

CONSTRUCTION DOCUMENTS

FOR

21

CONTRACT FCD 2002C031
LAVEEN AREA CONVEYANCE CHANNEL
PCN 117.08.31



(Engineer's Seal)

Prepared By

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

Recommended by: Edward A. Raleigh Date: 4/2/03
Edward A. Raleigh, P.E.
Manager Engineering Division

Issued for Public Bidding by: M.S. Ellegood Date: 4/4/03
Michael S. Ellegood, 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 2003.

AGENDA ITEM C-69-03-020-5-00

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 2002C031

PCN 117.08.31

TABLE OF CONTENTS

	<u>PAGE</u>
1. INVITATION FOR BID	4
2. PRINCIPLE ITEMS AND APPROXIMATE QUANTITIES.....	7
3. BID	8
4. BID SCHEDULE	10
5. SUBCONTRACTOR LISTING	15
6. SURETY BOND.....	16
7. NO COLLUSION AFFIDAVIT	17
8. CERTIFICATION OF LICENSE.....	18
9. MWBE ASSURANCES AFFIDAVIT	19
10. MWBE ACTUAL PARTICIPATION AFFIDAVIT	20
11. MWBE PARTICIPATION REPORT	21
12. CONTRACT AGREEMENT	22
13. STATUTORY PAYMENT BOND PURSUANT TO TITLE 34	25
14. STATUTORY PERFORMANCE BOND PURSUANT TO TITLE 34.....	26
15. INDEMNIFICATION	27
16. INSURANCE REQUIREMENTS.....	27
17. CERTIFICATE OF INSURANCE	31
18. CERTIFICATE OF PERFORMANCE.....	32
19. SUPPLEMENTARY GENERAL CONDITIONS (SGC).....	(31 pages)
20. SPECIAL PROVISIONS (SP)	(32 pages plus Appendices A, B, C, and D)
Appendix A – SOILS REPORT – NINYO AND MOORE	
Appendix B – DUCTILE IRON PIPE PLANS AND SPECIFICATIONS	
Appendix C – IRRIGATION SLEEVING PLANS AND SPECIFICATIONS	
Appendix D - SALT RIVER PROJECT CONSTRUCTION – FOR INFORMATION ONLY	
21. DRAWING(S) (140 Plan Sheet[s]).....	(Separate)



(Area to left reserved for Engineer's Seal)

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

INVITATION FOR BID

BID OPENING DATE: THURSDAY, MAY 22, 2003

PROJECT LOCATION: The project is located within the City of Phoenix and Maricopa County unincorporated area.

PROPOSED WORK: The project includes the channel excavation (approximately 5.8 miles in length), sump excavation, five concrete box culverts, three (3) concrete retaining walls, a concrete low-flow channel (approximately 5.8 miles in length), concrete grade control structures, installation of approximately 7,600 feet of storm drain pipe, manholes, and fittings, installation of tailwater and storm drain pipe, headwalls, and associated structures and connections, installation of siphon structures and concrete-lined irrigation ditches, backfilling of the existing Maricopa Drain, and installation of irrigation pipelines and sleeves. The Contractor shall be required to divert water from the existing Maricopa Drain to construct the Project, and shall be required to divert this water to the low-flow channel upon completion of the Project.

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 (MST) on Thursday, May 22, 2003 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 MANDATORY PRE-BID CONFERENCE

A MANDATORY site visit and MANDATORY Pre-Bid conference will be held on Tuesday May 6, 2003 at 1:00 P.M. (MST) at the Bougainvillea Golf Course, 5740 West Baseline Road, Laveen, Arizona 85339. All potential contractors must attend both the site visit and the 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 five hundred seventy (570) calendar days from the date of Notice to Proceed.

MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISE (MWBE) PARTICIPATION:

It is the policy of the Flood Control District of Maricopa County to endeavor to ensure in every way possible that minority and women-owned business enterprises have every opportunity to participate in providing professional services, purchased goods, and contractual services without being discriminated against on the grounds of race, religion, gender, age, disability, or national origin.

The utilization of MWBE subcontractors is governed by the Maricopa County Minority and Women-Owned Business Enterprise Program. The Maricopa County MWBE Program maintains a Certified Business Directory, compiled and updated monthly, of certified MWBE firms. The MWBE Program and the Certified Business Directory are both available at Internet Site <http://www.mcdot.maricopa.gov/procurement/mwbe/home.htm>. The Flood Control District of Maricopa County uses the MWBE Certified Business Directory as the official listing of certified minority and women-owned firms.

The Maricopa County Minority and Women-Owned Business Enterprise Program, effective January 1, 1992, is incorporated herein by reference.

Two Affidavits are included herein. The first form, the "MWBE Assurances Affidavit," must be completed and submitted with the bid – **Failure to do so may be cause for rejection of the bid.**

If MWBE goals have been established, the first and second low bidders must complete and return the second form, "Actual MWBE Participation Affidavit," to the Flood Control District of Maricopa County by 4:00 P.M. on the **seventh (7th) calendar day** after bid opening.

The MWBE goal for this contract is ten percent (10%) for minority and women-owned business enterprises.

Bidders unable to meet the established goal must submit "Good Faith" documentation. Failure to implement good faith efforts in accordance with the Maricopa County Minority and Women-Owned Business Enterprise program for MWBE to the satisfaction of the Flood Control District of Maricopa County may result in rejection of the bid.

PROJECT PLANS, SPECIAL PROVISIONS AND CONTRACT DOCUMENTS:

Paper Plans and Construction Documents for the cost of \$290.00 or *CD of Plans and paper Construction Documents (*Optional*) for the cost of \$16.50 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. 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.

PRINCIPLE ITEMS AND APPROXIMATE QUANTITIES

QUANTITY	UNIT	DESCRIPTION
850,000	CY	Channel and sump Excavation
53,300	CY	Channel Backfill
298,000	SF	Concrete- maintenance road
29,300	LF	Concrete Mow Strip
29,850	LF	Concrete Low Flow Channel
5,500	CY	Concrete structures
725	LF	18-inch Ductile Iron Pipe
572	LF	24-inch Pipe – RCP, CLCMP, CIP, or HDPE
1,629	LF	48-inch Pipe – RCP, CLCMP, CIP, or HDPE
5,929	LF	60-inch Pipe – RCP, CLCMP, or CIP, or HDPE
1,405	LF	24-inch Tailwater Pipe – RCP or CMP
2,455	LF	30-inch Tailwater – RCP or CMP and Siphon Pipe – RCP, CLCMP, CIP, or HDPE

BID

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

Gentlemen:

The following Bid is made for Contract **FCD 2002C031, Laveen Area Conveyance Channel**, 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 five hundred seventy (570) 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

Bid Schedule – Contract FCD 2002C031, Laveen Area Conveyance Channel					
ITEM NO.	DESCRIPTION	UNIT	PROJECT QUANTITY	UNIT COST NUMBERS	EXTENDED AMOUNT
105-1	Partnering Allowance	LS	1	\$20,000.00	\$20,000.00
107-1	AZPDES / SWPPP Permits	LS	1		
107-2	Public Information and Notification Allowance	LS	1	\$30,000.00	\$30,000.00
107-3	Project Signs Allowance	LS	1	\$10,000.00	\$10,000.00
107-4	Water Management	LS	1		
201-1	Clearing and Grubbing (Project Corridor)	LS	1		
202-1	Mobilization	LS	1		
211-1	Laveen Channel Fill	CY	53,887		
211-2	Maricopa Drain Fill	CY	1,774		
215-1	Channel Excavation	CY	806,908		
215-2	Sump Excavation	CY	22,223		
220-1	Plain RipRap (36" Thick)	CY	1,562		
310-1	Aggregate Base Course Maintenance Road (6")	SY	2,640		
336-1	Pavement Replacement	SY	1,874		
340-1	Concrete Mow Strip, Detail D3	LF	28,990		
340-2	Concrete Single Curb, MAG DET 222, Type "B"	LF	291		
350-1	Miscellaneous Removals	LS	1		
401-1	Traffic Control - Baseline Road	LS	1		
401-2	Traffic Control - Other	LS	1		
401-3	Off-Duty Uniformed Officer Allowance	HR	250		
420-1	6' Chain Link Fence	LF	2,421		
420-2	24' Chain Link fence gate	EA	1		
421-1	4 Strand Smooth Wire Fence	LF	1,105		
432-1	Gravel Mulch	SY	5,100		
441-1	Grasscrete	SY	1,430		
505-1	Concrete Box Culvert No. 1	LS	1		
505-2	Concrete Box Culvert No. 2	LS	1		
505-3	Concrete Box Culvert No. 3	LS	1		
505-4	Concrete Box Culvert No. 4	LS	1		
505-5	Concrete Box Culvert No. 5	LS	1		
505-6	Concrete Side Drain Outlet, Detail D12	EA	4		
505-7	Concrete Low-Flow Transition Sections, Detail D2	EA	10		

Bid Schedule – Contract FCD 2002C031, Laveen Area Conveyance Channel

ITEM NO.	DESCRIPTION	UNIT	PROJECT QUANTITY	UNIT COST NUMBERS	EXTENDED AMOUNT
505-8	Concrete Retaining Wall No.1	LS	1		
505 - 9	Concrete Retaining Wall No.2	LS	1		
505 - 10	Concrete Retaining Wall No.3	LS	1		
505 - 11	Concrete Grade Control Structure. Detail D7	EA	12		
505 - 12	Concrete Inlet Headwall, Detail D22	EA	1		
505 - 13	Concrete Inlet Headwall, MAG Detail 501-2-'U' Mod (24")	EA	4		
505 - 14	Concrete Catch Basin, MAG Det 535 'F'	EA	1		
505 - 15	Concrete Inlet Headwall, MAG Detail 501- 4 (48")	EA	1		
505 - 16	Concrete Headwall, MAG Detail 502-2-'L' (30")	EA	1		
505 - 17	Concrete Siphon Manhole, Detail D9	EA	12		
505 - 18	Concrete Lined Irrigation Ditch (D=1.5')	LF	2,975		
505 - 19	Concrete Lined Irrigation Ditch (D=2.5')	LF	2,072		
505 - 20	Concrete Side Drain Swale, Detail D6	CY	192		
505 - 21	Concrete Outlet Headwall, Detail D10	EA	5		
505 - 22	Concrete Headwall, MAG Detail 502-1	EA	1		
505 - 23	Concrete headwall, MAG Detail 502-1, Mod (Trash-rack)	EA	2		
505 - 24	Concrete Low Flow Channel	LF	29,844		
505 - 25	Concrete Maintenance Road	SF	297,980		
515 - 1	Access Barrier, COP Detail P-1562, P-1563 (60")	EA	3		
515 - 2	48" Flap Gate	EA	1		
515 - 3	Bollards	EA	20		
515 - 4	Power Pole Shoring	LS	1		
610 - 1	12" Water Line Relocation	LF	153		
610 - 2	12" Water Valve (Allowance)	EA	2		
610 - 3	12" x 22 1/2 Degree Bend	EA	4		
610 - 4	Water Service Line Relocation Allowance	LS	1	\$10,000.00	\$10,000.00
618 - 1	18" Pipe	LF	125		
618 - 2	24" Pipe	LF	840		
618 - 3	30" Pipe	LF	104		
618 - 4	48" Pipe	LF	1,856		
618 - 5	60" Pipe	LF	5,794		
618 - 6	18" Tailwater Pipe	LF	93		
618 - 7	24" Tailwater Pipe	LF	1,568		
618 - 8	30" Tailwater Pipe	LF	927		

Bid Schedule – Contract FCD 2002C031, Laveen Area Conveyance Channel

ITEM NO.	DESCRIPTION	UNIT	PROJECT QUANTITY	UNIT COST NUMBERS	EXTENDED AMOUNT
618 - 9	36" Tailwater Pipe	LF	268		
618 - 10	30" Siphon Pipes	LF	1,644		
618 - 11	Prefabricated Bend, 60" x 11 1/4 Degree Bend	EA	2		
618 - 12	Prefabricated Bend, 60" x 58 Degree Bend	EA	2		
618 - 13	Prefabricated Tee 48" x 48" x 18"	EA	1		
618 - 14	Prefabricated Tee 48" x 48" x 24"	EA	1		
618 - 15	Prefabricated Tee 60" x 60" x 24"	EA	2		
618 - 16	Concrete End Section (MAG Det 545)	EA	45		
618 - 17	Pipe Plug (MAG Det 427)	EA	8		
618 - 18	Concrete Pipe Collar (MAG Det 505)	EA	17		
625 - 1	Storm Drain Manhole (MAG Det 520 & 522)	EA	9		
625 - 2	Storm Drain Manhole (MAG Det 521 & 522)	EA	3		
625 - 3	Storm Drain Manhole, Detail D24	EA	4		
632 - 1	PVC Sleeves (4")	EA	60		
796 - 1	Owl Habitat Materials	LS	1		
	Appendix B Bid Schedule				
750 - 1	18" DIP, Elbows, blind flanges, air valve & vault	LS	1		
	Appendix C Bid Schedule				
440 - 1	2" Schedule 40 PVC Sleeve	LF	440		
440 - 2	4" Schedule 40 PVC Sleeve	LF	2,834		
440 - 3	8" Schedule 40 PVC Sleeve	LF	14		
440 - 4	Utility Pack #1 with 8" DIP Mainline	LF	92		
440 - 5	Utility Pack #1 with 12" DIP Mainline	LF	160		
440 - 6	Utility Pack #2	LF	390		
440 - 7	Utility Pack #3	LF	92		
440 - 8	Utility Pack #4	LF	135		
440 - 9	Utility Pack #5	LF	135		
440 - 10	Utility Pack #5A	LF	125		
440 - 11	Utility Pack #6	LF	138		
440 - 12	Utility Pack #7	LF	40		

Bid Schedule – Contract FCD 2002C031, Laveen Area Conveyance Channel

ITEM NO.	DESCRIPTION	UNIT	PROJECT QUANTITY	UNIT COST NUMBERS	EXTENDED AMOUNT
440 - 13	Utility Pack #8	LF	138		
440 - 14	Utility Pack #9	LF	20		
440 - 15	Utility Pack #10	LF	40		
440 - 16	Utility Pack #11	LF	52		
440 - 17	6" DIP Channel Crossing Complete	LF	1,273		
440 - 18	8" DIP Channel Crossing Complete	LF	162		
440 - 19	12" DIP Channel Crossing Complete	LF	288		
440 - 20	Electrical Pull Boxes	EA	14		
TOTAL BID AMOUNT IN WRITTEN NUMBERS:					
TOTAL BID AMOUNT IN WRITTEN WORDS:					

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 2002C031, Laveen Area Conveyance Channel.**

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:

Bond Number: _____

ATTACH SURETY POWER OF ATTORNEY

Principal

By: _____
(Printed Name)

(Signature)

(Title)

Surety Name

By: _____
(Printed Name)

By: _____
(Signature)

(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 2002C031 for Laveen Area Conveyance Channel, 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: _____

MWBE ACTUAL PARTICIPATION AFFIDAVIT

MARICOPA COUNTY
MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM

(NOTE: COMPLETED AFFIDAVIT MUST BE SUBMITTED
WITHIN SEVEN (7) CALENDAR DAYS
FOLLOWING THE BID OPENING.)

Name of Contractor _____ Contract No. FCD 2002C031 Total Amount of Contract _____

Contact Person _____ MWBE Goal: 10 %

Street No. _____

City _____ State _____ Zip _____

Minority and Women-Owned Firm Principal Address Type of Work Dollar Amount & Contract Percentage

<u>Minority and Women-Owned Firm</u>	<u>Principal</u>	<u>Address</u>	<u>Type of Work</u>	<u>Dollar Amount & Contract Percentage</u>

TOTALS (Dollars/Percentage) _____

The undersigned has entered into a formal agreement with the MWBE subconsultants/subcontractors/suppliers listed above in the execution of this contract with the Flood Control District of Maricopa County.

Signature _____ Date _____

Title _____

STATE OF _____)
County of _____)§

Subscribed and sworn to before me this _____ day of _____ by _____
Notary Public

My Commission Expires: _____

MWBE PARTICIPATION REPORT

MARICOPA COUNTY
MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM
(To be attached with each request for pay for each MWBE Subcontractor.)

Date: _____

Prime Contractor: _____

Contractor Contact Person: _____

Contractor Address: _____

Contractor Telephone Number: _____

Contractor Fax Number: _____

Contract Description: _____

Contract Number: _____

Invoice For Pay Period of (indicate dates): _____

MWBE Subcontractor Name: _____

Contact Person: _____

Address: _____

Telephone Number: _____

Type of Firm: _____

Type of Work performed for this contract
by this MWBE firm: _____

Total MWBE Subcontract Amount for this Subcontractor: _____

The amount above is the MWBE percentage goal calculated from the TOTAL CONTRACT AMOUNT; it is THE SAME TOTAL amount shown for the subcontractor on the MWBE Actual Affidavit previously submitted by your firm.

Amount Paid to this MWBE Subcontractor *on this invoice* payment: _____

Total paid to this Subcontractor since the contract start date: _____

Total MWBE Contract Goal = _____ %

Total MWBE Participation on this contract to date = _____ %

Send to: Flood Control District of Maricopa County
Finance Services Branch
2801 West Durango Street
Phoenix, Arizona 85009

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 2002C031, Laveen Area Conveyance Channel** 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 five hundred seventy (570) 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 form "MWBE Participation Report" 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 – MWBE PROGRAM: The Owner will endeavor to ensure in every way possible that minority and women-owned business enterprises shall have every opportunity to participate in providing professional services, purchased goods, and contractual services to the Owner without being discriminated against on the grounds of race, religion, gender, age, disability, or national origin. The Maricopa County Minority and Women-Owned Business Enterprise Program is incorporated by reference.

ARTICLE IX – 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.

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.

Party of the First Part

By: _____
Printed Name

Signature

Title:

Date:

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

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.

District General Counsel 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 2002C031, Laveen Area Conveyance Channel**, 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 _____ the **Contract FCD 2002C031, Laveen Area Conveyance Channel**, 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

Principal

Agent Address and Phone Number:

Signature

By: _____

Printed Name

Title: _____

Bond Number: _____

Surety Seal

Signature

By: _____

Printed Name

ATTACH SURETY POWER OF ATTORNEY

INDEMNIFICATION

To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Flood Control District of Maricopa County (District) and Maricopa County, 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 acts, errors, omissions or mistakes relating to the performance of this contract. Contractor's duty to defend, indemnify and hold harmless the District, Maricopa County, City of Phoenix, Salt River Project, Maricopa County Department of Transportation and their respective 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 acts, errors, omissions or mistakes in the performance of this contract including any person for whose 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.

Abrogation of Arizona Revised Statutes Section 34-226:

In the event that A.R.S. § 34-226 shall be repealed or held unconstitutional or otherwise invalid by a court of competent jurisdiction, then to the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless the District and Maricopa County, 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, and the cost of appellate proceedings), relating to, arising out of, or resulting from Contractor's work or services. Contractor's duty to defend, indemnify and hold harmless, the District and Maricopa County, 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, injury to, impairment or destruction of property including loss of use resulting therefrom, caused in whole or in part by any act or omission of the Contractor, anyone Contractor directly or indirectly employs or anyone for whose acts Contractor may be liable, regardless of whether it is caused in part by a party indemnified hereunder, including the District, Maricopa County, City of Phoenix, Salt River Project, and the Maricopa County Department of Transportation.

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

The scope of this indemnification does not extend to the sole negligence of the District and Maricopa County.

INSURANCE REQUIREMENTS

Contractor, at Contractor's own expense, shall purchase and maintain the herein stipulated minimum insurance with companies duly licensed, possessing a current A.M. Best Company, Inc. Rating of at least B++ or a Financial Performance Rating (FPR) of at least 6, or approved unlicensed companies in the State of Arizona with policies and forms satisfactory to the District.

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. Failure to do so may, at the sole discretion of the District, constitute a material breach of this contract.

The Contractor's insurance shall be primary insurance as respects the District, and any insurance or self-insurance maintained by the District 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 coverage afforded under the insurance policies to protect the District.

The insurance policies may provide coverage which 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 District under such policies. The Contractor shall be solely responsible for the deductible and/or self-insured retention and the District, 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 District 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 District shall not be obligated, however, to review such policies and/or endorsements or to advise Contractor of any deficiencies in such policies and endorsements, and such receipt shall not relieve Contractor from, or be deemed a waiver of the District's right to insist on strict fulfillment of Contractor's obligations under this contract.

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

The policies required hereunder, except Workers' Compensation, shall contain a waiver of transfer of rights of recovery (subrogation) against the District, Maricopa County, City of Phoenix, Salt River Project, Maricopa County Department of Transportation and their respective agents, representatives, officers, directors, officials and employees for any claims arising out of Contractor's work or service.

REQUIRED COVERAGE

Commercial General Liability.

Contractor shall maintain Commercial General Liability insurance with a limit of not less than \$1,000,000 for each occurrence with a \$2,000,000 Products/Completed Operations Aggregate and a \$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 including, but not limited to, the liability assumed under the indemnification provisions of this contract which coverage will be at least as broad as Insurance Service Office, Inc. Policy Form CG 00 01 10 93 or any replacements thereof. The coverage shall include X.C.U.

The policy shall contain a severability of interest provision, and shall not contain a sunset provision or commutation clause, or any provision that would serve to limit third party action over claims.

The Commercial General Liability additional insured endorsement shall be at least as broad as the Insurance Service Office, Inc.'s Additional Insured, CG 20 10 11 85, and shall include coverage for Contractor's operations and products and completed operations.

If the Contractor subcontracts any part of the work, services or operations awarded to the Contractor, he shall purchase and maintain, at all times during prosecution of the work, services or operations under this contract, an Owner's and Contractor's Protective Liability insurance policy for bodily injury and property

damage, including death, which may arise in the prosecution of the Contractor's work, service or operations under this contract. Coverage shall be on an occurrence basis with a limit not less than \$1,000,000 per occurrence, and the policy shall be issued by the same insurance company that issues the Contractor's Commercial General Liability insurance.

Automobile Liability:

Contractor shall maintain Automobile Liability insurance with an individual single limit for bodily injury and property damage of no less than \$1,000,000, each occurrence, with respect to Contractor's vehicles (whether owned, hired, non-owned), assigned to or used in the performance of this contract. Coverage will be at least as broad as coverage code 1, "any auto" (Insurance Services Office, Inc. Policy Form CA 00 01 12 93, or any replacements thereof). Such insurance shall include coverage for loading and off-loading and off-loading hazards. If hazardous substances, materials, or wastes are to be transported, MCS 90 endorsement shall be included and \$5,000,000 per accident limits for bodily injury and property damage shall apply.

Workers' Compensation:

The Contractor shall carry Workers' Compensation insurance to cover obligations imposed by federal and state statutes having jurisdiction of Contractor's employees engaged in the performance of the work or services, as well as 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.

In case any work is subcontracted, the Contractor will require the Subcontractor to provide Workers' Compensation and Employers' Liability insurance to at least the same extent as required of the Contractor.

Builders' Risk (Property) Insurance:

The Contractor shall purchase and maintain, on a replacement cost basis, Builders' Risk 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 final payment has been made or until no person or entity other than the District has an insurable interest in the property required to be covered, whichever is earlier. This insurance shall include interest of the District, 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 District. 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 an all-risk policy 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 Contractor's control and/or responsibility, and continue without interruption during construction, renovation, or installation, 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.

Required coverage may be modified by an amendment to the contract documents.

If the contract requires testing of equipment or other similar operations, at the option of the District, 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, Contractor shall furnish the District with Certificates of Insurance (Attachment 1), or formal endorsements as required by the contract, issued by Contractor's insurer(s), as evidence that policies providing the required coverages, conditions and limits required by this contract are in full force and effect. Such certificates shall identify this contract number and 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 District fifteen (15) days prior to the expiration date.

Cancellation and Expiration Notice:

Insurance required herein shall not expire, be cancelled, or materially changed without thirty (30) days prior written notice to the District.

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

CONTRACT FCD 2002C031

PROJECT TITLE: Laveen Area Conveyance Channel

NAME AND ADDRESS OF INSURANCE AGENCY:	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%; text-align: center;">Company Letter</td> <td style="width:10%; text-align: center;">A</td> <td style="width:80%;"></td> </tr> <tr> <td style="text-align: center;">Company Letter</td> <td style="text-align: center;">B</td> <td></td> </tr> <tr> <td style="text-align: center;">Company Letter</td> <td style="text-align: center;">C</td> <td></td> </tr> <tr> <td style="text-align: center;">Company Letter</td> <td style="text-align: center;">D</td> <td></td> </tr> <tr> <td style="text-align: center;">Company Letter</td> <td style="text-align: center;">E</td> <td></td> </tr> <tr> <td style="text-align: center;">Company Letter</td> <td style="text-align: center;">F</td> <td></td> </tr> </table>	Company Letter	A		Company Letter	B		Company Letter	C		Company Letter	D		Company Letter	E		Company Letter	F	
Company Letter	A																		
Company Letter	B																		
Company Letter	C																		
Company Letter	D																		
Company Letter	E																		
Company Letter	F																		
NAME AND ADDRESS OF INSURED:																			

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				<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:70%;">GENERAL AGGREGATE</td> <td style="width:30%; text-align: right;">\$2,000,000</td> </tr> <tr> <td>PRODUCTS/COMPLETED OPERATIONS AGGREGATE</td> <td style="text-align: right;">\$2,000,000</td> </tr> <tr> <td>EACH OCCURRENCE</td> <td style="text-align: right;">\$1,000,000</td> </tr> </table>	GENERAL AGGREGATE	\$2,000,000	PRODUCTS/COMPLETED OPERATIONS AGGREGATE	\$2,000,000	EACH OCCURRENCE	\$1,000,000		
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				<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:70%;">Combined Single Limit</td> <td style="width:30%; text-align: right;">\$1,000,000</td> </tr> <tr> <td>Bodily Injury</td> <td style="text-align: right;">\$1,000,000</td> </tr> <tr> <td>Property Damage</td> <td style="text-align: right;">\$1,000,000</td> </tr> <tr> <td>Per person/Per accident</td> <td style="text-align: right;">\$1,000,000</td> </tr> </table>	Combined Single Limit	\$1,000,000	Bodily Injury	\$1,000,000	Property Damage	\$1,000,000	Per person/Per accident	\$1,000,000
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				<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:70%;">Each occurrence</td> <td style="width:30%; text-align: right;">\$</td> </tr> <tr> <td>Aggregate</td> <td style="text-align: right;">\$</td> </tr> </table>	Each occurrence	\$	Aggregate	\$				
Each occurrence	\$												
Aggregate	\$												
	<input checked="" type="checkbox"/> : WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY				<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:70%;">STATUTORY LIMITS AND EMPLOYER'S LIABILITY:</td> <td style="width:30%;"></td> </tr> <tr> <td> EACH ACCIDENT</td> <td style="text-align: right;">\$1,000,000</td> </tr> <tr> <td>DISEASE: EACH EMPLOYEE</td> <td style="text-align: right;">\$1,000,000</td> </tr> <tr> <td>DISEASE: POLICY LIMIT</td> <td style="text-align: right;">\$1,000,000</td> </tr> </table>	STATUTORY LIMITS AND EMPLOYER'S LIABILITY:		EACH ACCIDENT	\$1,000,000	DISEASE: EACH EMPLOYEE	\$1,000,000	DISEASE: POLICY LIMIT	\$1,000,000
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				<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:70%;">REPLACEMENT COSTS</td> <td style="width:30%;"></td> </tr> </table>	REPLACEMENT COSTS							
REPLACEMENT COSTS													
	<input checked="" type="checkbox"/> : OTHER:	Except for Workers' Compensation and Professional Liability Insurance, the Flood Control District of Maricopa County, Maricopa County, City of Phoenix, Salt River Project, Maricopa County Department of Transportation, and their respective 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, City of Phoenix, Salt River Project, Maricopa County Department of Transportation and their respective 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 Contract FCD 2002C031, 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 2002C031 for Laveen Area Conveyance Channel 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.

