 Caved to 15.0 feet

GEO_ADOT_EWIEL 47724.GPJ 09/08/2004



LOG OF BORING B-9

Reems Road Channel and Basin
 Flood Control District of Maricopa County
 Half-mile South of Olive Avenue to Peoria Avenue
 Maricopa County, Arizona

BORING

B-9

Drafted By: RGP
 Date: September, 2004

Project Number:
47724

Northing and Easting: N33 deg. 34.226' W112 deg. 23.880'
 Groundwater (ft): No Free Groundwater Encountered
 Drilling Company: GSI Equipment: CME-75
 Hole Diameter (in): 6 5/8 Drilling Method: Hollow Stem Auger
 Hammer Type: Automatic

Date Started: 8/3/2004
 Date Completed: 8/3/2004
 Logged By: Kevin Brooks
 Total Depth (ft): 21.5

ELEVATION (ft)	DEPTH (ft)	FIELD			LABORATORY							Graphical Log	USCS Classification	DESCRIPTION	
		Sample Interval	Blow Counts per 6" Interval	Continuous Pen. Resistance (bpf)	Dry Density (pcf)	Moisture Content (%)	Liquid Limit	Plasticity Index	Passing #4 Sieve (%)	Passing #200 Sieve (%)	Other Tests			0.0 to 21.5 feet	
														CL	Sandy Clay, light brown, slightly moist, moderately firm to soft, low plasticity
	5		3 2 5												
	10		16/12		117	6.7				Direct Shear				SP	Sand, trace clay, with gravel, coarse grained sand, light brown, slightly moist, medium dense, nonplastic
	15		5 14 10												
	20		5 8 7											SP-SM	Sand, some silt, with gravel, coarse to medium grained sand, brown, slightly moist, medium dense, nonplastic
	25														Boring terminated at 21.5 feet Sampling stopped at 21.5 feet Caved to 14.5 feet

GEO_ADOT_EW/EL 47724.GPJ 09/08/2004



LOG OF BORING B-10
 Reems Road Channel and Basin
 Flood Control District of Maricopa County
 Half-mile South of Olive Avenue to Peoria Avenue
 Maricopa County, Arizona

BORING

B-10

Page 1 of 1

Drafted By: RGP
 Date: September, 2004

Project Number:
 47724

APPENDIX B

Laboratory Testing

APPENDIX B

LABORATORY TESTING

LABORATORY TESTS

Laboratory tests were performed on selected samples to aid in soil classification and to evaluate physical properties of the soils, which may affect the geotechnical aspects of project design and construction. A description of the geotechnical laboratory testing program is presented below.

Moisture Content and Dry Unit Weight

Moisture content and dry unit weight tests were performed to evaluate moisture-conditioning requirements during site preparation and earthwork grading; soil overburden, and active and passive earth pressures; and relative soil strength and compressibility. Moisture content was evaluated in general accordance with ASTM Test Method D 2216; dry unit weight was evaluated using procedures similar to ASTM Test Method D 2937.

Sieve Analysis

Sieve analyses were performed to evaluate the gradational characteristics of the material and to aid in soil classification. Tests were performed in general accordance with ARIZ 201b.

Atterberg Limits

Atterberg Limits tests were performed to aid in soil classification and to evaluate the plasticity characteristics of the material. Additionally, test results were correlated to published data to evaluate the shrink/swell potential of near-surface site soils. Tests were performed in general accordance with AASHTO T 90.

Moisture/Density Relationship

Standard proctor tests were performed on bulk soil samples to evaluate maximum compacted dry density and optimum moisture content. Test procedures were in general accordance with ARIZ 225.

Direct Shear

Direct shear tests were performed on selected undisturbed soil samples to evaluate the strength parameters of the site soils. The direct shear tests were performed over the range of expected normal loading.

Resistivity and pH

Resistivity and pH tests were performed to evaluate the corrosive potential of the site soils. Tests were performed in general accordance with ADOT Test Method 236.

Sulfate and Chloride

Sulfate and Chloride tests were performed to evaluate the corrosive potential of site soils toward Portland cement concrete. Tests were performed in general accordance with California Test Methods 417 and 422 (sulfate and chloride, respectively).

Consolidation

Consolidation tests were performed on selected undisturbed samples to evaluate the settlement potential of the site soils when subjected to typical foundation loads and wetting.

Agronomy

Agronomy testing for topsoil was performed on selected bulk samples to determine amendments recommended for growth of grasses in channels and basins.



KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
REVIEWED BY: M. CONNOLLY

Handwritten signature of M. Connolly

PROJECT NO: 47724
WORK ORDER NO: 04235
DATE SAMPLED: 8/2 & 8/3/04

MECHANICAL SIEVE ANALYSIS
GROUP SYMBOL, USCS (ASTM D-2487)

SIEVE SIZES

Table with columns for Sieve Sizes: COBBLES (6", 4"), GRAVEL (Coarse: 3", 2", 1 1/2", 1"; Fine: 3/4", 1/2", 3/8", 1/4"), SAND (Coarse: #4, #8; Medium: #10, #16, #30; Fine: #40, #50, #100), Silt or Clay (#200), and Lab #.

PERCENT PASSING BY WEIGHT

Table showing Percent Passing by Weight for various samples (B-1 @ 0-1.5 to B-7 @ 5-6.5) across different sieve sizes and soil classification parameters (USCS, LL, PL, PI).



PROJECT: REEMS ROAD CHANNEL & BASIN
 LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
 REVIEWED BY: M. CONNOLLY

PROJECT NO: 47724
 WORK ORDER NO: 04235
 DATE SAMPLED: 8/2 & 8/3/04

MECHANICAL SIEVE ANALYSIS
 GROUP SYMBOL, USCS (ASTM D-2487)

SIEVE SIZES

Location & Depth	USCS	LL	PL	PI	COBBLES		GRAVEL							SAND						Silt or Clay	Lab #
					6"	4"	Coarse			Fine				Coarse		Medium			Fine		
							3"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	1/4"	#4	#8	#10	#16	#30		

PERCENT PASSING BY WEIGHT

B-8 @ 5-6.5	SC	26	12	14	100	100	100	100	100	100	100	100	100	100	99	96	95	91	79	70	63	53	44	37
B-9 @ 5-6	SC	28	17	11	100	100	100	100	100	100	100	100	100	98	97	93	92	87	80	76	70	59	47	42
B-6 @ 0-3	CL	28	14	14	100	100	100	100	100	100	100	100	98	95	93	91	90	86	80	77	73	67	61	56
B-9 @ 3-10	CL	41	15	26	100	100	100	100	100	100	100	99	99	98	97	95	94	91	85	81	77	68	60	69



KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: SEE BELOW

PROJECT NO: 47724
WORK ORDER NO: 04235
LAB NO: SEE BELOW
DATE SAMPLED: 8/2 & 8/3/04
REVIEWED BY: M. CONNOLLY

MOISTURE CONTENT OF SOIL (ASTM D2216)

LAB #	BORING	DEPTH RANGE	USCS	WET WT. (gram)	DRY WT. (gram)	MOISTURE CONTENT
34	B-7	15-16.5	Soil Samples	324.9	299.4	8.5%
38	B-8	10-11.5	Soil Samples	307.3	271.3	13.3%



PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: SEE BELOW

PROJECT NO: 47724
WORK ORDER NO: 04235
LAB NO: SEE BELOW
DATE SAMPLED: 8/2 & 8/3/04
REVIEWED BY: M. CONNOLLY

DENSITY OF SOIL IN PLACE BY THE DRIVE-CYLINDER METHOD(ASTM D2937)

LAB #	BORING	USCS	MOISTURE			NUMBER OF RINGS	WET WGT.	WEIGHT	DRY
			WET WT. (g)	DRY WT. (g)	MOISTURE CONTENT		+ RINGS (g)	OF RINGS (g)	DENSITY (pcf)
2	B-1 @ 5-6	Soil Sample	803.3	736.2	9.1%	5.0	1,010.6	224.3	119.3
8	B-2 @ 10-11	Soil Sample	460.9	443.5	3.9%	5.0	932.6	231.2	111.8
14	B-3 @ 15-16	CL	379.2	379.2	0.0%	5.0	977.5	224.9	124.6
17	B-4 @ 5-6	Soil Sample	306.1	265.8	15.2%	5.0	914.8	226.2	99.0
23	B-5 @ 10-11	SP-SM	312.6	294.9	6.0%	5.0	949.8	215.8	114.7
29	B-6 @ 15-16	Soil Sample	474.1	446.1	6.3%	6.0	1,119.6	273.4	109.9
42	B-9 @ 5-6	SC	429.7	395.1	8.8%	5.0	945.3	226.8	109.4
48	B-10 @ 10-11	Soil Sample	517.9	485.6	6.7%	6.0	1,170.0	268.5	116.6



KLEINFELDER

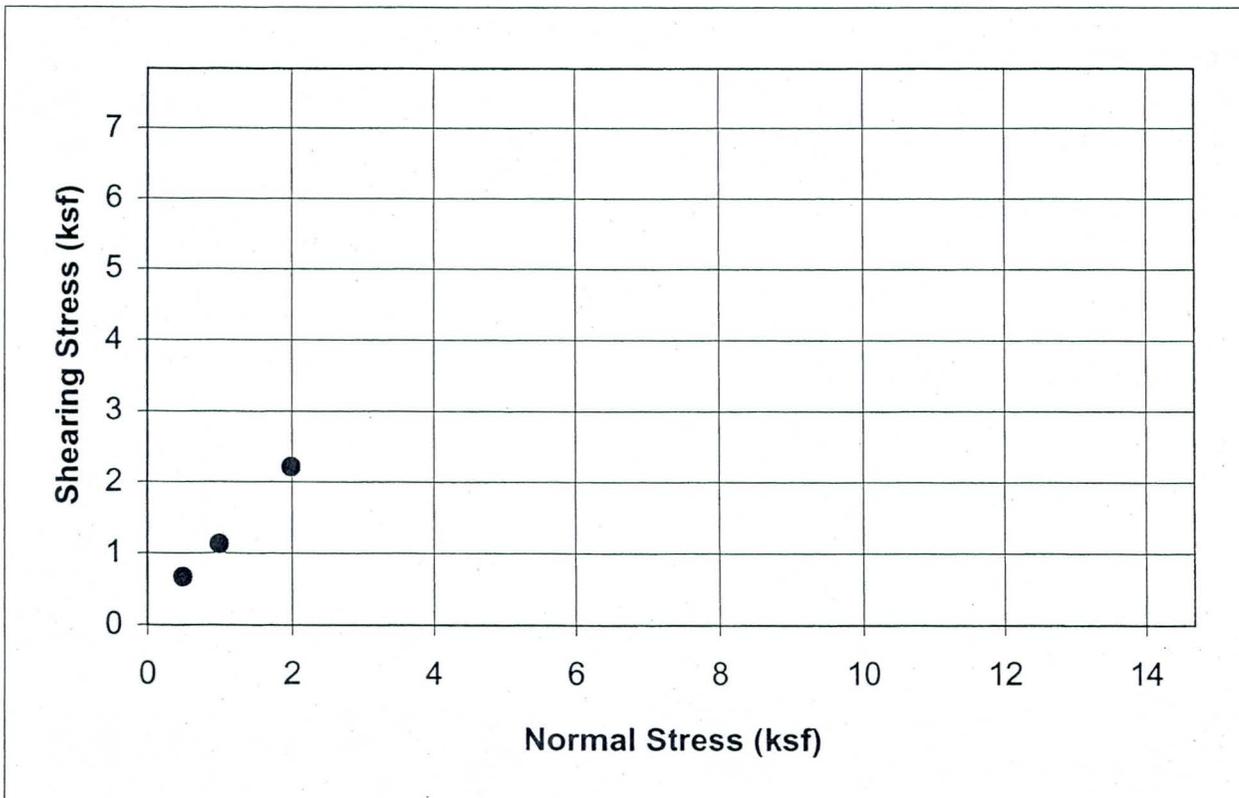
PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: B-2 @ 10-11
SAMPLE PREP.: SATURATED
TARGET: N/A

JOB NO: 47724
W.O. NUMBER: 04235
LAB NO: 8
DATE SAMPLED: 8/2 & 8/3/04

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS(ASTM D3080)

Created by DigiShear Version 1.2; Copyright 2000, GEOTAC

Initial thickness of specimen (in.):	1.00		
Initial diameter of specimen (in.):	2.42		
Shearing device used:	Created by DigiShear Version 1.2; Copyright 2000, GEOTAC		
Rate of deformation (in/min):	0.008		
Direct shear point:	1	2	3
Dry mass of specimen (g):	124.8	131.6	126.9
Initial Moisture Content:	6.3%	5.1%	6.2%
Initial Wet Density (lb per cu.ft):	109.8	114.5	111.6
Initial Dry Density (lb per cu.ft):	103.3	109.0	105.1
Final Moisture Content:	18.7%	17.5%	17.5%
Final Wet Density (lb per cu.ft):	123.5	128.1	124.2
Final Dry Density (lb per cu.ft):	104.1	109.7	105.9
Normal Stress (kips per sq. ft):	0.50	1.00	2.00
Maximum Shearing Stress (kips per sq. ft):	0.66	1.13	2.21
Vertical Deformation @ Max Shear (in):	-0.007	-0.001	-0.006
Horizontal Deformation @ Max Shear (in):	0.449	0.483	0.326



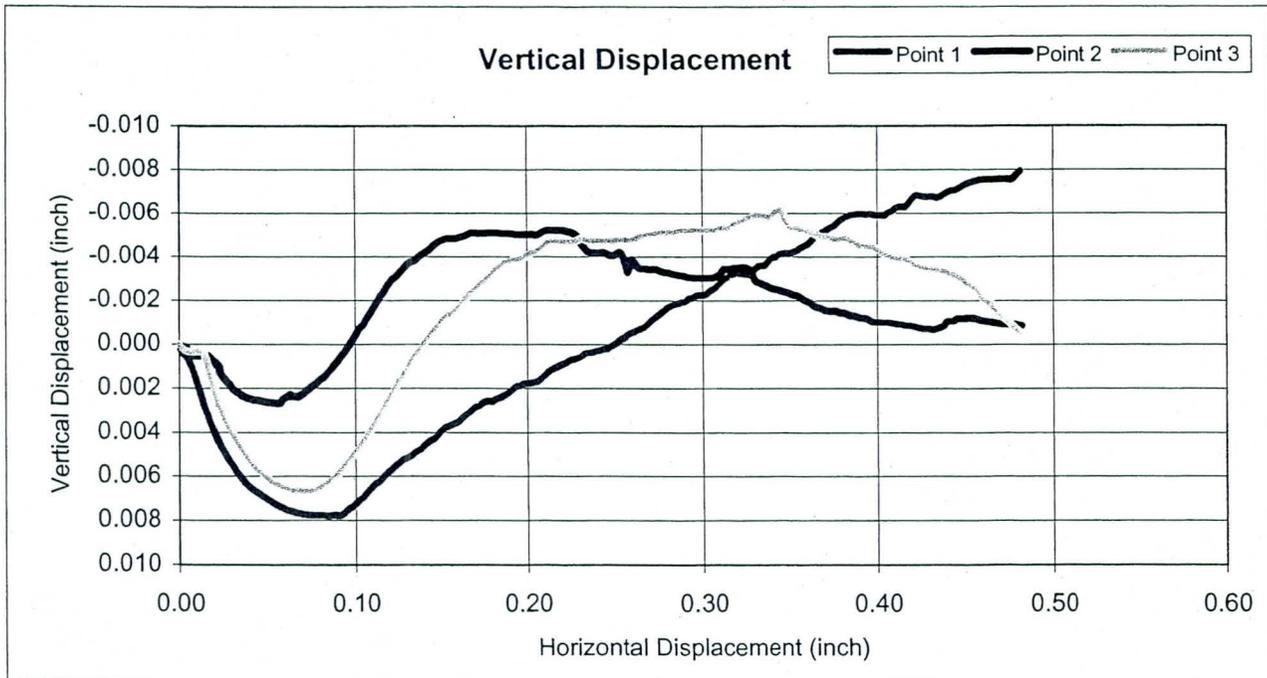
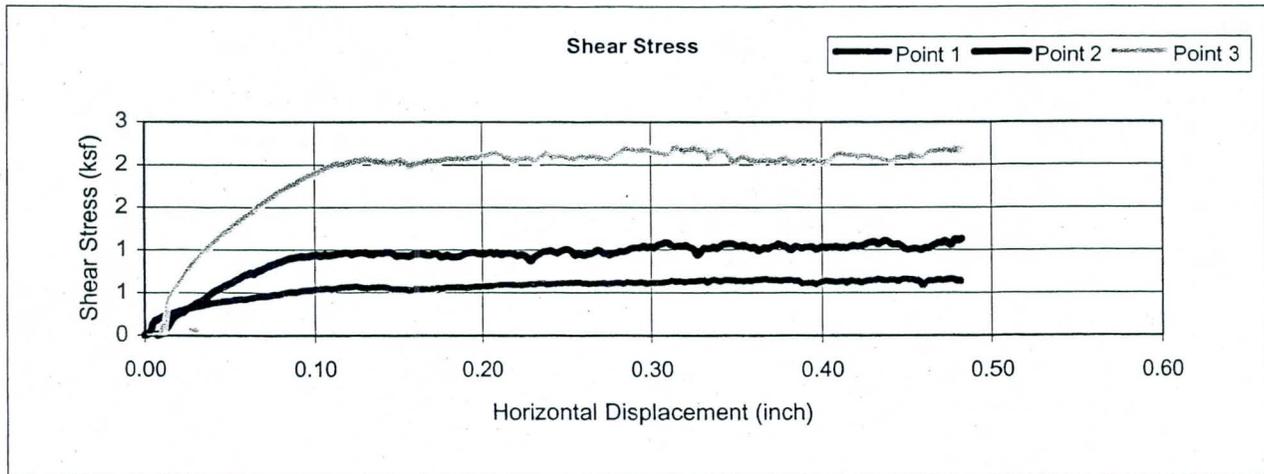


KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: B-2 @ 10-11
SAMPLE PREP.: SATURATED
NORMAL LOADS (ksf): 0.5 1 2