_____ 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 2002C031 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: _____



SUPPLEMENTARY GENERAL CONDITIONS

CONTRACT FCD 2002C031

LAVEEN AREA CONVEYANCE CHANNEL

PCN 117.08.31

SUPPLEMENTARY GENERAL CONDITIONS

SPECIFICATIONS

Except as otherwise amended in these Supplementary General Conditions and the 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 2003, and City of Phoenix (COP) Supplement to MAG Specifications and Details (2002 Edition).

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) Special Provisions, e) Project Plans, f) MAG Uniform Standard Specifications and Uniform Standard Details, and g) COP Supplements 2002 Edition.

Subsection 101.2 - Definitions and Terms:

1. Change the definition of the phrase "Board of Supervisors" to be the Board of Directors acting under the authority of the laws of the State of Arizona and in their capacity as 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 Board of Directors of the Flood Control District of Maricopa County.
3. Add to the definition of the phrase "Contract Documents," the phrase "Supplementary General Conditions."
4. Change the definition of the term "Engineer" to be the person appointed by the Board of Directors of the Flood Control District of Maricopa County 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 Manager 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 its 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 Minority and Women-Owned Business Enterprise Program to be the Program adopted by the Board of Supervisors effective January 1, 1992.

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

Add the following:

The geotechnical report is included in the Special Provisions Appendix "A". 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.

The Maricopa Drain, farm irrigation delivery ditches, farm tail water ditches, and storm drains intersect the Project in many locations, and the Contractor shall be responsible for managing this water such that there are no adverse impacts to the Project or to adjacent land and facilities. The Contractor shall submit his plans for management to the Engineer and the City for review prior to commencing construction.

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 ground water and surface water.

The Contractor will encounter gravel-bedding material for an existing sewer line at approximately five (5) feet of depth when excavating at and near 51st Avenue.

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 of Maricopa County. 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. **Bids which do not have appropriate addenda attached and show appropriate changes to the Bidding Schedule, and receipt of addenda acknowledged in the Proposal shall be invalid.**

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. The two lowest bidders may be required to provide certification of prior satisfactory completion for similar construction and to furnish a copy of their license and the renewal certificate.

Allowances as shown on the Bid Schedule shall cover the cost to the Contractor, and if applicable, delivered to the site, unloaded and handled on the site, labor, and installation costs. 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 monthly 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:

- (F) If the Maricopa County Minority and Women-Owned Business Enterprises Assurances Affidavit is not completed and submitted.
- (G) If any addenda are not acknowledged and attached.
- (H) If the Owner's bond forms are not utilized.
- (I) If the entire specifications document is not returned.
- (J) If the statement from the bidder's insurance carrier, as required by Subsection 103.6, is not included.

Subsection 103.6 - Contractor's Insurance:

Add the following:

A statement from the bidder's insurance carrier shall be included in the proposal certifying that it will furnish the specified kind and amounts of insurance to the bidder if it is awarded the contract, and that it will execute the form of Certificate of Insurance included in the documents. As required by law, the statement will be from an insurance carrier or carriers authorized to do business in the State of Arizona, or countersigned by an agent of the carrier authorized to do business in the State of Arizona. 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) – Additional Insured:

Add the following:

Include additional insureds as indicated on the included Certificate of Insurance. The Contractor expressly agrees to name the City of Phoenix, Maricopa County Department of Transportation, and Salt River Project (SRP) as an additional insured on such insurance policies as required by this 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 the City, County, and SRP harmless under the same terms and conditions as the District. The Contractor expressly agrees that the City, County, and SRP 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, interests, and privileges under the construction contract.

Subsection 104.1 - Work to be Done:

Add the following:

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.

Principal construction features for the project include the channel excavation (approximately 5.8 miles in length), sump excavation, five (5) concrete box culverts, three (3) concrete retaining walls, a concrete

low-flow channel (approximately 5.8 miles in length), concrete mow curb, concrete grade control structures, installation of approximately 7,600 feet of storm drain pipe, manholes, and fittings, installation of tailwater and storm drain pipe, headwalls, associated structures and connections, installation of siphon structures and concrete-lined irrigation ditches, backfilling of the existing Maricopa Drain, and installation of irrigation pipelines and sleeves (see Special Provisions Appendices B and C). The Contractor shall provide the specified quantity of stockpiles of excavated materials at locations shown on the plans and in tables provided in the contract documents. The Contractor shall be required to divert water from the existing Maricopa Drain to construct the Project, and shall be required to divert this water to the low-flow channel upon completion of the Project.

The Contractor shall submit plans for traffic control to the District, the City of Phoenix, and Maricopa County for review and approval. No interruption of traffic will be permitted on Baseline Road, 51st Avenue, and 63rd Avenue. The Contractor may close 59th Avenue to traffic during construction of the box culvert at 59th Avenue, provided he obtains a permit to do so from the City of Phoenix. The Contractor shall obtain required use permits from the City of Phoenix and Maricopa County Department of Transportation for working within the roadway prior to construction. Refer to Special Provisions Section 401 for specific details of traffic control and appropriate bid items.

The Contractor shall maintain access to all of the farm properties, private homes, and businesses in the Project area.

There is a historic house located within the Project right-of-way at approximately Station 67+50, adjacent to a retaining wall to be constructed as part of the Project. The Contractor shall take care to avoid damaging this historic house in any way. There are also a more "modern" house and tin roof structures located to the southeast of the historic house within the Project right-of-way. Any damage to these structures caused by the Contractor's activities will be corrected to the satisfaction of the City of Phoenix at no cost to the Project.

The Contractor is required to use some of the excavated materials to backfill the existing Maricopa Drain, as shown in the plans. Excavated materials shall be used for Project backfilling needs and for landscape mounds as indicated in the plans. Any excess excavated materials not required for the Project must first be disposed of at the spoil sites and in the quantities as noted in the plans for the benefit of the adjacent property owners. Thirty-four thousand (34,000) Cubic Yards of excavated materials shall be stockpiled at the site designated as "Spoil Site No. 5" on Sheet SP1 in the plans, within twenty-five (25) weeks of Notice-to-Proceed. Any excavated materials in excess of what is needed for the Project, and what is to be disposed of in the stockpile sites, and for the landscape mounds, shall be removed and disposed of off-site by the Contractor. The following is a list of landowners, developers, or their agents in the area who may be interested in acquiring the excess excavated material:

Perry Mathis	Cason Tyler Communities	Tel: 602-957-1799	Mobile: 602-647-8881
Rick Jellies	Trimark Homes	Tel: 480-557-7771	
Allen Willis	Capital Pacific Homes	Tel: 480-777-2400	
Jeff Klem	Elliott Homes	Tel: 480-831-9200	
Dr. Ruskin Lines	Lines Brothers Farms, Wells-85, LLC	Tel: 480-966-4121	
Max Killian	Sunny-Mesa Inc.	Tel: 480-832-3679	
John Williams		Tel: 602-236-5600	
Todd Wakely	Trend Homes	Tel: 602-679-0943	
Tim Goodrich	Centex Homes	Tel: 602-931-7047	

The Contractor shall not construct the channel and pipeline shown on sheets SD 14 and SD 15 until the Laveen Area Conveyance Channel (LACC) channel and associated low-flow channel and box culvert

have been completed downstream of Station 211+00, such that water can be diverted from the pipeline to the LACC low flow channel.

At the time of construction, the property-owner may have constructed a pipe and headwall to divert the Maricopa Drain to a concrete ditch within the north limits of the Project right-of-way between Station 307+00 and 320+00. Or, the property-owner may divert the Maricopa Drain and construct this ditch during Project construction, and the Contractor shall coordinate with the property-owner and allow access to the Project right-of-way for the property owner to complete the pipe, headwall, and ditch and to divert the water. The Contractor shall also allow SRP access to maintain this ditch. The Contractor shall remove this pipe, headwall, and ditch from the right-of-way and re-grade the Project right-of-way, as shown on the plans, when it is no longer needed; refer to Special Provisions Section 350.

In some locations the channel may be rough-graded and excavated by others prior to award of the Contract. The Contract bid quantity for excavation has not been adjusted for rough-grading. The Contractor shall survey any locations that have been rough-graded prior to commencing work at those locations, and provide the survey information to the Engineer for review and approval. This survey information will be used with any final excavation surveys that may be required to determine actual excavation quantities, and the quantity basis of payment for excavation will be adjusted accordingly by the Engineer at no cost penalty to the Owner.

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 the Maricopa Drain and any other water management requirements to the Engineer for review, prior to diversion of any water by the Contractor. The Contractor may be allowed to divert water from the Maricopa Drain to the 43rd Avenue Storm Drain during construction; provided the Contractor obtains a permit required by the City and complies with appropriate regulations. The Contractor must submit his plans for diversion into the storm drain to the City of Phoenix, SRP, and District for review and approval, and allow a minimum of two (2) weeks for the review and approval process. He will be required to detail the connection to the storm drain, and show that water will not back-up upstream of the connection, and a trashrack (MAG Standard Detail 502-1) will be required for the connection. Once the diversion into the storm drain is no longer required, the Contractor shall restore the storm drain to its original condition and to the approval of the Engineer.

Payment for management of all water for the Project, including water from the Maricopa Drain, farm irrigation delivery ditches, farm tailwater ditches, drainage from adjacent developments, and diversion of flood water and nuisance water, including labor, pumps, electricity, diversion ditches and pipes, 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.

The following environmental conditions exist and will need to be addressed:

Burrowing owls have been observed inhabiting and nesting in the Project Area. Burrowing owls are protected under the federal Migratory Bird Act, therefore it is illegal to harm, harass, pursue, take, capture, or kill any migratory bird, nest, or egg. The District will make its best effort to relocate the owls out of the Project area prior to commencement of the Contract, but some may remain and/or return to their burrows and nesting areas. The District has contracted with Bob Fox, a wildlife rehabilitation specialist, to relocate the owls. The Contractor shall keep Bob Fox and the Engineer apprised of the Project schedule and notify them two weeks prior to commencing excavation or backfilling in a new Project area of the Maricopa Drain, so that Bob Fox can survey for owls and relocate any that remain, to avoid injuring and disturbing the owls because of the construction activities. If the Contractor discovers a

burrowing owl habitat or owl(s) during construction, he shall stop construction immediately without disturbing the habitat or owl(s), and notify the Engineer and Bob Fox. **Bob Fox can be reached at (480) 595-5047.**

The Contractor shall remove several piles of debris and trash within the Project right-of-way; see Section 350.

The Ninyo and Moore soils report in Special Provisions Appendix A identifies that a small amount of dichlorodiphenyldichloroethylene (DDE) exists within the soils to be excavated. However the amount is minor so that no special handling is required.

All utilities in or near the Project construction limits are to be protected in place. All existing water lines in the Project limits will be maintained in operating condition during construction, except for brief periods of time if needed for relocations. The Contractor shall obtain all permits needed for waterline relocations from the City of Phoenix Water Services Department. The Contractor shall ensure that utility interruptions, especially along 63rd Avenue and along Baseline Road, are kept to a minimum. The Contractor shall notify the Engineer and affected landowners of utility interruptions at least two (2) days in advance of any interruptions, and Contractor shall ensure all utilities are connected and operable by the end of the workday that the interruption occurs. There is a waterline that has not been located precisely that runs parallel to 63rd Avenue, and this waterline will be impacted by excavation in this area. The Contractor shall notify the Engineer and landowners (Mr. Robert Moss @ (602) 237-3841, Mr. Ron Schlosser @ (623) 935-1104, Mr. Luke Schlosser @ (602) 237-3777, and Trend Homes @ (602) 255-6017) that the waterline will be impacted, at least two (2) days in advance of commencing excavation at this location, and Contractor shall ensure that the waterline is reconnected and operable by the end of the work day that the interruption occurs.

Payment for water service line relocations will be made on a time and material basis of actual costs and will be authorized for use only by the Engineer in advance; see Section 610.

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.

Quality control refers to those actions taken by the Contractor, and those parties charged with the procurement and installation of manufactured materials, and the placement and compaction of the soil materials, which provide a means to determine and sometimes quantify the characteristics of the product. The results of a quality control program are compared to the Special Provisions of other contractual or regulatory requirements. During each aspect of the handling of these materials, quality control is provided by the manufacturer, fabricator, or installer of the materials, or the supplier and earthworks contractor for the soils, to ensure that the materials and workmanship conform to the plans and Special Provisions. The Contractor and his suppliers and manufacturers retain quality control responsibility.

Quality assurance is a planned and systematic pattern of all means and actions intended to provide adequate confidence that the materials and procedures conform to the plans and Special Provisions, and any applicable regulatory requirements. The Owner, or their designated representative, provides quality assurance.

104.2.3 - Changes:

Add the following:

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 (2) 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:

Add the following:

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:

Add the following:

- 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 fifteen-(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 fifty percent (50%). 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 the 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 SGC 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 that 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 – 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.

- B) 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) Preliminary work schedule/sequence of construction
- 2) Preliminary traffic control plan and Contractor Contact
- 3) Emergency telephone numbers
- 4) Preliminary water diversion plan
- 5) Signing authority letter
- 6) Name and telephone number of the certified safety professional
- 7) Preliminary copies of the NOI and SWPPP per Subsection 107.2.1
- 8) Estimated billing schedule
- 9) Proposed pavement mix design composition
- 10) Manufacturer's certification for all materials
- 11) Material data safety sheets
- 12) Preliminary survey layout, staking and excavation plans
- 13) Contractor bid item cost breakdown as noted in the Special Provisions
- 14) Any other documents specified in the SP's and SGC'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 will 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 forty-eight (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 accepted 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 forty-eight (48) hours of the meeting. At the subsequent construction progress meeting, the minutes will be attested or revised, as appropriate.

The Contractor shall attend coordination meetings with the landowners/developers (or their representatives) in the area and their farmers, and the District, beginning at the start of the contract and every six (6) months thereafter until the contract is complete. The District shall invite the landowners/developers to the meetings, and request that they notify and invite their farmers.

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 the location of which has been brought to its attention, 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.

There are some utilities located within the project limits, including water service connections as well as water and sewer mains and other service connections for gas and cable TV that are located within and across streets where storm drain, channel and box culvert construction will occur. As many as possible have been identified and shown in the approximate or anticipated locations. The Contractor shall bid his work recognizing that such utility interferences exist, and that other such utility crossings may exist that are not shown on the plans. The Contractor shall consider these utility interferences when bidding the

project. All existing utilities shall be protected-in-place (P.I.P.). It may be necessary for some of the water lines to be relocated to avoid conflict with the construction. An appropriate bid item allowance has been provided for such occurrences, and the Contractor shall bid the allowance accordingly.

All existing water lines in the Project limits will be maintained in operating condition during construction, except for brief periods of time if needed for relocations. The Contractor shall obtain all permits needed for waterline relocations. The Contractor shall ensure that utilities interruptions, especially along 63rd Avenue and along Baseline Road, are kept to a minimum. The Contractor shall notify the Engineer and affected landowners of utility interruptions at least two (2) days in advance of any interruptions, and Contractor shall ensure all utilities are connected and operable by the end of the workday that the interruption occurs.

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

El Paso Natural Gas Company (EPNG) 24" line	
Mr. Bill Ward, Phoenix District Superintendent	(602) 438-4224
Mr. John McNeely, Principal Engineer	(602) 438-4214
City of Phoenix (COP) water lines and sanitary sewer lines	
Mr. Jerry Arakaki, Senior Engineer	(602) 261-8229
Salt River Project Irrigation (SRP)	
Existing Maricopa Drain	
Mr. Gerry Bastian, Senior Engineer	(602) 236-4609
Salt River Project Power Distribution (SRPPD)	
Mr. Dan Hawkins, Project Leader	(602) 236-8603
Mr. Greg Wilson	(602) 236-8643
Salt River Project Power Transmission (SRPPT)	
Mr. Bill Phillips (500 kV transmission line and 230 kV transmission line)	(602) 236-8092
Western Area Power Administration (WAPA)	
Mr. Donald Byron (500 kV Liberty-Coolidge Transmission Line)	(602) 352-2685
Southwest Gas	
Mr. Chris Farhendorff	(602) 484-5338
Kinder-Morgan Energy Partners	
Mr. Dan Tarango	(602) 278-2320
QWEST Telecommunication Lines	
Mr. Al Soto	(602) 630-3706

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.

Existing utilities within the project area may include, but may not be limited to, the following:

City of Phoenix (COP):

The COP maintains a 36-inch waterline along 43rd Avenue and a 54-inch waterline along Baseline Road.

SRPPT:

SRP maintains high voltage (230kV) overhead electric transmission lines along Baseline Road. The excavation for the box culvert at Baseline Road and 57th Avenue will be close to one of the 230 kV power poles, and this excavation will require installation of a soil retention system of sheet pile or shoring in order to maintain required horizontal clearances from the power pole foundation. Refer to the plans for the minimum distances for locating the soil retention system from the pole foundation. The Contractor shall submit his plans for sheet pile or shoring system to the Engineer and SRP for review and approval, prior to commencing work in the area. The Contractor shall maintain required vertical clearances from the overhead power lines.

SRP maintains high voltage (500kV) overhead electric transmission lines along the west boundary of the Project.

Western Area Power Administration (WAPA):

WAPA maintains high voltage (500 kV) overhead electric transmission lines that cross the Project at approximately Station 285+00. The Contractor shall notify WAPA at least ten (10) days prior to commencing construction under these transmission lines.

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 and specific requirements of SRP when working in the vicinity of these high voltage lines.

Note: The cost for repair of any damage to these facilities, and any loss of revenues by SRP 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.

SRPPD:

SRP has overhead and underground distribution facilities along 43rd Avenue, 51st Avenue, 59th Avenue, 63rd Avenue, and Baseline Road. These are to be protected in place and the Contractor shall use caution in the adjacent areas.

Seven 12 kV power poles along 63rd Avenue shall be protected-in-place during installation of the storm drain and box culvert. The Contractor shall keep a minimum of ten (10) feet away from the poles with his excavation for the storm drain, except for the pole furthest south, which has been deepened. The Contractor shall protect all poles in place.

There are 12 kV power poles along the north side of Baseline Road, and the poles are immediately adjacent to the construction for installation of the storm drain and for excavation and backfilling of the Maricopa Drain. The poles located along the storm drain installation have been deepened so will not require bracing during construction. The poles located along the reach of the Maricopa Drain to be backfilled have not been deepened and care and caution must be exercised when working around these poles during the backfilling activities. The Contractor shall protect all of these poles in place during construction, and the Contractor shall maintain required clearances to the overhead power lines.

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 and specific requirements of SRP when working in the vicinity of electrical lines.

Note: The cost for repair of any damage to these facilities, and any loss of revenues by SRP 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.

Salt River Project (SRP) Irrigation:

SRP provides irrigation water to several farmers in the Project area. The Contractor shall construct siphons and ditches as shown on the plans and maintain the irrigation water supplies and tailwater drainage at all times during construction.

SRP maintains a tailwater ditch called the Maricopa Drain that runs through the entire Project area. The Project flood control channel will cross this ditch in several locations and replace the ditch in part of the Project area. The Contractor shall be responsible for management and/or diversion of the Maricopa Drain flows during construction.

The Contractor shall divert the water from the Maricopa Drain to the low-flow channel after it has been constructed as shown on the plans.

The District has obtained a permit from SRP to work within the Maricopa Drain within the Project area, west of 43rd Avenue to the Salt River. The Contractor shall submit his plans for diversion of the water from the Maricopa Drain to the District for review prior to diverting water from the Maricopa Drain.

NOTE: The Contractor shall exercise caution and care when working around these facilities. The costs for the repair of any damage to neighboring property and any loss of water conveyance or revenue by the SRP (except loss of water due to the diversion of water from the existing Maricopa Drain, which is acceptable) 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 SRP solely at the Contractor's expense and at no cost to the Project. The Contractor is cautioned that Maricopa Drain currently intercepts a significant amount of off-site storm water. The Contractor must make provisions to maintain the existing capacity at all times during construction and protect his construction from any flows in the drain.

Peninsula & Horowitz Irrigation Company (P&H):

P&H provides irrigation water to several farmers in the Project area. The Contractor shall construct siphons and ditches as shown on the plans and maintain the irrigation water supplies at all times during construction.

NOTE: The Contractor shall exercise caution and care when working around these facilities. The costs for the repair of any damage to neighboring property and any loss of water conveyance or revenue by the Peninsula & Horowitz Irrigation Company 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 Peninsula & Horowitz Irrigation Company solely at the Contractor's expense and at no cost to the project.

QWest:

QWest maintains underground fiber optic cables along Baseline Road, 43rd Avenue, and 51st Avenue. QWEST also maintains overhead cables on some of the 12 kV power poles.

El Paso Natural Gas (ELPNG):

ELPNG maintains a 24-inch high-pressure gas line that parallels the west side of 43rd Avenue.

Southwest Gas Company (SWG):

SWG maintains a 4-inch gas line along the east side of 43rd Avenue.

Kinder Morgan Energy Partners

Kinder Morgan Energy Partners maintains 6-inch and 8-inch petroleum lines along the west side of 51st Avenue. These lines are in the process of being relocated, and Kinder Morgan may be relocating the lines to get them out of conflict with the Project for up to two (2) months after Notice-to-Proceed is issued. The Contractor shall avoid working near the petroleum lines until the relocations are complete.

As is evidenced by the information provided above and on the plans there are numerous overhead and underground utilities within the project limits. The Contractor shall protect-in-place all of these utilities and support in place such utilities as required. The Contractor shall account for in his bid the impact of underground utilities on the excavation, storm drain trenching and installation activities.

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.

Subsection 105.6.4 – 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 ditches, siphon structures, and tailwater outlets to the channel as shown on the plans. This may also require some temporary diversions. The Contractor shall ensure that all Project activities occur within the Project right-of-way and temporary construction easements (TCE's) as shown on the plans, and the Contractor shall avoid disturbing the adjacent farming activities outside Project rights-of-way. The Contractor shall construct a temporary fence along the east edge of the TCE along 63rd Avenue during construction of the storm drain at this location. The cost for this temporary fencing is incidental to the cost for installation of the storm drain.

The Contractor shall construct the siphon at Station 71+50 prior to excavation of the channel upstream of this location. The Contractor shall coordinate with the Engineer and Elliott Homes (Jeff Klem @ [480] 831-9200) to ensure that the water supply is available to the siphon prior to excavating the channel upstream of the siphon that will cut off the water supply to the farm to the south. The Contractor shall allow Elliott Homes sixty (60) days notice to provide the water supply to the siphon.

When the Contractor completes the channel construction and associated low flow channel between Stations 160+00 and 209+00, such that tailwater can be diverted to the channel, he shall notify the Engineer and Farmer at this property (Mr. Ken Rogers @ [602] 237-2286) that tailwater can be diverted to the channel. The Contractor shall allow the Farmer ninety (90) days from the time he notifies the Engineer and Farmer that water can be diverted to the channel, for the Farmer to divert the tailwater to the channel, before the Contractor backfills the existing Maricopa Drain north of this stretch of channel.

When the Contractor excavates the channel in the vicinity of Station 31+00, he shall divert the water from the existing Maricopa Drain to the east side and coordinate with the landowner so that the landowner will

have the ability to continue diverting water to his property. The landowner's name is Mr. Herrera and his phone number is (602) 663-5737.

Subsection 105.6.5 – Construction Water:

Add the following:

Construction water may be available as follows:

The City of Phoenix (COP) has municipal water lines and hydrants along Baseline Road, along 43rd Avenue, and along 51st Avenue, and this municipal source could be used for construction water provided the Contractor obtains a permit from the COP for this use. The Contractor should allow two (2) weeks for the COP installation of any meters. There is a charge for installation and removal of the meter, and monthly service charges and water consumption rates are based on current rates established by COP Code. If the Contractor wishes to use this water for construction purposes, he will contact the COP for specific information regarding the use of COP water and for all costs associated with its use.

Other possible sources of construction water in the area are privately owned agricultural wells and the Peninsula-Horowitz Irrigation Company. If the Contractor wishes to use these sources of water for construction purposes, it will be his responsibility to contact the private owners 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 shall coordinate and cooperate with other contractors and subcontractors working in the Project area. There are several residential and commercial developments that are going to be constructed in the immediate vicinity of the Project during the same time period as the Project construction. The Contractor shall maintain access for contractors and public at 57th Avenue and Baseline, where there is a driveway for the Bougainvillea Golf Course just west of the Project right-of-way, and an emergency access road for the development immediately east of the golf course. A contractor has constructed a box culvert at 55th Avenue within the Project right-of-way.

At the start of construction, the property owner and/or SRP may have diverted the Maricopa Drain from the south side of the Project right-of-way to a concrete ditch within the north limits of the Project right-of-way between Station 307+00 and 320+00. Or, the property owner and/or SRP may construct this ditch during Project construction, and the Contractor shall coordinate with the property owner and/or SRP and allow access to the Project right-of-way for the property owner and/or SRP to complete the ditch and to divert the water. The Contractor shall remove this ditch from the right-of-way, connect the Maricopa Drain flows to the newly constructed low-flow channel, and re-grade the Project right-of-way as shown on the plans, when the ditch is no longer needed (refer to Special Provisions Section 350).

During Project construction, the property owner may construct a roadway for his development within the TCE limits between Stations 281+00 and 289+00 along the south side of the channel. The property owner will give the Contractor sixty (60) days notice for commencement of this roadway construction, and the Contractor shall avoid use of this TCE while the roadway is being constructed. Upon completion of roadway construction by others, the Contractor may again use the TCE at his own risk, being responsible for the repair of any damage caused to the roadway by such Contractor use.

At the start of construction, the property owner may have constructed some retention basins within the TCE between Stations 146+00 and 160+00, on the north side of the channel, and diverted on-site drainage to the basins.

Salt River Project (SRP) will be constructing some project features within and adjacent to the channel near Baseline Road and 75th Avenue, and the Contractor will coordinate with SRP's contractor and allow him access to the site. The features that SRP will be constructing include pipelines, a pump station, a weir within the low-flow channel, and a turnout within the low-flow channel (see Special Provisions Appendix D). When the Contractor completes the sump excavation and the channel and low-flow channel between Station 56+00 and Station 67+00, he will notify the Engineer that the site is available for SRP to construct its features.

A separate contract will be bid for the irrigation system and landscaping of the Laveen Area Conveyance Channel. At the time of the preparation of these SGC's it was anticipated that this would occur toward the end of the Project construction to minimize Contractor overlap and to provide the landscape contractor with a more complete channel project to work on. The Contractor shall coordinate with the landscape contractor and allow him access to the site.

Subsection 105.8 - Construction Stakes, Lines, and Grades:

Add the following:

- A) The Engineer will furnish benchmarks, which 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. In some locations the channel may be rough-graded and excavated by others prior to award of the Contract. The Contract bid quantity for excavation has not been adjusted for rough-grading. The Contractor shall survey any locations that have been rough-graded prior to commencing work at those locations and provide the survey information to the Engineer for review and approval. This survey information will be used with the final excavation surveys that may be required to determine actual excavation quantities, and the quantity basis of payment for excavation will be adjusted accordingly by the Engineer.
- 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) As-built drawings shall be prepared by updating original mylar drawings as provided by the Owner. Any changes required are to be made in red ink having waterproof, opaque, and reproducible characteristics. Deleted items shall be crossed out or lined out; no erasures will be allowed. Paper as-built progress drawings shall be maintained in a current condition at all times until completion of the work and shall be available for review by the Engineer at all times. The final as-built mylar drawings shall be sealed by an Engineer registered in the State of Arizona and shall be provided by the Contractor to the Engineer prior to project close out and prior to the final contract payment. And, as-builts will also be provided in electronic format using files on disk or CD as provided by the Owner.

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 the 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. The Engineer may decide what 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, located south of Baseline Road and west of 75th Avenue. If the Contractor wishes to establish a CWA at this site, he must submit his plans for use of the site to the Engineer for approval. If the Contractor establishes a CWA at this site, he must take whatever precautions are necessary to avoid damaging existing facilities, including the historic Webster House, the modern house south of the Webster House, and facilities to be constructed by SRP during the contract. Also, the historic Webster house and modern house may be leased during the construction time period after the Contractor has completed construction at this property and has completed the construction downstream of this property. The Contractor shall work with the Engineer and lessee to allow ingress and egress to the houses and use by the lessee of some of the area near the houses for parking.

Should the Contractor use private property to park and service equipment and store materials for use during construction, the Contractor will obtain prior written approval of the property owner for such use and submit a copy of the approval to the Engineer prior to use of the property.

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.

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

Subsection 106.5.1 – Contractor Access:

Add the following:

The Project can be accessed from the roadways it crosses, including Baseline Road, 43rd Avenue, 51st Avenue, 59th Avenue, 63rd Avenue, and 75th Avenue.

The temporary construction easements (TCE's) are shown on the plans and each component shall be relinquished by the Contractor at the earliest date that it is no longer needed for the Project, with the approval of the Engineer. The TCE for the backfill of the Maricopa Drain at the 65th Avenue alignment and along the south side of Baseline Road between the 65th Avenue alignment and the 63rd Avenue alignment shall be relinquished by the Contractor twenty-five (25) weeks after the date of Notice-to-Proceed (see Sheet No. SP1). The 40-foot TCE for the channel construction between Stations 147+00 and 160+00 shall be relinquished by the Contractor one (1) year after the date of Notice-to-Proceed. If the Contractor needs to extend these TCE's to complete the contract work, it will be the Contractor's responsibility and cost to obtain the extension from the landowner. The TCE's for the remainder of the storm drain construction shall be relinquished when the storm drain construction is complete and the Maricopa Drain associated with the storm drain has been backfilled.

There is an ingress/egress easement along 63rd Avenue. The Contractor shall keep this roadway open to local and dairy traffic at all times during construction.

The Contractor shall at all times stay within the Project rights-of-way, current Project TCE's, Project spoil sites, or public rights-of-way, and shall not trespass on Gila River Indian Community (GRIC) property or private property. The Contractor shall avoid impacting farmland and crops adjacent to the Project rights-of-way and TCE's.

Subsection 107.2 - Permits:

Replace with the following:

Contractor shall obtain all permits and licenses, including those required by the City of Phoenix (COP), State of Arizona, Maricopa County (County), U. S. Government, or any other local or federal agency, and shall pay all charges, fees, taxes and provide all notices necessary and incidental to due and lawful prosecution of work. A permit will be required for working within the roadway rights-of-way for construction of the storm drain and box culverts, from either the COP or County, depending on who has jurisdiction at the time of construction.

In particular the Contractor will obtain all necessary AZPDES and SWPPP permits as required and in accordance with subsection 107.2.1.

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 thirty-two (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
Phone: (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 at least once every fourteen (14) calendar days, and also within twenty-four (24) hours of the end of a storm event of fifty inches (0.50") 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 (3) 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 Arizona Department of Environmental Quality 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 NOT form to the Arizona Department of Environmental Quality 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 of Maricopa County, 2801 West Durango Street, Phoenix, Arizona 85009.

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 – Safety, Health & Sanitation Provisions:

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 is deemed a health hazard. 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:

Informing the public on a regular basis of construction activities and associated disruptions and inconveniences will be extremely important on this project. The Contractor shall employ a specialty public information service as a subcontractor to provide the community relations program for the Project as described herein. The public information service shall have staff available specifically for this project who are fluent in Spanish. The name and address of the public information subcontractor shall be submitted with the bid as specified in subsection 102.6 of the Supplementary General Conditions. 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 one-half (½) mile 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 as required or as directed by the Engineer. All printed materials must be in both English and Spanish.

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, water and sewer service disruption, 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 must be fluent in both English and Spanish and 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 | 6. Name of Area Supervisor |
| 2. 24-hour telephone complaint number | 7. Construction schedule including anticipated work hours |
| 3. Brief description of the project | 8. Traffic regulations including lane restrictions |
| 4. Name of Contractor Project Superintendent | |
| 5. Name of Engineer | |

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 five percent (5%) 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 ten (10) Project information signs, at locations to be determined by the Engineer, at the start of construction to inform the public of the forthcoming project, construction dates, and suggested alternate travel routes. 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 fifty percent (50%) upon installation, and the remaining fifty percent (50%) upon final completion for the work.

ITEM 107-3 - PROJECT SIGNS ALLOWANCE

Subsection 107.8 – Use of Explosives:

Delete in its entirety and replace with the following:

The use of explosives will NOT be permitted for any construction activities on the project.

Subsection 107.9 - Protection and Restoration of Property and Landscape:

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, transmission towers, utilities, roadways, irrigation control structures, adjacent residential and commercial structures, farm fields and crops, farm roads, farm irrigation and tailwater facilities, fences and walls, survey monuments, and existing vegetation located outside of the right-of-way limits.

The Contractor shall protect-in-place at all times the historic house located to the east of the channel footprint at approximate Station 67+50; the modern house south of the historic house, the box culvert located at approximate Station 222+00; the SRP pump facility located north of Baseline Road to the west of the channel right-of-way at approximate Station 58+00; the pump located south of Baseline Road to the west of the channel right-of-way at approximate Station 60+00; golf course facilities at the Bougainvillea Golf Course including landscaping, landscape wall, and irrigation system; and all utilities that are located adjacent to construction.

The Contractor shall reasonably avoid impacting cottonwoods and other trees and vegetation at the downstream end of the Project at the Salt River.

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 two (2) houses within the Project right-of-way south of Baseline Road and west of 75th Avenue may be leased during the construction time period, after the Contractor has completed construction at this property and has completed the construction downstream of this property. The Contractor shall work with the Engineer and lessee to allow ingress and egress to the houses, and use by the lessee of some of the area near the houses for parking.

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.

If the Contractor constructs ditches to divert water within the Project right-of-way or within the TCE, the Contractor shall backfill the ditches to ninety-five percent (95%) in accordance with SP Section 211, prior to completion of the Project or prior to relinquishing the TCE, whichever comes first.

Subsection 107.10 - Contractor's Responsibility for Work:

Add the following:

- A. Contractor is advised that 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. Owner assumes no responsibility for notifying Contractor of any anticipated flows, or 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. Storm water runoff in the area generally flows toward the existing Maricopa Drain, which is typically the low-lying land. The existing Maricopa Drain carries tailwater continuously to the Salt River. It is the Contractor's responsibility to maintain tailwater and other drainage ways and flow capacity in the Maricopa Drain to the extent practical, to manage tailwater, drainage from adjacent developments, and storm water. The Contractor shall take all necessary precautions to protect his work from damage that may be caused by such runoff and ponding. The Contractor shall provide his plans for managing surface water flows, including tailwater flows, water from adjacent developments, and storm water, to the Engineer for review, prior to commencement of construction.

Payment for management of all water for the Project, including water from the Maricopa Drain, farm irrigation delivery ditches, farm tailwater ditches, drainage from adjacent developments, and diversion of flood water and nuisance water, including labor, pumps, electricity, diversion ditches and pipes, 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.

ITEM 107-4 - WATER MANAGEMENT

- B. 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.

- C. The Contractor shall take all necessary action to protect the public from the construction work area. The Contractor will also notify the Engineer of any unauthorized personnel in the project area, including the presence of the general public.
- D. The Contractor will be required to coordinate with other Contractors working in the area. SRP will be constructing sump facilities adjacent to and within the channel and the Contractor shall contact Floyd Peters, SRP Inspector, at (602) 236-5664 to coordinate activities. Several developers will be working near and adjacent to the Project area. The Contractor shall coordinate his activities with these developers' activities. A Contractor will be installing a twelve-inch (12") waterline along 51st Avenue, either prior to or during Project construction, and the Contractor shall coordinate with this waterline contractor if necessary.
- E. The Contractor will contact SRP at least fourteen (14) calendar days in advance of any construction activities that affect the existing Maricopa Drain east of 43rd Avenue, or other SRP facilities. The Contractor will request a pre-construction meeting with SRP a minimum of seventy-two (72) hours prior to the start of any such construction activities. The Contractor shall contact SRP Inspector Floyd Peters at (602) 236-5664 to set the date and time for the meeting, and notify the Engineer so he can attend the preconstruction meeting with SRP.
- F. The Contractor shall notify the Engineer and Bob Fox, the environmental coordinator, two (2) weeks prior to commencing work in any area of the Project where burrowing owls may be located, so that Bob Fox can survey the area and remove any burrowing owls and habitat prior to construction
- G. Where existing fences are to be removed, the Contractor shall replace fencing with permanent fencing as shown on the plans and identified in Special Provisions Section 420.
- H. The Contractor shall protect-in-place the 230 kV power pole located to the west of Concrete Box Culvert No. 4. The soil retention system shall be installed to the east of the line shown on Sheet No. C21, (or Sheet No. B4) to provide the necessary minimum horizontal distance between the excavation and the power pole foundation. The minimum required vertical clearance between construction equipment and the 230 kV power line will be per OSHA requirements. The Contractor will be required to ground the construction equipment properly. The Contractor shall submit his plans for the soil retention system, including his plans for grounding his equipment and maintaining required clearances, to the Engineer for review. The Contractor will be allowed to leave a shoring system in place and bury it, except for the top five (5) feet, which shall be removed. The Contractor shall be required to remove a soldier pile lagging system in its entirety. Refer to SGC Subsection 105.6 for other information.

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 **five hundred and seventy (570)** calendar days beginning with the date specified in the Notice-to-Proceed.

The Contractor shall complete part of the storm drain installations and part of the backfilling of the Maricopa Drain within twenty-five (25) weeks of Notice-to-Proceed; see SGC Subsection 108.9. The Contractor shall also stockpile 34,000 CY of excavated material within Spoil Site No. 5 (Sheet No. SP1) within twenty-five (25) weeks of Notice-to-Proceed; see SGC Subsection 108.9.

Subsection 108.2 - Subletting of Contract:

Add the following:

For this project, Contractor shall perform, with its own organization, work amounting to fifty percent (50%) 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. The Contractor shall supply a separate schedule for the storm drain work. 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, which 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 forty (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 twenty-four (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.

Burrowing owls have been living and nesting in the Project Area. Per the Federal Migratory Bird Act, it is unlawful to disturb the owls when they are nesting. The nesting period runs from March to July each year. The District has contracted with Bob Fox, a wildlife specialist, to relocate the owls prior to construction. The Contractor shall notify the Engineer and Bob Fox two weeks prior to commencing construction in an area of the Project, so that he can survey the area for owls and relocate them. If the Contractor discovers any owls during construction, he shall stop work and notify Bob Fox, and not commence again until Bob has cleared the area of owls. Refer to SGC Subsection 104.1 for other restrictions and limitations.

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.

Liquidated damages will be assessed per calendar day for each and every calendar day that the following items of work remain incomplete after twenty-five (25) weeks after Notice-to-Proceed has been given:

- Storm drain installation along 63rd Avenue and along Baseline Road between 63rd Avenue and the 65th Avenue alignment. Refer to Sheet Nos. SD1 through SD 7, from Station 5 + 28.1 to Station 21+20 and from Station 106+40 to Station 120+14.
- Backfilling of the Maricopa Drain along the south side of Baseline Road from the storm drain installation along 63rd Avenue going west to the 65th Avenue alignment and then south along the 65th Avenue alignment to where the existing Maricopa Drain intersects the Project right-of-way. Refer to Sheet No. SP1 for the backfilling locations.

NOTE: The Contractor must manage the water that flows in the Maricopa Drain from the east to 63rd Avenue; and the water that flows to the Maricopa Drain at the 65th Avenue alignment. The Contractor must determine how to manage the water from the outlet of the storm drain along 63rd Avenue, until the LACC has been completed such that this water can be discharged into the LACC.

- Storm drain installation along Baseline Road and backfilling of the Maricopa Drain, Sheets Nos. SD11 through SD 13, from Station 627+00 to Station 637+10
- Stockpiling of 34,000 CY of excavated material in Spoil Site No. 5.

The liquidated damages for delay in completion of these items of work will be calculated at the pro-rated rate as identified in MAG 108.9, Table 108-1, pro-rated per the bid amount for that item of work. If any event or adverse conditions occur which are outside the Contractor's control and which may delay completion of any of these tasks past twenty-five (25) weeks after Notice-to-Proceed, the Contractor shall notify the Engineer immediately and provide details of the reason for the possible delay. He shall then notify the Engineer when he is able to recommence the work.

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.**

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 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 form of Certificate of Performance shall be provided to Contractor by attachment to the Contract documents.

(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 2002C031

LAVEEN AREA CONVEYANCE CHANNEL

PCN 117.08.31

SPECIAL PROVISIONS

TABLE OF CONTENTS

SECTION 201 - CLEARING AND GRUBBING	4
SECTION 202 - MOBILIZATION	4
SECTION 206 - STRUCTURE EXCAVATION AND BACKFILL	6
SECTION 211 - FILL CONSTRUCTION	7
SECTION 215 - EARTHWORK FOR OPEN CHANNELS	8
SECTION 220 - RIPRAP CONSTRUCTION	9
SECTION 301 - SUBGRADE PREPARATION.....	10
SECTION 310 - UNTREATED BASE.....	10
SECTION 336 - PAVEMENT MATCHING AND SURFACING REPLACEMENT	11
SECTION 340 - CONCRETE CURB	12
SECTION 350 - REMOVAL OF EXISTING IMPROVEMENTS.....	12
SECTION 401 - TRAFFIC CONTROL	13
SECTION 420 - CHAIN LINK FENCE	15
SECTION 421 - WIRE FENCES	16
SECTION 432 - GRAVEL MULCH.....	17
SECTION 440 - LANDSCAPE IRRIGATION SYSTEM SLEEVE AND PIPE INSTALLATION	19
SECTION 441 - GRASSCRETE	19
SECTION 505 - CONCRETE STRUCTURES.....	20
SECTION 515 - STEEL STRUCTURES	25
SECTION 520 - STEET HANDRAILS.....	26
SECTION 601 - TRENCH EXCAVATION, BACKFILLING AND COMPACTION	26
SECTION 610 - WATERLINE CONSTRUCTION	27
SECTION 618 - STORM DRAIN CONSTRUCTION	28

SECTION 625 - MANHOLE CONSTRUCTION29

SECTION 632 – PVC SLEEVES26

SECTION 703 – RIPRAP30

SECTION 725 - PORTLAND CEMENT CONCRETE.....31

SECTION 750 – DUCTILE IRON PIPE.....31

SECTION 796 – OWL HABITAT MATERIALS32

APPENDIX A – SOILS REPORT, NINYO AND MOORE

APPENDIX B – DUCTILE IRON PIPE

APPENDIX C – IRRIGATION SLEEVING

APPENDIX D – SALT RIVER PROJECT CONSTRUCTION – FOR INFORMATION ONLY

SECTION 201 - CLEARING AND GRUBBING

Clearing and grubbing shall conform to Section 201 of the MAG Uniform Standard Specifications and City of Phoenix (COP) Supplement except as modified herein.

Subsection 201.1 - Description

Add the following to this subsection:

The work consists of the removal and disposal of all vegetation including shrubs, trees of all sizes, farm field vegetation, and other plants and objectionable material within the channel right-of-way unless directed otherwise by the engineer. Clearing and grubbing of the spoil site areas is not required. Prior to starting this work, the Contractor must verify the location of existing utilities that might be damaged by this work.

Subsection 201.5 – Payment, Clearing and Grubbing

Replace this subsection with the following:

No measurement or payment will be made for any clearing and/or grubbing outside of the permanent Project Rights-of-Way. The cost thereof shall be considered incidental to the item that said clearing and grubbing is incidental or appurtenant.

No measurement for the clearing and grubbing of the Project Corridor will be made. Payment for said clearing and grubbing shall be made on the basis of the lump sum price bid and shall be full compensation for said operation including, but not limited to, the hauling and proper disposal of all material cleared and grubbed.

ITEM 201-1 - CLEARING AND GRUBBING (Project Corridor)

Subsection 201.6 – Measurement, Removal and Disposal of Trees

Replace this subsection with the following:

No measurement will be made for the removal or disposal of trees regardless of size.

Subsection 201.7 – Payment, Removal and Disposal of Trees

Replace this subsection with the following:

No payment will be made for the removal or disposal of trees regardless of size. The cost thereof shall be included in the price bid for clearing and grubbing.

SECTION 202 - MOBILIZATION

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

Subsection 202.1 - Description

Add the following subsection:

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 and operations that must be performed and costs incurred prior to beginning work on various items on the project site. The work under this section also includes maintenance and utilities costs for all offices, buildings, and facilities during construction, and removal of all offices, buildings, and facilities upon completion of construction.

Field Office:

This work shall consist of providing and maintaining a furnished Field Office for the exclusive use of and occupancy by the Engineer and the Engineer's staff.

The office shall be a building or mobile trailer erected at a location convenient to the project. The office shall not be in the same building or mobile trailer as office space of the Contractor.

The Contractor shall obtain written approval from the property owner upon site selection of the field office. The Contractor may furnish equivalent facilities in an existing building provided such facilities and building are located to provide convenient service.

The field office shall be an approved and weatherproof building or mobile trailer providing a minimum of five hundred (500) square feet of clear floor space, not including the toilet area. The structure shall have a minimum ceiling height of seven (7) feet and shall be provided with weatherproof doors equipped with adequate locking devices. Windows shall also be provided with adequate locking devices. The Contractor shall also provide the following:

- a. Lighting - Electric light, non-glare type luminaries to provide a minimum illumination level at desk height level.
- 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 (2) 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 (2) 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 (2) office desks with drawers, five office chairs (padded, swivel type), one (1) drafting table (adjustable height three feet (3') by six feet (6'), three (3) eight (8) foot conference tables, twelve (12) folding chairs, one (1) draftsman's stool, and two (2) four (4) drawer legal file cabinets. All furnishings shall be in good working order.
- i. Copier - Copier for eight and one-half inch by eleven inch (8½" X 11") and eleven inch by eleven inch by seventeen inch (11" X 17") paper with minimum of ten (10) copy capacity.
- j. Potable Water Supply - Contractor shall provide a potable water supply and pay for all water service.

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 ten (10) days after the date of Notice-to-Proceed (NTP). 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.

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 and COP Supplement except as modified herein.

Subsection 206.1 - Description

Add the following to this subsection:

The Contractor should be aware that the trench constructed for the sanitary sewer that crosses underneath the box culvert in 51st Avenue was backfilled with A.B.C. and may be as wide as sixty feet (60') at the top of the trench.

The Contractor shall take special care with excavation for Box Culvert number four (4) at Baseline Road and 57th Avenue to avoid impacting and damaging the 230 KV power pole that is close to the excavation for the box culvert; see the Supplementary General Conditions and Special Provisions Sections 505 and 515. The Contractor shall submit his plan for excavating this box culvert to the engineer for review.

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 ninety-five percent (95%) of the maximum ASTM D698 density.

Compaction against wing walls, or channel lining within three feet (3') of the walls or lining 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 Special Provisions 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 four inches (4") 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 - FILL CONSTRUCTION

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

Subsection 211.1 - Description

Add the following to this subsection:

Work under this item shall consist of filling in the existing Maricopa Drain to the limits as shown on the 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
Below Pavement	95
All other locations	85
Backfill:	
Restoration of channel bank	95
Against structures	95
All other locations	85
Backfill of existing Maricopa Drain within the LACC channel prism	95
Backfill of existing Maricopa Drain outside The LACC channel prism	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. The measurement for fill material shown in the plans was calculated from the cross sections in the plans. The Contractor is responsible for verifying the validity of the cross sections prior to placing any fill.

Subsection 211.6 - Payment

Replace this Subsection with the following:

No payment will be made for fill placed at the authorized spoil sites or for landscape mounds; the cost thereof shall be included in channel excavation to which such work is considered incidental.

Payment for fill within the channel prism will be paid at the unit price bid per cubic yard. Payment shall include hauling, placing, compacting, drying or removing saturated material and all other miscellaneous items necessary to accomplish the work in conformance with the plans.

ITEM 211-1 – LAVEEN CHANNEL FILL

Payment for fill construction of the existing Maricopa Drain outside the limits of the channel prism as shown in the construction plans will be made on the basis of the price bid per cubic yard. Payment shall include hauling, placing, compacting, drying or removing saturated material, removing lining, and all other miscellaneous items necessary to accomplish the work in conformance with the plans. Backfill placed over a new pipe will be considered as incidental to the cost of pipe and will not be a fill pay quantity. Some of the fill construction may be constructed by others and deleted from the contract, so the quantity provided in the bid schedule may be higher than the actual amount of fill construction. This will not result in any additional cost to the contract.

ITEM 211-2 - MARICOPA DRAIN FILL

SECTION 215 - EARTHWORK FOR OPEN CHANNELS

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

Subsection 215.1 - Description

Replace this subsection with the following:

The work in this section consists of excavation, fill, grading, and disposal of excavated and removed material for the construction of the Laveen Area Conveyance Channel (LACC) and the channel at the south side of the Bougainvillea Golf Course, and for the excavation, grading and disposal of the basin at the southwest corner of 75th Avenue and Baseline Road.

All material excavated and not used as fill elsewhere on the project will be the property of the Contractor. Approximately 411,000 CY of excess material shall be deposited on the designated spoil sites and landscape mounds as shown in the plans. All spoil sites will be left in a neat fashion with the top of all stockpiles knocked down and with the height of each stockpile not to exceed six feet (6') in height and with side slopes not to exceed two feet (2') horizontal to one foot (1') vertical. The Contractor shall ensure drainage paths are not blocked by the stockpiles. The Contractor is not responsible for the material once it is placed on the spoil site. This material and the responsibility of handling, storing, etc. then becomes that of the spoil site owner.

The Contractor shall deposit approximately 30,500 CY of excavated material at landscape mounds locations shown on Detail D32 on the plans. The mounds shall not exceed three feet (3') in height and with side slopes not to exceed two feet (2') horizontal to one foot (1') vertical. The Contractor shall ensure the mounds do not block drainage paths.

Owners of the stockpiles have expressed an interest in obtaining additional material (See Section 104.1 in the Supplementary General Conditions for names and phone numbers).

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 these Special Provisions. 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 June 9, 2000. 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.

Subsection 215.7 - Measurement

Replace this subsection with the following:

Measurement for excavation material on site for the channel will be made according to the quantity of material excavated from existing ground to the finished grades shown on the plans. No measurement will be made for fill construction, imported material, or disposal of excess material or any over-excavation. The Engineer will verify the quantities of excavation by a method that in his opinion is best suited to obtain an accurate determination.

Subsection 215.8 - Payment

Replace this subsection with the following:

Payment for excavation of material for the channel and sump will be made on the basis of the price bid per cubic yard of excavation. Payment shall include excavation, backfill, except as identified and paid for in Section 211, compaction, grading, hauling, removal, dust control, depositing material at the spoil sites and for landscape mounds, disposal of excess material, additional survey as required, and all other miscellaneous items necessary to accomplish the work in conformance with the plans.

ITEM 215-1 - CHANNEL EXCAVATION

ITEM 215-2 - SUMP EXCAVATION

SECTION 220 - RIPRAP CONSTRUCTION

Riprap Construction shall conform to Section 220 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 220.1 - Description

Add the following to this subsection:

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

Subsection 220.7 - Measurement

Add the following to this subsection:

Riprap shall be measured by the cubic yard in place within the limits of dimensions shown on the plans. The measurement shall be to the neat line as delineated on the plans.

Subsection 220.8 - Payment

Add the following to this subsection:

Payment for riprap will be made on the basis of the price bid per cubic yard in place, within the limits of dimensions shown on the plans. Payment shall include labor, preparation of ground surfaces, excavation, riprap, geotextile fabric, curing, and all other miscellaneous items required for riprap construction.

ITEM 220-1 – PLAIN RIPRAP (36” Thick)

SECTION 301 - SUBGRADE PREPARATION

Subgrade preparation shall conform to Section 301 of the MAG uniform Standard Specifications and COP Supplement 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 MAG uniform 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, 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 one hundred percent (100%) as determined under Section 301 of the MAG uniform 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 (½”) 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 asphalt pavement or pavement replacement.

Payment will be made for aggregate base course used for surface treatment of the maintenance road 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 – AGGREGATE BASE COURSE MAINTENANCE ROAD (6")

SECTION 336 - PAVEMENT MATCHING AND SURFACING REPLACEMENT

Pavement matching and surfacing replacement shall conform to Section 336 of the MAG Uniform Standard Specifications and COP Supplement 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 in Baseline Road, 59th and 51st Avenues for the construction of the concrete box culverts, storm drain and waterline pipes, 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:

Type A pavement replacement will be utilized for all pavement replacement. No "T" top will be utilized. The pavement replacement shall consist of at least two (2) layers of asphalt pavement over twelve inches (12") of aggregate base course.

Baseline Road, 51st Avenue, and 59th Avenue

The pavement replacement shall be a minimum of eight inches (8") (compacted thickness). The base courses of the asphalt pavement shall be lifts not exceeding three inches (3") when compacted of C-3/4 and the surface course shall be two inches (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 (1½% 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 asphalt, subgrade preparation, aggregate base course material, transportation, placement, labor, equipment, and roller compaction.

ITEM 336-1 – PAVEMENT REPLACEMENT

SECTION 340 - CONCRETE CURB

Concrete single curb shall conform to Section 340 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 340.1 - Description

Add the following to this subsection:

The work shall include the construction of a concrete single curb mow strip and concrete single curb as shown on the plans.