JOB NO: 47724
WORK ORDER NO: 04235
LAB NO: 8
DATE SAMPLED: 8/2 & 8/3/04

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





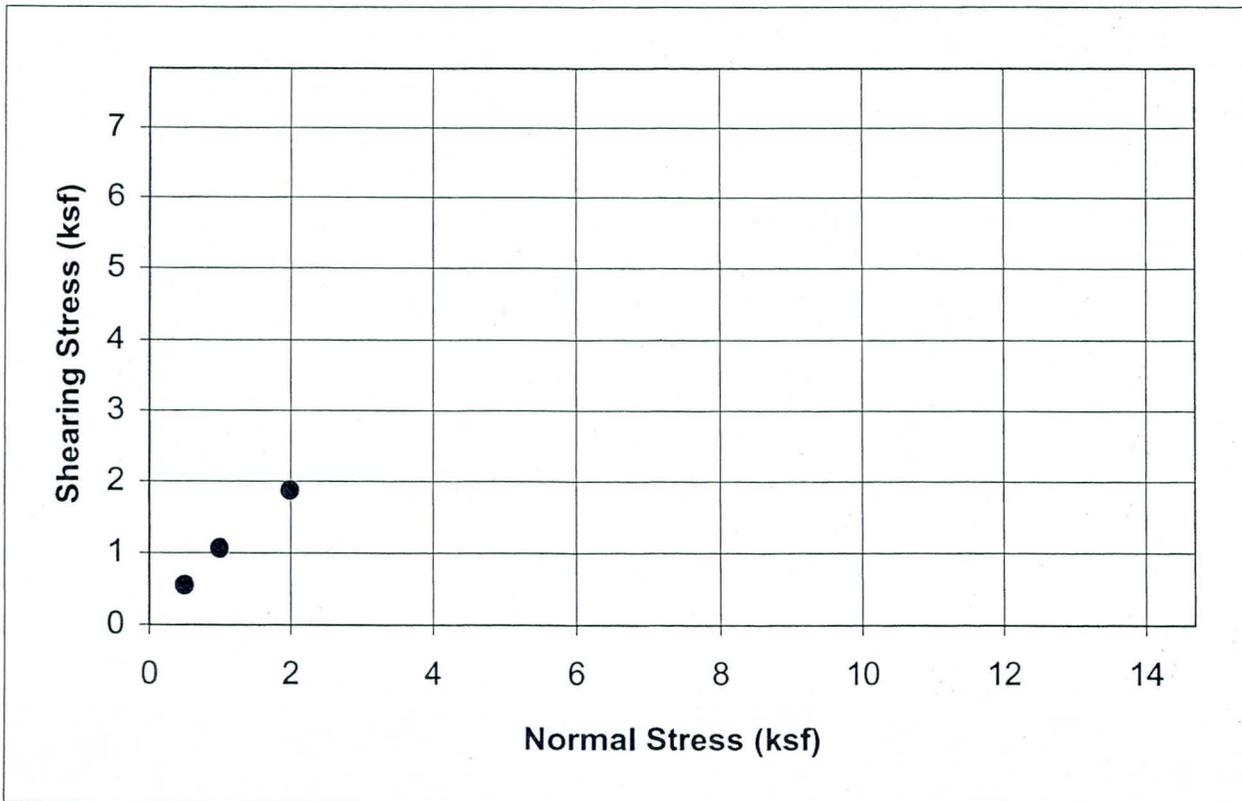
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PROJECT: REEMS ROAD CHANNEL & BASIN
 LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
 MATERIAL: SOIL SAMPLES
 SAMPLE SOURCE: B-4 @ 5-6
 SAMPLE PREP.: SATURATED
 TARGET: N/A

JOB NO: 47724
 W.O. NUMBER: 04235
 LAB NO: 17
 DATE SAMPLED: 8/2 & 8/3/04

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS(ASTM D3080)

Initial thickness of specimen (in.):	1.00		
Initial diameter of specimen (in.):	2.42		
Shearing device used:	Created by DigiShear Version 1.2; Copyright 2000, GEOTAC		
Rate of deformation (in/min):	0.008		
Direct shear point:	1	2	3
Dry mass of specimen (g):	112.9	110.9	113.8
Initial Moisture Content:	13.5%	16.1%	16.3%
Initial Wet Density (lb per cu.ft):	106.1	106.6	109.6
Initial Dry Density (lb per cu.ft):	93.5	91.9	94.3
Final Moisture Content:	29.4%	31.0%	28.2%
Final Wet Density (lb per cu.ft):	119.9	119.1	119.8
Final Dry Density (lb per cu.ft):	92.7	91.1	93.5
Normal Stress (kips per sq. ft):	0.50	1.00	2.00
Maximum Shearing Stress (kips per sq. ft):	0.55	1.06	1.87
Vertical Deformation @ Max Shear (in):	0.008	0.010	0.009
Horizontal Deformation @ Max Shear (in):	0.098	0.101	0.087



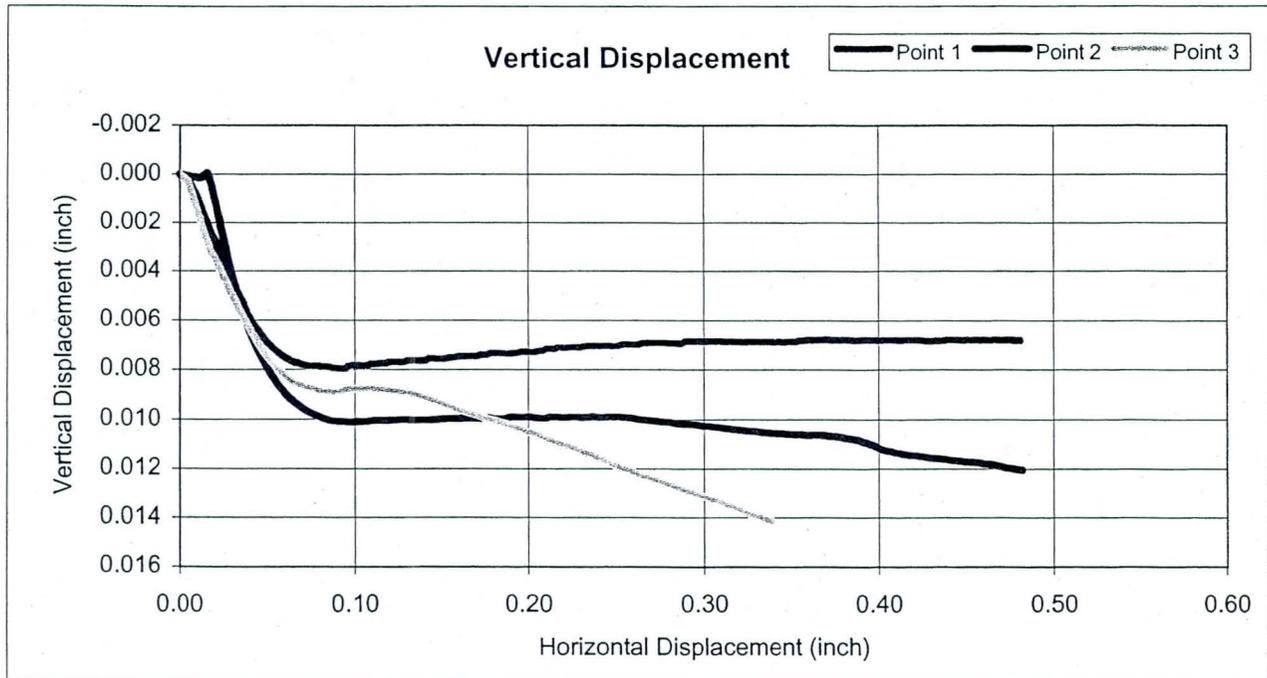
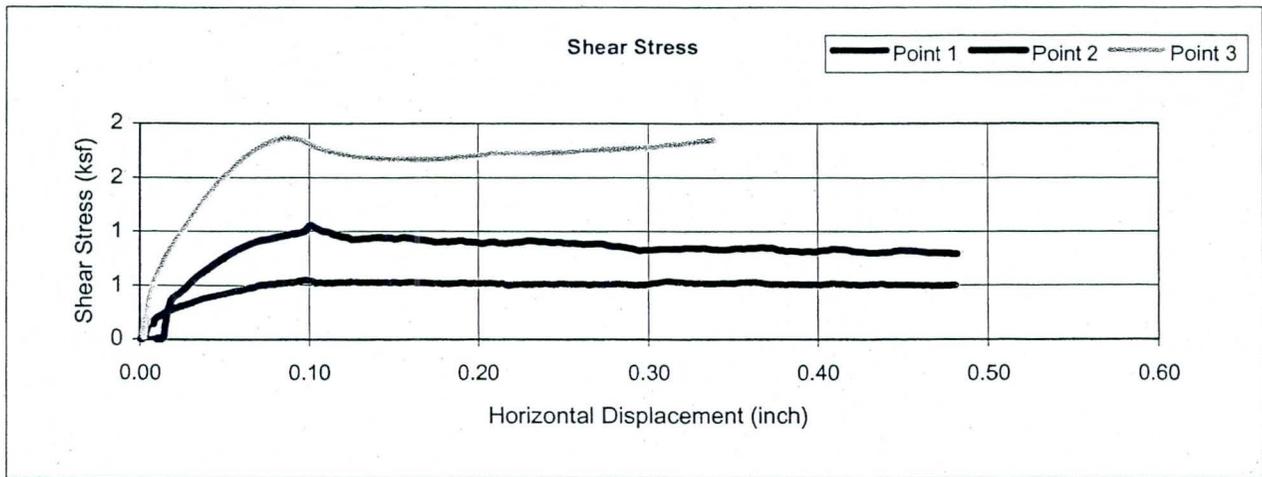


KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: B-4 @ 5-6
SAMPLE PREP.: SATURATED
NORMAL LOADS (ksf): 0.5 1 2

JOB NO: 47724
WORK ORDER NO: 04235
LAB NO: 17
DATE SAMPLED: 8/2 & 8/3/04

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS(ASTM D3080)