Subsection 340.6 - Payment

Replace this subsection with the following:

Payment for concrete mow strip and concrete single curb shall be made on the basis of the price bid per linear foot. This price shall be considered full compensation for the item complete including all construction equipment, labor, materials, pavement removal and replacement if necessary, and all incidentals items necessary to accomplish the work in conformance to the plans including construction of the curb transitions.

ITEM 340-1 - CONCRETE MOW STRIP, DETAIL D3

ITEM 340-2 - CONCRETE SINGLE CURB, MAG DET 222, TYPE 'B'

SECTION 350 - REMOVAL OF EXISTING IMPROVEMENTS

Removal of existing improvements shall conform to Section 350 of the MAG Uniform Standard Specifications and COP Supplement 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 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 landowner west of 43rd Avenue may have constructed (or may construct during this contract) a diversion ditch for the Maricopa Drain within the Project right-of-way. The Contractor shall remove and dispose of this concrete ditch after diverting the Maricopa Drain to the low-flow channel.

If a Maricopa County landfill is selected for the disposal of waste materials and/or debris, a Maricopa County Landfill Use Permit will be required. Application for permit can be made at the Maricopa County Landfill Office, located at 2801 West Durango Street, Phoenix, Arizona 85009 (telephone [602] 506-7386). Charges will be levied on a volume basis for each load delivered to the landfill in accordance with the current fee schedule.

Subsection 350.4 – Payment

Replace this subsection with the following:

Payment for miscellaneous removals shall be made on the basis of the lump sum price bid. This price shall be full compensation for all construction equipment, labor, materials, pavement removal, disposal, disposal fees, and all incidentals necessary to accomplish the work in conformance to the plans.

ITEM 350-1 - MISCELLANEOUS REMOVALS

SECTION 401 - TRAFFIC CONTROL

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

Subsection 401.1 – Description

Replace this subsection with the following:

This work shall consist of traffic control devices and flagmen or pilot cars in accordance with Section 401 of the COP Supplement and the City of Phoenix Traffic Barricade Manual, latest revision.

a. Traffic Control Devices

All traffic and/or traffic control devices on this project shall be provided, maintained and/or controlled as specified in the City of Phoenix Traffic Barricade Manual, latest revision.

b. Street Closure Permits

Permission to restrict city streets, sidewalks and alleys (street closure permits) shall be requested as specified in Section III of the City of Phoenix Traffic Barricade Manual.

c. Traffic Manual

Unless otherwise provided for in the following “General Traffic Regulations,” all traffic on this project shall be regulated as specified in Section IV of the City of Phoenix Traffic Barricade Manual.

d. Prior Approval

No deviation to the “General Traffic Regulation” will be allowed or implemented unless submitted to the Engineer for review and approval two weeks prior to the proposed work.

Subsection 401.5 – General Traffic Regulations

Add the following to this subsection:

a. Local Access Requirements

The Contractor shall maintain local access to all side streets, access roads, driveways, alleys, and parking lots at all times and shall notify residents seventy-two (72) hours in advance of any restrictions which will affect their access. The Contractor shall restore the access as soon as possible. If the primary access cannot be restored in a timely manner, the Contractor shall provide an alternative, which shall be predetermined with the residents prior to imposing any restrictions. Any local street restrictions imposed shall be such that local area traffic circulation is maintained unless specified to be closed herein or as shown on the detour plans.

b. Flagging of Traffic

Intermittent flagging of traffic in both directions will be allowed during daylight hours to facilitate construction and access for heavy construction equipment.

c. Traffic Control Plan

The Contractor shall submit a Traffic Control Plan (TCP) to the Engineer for review and approval, and to the City of Phoenix, and Maricopa County Department of Transportation showing placement of all

traffic control devices, including all conflicting signs to be covered/removed or relocated, or other features that may conflict with the placement of temporary signage. This plan shall be professionally drawn on a twenty-four inch by thirty-six inch (24" x 36") reproducible medium, and shall be submitted to the Engineer at the Pre-Construction Conference meeting.

d. Business Access Requirements

Access shall be maintained to adjacent businesses at all times during their hours of operation. Access may be maintained by such measures as constructing driveways in half sections, or by providing bridging over new concrete. Properties having more than one point of access shall not have more than one access restricted for more than fourteen (14) calendar days at any given time. Access to adjacent driveways shall be provided during all non-working hours. Any business restrictions shall be coordinated with the affected business in writing at least seven (7) days prior to imposing restrictions.

e. Pedestrian Access Requirements

The Contractor shall ensure that all sidewalks on this project remain open and safely usable at all times. Such measures as backfilling or ramping to existing sidewalks, or providing alternate sidewalk areas adjacent to existing sidewalks may be used. In high pedestrian use areas, the Engineer may request temporary hard-surface walkways, such as plywood sheets to be installed at no additional cost to the District.

f. Bus Stops

The Contractor shall maintain all existing bus stop locations on this project in a safe manner, or provide alternate bus stop locations as required by the Engineer.

g. Sanitation Pickup

The Contractor shall provide sanitation pickup for affected residents by relocating trash containers, or by providing alternative measures acceptable to the Sanitation Division of the City of Phoenix Public Works Department.

h. Traffic Control and Safety

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 and safety, to be available on the project site during all periods of construction to coordinate and maintain safe barricading whenever construction restricts traffic.

i. Coordination with COP Construction Traffic Control

The Contractor shall contact John Morgan at (602) 262-4483 or Mike Keffer at (602) 495-0243 at Construction Traffic Control, City of Phoenix, and Gerald Toscano at (602) 506-8620 at Maricopa County Department of Transportation.

Subsection 401.5.1 – Special Traffic Regulations

Replace this subsection with the following:

A traffic lane shall be a minimum of 10 feet of clear street width with a safe operating speed of at least twenty-five (25) mph.

A minimum of two (2) traffic lanes, one in each direction, shall be maintained open to traffic at all times on Baseline Road and 51st Avenue. A full road closure of 59th Avenue will be allowed for construction of the 59th Avenue crossing.

- a. For nighttime work or on weekends the Contractor shall minimize noise disturbance to the surrounding residential areas by disengaging "back-up beepers" and utilizing back-up strobe lights with spotters, and by increasing the muffler capacities of all equipment.

- b. Prior to excavation, the Contractor shall:
1. Develop a haul route plan and obtain a no-fee-permit from COP Development Services Department
 2. Obtain COP Street Transportation Department approval of haul route, truck volumes and operating hours.
 3. Obtain COP Development Services Department grading permit, including Floodplain Section if applicable, for the proposed spoil location
 4. Street Transportation Department Permit does not release Contractor from MAG Subsection 108.5 requirements.

Subsection 401.7 - Payment

Replace this subsection with the following:

Payment for traffic control for Baseline construction activities, including all mobilization, signage, materials, flagging operation, jersey barriers, 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.

ITEM 401-1 – TRAFFIC CONTROL –BASELINE ROAD

Payment for traffic control for all other items of work shall be made on the basis of the lump sum price bid. This price shall be full compensation for all construction equipment, mobilization, signage, materials, jersey barriers, flagging operations, maintenance, labor, permits, materials, and all incidentals necessary to accomplish the work in conformance to the plans.

ITEM 401-2 - TRAFFIC CONTROL - OTHER

Payment for off-duty City of Phoenix uniformed officers as mandated by the City of Phoenix will be on an as-used basis as determined by the Engineer. The Contractor shall submit documentation as required by the Engineer to support payment for this item. Payment for off-duty uniformed officers shall be made on the basis of the contract unit price bid per hour.

ITEM 401-3 - OFF-DUTY UNIFORMED OFFICER ALLOWANCE

SECTION 420 – CHAIN LINK FENCE

Chain link fence shall conform to Section 420 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 420.1 – Description

Add the following:

The work under this section shall consist of constructing chain link fence and gates at the SRP Sump and pump site and at other locations as 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 420.5 – Payment

Replace this subsection with the following:

Payment for chain link fence shall be made at the basis of the price bid per lineal foot. Payment for chain link fence gate(s) shall be made at the basis of the price bid per each. Price shall include all labor, materials, and equipment to install fence and gate(s) including all incidental fence installation costs.

ITEM 420-1 – 6' CHAIN LINK FENCE

ITEM 420-2 - 24' CHAIN LINK FENCE GATE

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 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 ½ 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

SECTION 432 – GRAVEL MULCH

Add this section in its entirety.

Subsection 432.1 - Description

The work shall consist of the application of gravel mulch over the slopes on the channel in front of the Bougainvillea Golf Course on the North side of Baseline Road east of 59th Avenue as shown on the plans, and in these Special Provisions. Gravel shall meet the requirements of Section 701.2.2 of the MAG Uniform Standard Specifications.

Subsection 432.2 - Materials

Gravel mulch will be graded material and shall be free of debris, fines and soil particles. Gravel mulch will consist of a combination of crushed and rounded material with a minimum of fifty percent (50%) by weight crushed material. Crushed rock shall have at least fifty percent (50%) of the rock having three fractured faces. A sample must be approved by the engineer prior to delivery to the site.

The percentage wear of the material to be used as gravel mulch will be determined by the test procedure of ASTM Standard C-131, Grading B. The percentage of wear of the material shall not exceed forty (40) after five hundred (500) revolutions.

The aggregates shall be well graded when tested in accordance with ASTM C-136 and ASTM C-117. The percentage composition by weight shall be within the following limits:

<u>SIZE OF OPENING</u>	<u>PERCENTAGE PASSING SIEVE</u>
1½-inch	100
¾-inch	0 - 15

Gravel mulch shall be gold or natural desert in color. Color shall be approved by the Engineer prior to delivery to the site.

Subsection 432.3 - Subgrade Preparation

The subgrade surfaces shall be to the neat lines and grades shown on the drawings.

The sites where equipment can safely operate, (generally slopes 3.5:1 or flatter), and designated to receive gravel mulch shall be adequately loosened. Discing or cultipacking or both may be necessary, as determined by the Engineer. On sites where equipment cannot operate, the area designated to receive gravel mulch shall be prepared by scarifying to provide a roughened surface so that the gravel mulch will stay in place.

The finished surface for both equipment and hand-tilled areas shall be left in a roughened condition as approved by the Engineer. This is the normal surface resulting from the tillage operations.

Rocks larger than three inches (3") in diameter, trash, weeds, and other debris that will interfere with gravel placement shall be removed or disposed of as determined by the Engineer.

Subgrade preparation shall be discontinued when soil moisture conditions are not suitable for the preparations of a satisfactory subgrade as determined by the Engineer.

Gravel mulch shall not be placed until the subgrade surfaces have been inspected and approved by the Engineer.

Subsection 432.3 - Placement

The gravel mulch shall be placed by equipment on the prepared surfaces. The mulch shall be constructed to the full course thickness in one operation and in such a manner as to avoid serious displacement of the underlying materials. The gravel mulch shall be delivered and placed in a manner that will ensure that the in-place mulch layer shall be reasonably homogeneous and the fractions uniformly distributed. Hand placing of gravel cover shall be required to the extent necessary to prevent damage to the permanent works. The average thickness of the gravel mulch shall be two inches (2") and shall be applied at an average of one hundred fifty (150) pounds per square yard. In no case shall the thickness of the gravel mulch layer be less than one and a half inches (1½").

The gravel mulch will be hand raked and smoothed prior to water spray settling. The application of a uniform spray of water will be made at a rate not exceeding the infiltration rate to minimize run off. The use of pressure pumps and spray bars on all sprinkling equipment used for the application of water will be required. The use of gravity flow spray bars and splash plates will not be permitted.

Subsection 432.4 - Measurement

Gravel mulch shall be measured by the square yard in place within the limits of dimensions as shown on the plans. The measurement shall be to the neat line as delineated on the plans.

Subsection 432.5 - Payment

Payment for gravel mulch shall be made on the basis of the price bid per square yard. This price shall be considered full compensation for the item complete including all labor, materials, equipment, and all other items necessary and incidental to the placement of the gravel mulch. No separate payment will be made for water to settle gravel.

ITEM 432 – 1 - GRAVEL MULCH

SECTION 440 – LANDSCAPE IRRIGATION SYSTEM SLEEVE AND PIPE INSTALLATION

Landscape irrigation system installation shall conform to Section 440 of the MAG Uniform Standard Specifications and the City of Phoenix Supplement except as modified herein.

Subsection 440.1 - Description

Replace this subsection with the following:

The work under this section is covered in Appendix C of these Special Provisions.

Subsection 440.11 – Measurement and Payment

Replace this subsection with the following:

Payment for the work under this section is covered in Appendix C of these Special Provisions.

SECTION 441 - GRASSCRETE

Add this Section in its entirety.

Subsection 441.1 - Description

GRASSCRETE is a porous concrete-grass-system that will be constructed in accordance with the plans and these Special Provisions.

Grass Coverage: Surface area shall be forty-seven percent (47%) concrete and fifty-three percent (53%) hole. Grass usually covers much of the concrete in areas not subject to regular vehicle traffic.

Concrete Coverage: The volume of concrete used in GRASSCRETE shall be equal to a normal four-inch (4") slab.

Drainage: GRASSCRETE shall drain at the same rate, as would an ordinary lawn at the same location. The manufacturer shall provide a test report by an independent laboratory of infiltration rates upon request.

Concrete Volume: GRASSCRETE shall have sixty percent (60%) concrete by volume and forty percent (40%) void area, not including widened edges and solid borders.

Subsection 441.2 – Subgrade Preparation

Subgrade preparation for GRASSCRETE shall conform to Section 301 of the MAG uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 441.3 – Concrete

Class "A" Concrete, $f_c = 3,000$ psi, shall be used for all GRASSCRETE. Aggregates shall conform to ASTM C 33 and be 3/8" minus.

Subsection 441.4 – Slab Design

The GRASSCRETE slab shall have a minimum thickness of five and a half inches (5 1/2"). GRASSCRETE shall be recessed one-inch (1") to one and a half inches (1 1/2") below adjoining surfaces to allow for grass and topsoil. A monolithic concrete border shall restrain all perimeters.

Subsection 441.5 – Reinforcement

The GRASSCRETE shall be continuously reinforced with six-inch x six-inch x six gauge (6" x 6" x 6 gauge) welded wire fabric chaired between two (2) and three (3) inches above subgrade.

Subsection 441.6 - Measurement

GRASSCRETE shall be measured by the square yard in place within the limits of dimensions as shown on the plans. The measurement shall be to the neat line as delineated on the plans.

Subsection 441.7 – Payment

Payment for GRASSCRETE shall be made on the basis of the price bid per square yard. This price shall be full compensation for all labor, materials, tools, and equipment to complete the GRASSCRETE according to the plans.

ITEM 441-1 - GRASSCRETE**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, wing walls, headwalls, grade control structure walls, catch basins, siphon manholes, irrigation ditches, retaining walls, drain outlets, side drain swales, transition structures, low-flow channel, and maintenance road as located and indicated on the plans.

The Contractor shall protect-in-place the 230 kV power pole located to the west of Concrete Box Culvert No. 4. The Contractor shall construct either a sheet-pile shoring system or soldier pile and lagging system to protect the power pole from the box culvert excavation. The shoring or lagging system shall be installed to the east of the line shown on Sheet No. C21, (or Sheet No. B4) to provide the necessary minimum horizontal distance between the excavation and the power pole foundation. The Contractor will be required to ground the construction equipment properly. The Contractor shall submit his plans for the shoring or lagging system, including his plans for grounding his equipment and maintaining required safety clearances, to the Engineer for review. The Contractor will be allowed to leave a shoring system in place and bury it, except for the top five feet (5'), which shall be removed. The Contractor shall be required to remove a soldier pile lagging system in its entirety.

The Contractor shall ensure that the concrete maintenance road is not steeper than 0.05 feet/feet at any location along its length.

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.

Class "A" Concrete, $f_c = 3,000$ psi with Type V cement (ASTM C-150) or Type II with 15% to 20% fly ash (Class F) or Type 1P cement (ASTM C595) shall be used for all concrete structures.

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 Arizona Department of Transportation (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 twenty-eight (28)-day compressive strength. Place backfill simultaneously on both sides of wall, where required, to prevent differential pressures.

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 four inches (4"). 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 one-fourth-inch ($\frac{1}{4}$ ") 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.

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 one inch (1") 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. Do not use curing compounds.

Subsection 505.9 - Finishing Concrete

Add the following to this subsection:

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

All exposed surfaces of the retaining walls, box culvert, except the top six inches (6") of the retaining walls and box culverts. All exposed surfaces of the concrete outlet structures except for MAG Standard Detail 545 end sections, and the nose and interior of the box culvert piers with ten feet (10') of the inlet/outlets shall be stained with Tamms- Aquastain T-96- decorative coating color "Sand" or approved equal per plans. All exposed surfaces on the top six inches (6") and the top of the retaining walls and box culverts shall be stained with Tamms- Aquastain T-96- decorative coating custom color "Tile Red" or approved equal per plans. The underside of the box culvert, the interior of the box culvert piers greater than ten feet (10') from the inlet/outlets, and any other structures not specified herein shall not receive any stain.

The color shall conform to the color requirements with respect to hue, value, and chroma. A five foot by five foot (5' x 5') test panel shall be made for each concrete stain color, the color shall match the color examples provided by the Owner and approved by the Engineer prior to use. The cost of the concrete stain and concrete test panels shall be considered incidental to the cost of the structure. Concrete stain remaining after the completion of construction shall be provided to the Flood Control District of Maricopa County.

Form liners shall be used on the exterior vertical faces of the retaining walls and box culverts wingwalls, as specified on plans. The form liner shall be running bond ashler, No. 329, dura-cast, super-cast, and/or ultra-cast sheets as manufactured by Greenstreak, or approved equal. Form liners shall be prepared, placed and stripped per the manufacturer's requirements, recommendations and specifications. The form liner shall not infringe on or reduce the required thickness of the retaining wall as detailed on the plans. A five foot by five foot (5' x 5') test panel shall be made and approved by the Engineer prior to use. The test panel shall remain on the project site until completion of the structure.

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 three-fourths-inch ($\frac{3}{4}$ ") 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 culverts shall be made on the basis of the lump sum price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color stain, protective coating, aesthetic form liner, ABC and liner, handrails, painting handrails, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special

Provisions. The concrete floor and ABC backfill on the culverts with an equestrian cell shall be considered as incidental to the price for the box culvert and no additional payment shall be made.

ITEM 505-1 - CONCRETE BOX CULVERT No. 1

ITEM 505-2 - CONCRETE BOX CULVERT No. 2

ITEM 505-3 - CONCRETE BOX CULVERT No. 3

ITEM 505-4 - CONCRETE BOX CULVERT No. 4

ITEM 505-5 - CONCRETE BOX CULVERT No. 5

Payment for the concrete outlet shall be made on the basis of the price bid per 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.

ITEM 505-6 - CONCRETE SIDE DRAIN OUTLET (DETAIL D12)

Payment for concrete low-flow transition sections walls shall be made on the basis of the price bid per 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.

ITEM 505-7 - CONCRETE LOW-FLOW TRANSITION SECTIONS (DETAIL D2)

Payment for concrete retaining walls shall be made on the basis of the lump sum price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, aesthetic form liner, color stain, protective coating, handrails, painting handrails, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions including handrails.

ITEM 505-8 - CONCRETE RETAINING WALL No. 1

ITEM 505-9 - CONCRETE RETAINING WALL No. 2

ITEM 505-10 - CONCRETE RETAINING WALL No. 3

Payment for concrete grade control structures shall be made on the basis of the lump sum 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.

ITEM 505-11 - CONCRETE GRADE CONTROL STRUCTURE (DETAIL D7)

Payment for concrete headwalls, catch basins, and the low-flow measuring flume shall be made on the basis of the unit price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color stain, protective coating, handrails, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions.

ITEM 505-12 CONCRETE INLET HEADWALL (DETAIL D22)

ITEM 505-13 CONCRETE INLET HEADWALLS (MAG DETAIL 501-2 'U' MODIFIED (24"))

ITEM 505-14 CONCRETE CATCH BASIN (MAG DETAIL 535 'F')

ITEM 505-15 CONCRETE INLET HEADWALL (MAG DETAIL 501-4(48"))

ITEM 505-16 CONCRETE HEADWALL (MAG DETAIL 502-2 'L' (30"))

Payment for siphon manhole structures shall be made on the basis of the price bid per each structure. This price shall be full compensation for all labor, materials, reinforcing steel, access barriers, 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.

ITEM 505-17 - CONCRETE SIPHON MANHOLE (DETAIL D9)

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, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions.

ITEM 505-18 - CONCRETE LINED IRRIGATION DITCH (D=1.5')

ITEM 505-19 - CONCRETE LINED IRRIGATION DITCH (D=2.5')

Payment for side drain lining shall be made on the basis of the price bid per cubic yard of concrete. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color stain, and all other items necessary and incidental to construct the lining complete in place according to the plans and these Special Provisions.

ITEM 505-20 - CONCRETE SIDE DRAIN SWALE (DETAIL D6)

Payment for concrete drop inlet and concrete outlet shall be made on the basis of the unit price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, aesthetic form liner, 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.

ITEM 505-21 CONCRETE OUTLET HEADWALL (DETAIL D10)

ITEM 505-22 CONCRETE HEADWALL (MAG DETAIL 502-1)

ITEM 505-23 CONCRETE HEADWALL MAG DETAIL 502-1, MOD (TRASHRACK)

Payment for concrete low flow channel 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, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions.

ITEM 505-24 - CONCRETE LOW FLOW CHANNEL

Payment for concrete maintenance road shall be made on the basis of the price bid per square foot. This price shall be considered full compensation for the item complete including all construction equipment, labor, materials, and all incidentals items necessary to accomplish the work in conformance to the plans and these Special Provisions.

ITEM 505-25 - CONCRETE MAINTENANCE ROAD

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

Add the following to this subsection:

The work under this section shall consist of supplying and installing access barriers, flap gate, bollards, and power pole shoring according to the plans and these Special Provisions.

All material for the access barriers shall be A36 steel. The access barriers and associated embedments shall be galvanized in accordance with MAG Section 771. The flap gate shall be a Waterman model or approved equal.

Subsection 515.7 - Payment

Add the following to this subsection:

Payment for access barrier and bollards will be made at the unit price bid for each. This price shall be full compensation for all labor, materials, equipment, and all other items necessary to complete the work in place according to the plans and these Special Provisions.

ITEM 515-1 – ACCESS BARRIER, COP DETAIL P-1562, 1563 (60”)

ITEM 515-2 – 48-INCH FLAP GATE

ITEM 515-3 – BOLLARDS

Payment for Power Pole Shoring will be made at the lump sum price bid. This price shall be full compensation for all labor, materials, equipment, and all other items necessary to complete the work in place according to the plans and these Special Provisions.

ITEM 515-4 – POWER POLE SHORING

SECTION 520 - STEEL HANDRAILS

Steel handrails shall conform to Section 520 of the MAG Uniform Standard Specifications and COP Supplement 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 two (2) coats of Benjamin Moore "Arroyo Red 2085-10" CM74 Aliphatic Acrylic Urethane Gloss, or equal, applied per manufacturer's specifications.

All independent sections of handrail require grounding.

Subsection 520.5 - Payment

No payment shall be made for handrails and painting handrails, the cost thereof shall be considered incidental to the item that the handrail is attached.

SECTION 601 - TRENCH EXCAVATION, BACKFILLING AND COMPACTION

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

Subsection 601.4.2 – Bedding

Add the following to this subsection:

Bedding material may be one-half (½) 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 one and a half inches (1½") 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 twelve inches (12") 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 (1') 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 610 - WATERLINE CONSTRUCTION

Waterline construction shall conform to Section 610 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 610.1 - Description

Add the following to this subsection:

Except where noted otherwise, the Contractor is responsible for protecting all water lines in place and for maintaining all waterlines in service for the duration of the project. If the Contractor elects to temporarily shut down a water main for a period of time that exceeds eight (8) hours, the Contractor shall provide a temporary bypass waterline at no additional cost, which is approved by the City of Phoenix, depending on location.

The City of Phoenix requires seventy-two (72) hours written notice prior to shutdowns on waterlines. The City Fire Department must be notified at least twenty-four (24) hours in advance of any shutdowns for waterlines serving fire hydrants. See SGC Subsection 104.1 for additional notification requirements.

The Contractor is responsible for maintaining access to water valves within the construction area. Failure to do so may result in delays to a scheduled or emergency water shutdown. Only City of Phoenix utility personnel are permitted to operate valves.

The Contractor shall provide all materials and labor necessary to complete all waterline work. City of Phoenix personnel will not provide materials, labor, or equipment for work related to this project.

Subsection 610.18 - Measurement and Payment

Add the following to this subsection:

Payment for ductile iron water pipe shall be made at the contract linear foot price bid. Such payment shall be full compensation for furnishing and installing the pipe complete in place, as specified, including fittings, labor, excavation, backfilling, compaction, pavement cutting and replacement, removal of obstructions, shoring, bracing, testing, permit costs, and all other work not specifically covered that is incidental.

ITEM 610-1 - 12-INCH WATER LINE RELOCATION

Payment for water valves shall be made at the contract unit price bid per each. Such payment shall be full compensation for furnishing and installing the valve, box, and cover complete in place, as specified, including labor, excavation, backfilling, compaction, removal of obstructions, shoring, bracing, testing, and all other work not specifically covered that is incidental.

ITEM 610-2 - 12-INCH WATER VALVE (ALLOWANCE)

Payment for bends shall be made at the contract unit price bid per each. Such payment shall be full compensation for furnishing and installing the valve, box, and cover complete in place, as specified, including labor, excavation, backfilling, compaction, removal of obstructions, shoring, bracing, testing, and all other work not specifically covered that is incidental.

ITEM 610-3 - 12 INCH x 22 ½ DEGREE BEND

All existing water lines in the Project area will be maintained in operating condition during construction, except for brief periods of time if needed for relocations, see SGC Subsection 104.1. The Contractor will obtain all permits needed for waterline relocations.

Payment for water service line relocations will be made for a total amount not to exceed the amount shown in the bid schedule for the item including any permit costs and will be authorized for use only by the Engineer in advance,

ITEM 610-4 – WATER SERVICE LINE RELOCATION ALLOWANCE

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 618.5 – Measurement

Add the following to this subsection:

(D) Tailwater Pipe: Shall be the number of linear feet of pipe installed, as measured along the axis of the pipe from the connection with the end section on the inlet side to the connection to the end section or the outlet on the outlet side, and shall include any portions that are embedded in the above structures.

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. The cost of temporary fencing on 63rd Avenue shall be considered incidental to the cost of the storm drain pipe.