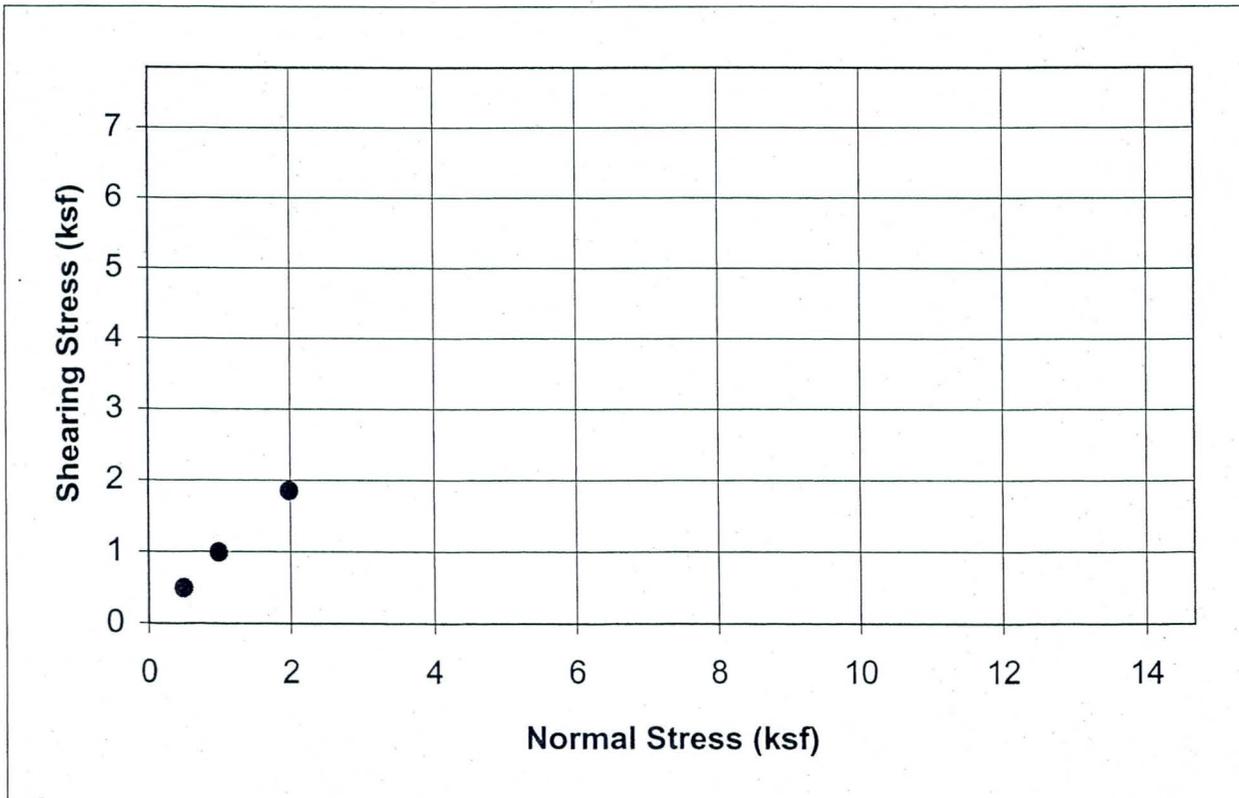


PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: B-6 @ 15-16
SAMPLE PREP.: SATURATED
TARGET: N/A

JOB NO: 47724
W.O. NUMBER: 04235
LAB NO: 29
DATE SAMPLED: 8/2 & 8/3/04

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS(ASTM D3080)

Initial thickness of specimen (in.):	1.00		
Initial diameter of specimen (in.):	2.42		
Shearing device used:	Created by DigiShear Version 1.2; Copyright 2000, GEOTAC		
Rate of deformation (in/min):	0.008		
Direct shear point:	1	2	3
Dry mass of specimen (g):	126.6	126.2	128.0
Initial Moisture Content:	7.9%	9.4%	7.6%
Initial Wet Density (lb per cu.ft):	113.1	114.3	114.1
Initial Dry Density (lb per cu.ft):	104.9	104.5	106.0
Final Moisture Content:	18.9%	22.6%	23.1%
Final Wet Density (lb per cu.ft):	124.3	126.9	127.0
Final Dry Density (lb per cu.ft):	104.5	104.2	105.7
Normal Stress (kips per sq. ft):	0.50	1.00	2.00
Maximum Shearing Stress (kips per sq. ft):	0.48	0.99	1.84
Vertical Deformation @ Max Shear (in):	0.003	0.009	0.027
Horizontal Deformation @ Max Shear (in):	0.399	0.431	0.476



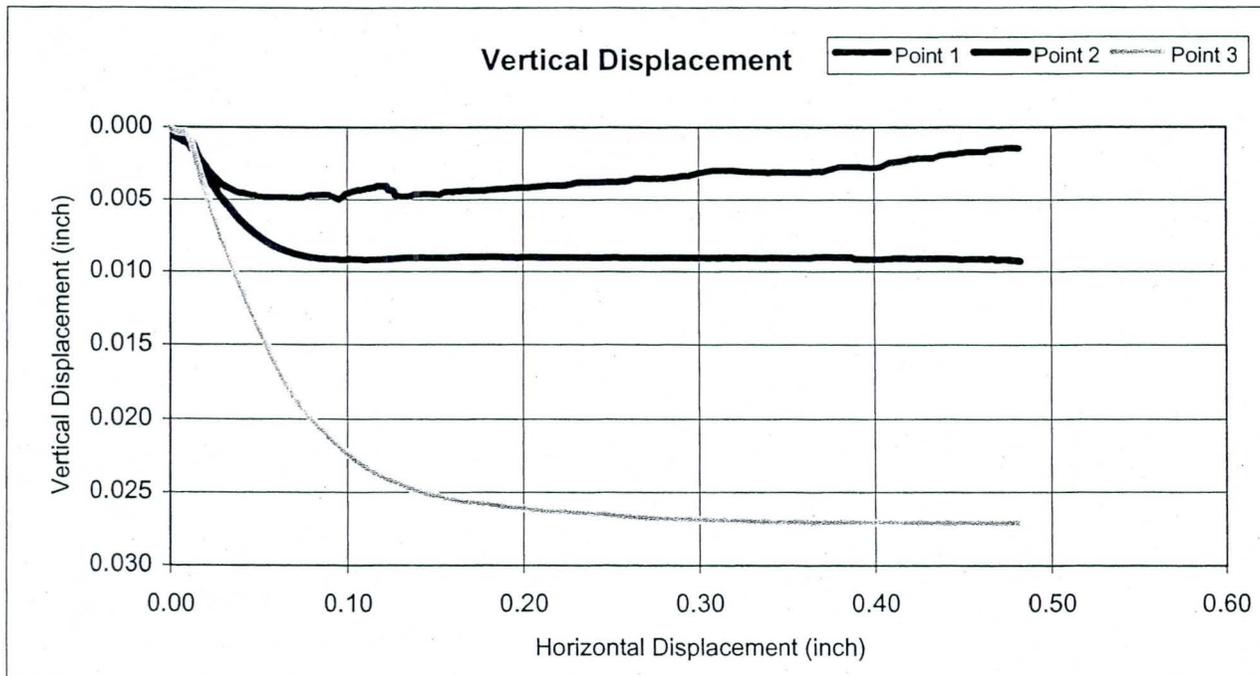
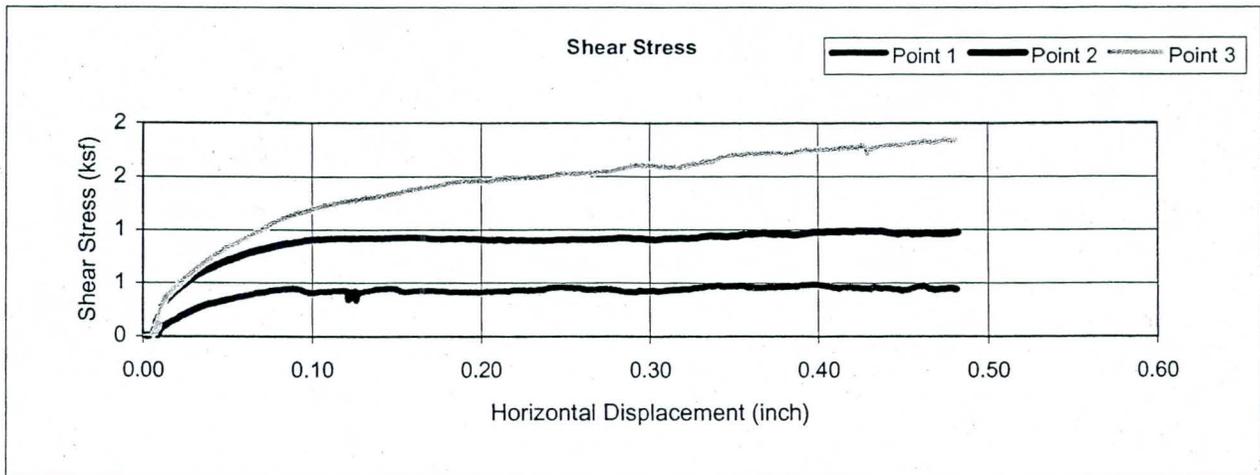


KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: B-6 @ 15-16
SAMPLE PREP.: SATURATED
NORMAL LOADS (ksf): 0.5 1 2