ITEM 618-1 - 18 INCH PIPE

ITEM 618-2 - 24-INCH PIPE

ITEM 618-3 - 30 INCH PIPE

ITEM 618-4 - 48-INCH PIPE

ITEM 618-5 - 60-INCH PIPE

Payment for side drainpipes shall be made at the unit price bid per linear foot, to the nearest foot for each size and type of pipe. This price shall be full compensation for furnishing and installing the pipe, pipe collars, 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 618-6 – 18” TAILWATER PIPE

ITEM 618-7 – 24” TAILWATER PIPE

ITEM 618-8 – 30” TAILWATER PIPE

ITEM 618-9 – 36” TAILWATER PIPE

Payment for siphon pipes shall be made at the unit price bid per linear foot, to the nearest foot. 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 618-10 - 30 INCH SIPHON PIPES

Payment for the prefabricated tees and prefabricated bends shall be at the contract unit price for each. This price shall be for the cost of fabrication only.

ITEM 618-11 - PREFABRICATED BEND, 60” x 11 ¼ DEGREE BEND

ITEM 618-12 - PREFABRICATED BEND, 60” x 58 DEGREE BEND

ITEM 618-13 - PREFABRICATED TEE, 48” x 48” x 18”

ITEM 618-14 - PREFABRICATED TEE, 48” x 48” x 24”

ITEM 618-15 - PREFABRICATED TEE, 60” x 60” x 24”

Payment for concrete end sections, pipe plugs, and pipe collars shall be at the contract unit price for each irrespective of size. This price shall be full compensation for furnishing and installing the end section and other fittings necessary to complete installation in place, as specified, including excavation, backfilling, compaction, testing and all incidental work not specifically covered in.

ITEM 618-16 – CONCRETE END SECTION (MAG DETAIL 545)

ITEM 618-17 – PIPE PLUG (MAG DETAIL 427)

ITEM 618-18 – CONCRETE PIPE COLLAR (MAG DETAIL 505)

SECTION 625 - MANHOLE CONSTRUCTION

Manhole construction shall conform to Section 625 of the MAG Uniform Standard Specifications and the City of Phoenix Supplemental Specifications except as modified herein.

Subsection 625.1 - Description

Add the following to this subsection:

The work includes the installation of the manhole structures for the storm drains in accordance with the plans.

Subsection 625.5 - Payment

Add the following to this subsection:

Payment for manhole construction shall be made at the unit price bid per each. This price shall include all labor, materials, and equipment necessary to install manholes including excavation, bedding, backfill, compaction, embedments, rims, and covers, and all incidental work.

ITEM 625-1 – STORM DRAIN MANHOLE, MAG DET 520 AND 522

ITEM 625-2 – STORM DRAIN MANHOLE, MAG DET 521 AND 522

ITEM 625-3 – STORM DRAIN MANHOLE, DETAIL D24

SECTION 632 – PVC SLEEVES

This Section shall be added to the MAG Standard Specifications.

Subsection 632.1 - Description

The work under this section shall consist of furnishing and installing PVC sleeves underneath the concrete maintenance road for use in the future. The sleeves shall be placed at the locations and elevations as indicated on the plans or as directed by the Engineer.

Subsection 632.2 - MATERIALS

The PVC sleeves shall be 4" diameter PVC Schedule 40 pipe. The materials used in the manufacture of the PVC pipe and fittings shall conform to the requirements of ASTM D 1784, Class 12454-B.

PVC pipe shall conform to the requirements of ASTM D-1785.

Subsection 632.3 - CONSTRUCTION

At the Contractor's option and expense, a larger size sleeve than specified may be used provided the larger size is continuous for the entire length of the run. The PVC sleeve shall be cut square and trimmed to remove all rough edges. Connections shall be of the solvent weld type. Purple primer conforming to the ASTM F 656 shall be applied to the joined surfaces prior to the use of cement. The joint cement shall be the gray PVC cement conforming to the requirements of ASTM D-2672.

Excavation and backfill shall be in accordance with the requirements of Section 601 of the Special Provisions.

The ends of each sleeve shall be capped and marked with a #20 copper wire with yellow insulation attached to a two inch by 4 inch by twelve inch (2" x 4" x 12") redwood stake at the surface and anchored by a brick or stake located at the bottom of the trench. The sleeves shall be placed at least thirty-six inches (36") below the paved surface. The sleeves shall extend at least three feet (3') beyond the outside edge of the pavement.

Subsection 632.4 - Measurement

Measurement for sleeves shall be per each sleeve installed within the limits shown on the plans.

Subsection 632.5 - Payments

Payment for the sleeves shall be made at the contract unit price bid per each. Such payment shall be full compensation for furnishing and installing the sleeves complete in place, including fittings to cap the ends, cost of materials, equipment, labor, excavation, removal of obstruction, shoring, bracing, bedding, backfilling, marking, compaction, testing, and all other work not specifically covered that is incidental.

ITEM 632-1- PVC SLEEVES (4")

SECTION 703 – RIPRAP

Riprap shall conform to Section 703 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 703.1 - Stone

Add the following to this subsection:

In addition to the requirements of section 703.1, stone for riprap shall have a minimum apparent specific gravity of 2.4 per ASTM C-127.

Waste concrete shall not be used for riprap.

Subsection 703.2 – Size of Stone

Replace this subsection with the following:

The following requirements as listed in Table 703-1 that shall apply for grouted riprap Types I, II and III.

Table 703-1

Rock Riprap Gradation Limits	
Stone Size (ft)	% Of Gradation Smaller Than
1.5 D ₅₀ to 1.7 D ₅₀	100
1.2 D ₅₀ to 1.4 D ₅₀	85
1.0 D ₅₀ to 1.15 D ₅₀	50
0.4 D ₅₀ to 0.6 D ₅₀	15

SECTION 725 - PORTLAND CEMENT CONCRETE

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

Subsection 725.2 - Portland Cement

Add the following to this subsection:

Cement shall be Portland Cement, conforming to the requirements of ASTM C-150, Type V, or Type II with 15% of 20% flyash (Class F), or type 1P (ASTM C595) unless noted otherwise on the plans or in the specifications.

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 four percent (4%) or more than six percent (6%). 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.

SECTION 750 – DUCTILE IRON PIPE

Ductile Iron Pipe installation shall conform to Section 750 of the MAG Uniform Standard Specifications and the City of Phoenix Supplement except as modified herein.

Subsection 750.5 - Description

Add this subsection:

The work under this section is covered in Appendix B of these Special Provision.

Subsection 750.6 – Measurement and Payment

Add this subsection:

Payment for eighteen-inches (18”) ductile iron pipe shall be made on the basis of the lump sum price bid. 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, bends, testing and all incidental work not specifically covered in other pay items.

ITEM 750-1- 18” DIP, Elbows, Blind Flanges, Air Valve & Vault

SECTION 796 – OWL HABITAT MATERIALS

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

Subsection 796.1 - Description

The work under this section shall consist of furnishing materials to construct owl habitats by District Forces.

The Contractor shall provide the following materials for installation by District forces.

Description	Unit	Project Quantity
*4-inch plastic corrugated perforated drain pipe	100-foot roll	2
*6-inch Schedule 20 white pvc perforated sewer pipe	10-foot lengths	32
Orange Home Depot plastic 5 gallon bucket	Each	32
"Great stuff" or equivalent minimally expanding structural spray foam	16 ounce can	16
40-foot by 45-foot 50% shade cloth, 80% Lumite (Westech Supply)	Each	4
3/4-inch Schedule 40 pvc pipe	10-foot lengths	80
3/4-inch Schedule 40 pvc straight pipe couplings	Each	60
3/4-inch Schedule 40 45-degree pipe couplings	Each	60
6-inch or larger pointed wood landscaping stakes	10-foot lengths	8
1/2-inch galvanized steel electrical conduits	2.5-foot lengths	80
Steel 20-gauge wire	100-foot roll	2
8"X8"X16" concrete cinder blocks	Each	8
8' X 4' 1/4-inch plywood	Each	4
2" X 4" wood	10-foot lengths	4
Quart-size ceramic bowl	Each	8

Subsection 796.2 - Payment

Payment for owl habitat materials shall be made at the lump sum price bid. This price shall be full compensation for furnishing the equipment specified above. The owl habitats will be constructed by District forces and is not part of this Contract.

ITEM 796-1 – OWL HABITAT MATERIALS

SPECIAL PROVISIONS

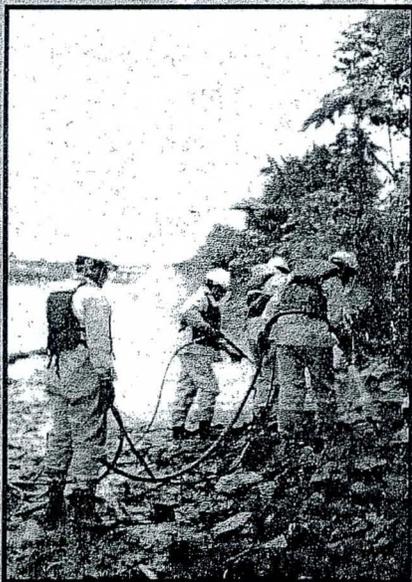
APPENDIX "A"

SOILS REPORT – NINYO AND MOORE

**Contract FCD 2002C031
Laveen Area Conveyance Channel**

PCN 117.08.31

GEOTECHNICAL EVALUATION
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA
FCD PROJECT NO. 1170831
CONTRACT FCD 2001C004
ASSIGNMENT NO. 1



Geotechnical
and
Environmental
Sciences
Consultants

Ninyo & Moore

**GEOTECHNICAL EVALUATION
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA
FCD PROJECT NO. 1170831
CONTRACT FCD 2001C004
ASSIGNMENT NO. 1**

PREPARED FOR:

Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009-6399

PREPARED BY:

Ninyo & Moore Geotechnical and Environmental Sciences Consultants
5035 South 33rd Street
Phoenix, Arizona 85040
(602) 243-1600

COPY

October 31, 2001
Project No. 600220001

October 31, 2001
Project No. 600220001

Mr. Warren Rosebraugh, P.E.
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009-6399

Subject: Geotechnical Evaluation
Laveen Area Conveyance Channel
Maricopa County, Arizona
FCD Project No. 1170831
Contract FCD 2001C004
Assignment No. 1

Dear Mr. Rosebraugh:

In accordance with our proposal dated May 17, 2001 and our proposal addendums dated June 14 and June 29, 2001, Ninyo & Moore has performed a Geotechnical Evaluation for the above referenced site. The attached report represents our deliverable for this project and presents our methodology, findings, conclusions, and recommendations regarding the geotechnical conditions at the project site. Our anticipated completion date for this project is October 31, 2001.

We appreciate the opportunity to be of service to you during this phase of the project. If you have any questions or comments regarding this report, please call at your convenience.

Sincerely,
NINYO & MOORE

Steven D. Nowaczyk

Steven D. Nowaczyk, P.E.
Senior Project Engineer

SDN/RM/LLG/avv

Distribution: (3) Addressee

Robert W. McMichael

Robert W. McMichael, P.E.
Manager/Chief Engineer



TABLE OF CONTENTS

	<u>Page</u>
1. INTRODUCTION	1
2. SCOPE OF SERVICES	1
3. SITE DESCRIPTION.....	2
4. PROPOSED CONSTRUCTION.....	2
5. FIELD EXPLORATION	3
6. LABORATORY TESTING	4
7. GEOLOGY AND SUBSURFACE CONDITIONS	4
7.1. Geologic Setting	4
7.2. Subsurface Conditions	5
7.3. Groundwater	6
8. GEOLOGIC HAZARDS	6
8.1. Land Subsidence and Earth Fissures	6
8.2. Faulting and Seismicity	7
8.3. Liquefaction Potential.....	8
9. CONCLUSIONS	8
10. RECOMMENDATIONS.....	9
10.1. Earthwork	9
10.1.1. Excavations	9
10.1.2. Slopes and Earthwork Factors.....	11
10.1.3. Temporary Earth Retaining Systems	11
10.1.4. Grading, Fill Placement, and Compaction	12
10.1.5. Imported Fill Material	13
10.2. Box Culverts	13
10.3. Jack-and-Bore Tunneling.....	14
10.4. Soil-Cement Stabilization.....	15
10.5. Pipe Installation and Trench Backfill	16
10.5.1. Construction Dewatering	16
10.5.2. Pipe Bedding and Modulus of Soil Reaction (E')	17
10.5.3. Trench Backfill.....	17
10.5.4. Pipeline Frictional Resistance	18
10.6. Retaining Walls.....	18
10.6.1. Retaining Wall Horizontal Pressures.....	19
10.6.2. Retaining Wall Foundations.....	21
10.7. Corrosion Potential	21
10.8. Concrete.....	22
10.9. Pre-Construction Conference.....	23
10.10. Construction Observation and Testing	23

11. LIMITATIONS.....24
12. SELECTED REFERENCES26

Tables

Table 1 – Percentage of Soil Type Encountered from Ground Surface to Estimated Bottom of Channel.....6
Table 2 – Percentage of Soil Type Encountered at the Anticipated Bottom of the Channel Excavation6
Table 3 – Seismic Design Parameters8
Table 4 – Summary of Auger Refusal Depths10
Table 5 – Recommended Earthwork Parameters11
Table 6 – Typical Variation in Cement Content.....16
Table 7 – Summary of Resultant Retaining Wall Forces20

Figures

Figure 1 – Site Vicinity Map
Figure 2 – Boring Location Map
Figure 3 – Lateral Earth Pressures for Braced Excavations
Figure 4 – Jack Pit Reaction-Lateral Earth Pressure Diagram
Figure 5 – Pipe Bedding and Trench Backfill Detail
Figure 6 – Typical Retaining Wall Drain Detail

Appendices

Appendix A – Boring Logs
Appendix B – Laboratory Testing
~~Appendix C – Environmental Sampling Results~~
~~Appendix D – Agronomic Tests Results~~
~~Appendix E – Hand Calculations for Retaining Wall Horizontal Forces~~

Available upon request

1. INTRODUCTION

In accordance with our proposal dated May 17, 2001 and our proposal addendums dated June 14 and June 29, 2001, we have performed a geotechnical evaluation for the Laveen Area Conveyance Channel (LACC) to be located in Maricopa County, Arizona. The purpose of our evaluation was to assess the subsurface conditions at the project site in order to formulate geotechnical recommendations for design and construction of the new channel. This report presents the results of our evaluation and our geotechnical conclusions and recommendations regarding the proposed construction.

2. SCOPE OF SERVICES

The scope of our services for the project generally included the following:

- Reviewing readily available aerial photographs and published geologic literature, including maps and reports pertaining to the project site and vicinity.
- Marking-out the boring locations based on the 30 percent construction plans that we received from your office and notifying Arizona Blue Stake of the boring locations prior to drilling.
- Drilling, logging, and sampling 20 small-diameter exploratory borings to depths of about 9 to 31 feet below ground surface (bgs). The boring logs are presented in Appendix A.
- Performing laboratory tests of selected samples obtained from the borings to evaluate in-situ moisture content and dry density, grain size analysis, Atterberg limits, maximum density/optimum moisture relationship, expansion index, agronomic testing (growability), direct shear tests and corrosivity characteristics (including pH, minimum electrical resistivity, soluble sulfates, and chlorides). The results of the laboratory testing are presented on the boring logs and/or Appendix B. The results from the agronomic testing are presented in Appendix D.
- Collecting sediment samples from the invert of the existing Maricopa Drain for limited environmental testing. The results of these tests are presented in Appendix C.
- Preparing this report presenting our findings, conclusions, and recommendations regarding the design and construction of the project.

3. SITE DESCRIPTION

The project site is located in the central portion of Maricopa County, in the City of Phoenix, Arizona. The proposed LACC will generally follow the alignment of the existing Maricopa Drain, extending from 43rd Avenue toward the southwest, to its outlet at the Salt River (Figure 1). It will cross several agricultural fields and five roadways.

According to the *Fowler, Arizona 7.5-Minute USGS Topographic Quadrangle Map (1952)* and *Laveen, Arizona 7.5-Minute USGS Topographic Quadrangle Map (1952)*, the proposed alignment lies at an average elevation of roughly 1,000 feet relative to mean sea level (MSL). Based on the information from these quadrangle maps, it appears the proposed alignment slopes very gently from the east to the west, with a vertical drop in elevation of about 40 feet.

Three aerial photographs were reviewed for this project. A 1973 photo from the *USDA Soil Survey of Maricopa County, Arizona – Central Part*, a 1997 USGS aerial photograph, and a 1999 aerial photo from *Landiscor's Phoenix Real Estate Photo Book* show the proposed channel alignment as crossing through predominantly agricultural fields, similar to its current condition. Our evaluation of the aerial photographs and visual reconnaissance did not indicate any large disturbed areas that might be indicative of past development or filling.

4. PROPOSED CONSTRUCTION

It is anticipated that the proposed LACC will include approximately six miles of unlined earthen channel. The new channel will extend to a depth of about 5 to 9 feet bgs. The project may be modified to include a concrete low-flow channel.

In addition, the project will include the construction of six box culverts, five of which are associated with roadway crossings, and one will be located within an agricultural field. The five roadway box culverts will be located at Baseline Road, about ¼ mile west of 75th Avenue; 63rd Avenue, about ½ mile south of Baseline Road; 59th Avenue, about ¼ mile south of Baseline Road; Baseline road, about ¼ mile east of 59th Avenue; and 51st Avenue, about 1/3 mile north of

Baseline Road. The new culverts will extend to depths of about 7 to 15 feet bgs, with their lengths varying from about 25 to 342 feet.

A total of eight retaining walls will be built along the western segment of the new alignment, specifically, where existing Salt River Project (SRP) high-tension power poles are currently located.

Dual-30 inch diameter jack-and-bores will be located along the 42nd Avenue alignment and will cross beneath Southern Avenue. The bores will be 120 feet long and will extend about 20 feet bgs:

Much of the existing Maricopa Drain will be filled to grade as part of this project. Some segments will include a new 30-inch diameter concrete pipe installed at or near the drain invert prior to the backfilling. This pipe will assist in transporting water from the old drain to the new channel.

5. FIELD EXPLORATION

On June 13, 21, 22, and 28, 2001, Ninyo & Moore conducted a subsurface evaluation at the site in order to evaluate the existing subsurface conditions and to collect soil samples for laboratory testing. Our evaluation consisted of the excavation, logging, and sampling of 20, small-diameter borings. A total of 21 borings were proposed in our original proposal; however, boring B-7 was deleted from our scope because of its location within an active agricultural field. The borings were drilled using a CME-75 truck-mounted drill rig. Of these borings, 18 were drilled within or near the new channel or the existing drain (denoted as B-1 through B-6 and B-8 through B-19) and, two were drilled for the jack-and-bore operation (denoted as B-20 and B-21). Bulk and relatively undisturbed soil samples were collected at selected intervals. Detailed descriptions of the soils encountered are presented in the boring logs in Appendix A.

The ground surface elevations at each boring location were not measured for this project. The stationing and lateral offset was estimated based on the 30 percent construction plans we received. The general locations of the borings are denoted on the Boring Location Map (Figure 2).

As part of our scope of services for this project, we collected five sediment samples from the invert of the existing Maricopa Drain for environmental testing. These tests included the analysis of total petroleum hydrocarbons (TPH) using ADHS Method 418.1AZ. We understand that this method is accepted by ADHS for screening of soils. The approximate locations of the sediment samples are also denoted on the Soil Boring Location Map. The results of these tests are presented in Appendix C.

6. LABORATORY TESTING

The soil samples collected from our drilling activities were transported to the Ninyo & Moore laboratory in Phoenix, Arizona for geotechnical laboratory analysis. The analysis included in-situ moisture content and dry density, grain size analysis, Atterberg limits, maximum density/optimum moisture relationship, expansion index, agronomic testing (growability), direct shear testing and corrosivity characteristics (including pH, minimum electrical resistivity, soluble sulfates, and chlorides). The results of the laboratory testing are presented on the boring logs and/or Appendix B.

Agronomic testing consisting of the testing of primary nutrients, secondary nutrients, micro nutrients as well as other agricultural characteristics, was performed by Fruit Growers Laboratory, Inc. of Santa Paula, California. The work performed by Fruit Growers Laboratory also included detailed fertilization recommendations for Bermuda Grass, which may be used in association with the channel lining. The results of these tests are presented in Appendix D.

7. GEOLOGY AND SUBSURFACE CONDITIONS

The geology and subsurface conditions at the site are described in the following sections.

7.1. Geologic Setting

The project site is located in the Sonoran Desert Section of the Basin and Range physiographic province, which is typified by broad alluvial valleys separated by steep, discontinuous, subparallel mountain ranges. The mountain ranges generally trend north-

south and northwest-southeast. The basin floors consist of alluvium with thickness extending to several thousands of feet.

The basins and surrounding mountains were formed approximately 10 to 13 million years ago during the mid- to late-Tertiary. Extensional tectonics resulted in the formation of horsts (mountains) and grabens (basins) with vertical displacement along high-angle normal faults. Intermittent volcanic activity also occurred during this time. The surrounding basins filled with alluvium from the erosion of the surrounding mountains, as well as from deposition from rivers. Coarser-grained alluvial material was deposited at the margins of the basins near the mountains. The surficial geology of the proposed canal is described as latest Quaternary age deposits (<10,000 years old) consisting of sand and silt, with local occurrences of fine gravels and coarse deposits, which contain minimal soil development (Demsey, 1989).

7.2. Subsurface Conditions

Our knowledge of the subsurface conditions at the project site is based on our field exploration and laboratory testing and our understanding of the general geology of the area. The following paragraph provides a generalized description of the materials encountered. More detailed descriptions are presented on the boring logs in Appendix A.

Alluvium was encountered at the surface of the borings and extended to the total depth explored. The alluvium consisted of clay (CL), silt (ML), sand (SP, SC, and SM), and gravel (GP, GC, and GM). Caliche nodules were present in borings B-8, B-10, and B-14 to B-18 from the ground surface to 12 feet bgs. Auger refusal was encountered in borings B-5, B-8, B-13, B-14, B-17, B-20, and B-21. Sand, gravel and cobbles (locally known as "SGC") likely caused the auger refusal, which occurred at depths ranging from about 9 to 25 feet bgs.

Table 1 provides a breakdown of the soil types encountered within the proposed channel excavation (e.g., from the ground surface to about 5 to 9 feet bgs):

Table 1 – Percentage of Soil Type Encountered from Ground Surface to Estimated Bottom of Channel

GP/GC/GM	SP	SC/SM	ML	CL
7%	4%	13%	36%	40%

The following table provides a breakdown of the soil types we encountered at the anticipated bottom of the channel excavation (e.g., about 5 to 9 feet bgs):

Table 2 – Percentage of Soil Type Encountered at the Anticipated Bottom of the Channel Excavation

GP/GC/GM	SP	SC/SM	ML	CL
18%	0%	24%	29%	29%

7.3. Groundwater

Groundwater was not encountered in our boring excavations. Based on well data from the Arizona Department of Water Resources (ADWR), the approximate depth to groundwater ranged from about 12 to 125 feet bgs within the project vicinity. Groundwater levels can fluctuate due to seasonal variations, irrigation, groundwater withdrawal or injection, and other factors. In general, groundwater is not expected to be a constraint to the construction of the project; however, given the occurrence of relatively pervious zones, perched tailwater resulting from flood irrigation of cropland might be encountered. Construction dewatering is further discussed in Section 10.5.1.

8. GEOLOGIC HAZARDS

The following sections describe potential geologic hazards at the site, including land subsidence and earth fissures, faulting and seismicity, surface rupture, and liquefaction.

8.1. Land Subsidence and Earth Fissures

Groundwater depletion, due to groundwater pumping, has caused land subsidence and earth fissures in numerous alluvial basins in southern Arizona. It has been estimated that subsidence has affected more than 3,000 square miles and has caused damage to a variety of engineered structures and agricultural land (Schumann and Genualdi, 1986). From 1948 to

1983, excessive groundwater withdrawal has been documented in several alluvial valleys where groundwater levels have been reportedly lowered by up to 500 feet. With such large depletions of groundwater, the alluvium has undergone consolidation, resulting in large areas of land subsidence.

In Arizona, earth fissures are generally associated with land subsidence and pose an ongoing geologic hazard. Earth fissures generally form near the margins of geomorphic basins where significant amounts of groundwater depletion have occurred. Reportedly, earth fissures have also formed due to tensional stress caused by differential subsidence of the unconsolidated alluvial materials over buried bedrock ridges and irregular bedrock surfaces (Schumann and Genualdi, 1986).

Based on our field reconnaissance and review of the referenced material, there are no known earth-fissures underlying the subject site. The closest earth fissure to this site is approximately 14 miles to the northwest, where water levels have dropped approximately 300 feet. Water levels in the area of the site have dropped 0 to 100 feet. Continued groundwater withdrawal in the area may result in subsidence of the valley and the formation of new fissures or the extension of existing fissures.

8.2. Faulting and Seismicity

The site lies within the Sonoran zone, which is a relatively stable tectonic region located in southwestern Arizona, southeastern California, southern Nevada, and northern Mexico (Euge et al., 1992). This zone is characterized by sparse seismicity and few Quaternary faults. Based on our field observations, review of pertinent geologic data, and analysis of aerial photographs, faults are not located on or adjacent to the property. The closest fault to the site is the Carefree fault zone, located approximately 35 miles to the northeast of the site (Pearthree, 1998). Approximately 2 meters of displacement has occurred along this fault within middle Pleistocene deposits (<750,000 years), but the upper Pleistocene and Holocene deposits (<250,000 years) are not displaced.

Based on a Probabilistic Seismic Hazard Assessment for the Western United States issued by the United States Geological Survey (1999), the site is located in a zone where the peak ground accelerations that have a 10 percent, 5 percent, and 2 percent probability of being exceeded in 50 years are 0.05g, 0.06g, and 0.09g, respectively. Seismic design parameters, according to the 1997 Uniform Building Code (UBC), are presented in the following table.

Table 3 – Seismic Design Parameters

Parameter	Value	1997 UBC Reference
Seismic Zone Factor, Z	0.075	Table 16 – I
Soil Profile Type	S_D	Table 16 – J
Seismic Coefficient C_a	0.12	Table 16 – Q
Seismic Coefficient C_v	0.18	Table 16 – R
Near-Source Factor, N_a	1.0	Table 16 – S
Near-Source Factor, N_v	1.0	Table 16 – T
Seismic Source Type	C	Table 16 – U

8.3. Liquefaction Potential

Based on the SPT values at the site, the lack of near surface water and the low ground motion hazard (relatively low ground accelerations), the likelihood or potential for liquefaction is considered to be negligible.

9. CONCLUSIONS

Based on the results of our subsurface evaluation, laboratory testing, and data analysis, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided that the recommendations of this report are incorporated into the design and construction of the proposed project, as appropriate. Geotechnical considerations include the following:

- The on-site soils should generally be excavatable to planned depths with conventional earth-moving construction equipment in good working condition. However, excavation of caliche-cemented zones or SGC deposits may be relatively slow and/or necessitate the use of more substantial equipment.
- We anticipate that the jack-and-bore crossing beneath Southern Avenue will encounter SGC deposits. Based upon recent District experience in the immediate vicinity, the size of cobbles and boulders should generally not preclude jack-and-bore operations.

- Groundwater was not observed in our borings. However, based on data from ADWR, the groundwater table is anticipated to range from about 12 to 125 feet bgs. It is possible that seepage of groundwater will be noted in excavations due to flood irrigation of agricultural fields. The contractor should be prepared to deal with nuisance groundwater.
- No known or reported geologic hazards are reported underlying or adjacent to the site.
- Corrosivity test results indicate that subgrade soils at the site may be corrosive to ferrous metals and that the soils in some areas present a severe sulfate exposure to concrete. Accordingly, special provisions to address corrosion potential may be needed.

10. RECOMMENDATIONS

The following sections present our geotechnical recommendations for the proposed channel. If the proposed construction is changed from that discussed in this report, Ninyo & Moore should be contacted for additional recommendations.

10.1. Earthwork

The following sections provide our earthwork recommendations.

10.1.1. Excavations

Our evaluation of the excavation characteristics of the on-site materials is based on the results of 20 exploratory borings, our site observations, and our experience with similar materials. In our opinion, excavation of the on-site materials can generally be accomplished to depths up to about 9 feet bgs with conventional earthmoving equipment in good operating condition. However, scattered caliche nodules were encountered within the top 9 feet in some of the borings, which may be somewhat more difficult to excavate.

Auger refusal was encountered in borings B-5, B-8, B-13, B-14, B-17, B-20, and B-21. We believe that buried stream channel deposits locally known as SGC likely caused the auger refusal, which occurred at depths ranging from about 9 to 25 feet bgs. Table 4 summarizes the auger refusal depths.

Table 4 – Summary of Auger Refusal Depths

Boring No.	Depth to Auger Refusal for Ground Surface
B-5	22 feet
B-8	25 feet
B-13	9 feet
B-14	16 feet
B-17	13 feet
B-20	20.3 feet
B-21	17.5 feet

The presence of relatively shallow auger refusal and potentially large diameter cobbles may affect the excavation for some of the deeper box culverts and jack-and-bore operations. However, a deeper larger-diameter jack-and-bore crossing performed for the District at about 43rd Avenue did not encounter large cobbles. Depending on the actual density and gradation of the SGC encountered during construction, heavy-duty excavation (e.g., hydraulic) equipment may be needed.

We recommend that trenches and excavations be designed and constructed in accordance with OSHA regulations. These regulations provide trench sloping and shoring design parameters for trenches up to 20 feet deep based on a description of the soil types encountered. Trenches greater than 20 feet deep should be designed by the Contractor's engineer based on site-specific geotechnical analyses. For planning purposes, we recommend that the OSHA soil classification for the encountered alluvial soil be considered as Type C.

In general, temporary slopes above the water table and excavations in alluvium soils should be inclined no steeper than 1:1 (horizontal: vertical). Temporary excavations that encounter seepage, if any, may call for shoring or may be stabilized by placing sandbags or gravel along the base of the seepage zone and should be evaluated on a case-by-case basis.

10.1.2. Slopes and Earthwork Factors

The earthwork factors given below are based on comparisons between the in-place density and Proctor tests performed in our laboratory. The slope factors are based on the soil type anticipated within the channel excavation

Table 5 – Recommended Earthwork Parameters

Approximate Location	Estimated Earthwork Factor	Steepest Recommended Cut Slope (H:V)
Station 10+00 to 60+00	+/- 10% Shrink	1:1
Station 60+00 to 300+00	+/- 15% Shrink	1:1
Station 300+00 to 318+37	+/- 20% Shrink	1:1
Jack-and-Bore Operation	+/- 15% Shrink	1:1

The shrink factors listed in the table above represent an average of the material observed with varying consistencies and contains scattered hard zones that resulted in auger refusal during our field work. Potential bidders should consider this in preparing estimates and should review the available data to make their own conclusions regarding excavation conditions.

Fill sections, if any, constructed with materials from areas of on-site excavation should be constructed with slopes no steeper than 2:1 (H:V).

10.1.3. Temporary Earth Retaining Systems

As an alternative to laying back the side walls, the excavations may be shored or braced. Temporary earth retaining systems will be subject to lateral loads resulting from earth pressures. Shored or braced trench and access shaft excavations in alluvium soils may be designed using the parameters on Figure 3. Trench boxes may also be a suitable alternative to laying back the side walls. Some sloughing is possible at the ends of the trench box, and any loose material should be removed prior to backfilling of the trench.

The design earth pressure diagram assumes that spoils from the excavation or other surcharge loads will not be placed above the excavation within a 1:1 plane extending up and back from the base of the excavation. If spoil piles are placed closer than this to the braced excavation, the resulting surcharge loads should be considered in the bracing or trench box design. We recommend that an experienced structural engineer design the shoring system. The shoring parameters presented in this report should be considered as guidelines.

10.1.4. Grading, Fill Placement, and Compaction

Vegetation and debris from the clearing operation should be removed from the site and disposed of at a legal dumpsite. Demolition debris should be removed from the site and disposed of at a legal dumpsite. Obstructions that extend below finish grade, if present, should be removed and the resulting holes filled with compacted soil.

The geotechnical consultant should carefully evaluate any areas of soft or wet soils prior to placement of fill or other construction. Of particular concern, are softened materials or sediments in the existing Maricopa Drain. Drying or overexcavation and replacement of such materials should be anticipated.

Imported soils and soils generated from on-site excavation activities that exhibit very low to low expansive potential and are relatively impermeable, are generally suitable for use as engineered fill. Very low to low expansive potential soils are defined as having an Expansion Index (by ASTM D 4829) of 50 or less, or a swell potential of 1.5 percent or less, when tested in accordance with ASTM D-4546-96, Method B when remolded at 98 percent of its standard Proctor (ASTM D 698-91) maximum dry density and at a moisture content of 2 percent below their optimum. Our laboratory testing indicated that the soils generated from on-site excavation activities will typically exhibit very low or low expansion potential.

Suitable fill should not include organic material, clay lumps, construction debris, rock particles, and other non-soil fill materials larger than 6 inches in dimension. This material should be disposed of offsite or in non-structural areas.

We recommend that new fill be placed in horizontal lifts approximately 9 inches in loose thickness and compacted by appropriate mechanical methods, to 98 percent or more relative compaction, in accordance with ASTM D 698-91 at a moisture content within 2 percent of its above optimum.

10.1.5. Imported Fill Material

Imported fill, if utilized, should consist of clean, granular material with a very low or low expansion potential. Import material in contact with ferrous materials or concrete should also have low corrosion potential (minimum resistivity greater than 2,000 ohm-cm or the average value for the site, chloride content less than 25 parts per million [ppm], and soluble sulfate content of less than 0.1 percent). The geotechnical consultant should evaluate such materials and details of their placement prior to importation.

10.2. Box Culverts

Box culverts will be used at six locations along the project alignment. Based on conversations with your office, we understand that the scour depth associated with these culverts will be about 4 feet below the bottom of the culvert. Consequently, the base of the box culverts will also be about 4 feet below the bottom of the culverts. Based on the soil boring information and the proposed depth of the culverts, we recommend that an allowable bearing capacity of up to 3,000 pounds per square foot (psf) be used for static conditions.

Total and differential settlement of up to about one inch and one-half inch, respectively, may occur. Distortions of no more than about 1 inch (vertical) over 20 feet (horizontal) are possible.

Following the excavation for the culverts, and prior to the placement of concrete, the geotechnical consultant should carefully evaluate the exposed surface. Based on the results of

this evaluation, remediation of the exposed surface may be needed. This could include scarification of the exposed surface or removal and replacement of unsuitable soils. This additional remediation, if needed, should be addressed by the geotechnical consultant during the earthwork operations.

Culverts that are subject to lateral loadings may be designed using an ultimate coefficient of friction of 0.4 (total frictional resistance equals the coefficient of friction multiplied by the dead load). An ultimate passive resistance value of 250 pounds psf per foot of depth can be used. The ultimate lateral resistance can be taken as the sum of the frictional resistance and passive resistance, provided that the passive resistance does not exceed two-thirds of the total allowable resistance. The passive resistance may be increased by one-third when considering loads of short duration such as wind or seismic forces.

10.3. Jack-and-Bore Tunneling

As mentioned earlier, we understand that there will be dual-30 inch diameter jack-and-bore crossings beneath Southern Avenue at the 42nd Avenue alignment. These crossings will be made at depths of roughly 20 feet bgs. Our borings B-20 and B-21, that were drilled in that area, met auger refusal on dense SGC deposits at depths of 20.3 and 17.5 feet, respectively. We understand that a large diameter jack-and-bore crossing, about 1,000 feet to the west, did not encounter cobbles or boulders larger than about 8 to 10 inches. However, auger refusal precluded evaluation of the conditions at the proposed jack-and-bore location for this project.

Design of shaft shapes, dimensions, and ground support systems for jack-and-bore excavations will be at the contractor's option in order to be compatible with his construction equipment and methods. Soldier piles with lagging or shored excavations may serve as a suitable system for rectangular shafts, while circular steel ribs in conjunction with timber lagging or liner plates may be suitable for circular shafts. Driven sheeting may be difficult to install because of hard ground conditions and the possibility of encountering buried boulders or large caliche cemented pieces.

Jacking reaction force is developed by the action of the jack-and-bore operation against the surface of the opposite wall of the jacking pit. The jacking force is resisted by the bearing of the wall. The allowable jacking force may be calculated using the lateral earth pressures shown on Figure 4.

Caving of the pipe shaft may occur, particularly where looser surface soils are present. For stability and safety purposes, and to reduce ground movement, a full perimeter shaft support system may be needed as the excavation progresses. Surface subsidence associated with jack-and-bore operations was not evaluated as part of our analysis, but should be minor.

10.4. Soil-Cement Stabilization

We understand that a soil-cement treated surface may be utilized for this project. This surface would be located either along the top or the bottom of the channel alignment, or both. We recommend that soil-cement treated surfaces associated with this project consist of 6 or more inches of soil-cement treated soil placed in accordance with MAG Section 311. It should be noted that this type of improvement is typically applied to unpaved roadways with average daily traffic (ADT) volumes less than about 300 vehicles, which we assume will be more than the anticipated traffic volumes associated with this application. Nevertheless, some maintenance and repair of this layer may be needed during the life of this channel.

The MAG Section identified above does not specify a minimum percentage of cement needed. The percentage of cement needed for this type of application is typically based on a desired compressive strength and the composition of the soils used. We recommend utilizing a compressive strength of 400 or more pounds per square inch. However, the percentage of cement content needed may differ along the alignment because of the variety of soil types encountered. The following table represents a typical range of cement content percentages needed to achieve a maximum dry density of about 120 pcf for various soil gradations.

Table 6 – Typical Variation in Cement Content

Material Retained on No 4 Sieve (%)	Typical Cement Content (%)
0 to 14	7 to 8
15 to 29	6 to 8
30 to 45	6 to 9
45 and greater	soil-cement not recommended

It should also be noted that soil-cement treated surfaces may be difficult to manufacture from soil types with excessive amounts of clay and silt.

10.5. Pipe Installation and Trench Backfill

As mentioned previously, much of the existing Maricopa Drain will be equipped with a 30-inch diameter concrete drainage pipe. Care should be used in the installation of the pipe and the restoration of grade. Future construction over the area should reflect the presence of the pipe and backfilled channel.

10.5.1. Construction Dewatering

A shallow groundwater table is not anticipated along the alignments during construction. However, groundwater (tailwater) seepage and surface run-off may be encountered where the alignments cross existing drainage courses. The need for dewatering could be expected in the larger drainage courses along the alignments, near any irrigation canals, and/or tailwater sumps, if present. Stream flow and surface run-off will vary seasonally depending on local rainfall.

Given the low probability of encountering significant seepage along the alignments, we anticipate that the excavations that do encounter nuisance seepage or surface run-off, could be dewatered by sumping the water from the bottom of the excavation. However, saturated sands, if encountered, may need more aggressive means of dewatering such as well points.

10.5.2. Pipe Bedding and Modulus of Soil Reaction (E')

Overexcavation of soft or saturated channel sediments prior to placement of bedding materials should be expected. The excavated material should be replaced with suitable fill.

We recommend that the new pipe be supported on 6 or more inches of granular bedding material such as graded sand or crushed rock with a maximum particle size of 3/4-inch or less. Crushed rock with a particle size of 3/4-inch or less, derived from excavated boulders, if any, would also be suitable for use as pipe bedding material. Bedding materials should be durable and relatively clean, with no more than 10 percent (by weight) passing the No. 200 sieve. Bedding materials should be compacted in lifts. The compaction requirements should be in accordance with the recommendations in this report and the Uniform Standard Specifications for Public Works Construction (Maricopa Association of Governments, 1992). Pipe bedding and trench backfill details are presented on Figure 5.

The modulus of soil reaction (E') is used to characterize the stiffness of soil backfill placed at the sides of buried pipe for the purpose of evaluating deflection caused by the weight of the backfill over the pipe. It is our understanding that the depth of pipe will generally be about 8 to 16 feet. For granular backfill soils, we recommend using an E' value of 1,500 pounds per square inch (psi).

10.5.3. Trench Backfill

The soils encountered along the alignments, as well as any crushed materials generated during construction, should generally be suitable for reuse as backfill in the trench zone, provided they are free of organic material, clay lumps, debris, and rocks greater than 6 inches in diameter. Deleterious material, such as non-soil objects, trash, or debris, was generally not encountered during our reconnaissance or subsurface exploration; however, if encountered during construction, these materials should not be reused. It is possible that cobble pieces and/or caliche deposits greater than 6 inches in diameter could be generated in some of the excavations. Particles larger than 6 inches should be

screened or crushed to a finer size. Potential fill soil imported to the site should consist of non-expansive, non-corrosive, durable, and graded granular material. The project geotechnical consultant should evaluate materials prior to importation. Estimated shrinkage factors were provided in Table 5.

Where the alignments cross known drainage courses, we recommend that the backfill material within the pipe zone either consist of a graded material that will not readily allow the infiltration of the surrounding native soils or the perimeter of the pipe zone be lined with a non-woven filter fabric. Consequently, we recommend that the content of rock in the backfill greater than 1-1/2 inches in diameter not exceed 40 percent of the backfill volume, and the content of material passing the No. 200 sieve should be 10 percent or less.

Backfill should be placed at a moisture content within one percent below to two percent above the optimum moisture content. Placed backfill should be compacted to a relative compaction of 95 or more percent of the maximum dry density as evaluated by ASTM D 698. The backfill in the upper 2 foot zone below pavement sections should, however, be placed to 100 percent relative density. Lift thickness for backfill will be dependent upon the type of compaction equipment utilized, but should generally be placed in uniform lifts not exceeding 8 inches in loose thickness. Special care should be exercised to avoid damaging the pipe or other structures during the compaction of the backfill.

10.5.4. Pipeline Frictional Resistance

For frictional resistance of an un-coated pipe, we recommend a coefficient of friction of 0.4. If the pipe is wrapped in a corrosion resistant tape or enamel, we recommend a coefficient of friction of 0.2.

10.6. Retaining Walls

Retaining wall foundations should be founded in the manner described in Section 10.6.2. Retaining walls that are not restrained from movement at the top and have a level backfill

behind the wall may be designed using an "active" equivalent fluid unit weight of 35 pounds per cubic foot (pcf). This value assumes compaction within about 5 feet of the wall will be accomplished with relatively light compaction equipment and that very low to low expansive backfill will be placed behind the wall. This value also assumes that the retaining walls will have a height less than 12 feet. Retaining walls should also be designed to resist a surcharge pressure of $0.35q$. The value for "q" represents the pressure induced by adjacent light loads, uniform slab, or traffic loads plus any adjacent footing loads.

Measures should be taken so that moisture does not build up behind retaining walls. Retaining walls should be provided with a drain, as shown on Figure 6. Back drainage measures should include free-draining backfill material and perforated drainpipes. Drainpipes should outlet away from structures, and retaining walls should be waterproofed in accordance with the recommendations of the project civil engineer or architect. To reduce the potential for water- and sulfate/salt-related damage to the retaining walls, particular care should be taken in selection of the appropriate type of waterproofing material to be utilized and in the application of this material.

For passive resistance to lateral loads, we recommend that an equivalent fluid weight of 250 pcf be used up to a value of 3,000 psf. This value assumes that the ground is horizontal for a distance of 10 feet or more behind the wall or three times the height generating the passive pressure, whichever is greater. We recommend that the upper 12 inches of soil not protected by pavement or a concrete slab be neglected when calculating passive resistance. For frictional resistance to lateral loads, we recommend that a coefficient of friction of 0.4 be used between soil and concrete. If passive and frictional resistances are to be used in combination, we recommend that the friction coefficient be reduced by two-thirds. The passive resistance values may be increased by one-third when considering loads of short duration such as wind or seismic forces.

10.6.1. Retaining Wall Horizontal Pressures

We understand that SRP will occasionally use a crane near the new retaining walls. Moreover, an outrigger pad from the crane will be situated as close as 2.5 feet from the

NOT 4' HIGH NOW

back of the retaining wall. The outrigger pad will be 2 feet by 2 feet in size and it will apply 220,000 pounds when in use. We were asked to analyze the horizontal pressures imposed on the retaining wall as a result of this outrigger load. This analysis was performed using an equation developed by Boussinesq, for a point load at the surface and the associated horizontal pressure at various depths. Boussinesq's equation was chosen because it approximates this load condition and is somewhat conservative; however, less conservative than the tri-wedge method. The equation we used is as follows:

$$\sigma_r = P/2\pi \times [3r^2Z/R^5 - (1-2\mu)(R-Z/Rr^2)]$$

- where: σ_r = horizontal pressure at specified depth
- P = point load
- r = radial distance at surface
- Z = depth
- μ = Poisson's ratio

Based on the above equation and a Poisson's ratio equal to 0.35, we have developed resultant horizontal forces for a 1 foot wide segment of wall, a 2 foot wide segment of wall, and a 4 foot wide segment of wall that are centered along to the point load. An average Poisson's ratio equal to 0.35 was assumed based on the consistency of the soil encountered in our borings. The resultant force from these various segment widths along with the depth from the surface to the resultant force is given in Table 7.

Table 7 – Summary of Resultant Retaining Wall Forces

	Resultant Force (kips)	Depth from Surface to Resultant Force (feet)
1 Foot Wide Segment	10.5	1.8
2 Foot Wide Segment	20.6	1.9
4 Foot Wide Segment	38.6	2.0

The hand calculations used to develop the values present above are given in Appendix E.

10.6.2. Retaining Wall Foundations

We also understand that there will be continuous footings constructed as part of this project. These foundations will be used to support the new retaining walls that will be located adjacent to the SRP power poles, and could extend 12 to 18 feet bgs.

We recommend utilizing continuous footings for this project, with a width of 12 or more inches. Continuous footings should be reinforced with two or more No. 4 reinforcement bars, one placed near the top and one placed near the bottom of the footings, and further detailed in accordance with the recommendations of the structural engineer. Footings may be designed using an allowable bearing capacity of up to 3,000 pounds psf for static conditions.

Total and differential settlement of up to about one inch and one-half inch, respectively, may occur. Distortions of no more than about 1 inch (vertical) over 20 feet (horizontal) are possible.

Foundations that are subject to lateral loadings may be designed using an ultimate coefficient of friction of 0.4 (total frictional resistance equals the coefficient of friction multiplied by the dead load). An ultimate passive resistance value of 250 pounds psf per foot of depth can be used. The ultimate lateral resistance can be taken as the sum of the frictional resistance and passive resistance, provided that the passive resistance does not exceed two-thirds of the total allowable resistance. The passive resistance may be increased by one-third when considering loads of short duration such as wind or seismic forces. The foundations should preferably be proportioned such that the resultant force from lateral loadings falls within the kern (i.e., middle one-third).

10.7. Corrosion Potential

The corrosion potential of the on-site materials was analyzed to evaluate its potential effect on the foundations and structures. Corrosion potential was evaluated using the results of laboratory testing of samples obtained during our subsurface evaluation that were considered representative of soils at the subject site.

Laboratory testing consisted of pH, minimum electrical resistivity, and chloride and soluble sulfate contents. The pH and minimum electrical resistivity tests were performed in general accordance with Arizona Test 236b, while sulfate and chloride tests were performed in accordance with Arizona Test 733 and 722, respectively. The results of the corrosivity tests are presented in Appendix B.

The soil pH value of the samples tested ranged from 7.1 to 8.1, which is considered to be alkaline. The minimum electrical resistivity measured in the laboratory ranged from 107 to 671 ohm-cm, which is considered to be corrosive to ferrous materials. The chloride content of the sample tested was measured to range from 104 to 1,900 ppm, which is also considered to be corrosive to ferrous materials. The soluble sulfate content of the soil sample was measured to range from .008 to 0.230 percent. Water-soluble sulfate contents between 0.20 and 2.00 percent represent a "severe" sulfate exposure. Additional tests are currently underway to evaluate the higher chloride and sulfate contents measured.

The results of the laboratory testing indicate that the on-site materials could be corrosive to ferrous metals. Therefore, special consideration should be given to the use of heavy gauge, corrosion protected, underground steel pipe or culverts, if any are planned. As an alternative, plastic pipe or reinforced concrete pipe could be considered. A corrosion specialist should be consulted for further recommendations.

10.8. Concrete

Concrete in contact with soil or water that contains high concentrations of soluble sulfates can be subject to chemical and/or physical deterioration. Based on the UBC criteria (ICBO, 1997), the potential for sulfate attack is negligible for water-soluble sulfate contents in soil ranging from 0.00 to 0.10 percent by weight (0 to 1,000 ppm), and moderate for water-soluble sulfate contents ranging from 0.10 to 0.20 percent by weight (1,000 to 2,000 ppm). The potential for sulfate attack is severe for water-soluble sulfate contents ranging from 0.20 to 2.00 percent by weight (2,000 to 20,000 ppm), and very severe for water-soluble sulfate contents over 2.00 percent by weight (20,000 ppm).

The results of our sulfate content laboratory tests indicate that the site soils present a severe sulfate exposure to concrete. According to Table 19-A-3 of the 1994 UBC, Type V cement should be used for the construction of concrete structures at this site. However, we understand that Type V cement is not readily available in Arizona. The ready-mix and concrete pipe suppliers should be consulted with respect to sulfate-resistant concrete.

The concrete should have a water-cementitious materials ratio no greater than 0.45 by weight for normal weight aggregate concrete. From a quality standpoint, a 28-day compressive strength of 4,000 psi or higher is desirable because it will improve concrete durability and resistance to sulfate attack.

10.9. Pre-Construction Conference

We recommend that a pre-construction conference be held. Representatives of the owner, the civil engineer, the geotechnical consultant, and the contractor should be in attendance to discuss the project plans and schedule. Our office should be notified if the project description included herein is incorrect, or if the project characteristics are significantly changed.

10.10. Construction Observation and Testing

During construction operations, we recommend that a qualified geotechnical consultant perform observation and testing services for the project. These services should be performed to evaluate exposed subgrade conditions, including the extent and depth of overexcavation, to evaluate the suitability of proposed borrow materials for use as fill and to observe placement and test compaction of fill soils. If another geotechnical consultant is selected to perform observation and testing services for the project, we request that the selected consultant provide a letter to the owner, with a copy to Ninyo & Moore, indicating that they fully understand our recommendations and that they are in full agreement with the recommendations contained in this report. Qualified subcontractors utilizing appropriate techniques and construction materials should perform construction of the proposed improvements.

11. LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only and may not provide sufficient data to prepare an accurate bid by some contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

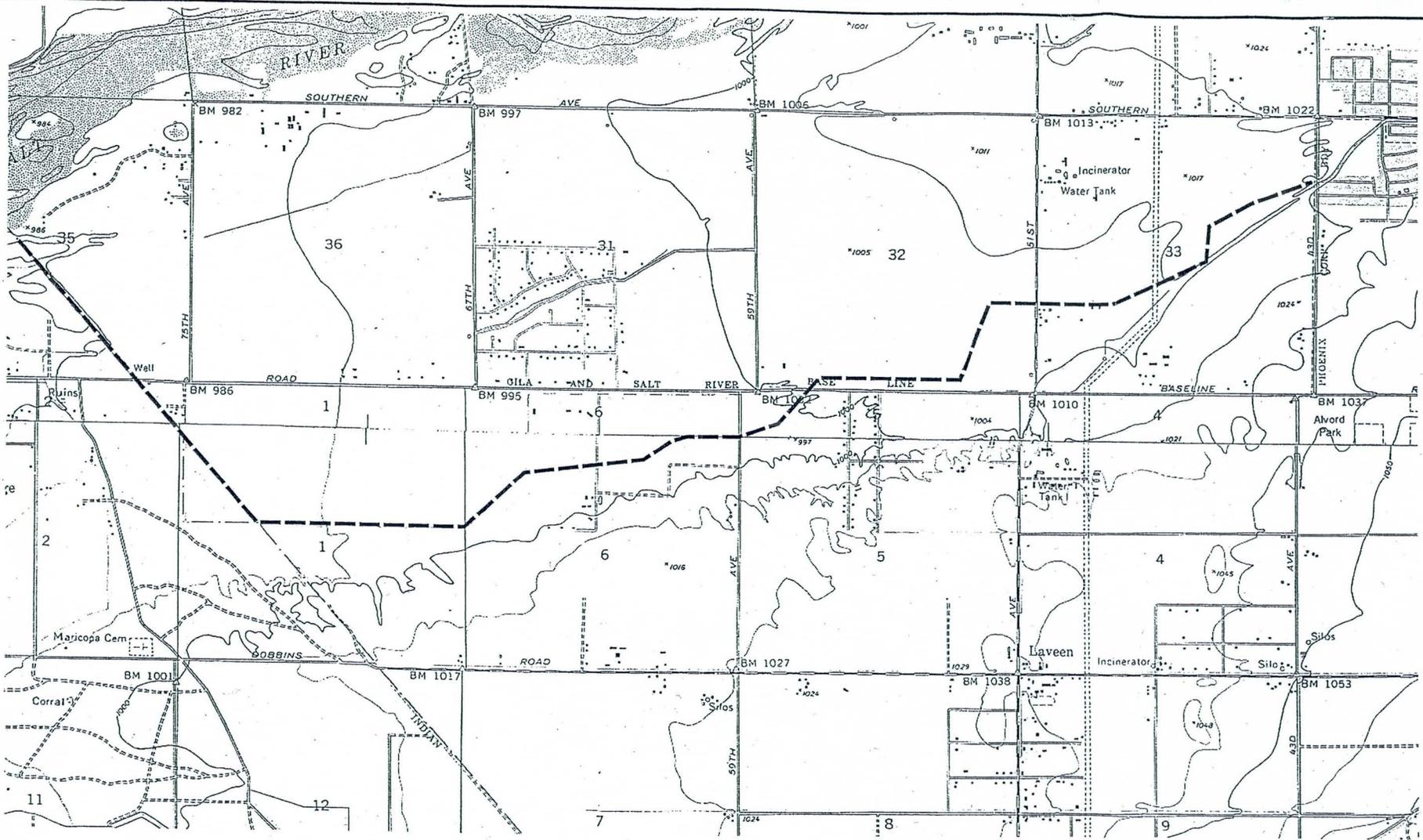
Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government ac-

tion or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

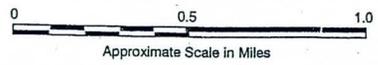
12. SELECTED REFERENCES

- American Concrete Institute, 1991a, Guidelines for Concrete Floor and Slab Construction (ACI 302.1R).
- American Concrete Institute, 1991b, Guidelines for Residential Cast-in-Place Concrete Construction (ACI 332R).
- American Society for Testing and Materials (ASTM), 1997 Annual Book of ASTM Standards.
- Arizona Department of Water Resources (ADWR). Drillers logs in file.
- Bowles, J.E., 1988, Foundation Design and Analysis, Mc Graw-Hill, Inc.
- Demsey, K.A., 1989, Geologic Map of Quaternary and Upper Tertiary Alluvium in the Phoenix South 30' X 60' Quadrangle, AZ: Arizona Geological Survey, Open-File Report Series OFR 89-7, Scale 1:100,000.
- Euge, K.M., Schell, B.A., and Lam, I.P., 1992, Development of Seismic Acceleration Contour Maps for Arizona: Arizona Department of Transportation Report No. AZ 92-344, dated September.
- International Conference of Building Officials, 1997, Uniform Building Code: Whittier California.
- Landiscor, 1999, Real Estate Photo Book for the Greater Phoenix Area.
- Maricopa Association of Governments, 1998, Uniform Standard Specifications and Details for Public Works Construction.
- Ninyo & Moore, In-house proprietary information.
- Pearthree, P.A., 1998, Quaternary Fault Data and Map for Arizona: Arizona Geological Survey, Open-File Report 98-24, 122 p.
- Schumann, H.H. and Genauldi, R., 1986, Land Subsidence, Earth Fissures, and Water-level Changes in Southern Arizona: Arizona Geological Survey OFR 86-14, Scale 1:500,000.
- United States Geological Survey, 1997, 1998, 1999, National Seismic Hazard Mapping Project, World Wide Web, <http://geohazards.cr.usgs.gov/eq>.
- United States Department of Agriculture, Soil Conservation Service, 1973 Soil Survey, USDA Soil Survey of Maricopa County, Arizona - Central Part: dated November 1973.
- United States Geological Survey, 1952 (photorevision 1982), Fowler -Arizona, Maricopa County, 7.5 Minute Series (Topographic): Scale 1" = 24,000'.
- United States Geological Survey, 1952 (photorevision 1967 and 1973), Laveen -Arizona, Maricopa County, 7.5 Minute Series (Topographic): Scale 1" = 24,000'.