JOB NO: 47724
WORK ORDER NO: 04235
LAB NO: 29
DATE SAMPLED: 8/2 & 8/3/04

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





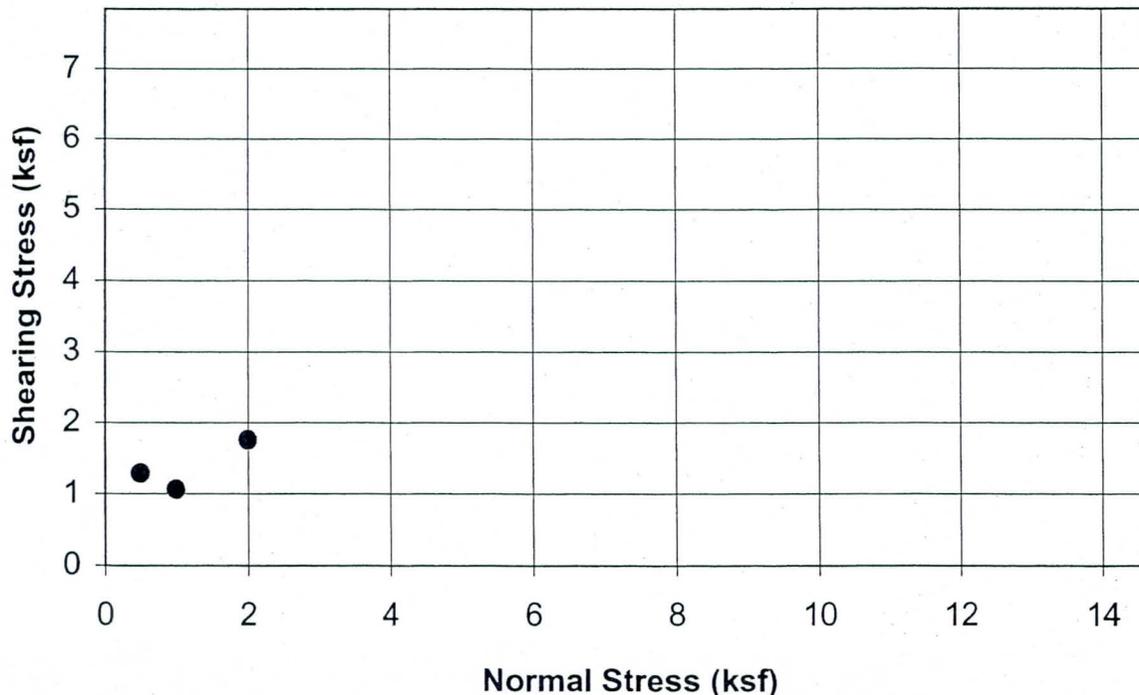
KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
 LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
 MATERIAL: SC
 SAMPLE SOURCE: B-9 @ 5-6
 SAMPLE PREP.: SATURATED
 TARGET: N/A

JOB NO: 47724
 W.O. NUMBER: 04235
 LAB NO: 42
 DATE SAMPLED: 8/2 & 8/3/04

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS(ASTM D3080)

Initial thickness of specimen (in.):	1.00		
Initial diameter of specimen (in.):	2.42		
Shearing device used:	Created by DigiShear Version 1.2; Copyright 2000, GEOTAC		
Rate of deformation (in/min):	0.008		
Direct shear point:	1	2	3
Dry mass of specimen (g):	132.8	115.9	105.8
Initial Moisture Content:	13.1%	16.3%	17.5%
Initial Wet Density (lb per cu.ft):	124.3	111.5	102.9
Initial Dry Density (lb per cu.ft):	110.0	96.0	87.6
Final Moisture Content:	23.0%	29.0%	33.8%
Final Wet Density (lb per cu.ft):	137.4	123.4	114.3
Final Dry Density (lb per cu.ft):	111.7	97.4	89.0
Normal Stress (kips per sq. ft):	0.50	1.00	2.00
Maximum Shearing Stress (kips per sq. ft):	1.28	1.06	1.75
Vertical Deformation @ Max Shear (in):	-0.016	0.003	0.025
Horizontal Deformation @ Max Shear (in):	0.054	0.115	0.457



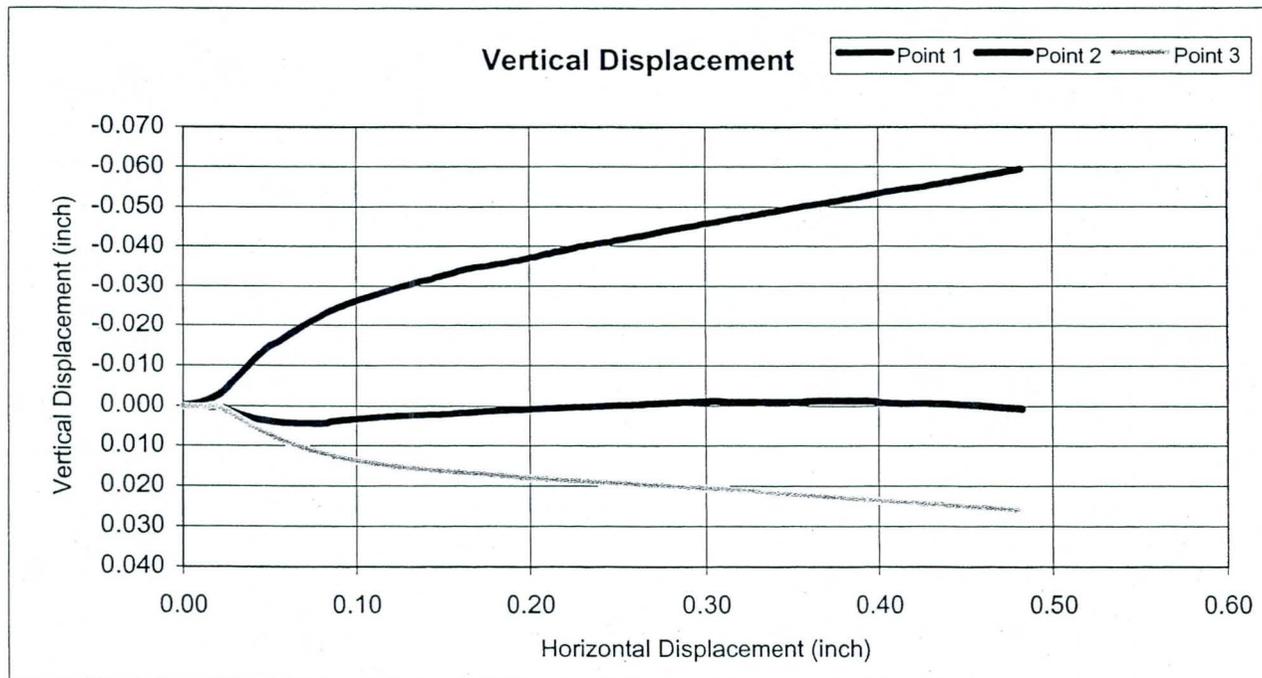
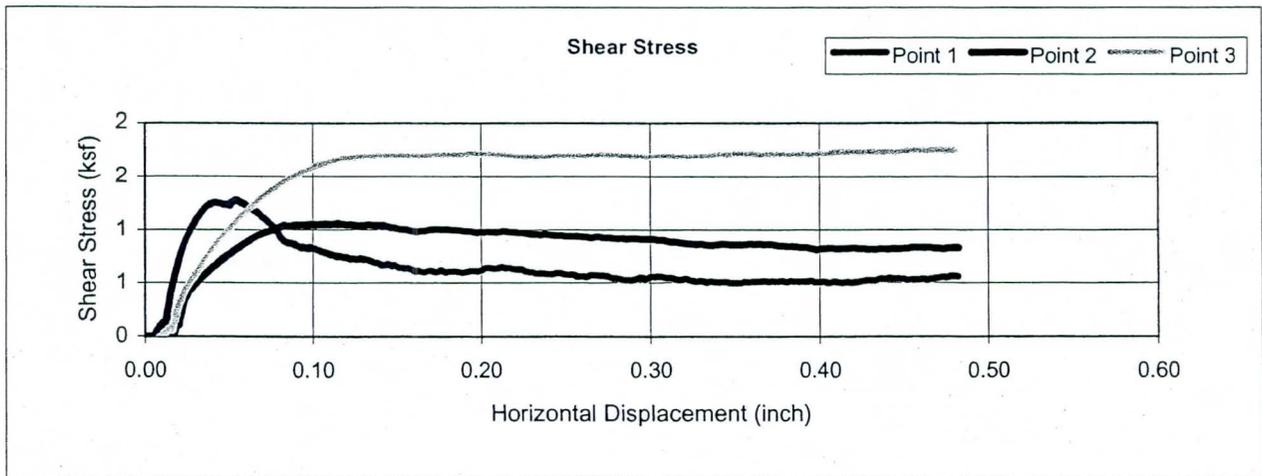


KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SC
SAMPLE SOURCE: B-9 @ 5-6
SAMPLE PREP.: SATURATED
NORMAL LOADS (ksf): 0.5 1 2

JOB NO: 47724
WORK ORDER NO: 04235
LAB NO: 42
DATE SAMPLED: 8/2 & 8/3/04

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





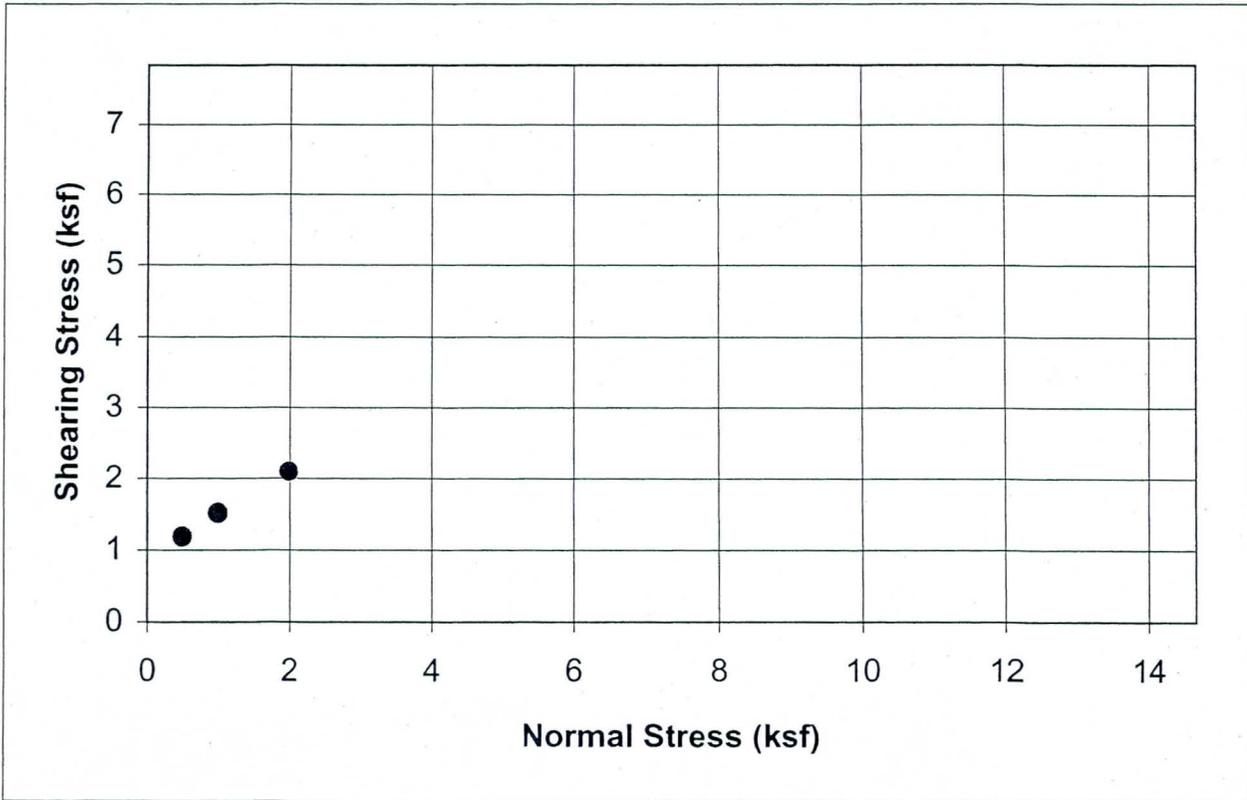
KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
 LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
 MATERIAL: SOIL SAMPLES
 SAMPLE SOURCE: B-10 @ 10-11
 SAMPLE PREP.: SATURATED
 TARGET: N/A

JOB NO: 47724
 W.O. NUMBER: 04235
 LAB NO: 48
 DATE SAMPLED: 8/2 & 8/3/04

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS(ASTM D3080)

Initial thickness of specimen (in.):	1.00		
Initial diameter of specimen (in.):	2.42		
Shearing device used:	Created by DigiShear Version 1.2; Copyright 2000, GEOTAC		
Rate of deformation (in/min):	0.008		
Direct shear point:	1	2	3
Dry mass of specimen (g):	128.9	130.8	135.8
Initial Moisture Content:	9.6%	11.3%	10.0%
Initial Wet Density (lb per cu.ft):	117.0	120.5	123.6
Initial Dry Density (lb per cu.ft):	106.8	108.3	112.5
Final Moisture Content:	9.6%	22.2%	20.1%
Final Wet Density (lb per cu.ft):	118.0	134.8	135.0
Final Dry Density (lb per cu.ft):	107.6	109.2	113.4
Normal Stress (kips per sq. ft):	0.50	1.00	2.00
Maximum Shearing Stress (kips per sq. ft):	1.18	1.51	2.09
Vertical Deformation @ Max Shear (in):	-0.008	-0.019	0.001
Horizontal Deformation @ Max Shear (in):	0.119	0.339	0.080



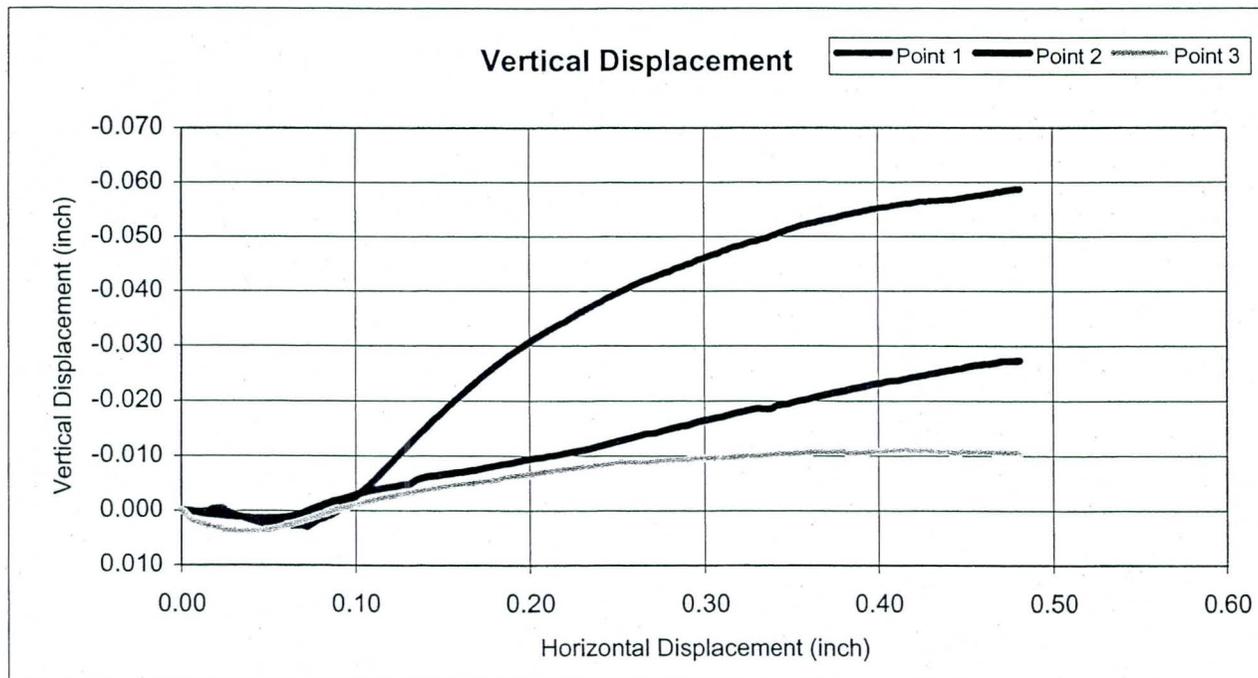
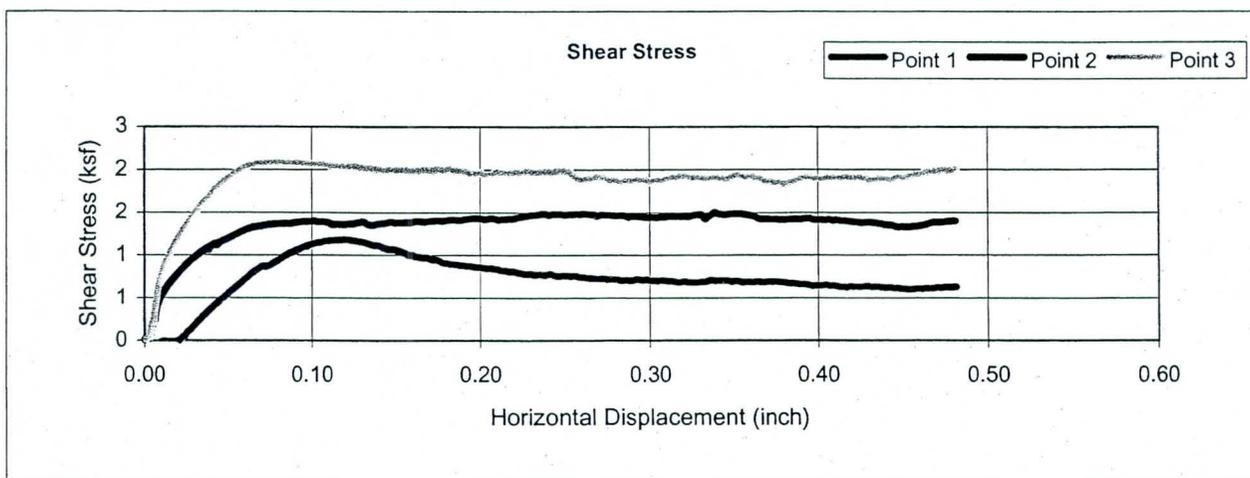


KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: B-10 @ 10-11
SAMPLE PREP.: SATURATED
NORMAL LOADS (ksf): 0.5 1 2

JOB NO: 47724
WORK ORDER NO: 04235
LAB NO: 48
DATE SAMPLED: 8/2 & 8/3/04

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





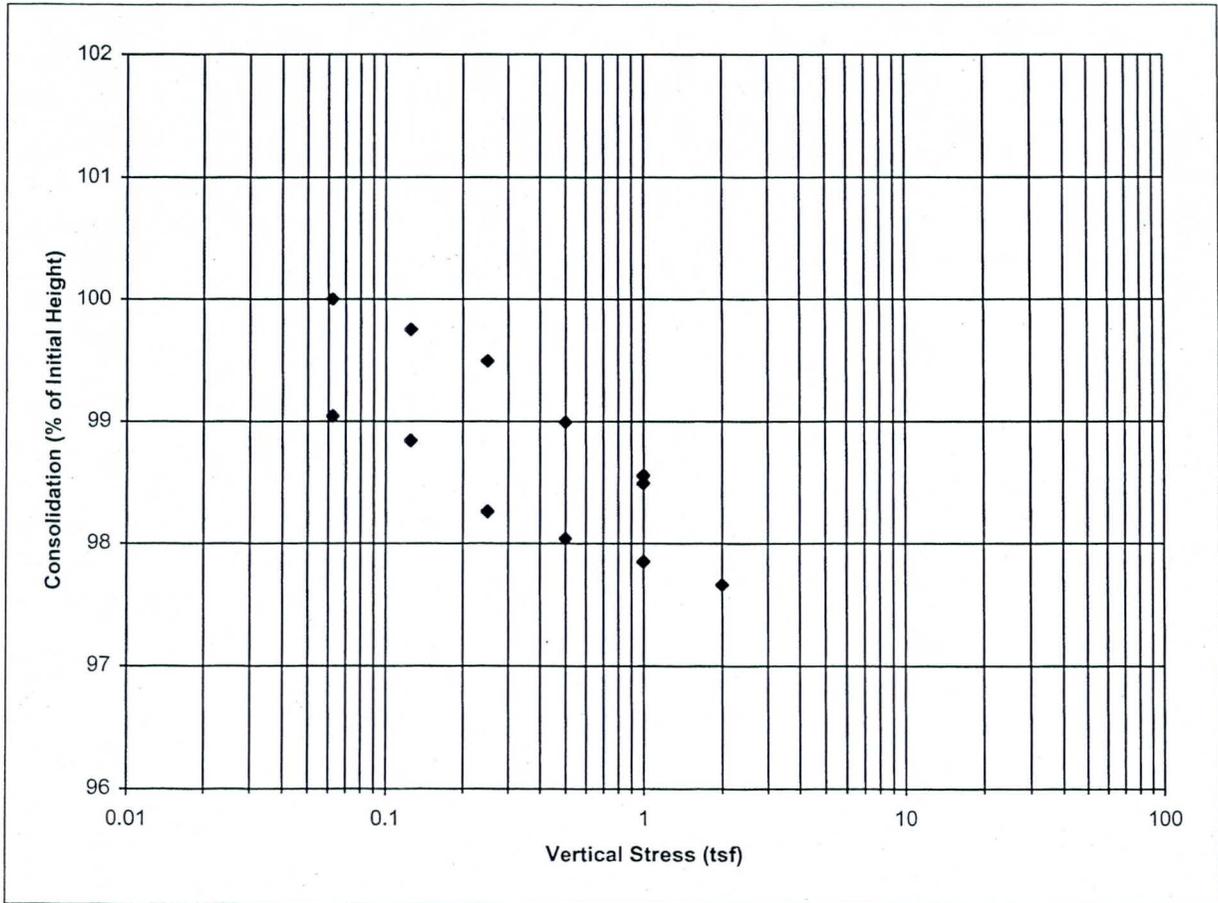
KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: B-1 @ 5-6
REVIEWED BY: M. CONNOLLY