LEGEND

--- Approximate Location of Conveyance Channel



NOTE: ALL DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

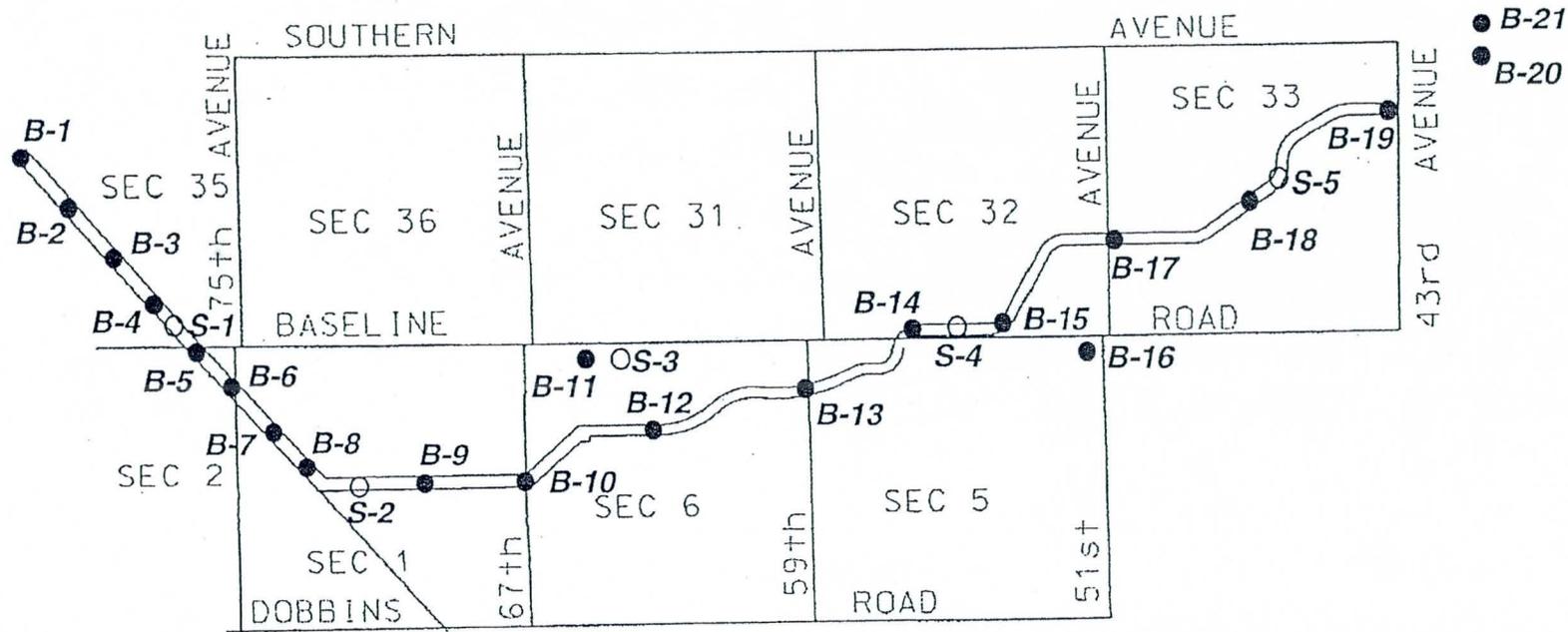


SITE VICINITY MAP

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO. 600220001	DATE 10/2001	FIGURE 1
--------------------------	-----------------	-------------

65400108-01SHE



LEGEND

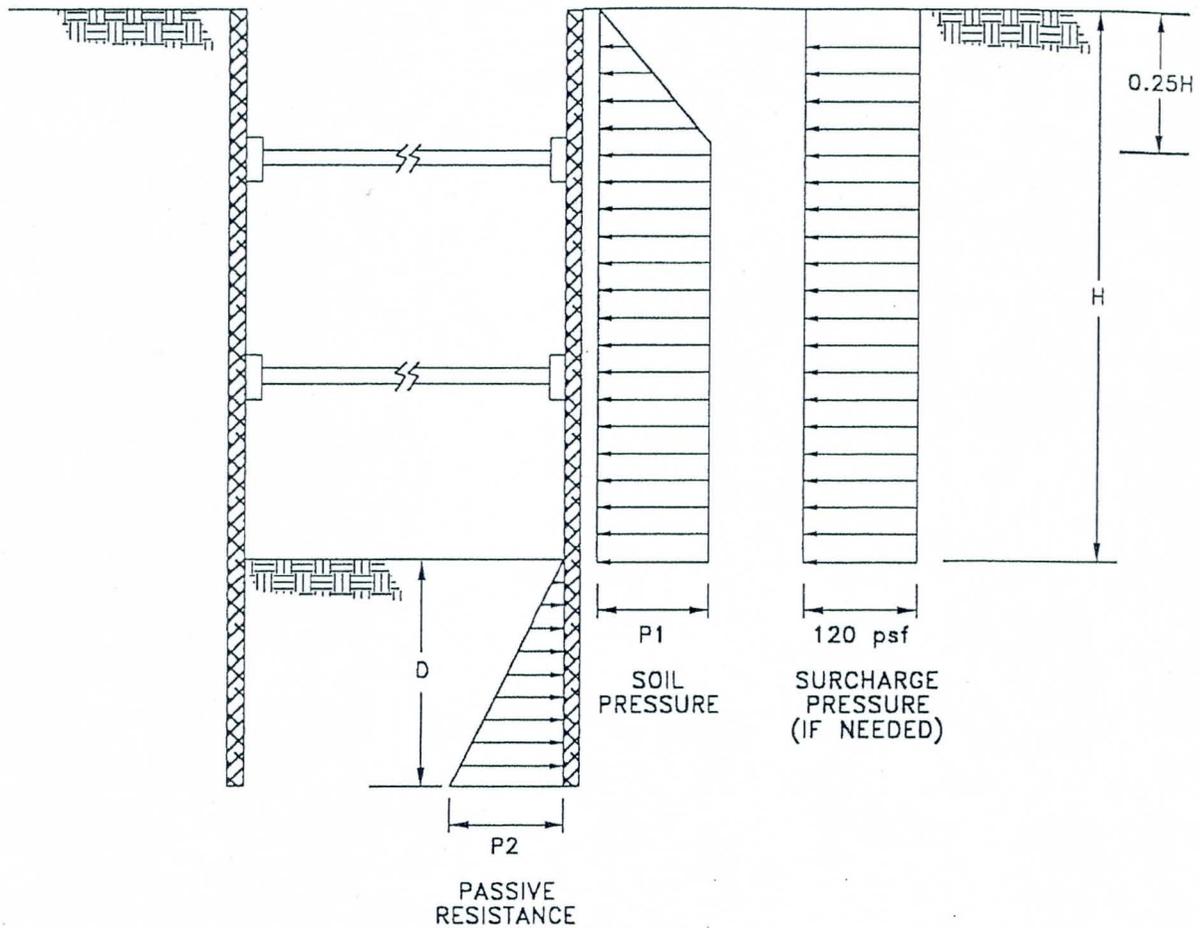
- B-21 Approximate location of soil boring
- S-5 Approximate location of sediment sample



BORING LOCATION MAP
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.	DATE
600220001	10/2001

FIGURE
2



ASSUMPTIONS AND NOTES

1. $P1 = 48 \times H \text{ psf}$
2. $P2 = 360 \times D \text{ psf}$
3. No groundwater encountered during construction.
4. Surcharge pressure consists of normal construction traffic. Roadway traffic from McDowell Road was not considered.
5. psf = pounds per square foot

NOT TO SCALE

Ningo & Moore

LATERAL EARTH PRESSURES
FOR BRACED EXCAVATIONS
FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

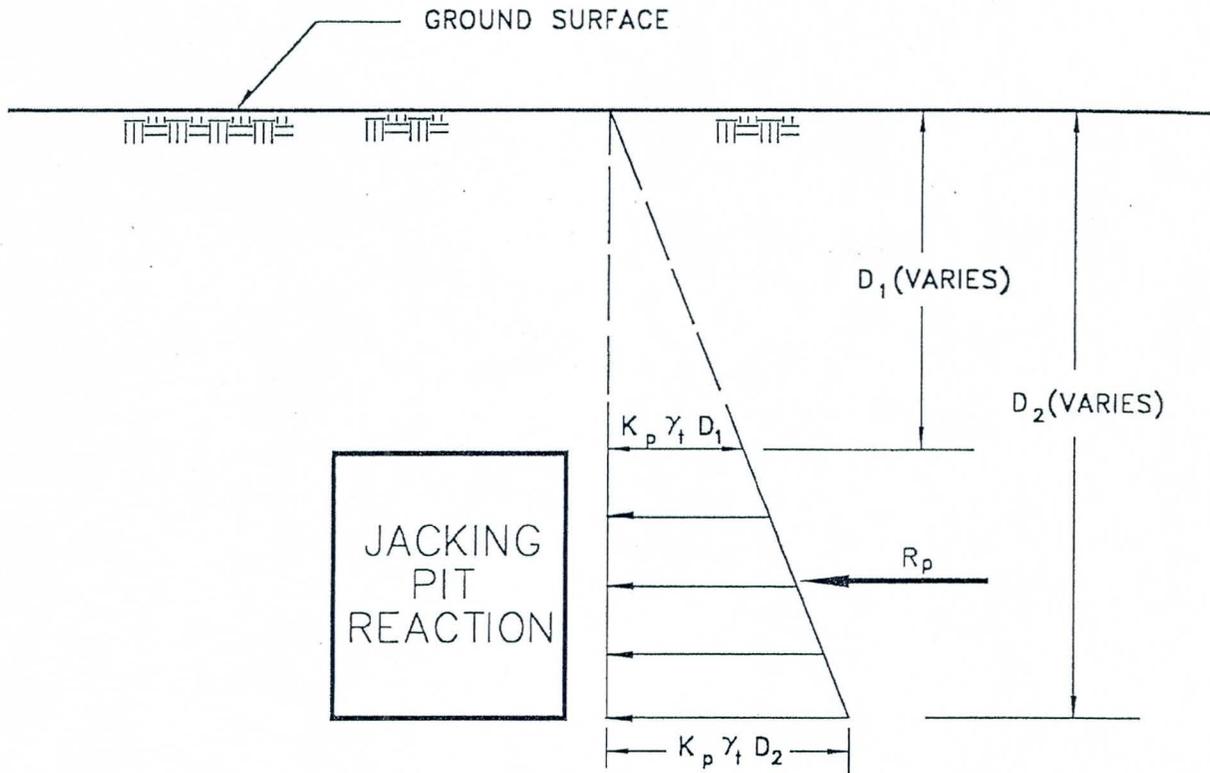
600220001

DATE

10/2001

FIGURE

3



$$R_p = [(1/2)K_p \gamma_t (D_2^2 - D_1^2)] / F.S.$$

ASSUMPTIONS AND NOTES

1. $\phi = 30^\circ$
2. $K_p = 3.00$
3. $\gamma_t = 120$ pcf
4. No groundwater encountered during construction.
5. F.S. = 1.5

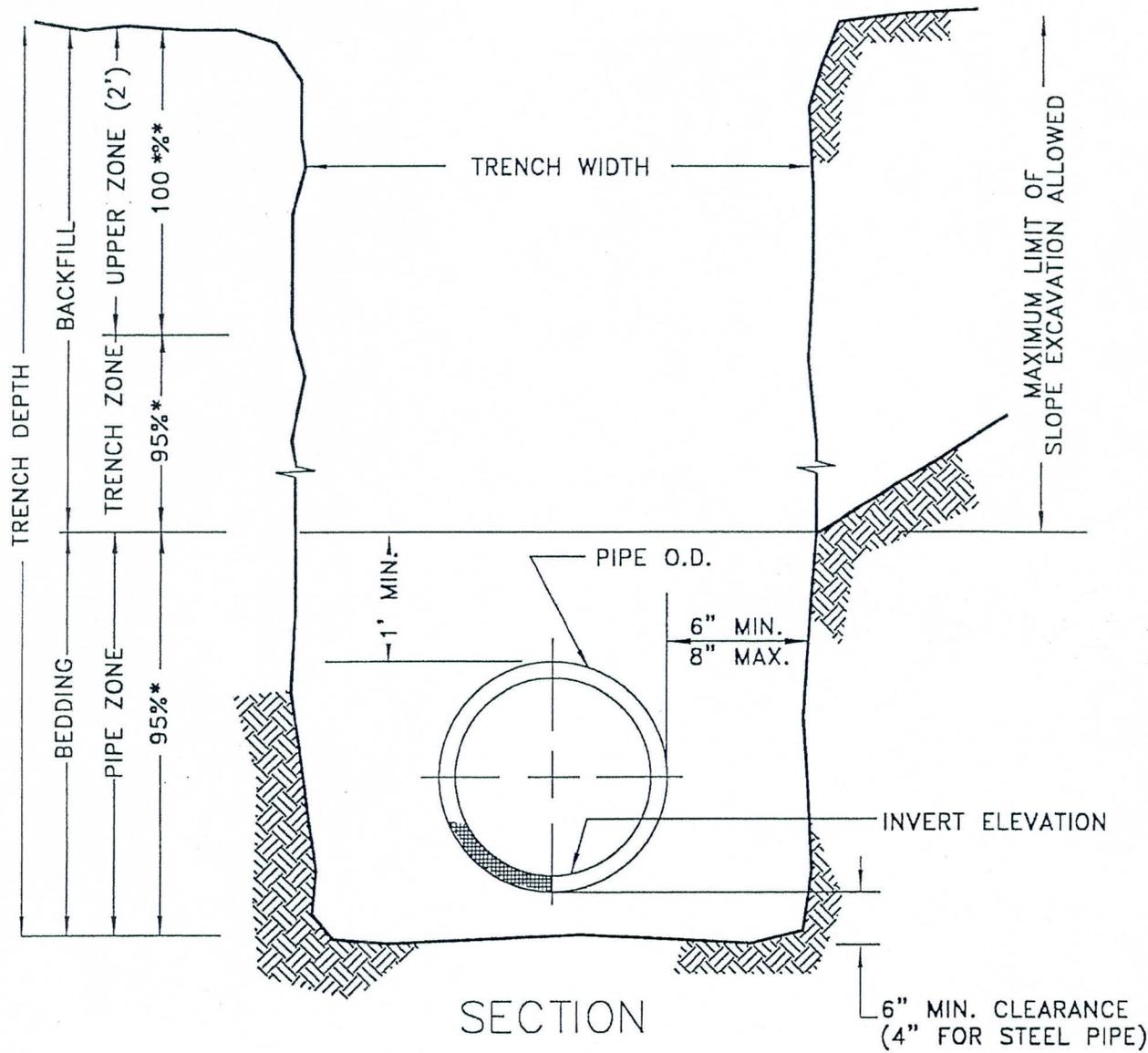
NOT TO SCALE



JACK PIT REACTION
 LATERAL EARTH PRESSURE DIAGRAM
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.	DATE
600220001	10/2001

FIGURE
4



SECTION

NOTE

* Indicates minimum relative compaction (see report for details).
 Upper zone required for pavement areas only.
 Diagram not drawn to scale.



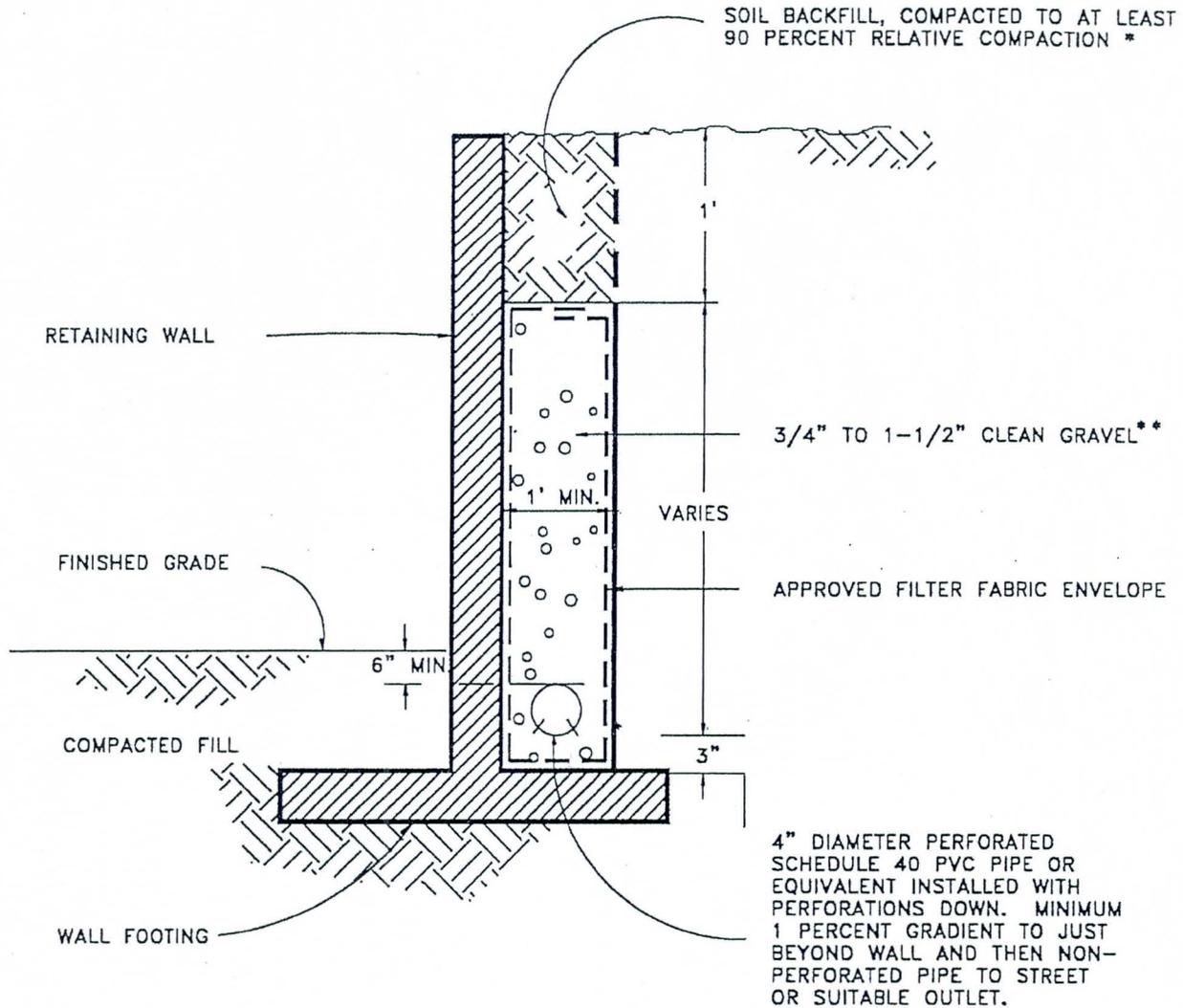
PIPE BEDDING AND TRENCH BACKFILL DETAIL
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.	DATE
600220001	10/2001

FIGURE
 5

PERMEABLE MATERIAL

SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	90-100
3/8"	40-100
No.4	25-40
No.8	18-33
No.30	5-15
No.50	0-7
No.200	0-3



* BASED ON ASTM D698-91, WITH WALL LOCATED IN NON-STRUCTURAL AREA.

** IF PERMEABLE MATERIAL (SEE GRADATION ABOVE) IS USED IN PLACE OF 3/4" TO 1-1/2" GRAVEL, FILTER FABRIC MAY BE DELETED. PERMEABLE MATERIAL SHOULD BE COMPACTED TO 90 PERCENT OF RELATIVE COMPACTION IN NON-STRUCTURAL AREAS.

NOT TO SCALE



TYPICAL
RETAINING WALL DRAIN DETAIL

FIGURE
6

APPENDIX A

BORING LOGS

Field Procedure for the Collection of Disturbed Samples

Disturbed soil samples were obtained in the field using the following methods.

Bulk Samples

Bulk samples of representative earth materials were obtained from the exploratory borings. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test Spoon

Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test spoon sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of 1-3/8 inches. The spoon was driven up to 18 inches into the ground with a 140-pound hammer free-falling from a height of 30 inches in general accordance with ASTM D 1586-84. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the spoon, bagged, sealed, and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples

Relatively undisturbed soil samples were obtained in the field using the following method.

The Modified Split-Barrel Drive Sampler

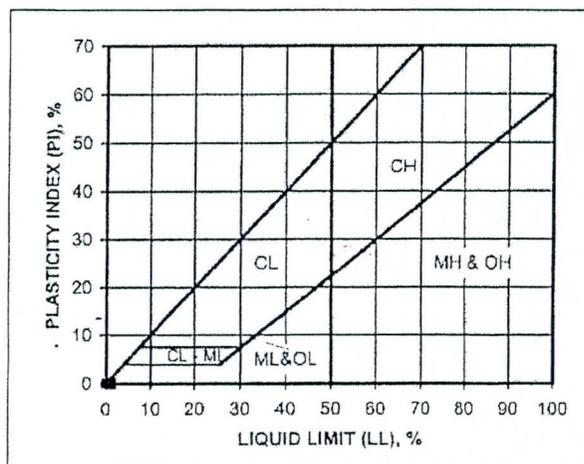
The sampler, with an external diameter of 3.0 inches, was lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with a 140-pound hammer free-falling from a height of 30 inches in general accordance with ASTM D 1586-84. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

U.S.C.S. METHOD OF SOIL CLASSIFICATION			
MAJOR DIVISIONS		SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (More than 1/2 of soil >No. 200 sieve size)	GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size)	GW	Well graded gravels or gravel-sand mixtures little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction <No. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (More than 1/2 of soil <No. 200 sieve size)	SILTS & CLAYS Liquid Limit <50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS Liquid Limit >50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils

CLASSIFICATION CHART (Unified Soil Classification System)

CLASSIFICATION	RANGE OF GRAIN SIZES	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL	3" to No.4	76.2 to 4.76
	Coarse 3" to 3/4"	76.2 to 19.1
Fine	3/4" to No. 4	19.1 to 4.76
SAND	No. 4 to No. 200	4.76 to 0.074
	Coarse No. 4 to No. 10	4.76 to 2.00
	Medium No. 10 to No. 40	2.00 to 0.420
Fine	No. 40 to No. 200	0.420 to 0.074
SILT & CLAY	Below No. 200	Below 0.074

GRAIN SIZE CHART



PLASTICITY CHART

Ninyo & Moore	U.S.C.S. METHOD OF SOIL CLASSIFICATION
--------------------------	--

DEPTH (feet)	Bulk Driven	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED _____	BORING NO. _____	PATTERNS _____
								GROUND ELEVATION _____	SHEET 1 OF 2	METHOD OF DRILLING _____	DRIVE WEIGHT _____	DROP _____	SAMPLED BY _____	LOGGED BY _____	REVIEWED BY _____
DESCRIPTION/INTERPRETATION										
SOILS										
0							GW	(GW:G3N) = well graded GRAVEL		
							GP	(GP:G) = poorly graded GRAVEL, sandy gravel, aggregate base		
							GM	(GM:GZ) = silty GRAVEL		
							GC	(GC:OG) = clayey GRAVEL		
							SW	(SW:D) = well graded SAND		
							SP	(SP:S) = poorly graded SAND		
5							SM	(NZ) = silty SAND		
							SC	(NO) = clayey SAND		
							CL	(O) = low plasticity CLAY or just CLAY		
							ML	(Z) = silt		
							OL	(4) = low plasticity organic SILT		
							CH	(C) = high plasticity CLAY		
							MH	(M) = plastic SILT		
10							OH	(5) = high plasticity organic CLAY		
							PT	(Q) = peat		
ROCKS AND CONCRETE										
							(I)	= SILTSTONE (clayey SILTSTONE, sandy SILTSTONE, etc.)		
							(1)	= SANDSTONE (silty SANDSTONE, clayey SANDSTONE, etc.)		
							(H)	= CLAYSTONE (sandy CLAYSTONE, silty CLAYSTONE, etc.)		
							(O12)	= BRECCIA rock with angular and/or gravel- or cobble-sized clasts		
15							(B) + (1)	= CONGLOMERATE		
							(>)	= SHALE or SLATE		
							(/)	= GRANITIC ROCK or BONSALL TONALITE		
							(2)	= METAVOLCANIC (or VOLCANIC) ROCK		
							(2+I)	= VOLCANIC TUFF		
							(V)	= GABBROIC ROCK or other intrusive igneous rock		
							(P)	= ASPHALT CONCRETE		
20							(9)	= CONCRETE		



BORING LOG

LEGEND FOR BORING LOGS

PROJECT NO.
PATTERNS

DATE
REV. 5/99

FIGURE
Legend-1

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED _____ BORING NO. _____ PATTERNS _____
	Bulk	Driven						GROUND ELEVATION _____ SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING _____
								DRIVE WEIGHT _____ DROP _____
								SAMPLED BY _____ LOGGED BY _____ REVIEWED BY _____
DESCRIPTION/INTERPRETATION								
20								(WATER) Water table during drilling. (FWATER) Water table at boring completion.
								(%) = CALICHE
								(.) = GYPSUM
								(\$) = SCHIST
								(7) = Mudstone
25								(()) Dolomite
30								
35								
40								

	BORING LOG	
	LEGEND FOR BORING LOGS	
	PROJECT NO. PATTERNS	DATE REV. 5/99	FIGURE Legend-2

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED _____ BORING NO. _____ SYMBOL SAMPLES _____	
	Bulk	Driven						GROUND ELEVATION _____ SHEET <u>1</u> OF <u>1</u>		METHOD OF DRILLING _____		DRIVE WEIGHT _____ DROP _____	SAMPLED BY _____ LOGGED BY _____ REVIEWED BY _____
0								DESCRIPTION/INTERPRETATION	
5				  				<p>Solid line denotes unit change.</p> <p>Dashed line denotes material change.</p> <p>Modified split-barrel drive sampler.</p> <p>No recovery with modified split-barrel drive sampler.</p> <p>Seepage.</p> <p>Groundwater encountered during drilling.</p> <p>Groundwater measured after drilling.</p>	
10								<p>Standard Penetration Test (SPT).</p> <p>No recovery with a SPT.</p>	
15								<p>Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.</p> <p>XX/ XX</p> <p>No recovery with Shelby tube sampler.</p> <p>Bulk sample.</p> <p>Continuous Push Sample.</p>	
20								<p>The total depth line is a solid line that is drawn at the bottom of the boring.</p>	

			BORING LOG		
EXPLANATION OF BORING LOG SYMBOLS					
PROJECT NO. SYMSAMP	DATE Rev. 5/99	FIGURE Legend-3			

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/13/01</u>	BORING NO. <u>B-1</u>	
	Driven						GROUND ELEVATION <u>--</u>	SHEET <u>1</u> OF <u>1</u>	
							METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>		
							BASELINE STATION = <u>19+20</u>	LATERAL OFFSET = <u>150' Rt.</u>	
							SAMPLED BY <u>EMS</u>	LOGGED BY <u>EMS</u>	REVIEWED BY <u>LLG</u>
DESCRIPTION/INTERPRETATION									

0					GM	ALLUVIUM: Brown, damp, medium dense, silty GRAVEL; little fine to coarse sand and rounded cobbles.
5	29	0.5				
10	22					
15	29	1.1	125.6		SP	Brown, damp, medium dense, gravelly fine to coarse SAND; few rounded cobbles.
20	29	1.5				
						Total Depth = 11.5' Groundwater not encountered. Backfilled on 6/13/01.