PROJECT NO: 47724
WORK ORDER NO 04235
LAB NO: 2
DATE SAMPLED: 8/2 & 8/3/04

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.50
INITIAL MOISTURE CONTENT	9.5%	FINAL MOISTURE CONTENT	14.8%
INITIAL DRY DENSITY(pcf)	118.5	FINAL DRY DENSITY(pcf)	120.7
INITIAL DEGREE OF SATURATION	60%	FINAL DEGREE OF SATURATION	101%
INITIAL VOID RATIO	0.4	FINAL VOID RATIO	0.4
ESTIMATED SPECIFIC GRAVITY	2.700	SATURATED AT	1tsf





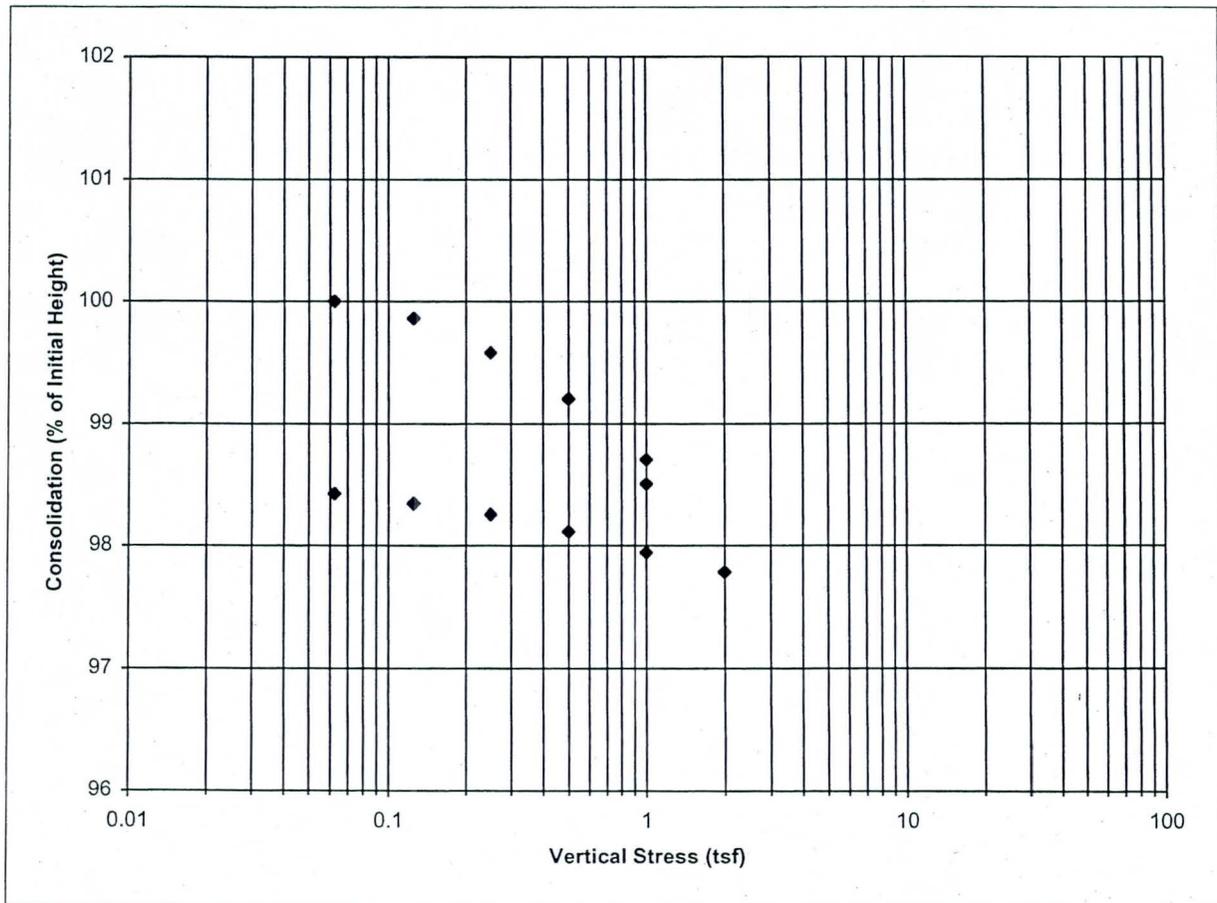
KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: B-5 @ 10-11
REVIEWED BY: M. CONNOLLY

PROJECT NO: 47724
WORK ORDER NO 04235
LAB NO: 23
DATE SAMPLED: 8/2 & 8/3/04

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.50
INITIAL MOISTURE CONTENT	6.8%	FINAL MOISTURE CONTENT	15.9%
INITIAL DRY DENSITY(pcf)	108.9	FINAL DRY DENSITY(pcf)	110.8
INITIAL DEGREE OF SATURATION	39%	FINAL DEGREE OF SATURATION	98%
INITIAL VOID RATIO	0.4	FINAL VOID RATIO	0.4
ESTIMATED SPECIFIC GRAVITY	2.500	SATURATED AT	1tsf





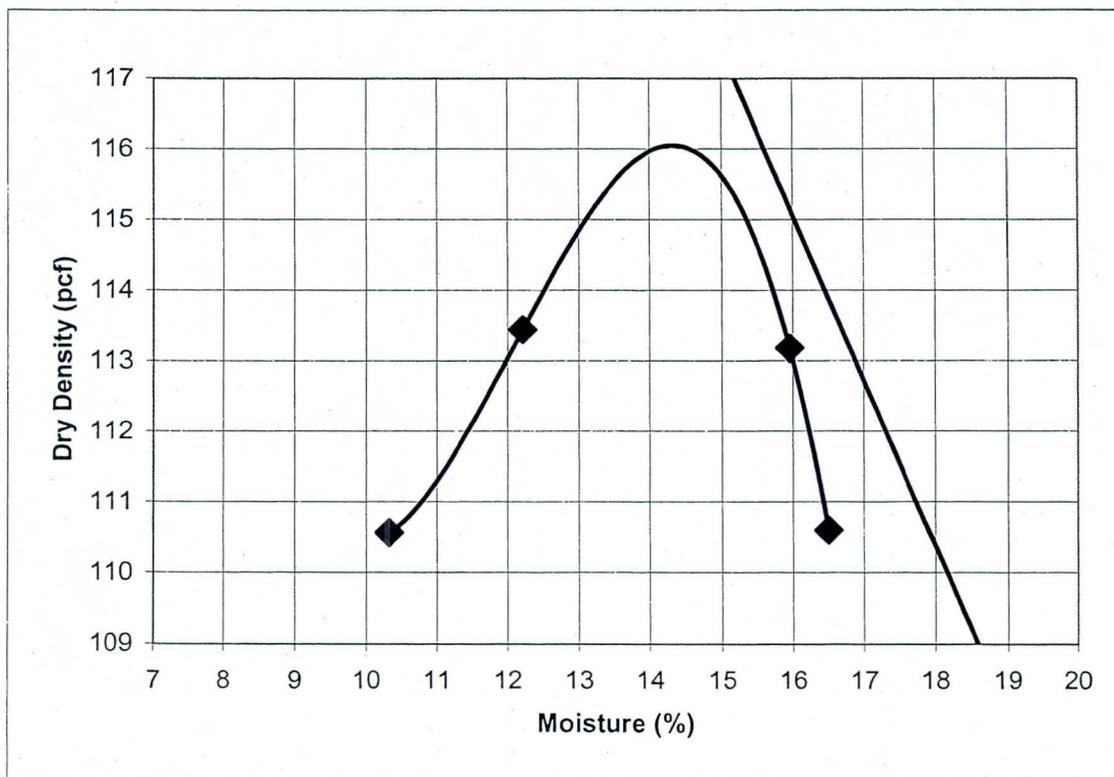
PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: B-4 @ 3-10

JOB NO: 47724
WORK ORDER NO: 04235
LAB NO: 64
SAMPLE DATE: 8/2 & 8/3/04

LABORATORY COMPACTION CHARACTERISTICS OF SOILS USING
STANDARD EFFORTS (12,400ft-lb-ft/cu.ft) (ASTMD698A)

CURVE: 04235-64
Maximum dry density:
Optimum moisture (%):

English (pcf)	Metric (kg/ cu.m.)
116.1	1859
14.3	14.3



NOTES:

- The zero air void curve represents a specific gravity of: 2.6 (assumed).
- This is a summarized report of the referenced procedures and does not include all reporting requirements. Additional data can be provided at clients request.

Reviewed by: _____

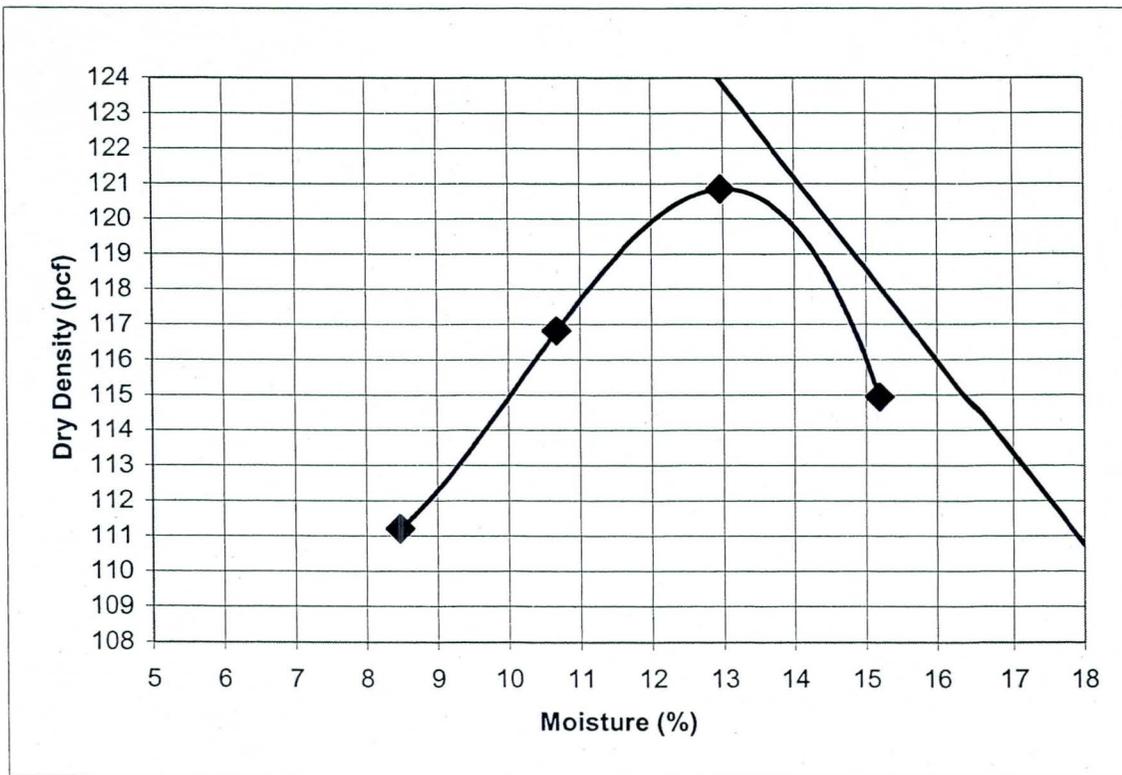
PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SOIL SAMPLES
SAMPLE SOURCE: B-5 @ 3-10

JOB NO: 47724
WORK ORDER NO: 04235
LAB NO: 65
SAMPLE DATE: 8/2 & 8/3/04

**LABORATORY COMPACTION CHARACTERISTICS OF SOILS USING
 STANDARD EFFORTS (12,400ft-lb-ft/cu.ft) (ASTMD698A)**

CURVE: 04235-65
Maximum dry density:
Optimum moisture (%):

English (pcf)	Metric (kg/ cu.m.)
120.8	1936
13.0	13.0



NOTES:

- The zero air void curve represents a specific gravity of: 2.65 (assumed).
- This is a summarized report of the referenced procedures and does not include all reporting requirements. Additional data can be provided at clients request.

Reviewed by: _____ *[Signature]*



PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SEE BELOW
SAMPLE SOURCE: SEE BELOW

PROJECT NO: 47724
WORK ORDER NO: 04235
LAB NO: SEE BELOW
DATE SAMPLED: 8/2 & 8/3/04
REVIEWED BY: M. CONNOLLY

Laboratory Compaction Characteristics of Soils using the One-Point method
AASHTO T 272-86 (2000)

LAB NO	SAMPLE SOURCE	MATERIAL	Maximum Dry Density (pcf)	Optimum Moisture (%)
62	B-2 @ 3-10	SOIL SAMPLES	139.7	10.1
66	B-6 @ 3-10	SOIL SAMPLES	138.2	11.8



PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: SEE BELOW
SAMPLE SOURCE: SEE BELOW

PROJECT NO: 47724
WORK ORDER NO: 04235
LAB NO: SEE BELOW
DATE SAMPLED: 8/2 & 8/3/04
REVIEWED BY: M. CONNOLLY

PH & RESISTIVITY (AZ 236)

LAB NO	SAMPLE SOURCE	MATERIAL	RESISTIVITY (Ohm-cm)	pH
61	B-1 @ 3-10	SOIL SAMPLES	903	8.0
63	B-3 @ 3-10	SOIL SAMPLES	1,966	7.9
65	B-5 @ 3-10	SOIL SAMPLES	1,550	8.1
66	B-6 @ 3-10	SOIL SAMPLES	848	7.9
68	B-8 @ 3-10	SOIL SAMPLES	1,074	8.0



KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: Soil Samples
SAMPLE SOURCE: B-1 DEPTH: 3-10

JOB NO: 47724
WORK ORDER NO: 04235
LAB NO: 61
TESTED BY: IAS LABORATORIES

ANALYSES RESULTS

ANALYSIS	RESULTS	UNITS
SULFATE	49	ppm
CHLORIDE	45	ppm



KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: Soil Samples
SAMPLE SOURCE: B-5

DEPTH: 3-10

JOB NO: 47724
WORK ORDER NO: 04235
LAB NO: 65
TESTED BY: IAS LABORATORIES

ANALYSES RESULTS

ANALYSIS	RESULTS	UNITS
SULFATE	27	ppm
CHLORIDE	13	ppm



KLEINFELDER

PROJECT: REEMS ROAD CHANNEL & BASIN
LOCATION: 1/2 MILE SOUTH OF OLIVE TO PEORIA
MATERIAL: Soil Samples
SAMPLE SOURCE: B-8 DEPTH: 3-10

JOB NO: 47724
WORK ORDER NO: 04235
LAB NO: 68
TESTED BY: IAS LABORATORIES

ANALYSES RESULTS

ANALYSIS	RESULTS	UNITS
SULFATE	46	ppm
CHLORIDE	38	ppm



IAS Laboratories

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Phoenix, Arizona 85034
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SOIL ANALYSIS REPORT

Page 1

Today's Date: 8/17/2004
Grower: 47724-04235 FCD
Submitted By: Sabine Guedamour
Send Report To: KLEINFELDER
Report Number: 6624231
Crop: No Interpretive Levels
Date Received: 8/12/2004

VL = Very Low
L = Low
M = Medium
H = High
VH = Very High

Sender Sample Id	Depth	Lab #	pH	Calcium (Ca) PPM	Magnesium (Mg) PPM	Sodium (Na) PPM	Potash (K) PPM	Iron (Fe) PPM	Zinc (Zn) PPM	Manganese (Mn) PPM	Copper (Cu) PPM	Salinity (EC x K) dS/m	Nitrate Nitrogen (NO3-N) PPM	Phosphorus (Bicarb - Soluble P) PPM	Computed % Sodium (ESP)	Sulfur (SO4-S) PPM	Boron (B) PPM	Free Lime Level
B6	0-3	399	7.9	5600 VH	430 VH	270 H	350 VH	15.0 VH	1.00 M	9.0 VH	2.1 VH	5.4 VH	300.0 VH	12.0 M	3.5	150 VH	.47 L	High
B9	3-10	400	8.6	7500 VH	370 VH	170 M	190 H	49.0 VH	.31 L	32.0 VH	1.1 VH	1.0 L	23.0 H	7.4 L	1.8	49 VH	.23 VL	High



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SOIL FERTILITY RECOMMENDATIONS

Lb/1000 Sq Ft

Grower: 47724-04235 FCD

Send To: KLEINFELDER

Report No: 6624231

Date: 8/12/2004

Page: 2

Sender Number	Crop	Nitrogen N	Phosphate P2O5	Potash K2O	Magnesium Mg	Sulfur S	Iron Fe	Zinc Zn	Manganese Mn	Copper Cu	Boron B	AMENDMENTS			Leaching of Excess Salts	
												Elemental Sulfur	Gypsum	Lime		
B1	No Interpretive Levels															
B5	No Interpretive Levels															
B8	No Interpretive Levels															
B6	Turf	excess	1 b								h					yes*
B9	Turf	1 a	2 b						excess		h	20**				

*Total salinity (EC) levels are high enough to deter turfgrass growth. Leach to remove excess salts.

**Till sulfur into the soil to reduce pH. When turf is already established about the best you can do is to work it in when verticutting or aerating. Disposul, a 95 sulfur product, dissolves readily and can be used. After sulfur addition, Leach by irrigating with large amounts of water to push sodium below rootzone.

a. Currently adequate. Apply this amount about every 4 weeks. The B6 sample has excessive N and will reduce growth due to salinity.

b Apply phosphorus as a blend or as triple superphosphate or as MAP. Phosphorus is most efficient when applied following aerating to work the P into the soil near the plant roots.

The Mn level is very high on the B9 sample and could reduce growth of turf.

h. Irrigation should give enough B for turf. However, it wouldn't hurt to test the water to be sure.