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-1

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION	
	Bulk	Driven						DATE DRILLED	BORING NO.
								6/13/01	B-2
								--	SHEET 1 OF 1
								METHOD OF DRILLING CME 75, 6.5" Hollow-Stem Auger	
								29+70	LATERAL OFFSET = 130' Rt.
								EMS	LOGGED BY EMS REVIEWED BY LLG
0							SP	ALLUVIUM: Brown, damp, medium dense, fine SAND.	
5			15	10.5			GP-GM	Brown, damp, loose, sandy GRAVEL with silt.	
10			17	4.0	112.0		SP	Brown, moist, medium dense, fine to coarse SAND; little gravel.	
15			23	4.5				Loose.	
20			20	3.0	103.2				
20			10	7.2				Total Depth = 16.5' Groundwater not encountered, backfilled on 6/13/01.	

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-2

DEPTH (feet)	Bulk Driven	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/13/01</u>	BORING NO. <u>B-3</u>	
								GROUND ELEVATION <u>--</u>	SHEET <u>1</u> OF <u>1</u>	
METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>								BASELINE STATION = <u>40+00</u>		LATERAL OFFSET = <u>145' Rt.</u>
SAMPLED BY <u>EMS</u>								LOGGED BY <u>EMS</u>		REVIEWED BY <u>LLG</u>
DESCRIPTION/INTERPRETATION										

0							ML	<u>ALLUVIUM:</u> Brown, damp, loose, fine sandy SILT.		
7			10.0							
5										
4			14.5	82.2				Very loose.		
3			10.2							
10							CL/SC	Brown, moist, firm, fine sandy CLAY to loose, clayey fine SAND.		
9			17.0	91.3						
8			15.5				SC	Brown, moist, loose, clayey fine to medium SAND.		
15								Total Depth = 13.0' Groundwater not encountered. Backfilled on 6/13/01.		
20										

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-3

DEPTH (feet)	BULK SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
							6/13/01	B-4	
							GROUND ELEVATION	SHEET	OF
							--	1	1
							METHOD OF DRILLING CME 75, 6.5" Hollow-Stem Auger		
							BASELINE STATION =	LATERAL OFFSET =	
							50+80	145' Rt.	
							SAMPLED BY	LOGGED BY	REVIEWED BY
							EMS	EMS	LLG
							DESCRIPTION/INTERPRETATION		
0						CL	<u>ALLUVIUM:</u> Brown, damp, firm, silty CLAY; little fine sand.		
		13	14.0	92.0					
5		4	16.8						
						SM	Brown, moist, loose, silty fine SAND.		
		14	7.7	94.4					
10		14	15.4	92.7					
						SP	Brown, moist, medium dense, fine to medium SAND.		
		13	2.6						
							Total Depth = 13.0' Groundwater not encountered. Backfilled on 6/13/01.		
15									
20									



BORING LOG

Flood Control District of Maricopa County
Laveen Area Conveyance Channel

PROJECT NO.
600220001

DATE
10/2001

FIGURE
A-4

DEPTH (feet)	SAMPLES Bulk Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/13/01</u>	BORING NO. <u>B-5</u>
							GROUND ELEVATION <u>--</u>	SHEET <u>1</u> OF <u>2</u>
							METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>	
							BASELINE STATION = <u>60+00</u> LATERAL OFFSET = <u>145' Rt.</u>	
							SAMPLED BY <u>EMS</u> LOGGED BY <u>EMS</u> REVIEWED BY <u>LLG</u>	
DESCRIPTION/INTERPRETATION								

0						CL	<u>ALLUVIUM:</u> Brown, damp, firm, silty CLAY; few fine to coarse sand.	
		6	12.8	95.2				
5		6	12.1	90.6			Some fine sand; few gravel.	
		12	11.2	88.9		ML	Brown, damp, stiff, clayey SILT; some fine sand; few gravel.	
10		21	14.5	90.9			Very stiff.	
							Few rounded cobbles.	
15		20						
20								

			BORING LOG		
			Flood Control District of Maricopa County Laveen Area Conveyance Channel		
PROJECT NO. 600220001	DATE 10/2001	FIGURE A-5			

DEPTH (feet)	Bulk	BLOWNS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/13/01</u>	BORING NO. <u>B-5</u>
	Driven						GROUND ELEVATION <u>--</u>	SHEET <u>2</u> OF <u>2</u>
							METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>	
							BASELINE STATION = <u>60+00</u> LATERAL OFFSET = <u>145' Rt.</u>	
							SAMPLED BY <u>EMS</u> LOGGED BY <u>EMS</u> REVIEWED BY <u>LLG</u>	
DESCRIPTION/INTERPRETATION								

20		64	2.5	111.3		SP	<u>ALLUVIUM:</u> Brown, moist, dense, gravelly fine to coarse SAND; few rounded cobbles.	
25							Total Depth = 22.0' (Refusal on sand, gravel, and cobbles) Groundwater not encountered. Backfilled on 6/13/01.	
30								
35								
40								

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-6

DEPTH (feet)	Bulk Driven	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/13/01</u>	BORING NO. <u>B-6</u>	
								GROUND ELEVATION <u>--</u>	SHEET <u>1</u> OF <u>2</u>	
METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>								BASELINE STATION = <u>70+70</u>		LATERAL OFFSET = <u>140' Rt.</u>
SAMPLED BY <u>EMS</u>								LOGGED BY <u>EMS</u>		REVIEWED BY <u>LLG</u>
DESCRIPTION/INTERPRETATION										

0							CL	<u>ALLUVIUM:</u> Brown, damp, very stiff, fine sandy CLAY.		
			26	17.3	97.5					
5			7	10.9	92.7			Firm; silty; few fine sand.		
			10	8.0	89.9		SM	Brown, damp, loose, silty fine SAND.		
10			18	2.2	101.3		SP	Brown, damp, loose, fine SAND; trace silt.		
								Few gravel.		
15			61/10"	2.5			SP-SM	Brown, damp, dense, gravelly fine to coarse SAND with silt; few rounded cobbles.		
20										

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-7

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/13/01</u> BORING NO. <u>B-6</u>	
	Bulk	Driven						GROUND ELEVATION <u>--</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>	
								BASELINE STATION = <u>70+70</u> LATERAL OFFSET = <u>140' Rt.</u>	
								SAMPLED BY <u>EMS</u> LOGGED BY <u>EMS</u> REVIEWED BY <u>LLG</u>	
DESCRIPTION/INTERPRETATION									
20			28	2.6	99.5		SP	<u>ALLUVIUM</u> ; (continued) Brown, moist, medium dense, fine to medium SAND; trace silt.	
							SC	Brown, moist to wet, very dense, clayey fine to coarse SAND; few gravel.	
25			96/9"	19.7			GP	Brown, wet, medium dense, sandy GRAVEL; trace clay.	
30			54					Total Depth = 31.5' Groundwater encountered at 30'. Backfilled on 6/13/01.	
35									
40									



BORING LOG		
Flood Control District of Maricopa County Laveen Area Conveyance Channel		
PROJECT NO. 600220001	DATE 10/2001	FIGURE A-8

DEPTH (feet)	Bulk	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED _____	BORING NO. _____	B-7
	Driven							GROUND ELEVATION _____	--	SHEET _____	1	OF _____	1
METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>								BASELINE STATION = _____		LATERAL OFFSET = _____
SAMPLED BY <u>EMS</u>								LOGGED BY <u>EMS</u>	REVIEWED BY <u>LLG</u>	

								DESCRIPTION/INTERPRETATION		
0								Boring was eliminated from scope.		
5										
10										
15										
20										

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-9

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION	
	Bulk	Driven						DATE DRILLED	BORING NO.
								6/21/01	B-8
								--	SHEET 1 OF 2
								METHOD OF DRILLING CME 75, 6.5" Hollow-Stem Auger	
								93+00	LATERAL OFFSET = 130' Rt.
								EMS	LOGGED BY EMS REVIEWED BY LLG
0							ML	<u>ALLUVIUM:</u> Brown, dry, medium dense, fine sandy SILT; scattered caliche nodules.	
5			24	8.0	97.7		CL	Brown, moist, stiff, silty CLAY; scattered caliche nodules.	
10			13	18.9			SC	Brown, moist, loose, clayey SAND; scattered caliche nodules.	
15			20	19.1	94.4		SM	Dark brown, moist, medium dense, silty fine SAND; trace clay.	
20			13	16.4			SP	Dark brown, moist to wet; medium dense; fine to medium SAND; little gravel.	
25			39	22.5			GP	Brown, moist, medium dense, sandy GRAVEL.	

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-10

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/21/01</u>	BORING NO. <u>B-8</u>	
	Driven						SAMPLES	GROUND ELEVATION <u>--</u>	SHEET <u>2</u> OF <u>2</u>
							METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>		
							BASELINE STATION = <u>93+00</u>	LATERAL OFFSET = <u>130' Rt.</u>	
							SAMPLED BY <u>EMS</u>	LOGGED BY <u>EMS</u>	REVIEWED BY <u>LLG</u>
DESCRIPTION/INTERPRETATION									

20	60	2.5	GP-GM	<p><u>ALLUVIUM</u>: (continued) Brown, moist, medium dense, sandy GRAVEL with silt.</p>
25	50/0"			<p>Very dense. Total Depth = 25' (Refusal on sand, gravel, and cobbles) Groundwater not encountered. Backfilled on 6/21/01.</p>
30				
35				
40				

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-11

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/13/01</u>	BORING NO. <u>B-9</u>	
	Driven						SAMPLES	GROUND ELEVATION <u>--</u>	SHEET <u>1</u> OF <u>1</u>
							METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>		
							BASELINE STATION = <u>114+00</u>	LATERAL OFFSET = <u>70' Rt.</u>	
							SAMPLED BY <u>EMS</u>	LOGGED BY <u>EMS</u>	REVIEWED BY <u>LLG</u>
DESCRIPTION/INTERPRETATION									

0						CL	<u>ALLUVIUM:</u> Brown, damp, firm, silty CLAY.	
7		7	20.3					
5		13	19.4	99.9			Stiff; few fine sand.	
15		15	24.1					
10		18	19.6	100.9				
22		22	17.4				Very stiff; sandy.	
15							Total Depth = 13.0' Groundwater not encountered. Backfilled on 6/13/01.	
20								

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-12

DEPTH (feet)	Bulk Driven	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/21/01</u>	BORING NO. <u>B-10</u>	
								GROUND ELEVATION <u>--</u>	SHEET <u>1</u> OF <u>2</u>	
METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>								BASELINE STATION = <u>131+50</u>		LATERAL OFFSET = <u>64' Rt.</u>
SAMPLED BY <u>EMS</u>								LOGGED BY <u>EMS</u>		REVIEWED BY <u>LLG</u>
DESCRIPTION/INTERPRETATION										

0							ML	<u>ALLUVIUM:</u> Dark brown, moist, loose, sandy SILT; scattered caliche nodules.		
17										
5				14.4	98.3					
13										
9				12.7				No caliche.		
10										
21				19.0	103.6					
15				3.2			GP-GC	Brown, moist, medium dense, sandy GRAVEL with clay.		
26										
20										

<i>Ninyo & Moore</i>		BORING LOG		
		Flood Control District of Maricopa County Laveen Area Conveyance Channel		
PROJECT NO. 600220001	DATE 10/2001	FIGURE A-13		

DEPTH (feet)	Bulk Driven	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/21/01</u> BORING NO. <u>B-10</u>
								GROUND ELEVATION <u>--</u> SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>
								BASELINE STATION = <u>131+50</u> LATERAL OFFSET = <u>64' Rt.</u>
								SAMPLED BY <u>EMS</u> LOGGED BY <u>EMS</u> REVIEWED BY <u>LLG</u>

DESCRIPTION/INTERPRETATION								
20			61				GP	<u>ALLUVIUM</u> : (continued) Brown, moist, very dense, sandy GRAVEL; trace clay.
								Total Depth = 21.5' Groundwater not encountered. Backfilled on 6/21/01.
25								
30								
35								
40								

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-14

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION	
	Bulk	Driven						DATE DRILLED	BORING NO.
								6/28/01	B-11
								--	SHEET 1 OF 1
								METHOD OF DRILLING CME 75, 6.5" Hollow-Stem Auger	
								148+00	LATERAL OFFSET = 1,320' Lt.
								EMS	LOGGED BY EMS REVIEWED BY LLG
0							CL	ALLUVIUM: Brown, damp, stiff, silty CLAY; little fine sand.	
5			19	15.1	96.6		SM	Brown, moist, loose, silty fine SAND.	
10			6	16.4			CL	Brown, moist, very stiff, silty CLAY; little fine sand.	
15			35	19.7	104.5		SM	Brown, moist, medium dense, silty fine SAND.	
20			16	16.3				Total Depth = 11.5' Groundwater not encountered. Backfilled on 6/28/01.	

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-15

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/21/01</u> BORING NO. <u>B-12</u>	
	Bulk	Driven						GROUND ELEVATION <u>--</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>	
								BASELINE STATION = <u>159+00</u> LATERAL OFFSET = <u>197'Rt.</u>	
								SAMPLED BY <u>EMS</u> LOGGED BY <u>EMS</u> REVIEWED BY <u>LLG</u>	
DESCRIPTION/INTERPRETATION									
0							SC	<u>ALLUVIUM:</u> Brown, damp, loose, clayey fine to coarse SAND; little gravel.	
			19	5.7	100.9				
5							SC	Reddish brown, damp, loose, clayey fine SAND.	
			7	9.6					
							CL	Reddish brown, damp, stiff, fine sandy CLAY.	
			18	13.2	99.4				
10								Very stiff.	
			30	19.2					
								Total Depth = 11.5' Groundwater not encountered. Backfilled on 6/21/01.	
15									
20									



BORING LOG

Flood Control District of Maricopa County Laveen Area Conveyance Channel		
PROJECT NO. 600220001	DATE 10/2001	FIGURE A-16

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
	Bulk	Driven						
0							ML	DATE DRILLED <u>6/21/01</u> BORING NO. <u>B-13</u> GROUND ELEVATION <u>--</u> SHEET <u>1</u> OF <u>1</u> METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u> BASELINE STATION = <u>188+50</u> LATERAL OFFSET = <u>80' Lt.</u> SAMPLED BY <u>EMS</u> LOGGED BY <u>EMS</u> REVIEWED BY <u>LLG</u>
17			17	20.4	98.4		ML	<u>ALLUVIUM:</u> Yellow brown, damp, loose, SILT; few fine sand.
5			25	18.1	106.8		ML	Yellow brown, damp, very stiff, clayey SILT; few fine sand.
70			70	6.7			GC	Brown, moist, dense, clayey GRAVEL; little fine to coarse sand.
10								Total Depth = 9.0' (Refusal on sand, gravel, and cobbles) Groundwater not encountered. Backfilled on 6/21/01.
15								
20								

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-17

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION	
	Bulk	Driven						DATE DRILLED	BORING NO.
								6/22/01	B-14
								--	SHEET 1 OF 1
								METHOD OF DRILLING CME 75, 6.5" Hollow-Stem Auger	
								210+00	LATERAL OFFSET = 45' Lt.
								EMS	LOGGED BY EMS REVIEWED BY LLG
0							ML	ALLUVIUM: Brown, damp, loose, fine sandy SILT.	
			19	12.6	93.8				
5							CL	Brown, damp, very stiff, silty CLAY; scattered caliche nodules.	
			24	17.5	102.0				
							SC	Dark brown, moist, medium dense, clayey fine SAND; few fine to coarse sand; scattered caliche nodules.	
			13	12.7					
10							CL	Dark brown, moist, stiff, silty CLAY; few fine to coarse sand; scattered caliche nodules.	
			16				SM	Yellowish brown, damp, loose, silty fine SAND.	
							GP	Brown, damp, dense, sandy GRAVEL.	
15			85						
								Total Depth = 16.0' (Refusal on sand, gravel, and cobbles) Groundwater not encountered. Backfilled on 6/22/01.	
20									

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-18

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION	
	Bulk	Driven						DATE DRILLED	BORING NO.
								6/22/01	B-15
								--	SHEET 1 OF 1
								METHOD OF DRILLING CME 75, 6.5" Hollow-Stem Auger	
								226+50	LATERAL OFFSET = 93' Rt.
								EMS	LOGGED BY EMS REVIEWED BY LLG
0							ML	ALLUVIUM: Light brown, damp, loose, sandy SILT.	
20			20	13.9					
5							CL	Dark brown, damp to moist, stiff, silty CLAY; few fine sand.	
12			12	14.6					
19							ML	Dark brown, moist, loose, fine sandy SILT; trace clay; scattered caliche nodules.	
15.2			19	15.2	107.6				
10									
9			9	21.3					
								Total Depth = 11.5' Groundwater not encountered. Backfilled on 6/21/01.	
15									
20									

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-19

DEPTH (feet)	Bulk Driven	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/22/01</u>	BORING NO. <u>B-16</u>
								GROUND ELEVATION <u>--</u>	SHEET <u>1</u> OF <u>1</u>
METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>								BASELINE STATION = <u>251+50</u> LATERAL OFFSET = <u>1,850' Rt.</u>	
SAMPLED BY <u>EMS</u> LOGGED BY <u>EMS</u> REVIEWED BY <u>LLG</u>								DESCRIPTION/INTERPRETATION	

0							CL	<u>ALLUVIUM:</u> Dark brown, moist, stiff to very stiff, silty CLAY.	
			20	20.8	96.4				
5			20	14.9					Very stiff.
			24	13.7	107.5				Scattered caliche nodules.
10			10	20.6					Few fine to coarse sand.
									Total Depth = 11.5' Groundwater not encountered. Backfilled on 6/22/01.
15									
20									

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-20

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/22/01</u>	BORING NO. <u>B-17</u>
	Bulk	Driven						GROUND ELEVATION <u>--</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>	
								BASELINE STATION = <u>256+50</u> LATERAL OFFSET = <u>40' Lt.</u>	
								SAMPLED BY <u>EMS</u> LOGGED BY <u>EMS</u> REVIEWED BY <u>LLG</u>	
DESCRIPTION/INTERPRETATION									

0						SM	<u>ALLUVIUM:</u> Brown, damp, loose, silty fine to coarse SAND; little gravel.
5	19					CL	Dark brown, moist, stiff, silty CLAY; little fine sand.
	15	17.4	102.7				
	10	25.4					
10	18	20.2	103.3			ML	Dark brown, moist, loose, fine sandy SILT; scattered caliche nodules.
15							Total Depth = 13.0' (Refusal on sand, gravel, and cobbles) Groundwater not encountered. Backfilled on 6/22/01.
20							

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-21

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/28/01</u>	BORING NO. <u>B-18</u>
	Driven						SAMPLES	GROUND ELEVATION <u>--</u>	SHEET 1 OF 1
							METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>	
							BASELINE STATION = <u>284+00</u> LATERAL OFFSET = <u>30' Lt.</u>	
							SAMPLED BY <u>EMS</u> LOGGED BY <u>EMS</u> REVIEWED BY <u>LLG</u>	
DESCRIPTION/INTERPRETATION								

0					ML	<u>ALLUVIUM:</u> Brown, damp, loose, fine sandy SILT.
		13	16.9	93.5		
5		9	19.6			Scattered caliche nodules.
		19	17.5	102.7		Few gravel; no caliche.
10		10	17.5			Moist.
						Total Depth = 11.5' Groundwater not encountered. Backfilled on 6/28/01.
15						
20						

	BORING LOG	
	Flood Control District of Maricopa County Laveen Area Conveyance Channel	
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-22

DATE DRILLED 6/22/01 BORING NO. B-19
 GROUND ELEVATION -- SHEET 1 OF 1
 METHOD OF DRILLING CME 75, 6.5" Hollow-Stem Auger
 BASELINE STATION = 314+50 LATERAL OFFSET = 40' Rt.
 SAMPLED BY EMS LOGGED BY EMS REVIEWED BY LLG
DESCRIPTION/INTERPRETATION

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
	Bulk	Driven						
0							ML	ALLUVIUM: Brown, damp, loose SILT; little fine sand.
13			13	9.2	93.7			
5			16	15.3				Medium dense.
16			16	13.8	101.6		SM	Brown, damp, loose, silty fine SAND.
10			14	7.5				Few coarse sand.
15								Total Depth = 11.5' Groundwater not encountered. Backfilled on 6/22/01.
20								

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-23

DATE DRILLED 6/22/01 BORING NO. B-20
 GROUND ELEVATION -- SHEET 1 OF 2
 METHOD OF DRILLING CME 75, 6.5" Hollow-Stem Auger
 BASELINE STATION = NA LATERAL OFFSET = NA
 SAMPLED BY EMS LOGGED BY EMS REVIEWED BY LLG

DEPTH (feet)	BULK SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						CL	ALLUVIUM: Dark brown, damp, stiff to very stiff, fine sandy CLAY.
20		20	12.3	99.5			
5		13	17.1				Stiff; scattered caliche nodules.
19		19	12.3	96.6		SM	Brown, damp, loose, silty fine SAND.
10		8	16.5				
15		27	3.4			GW-GM	Brown, damp, medium dense, sandy GRAVEL with silt.
20							

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-24

DEPTH (feet)	Bulk	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/22/01</u>	BORING NO. <u>B-20</u>
	Driven							GROUND ELEVATION <u>--</u>	SHEET <u>2</u> OF <u>2</u>
METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>								BASELINE STATION = <u>NA</u> LATERAL OFFSET = <u>NA</u>	
SAMPLED BY <u>EMS</u> LOGGED BY <u>EMS</u> REVIEWED BY <u>LLG</u>								DESCRIPTION/INTERPRETATION	

20			50/4"				GP	<u>ALLUVIUM: (continued)</u> Brown, damp, very dense, sandy GRAVEL. Total Depth = 20.3' (Refusal) Groundwater not encountered. Backfilled on 6/22/01.	
25									
30									
35									
40									

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-25

DEPTH (feet)	Bulk Driven SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>6/28/01</u>	BORING NO. <u>B-21</u>	
							GROUND ELEVATION <u>--</u>	SHEET <u>1</u> OF <u>1</u>	
							METHOD OF DRILLING <u>CME 75, 6.5" Hollow-Stem Auger</u>		
							BASELINE STATION = <u>NA</u>	LATERAL OFFSET = <u>NA</u>	
							SAMPLED BY <u>EMS</u>	LOGGED BY <u>EMS</u>	REVIEWED BY <u>LLG</u>
DESCRIPTION/INTERPRETATION									

0					CL	<u>ALLUVIUM:</u> Brown, damp, very stiff, silty CLAY; few fine to coarse sand.	
		35	16.2	106.7			
5						SM	Brown, damp, loose to medium dense, silty fine SAND; few coarse sand.
		21	11.7	97.0			
		16	12.5				Medium dense.
10						ML	Brown, damp, medium dense, fine sandy SILT; few gravel.
	26	15.7	100.4				
					GC	Brown, damp, medium dense, clayey GRAVEL; little fine to coarse sand.	
					GP	Brown, damp, dense, sandy GRAVEL; trace silt.	
15	85/11"	2.0					
Total Depth = 17.5' (Refusal) Groundwater not encountered. Backfilled on 6/28/01.							
20							

	BORING LOG		
	Flood Control District of Maricopa County Laveen Area Conveyance Channel		
	PROJECT NO. 600220001	DATE 10/2001	FIGURE A-26

APPENDIX B

LABORATORY TESTING

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488-93. Soil classifications are indicated on the logs of the exploratory excavations in Appendix A.

Moisture Content

The moisture content of samples obtained from the exploratory excavations was evaluated in accordance with ASTM D 2216-92. The test results are presented on the logs of the exploratory excavations in Appendix A.

In-Place Moisture and Density Tests

The moisture content and dry density of relatively undisturbed samples obtained from the exploratory excavations were evaluated in general accordance with ASTM D 2937-94. The test results are presented on the logs of the exploratory excavations in Appendix A.

Gradation Analysis

Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422-63. The grain-size distribution curves are shown on Figures B-1 through B-22. These test results were utilized in evaluating the soil classifications in accordance with the Unified Soil Classification System.

200 Wash

An evaluation of the percentage of minus-200 sieve material in selected soil samples was performed in general accordance with ASTM D 1140-97. The results of the tests are presented on Figures B-23 and B-24.

Atterberg Limits

Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318-98. These test results were utilized to evaluate the soil classification in accordance with the Unified Soil Classification System. The test results and classifications are shown on Figures B-25 through B-27.

Direct Shear Tests

Direct shear tests were performed on undisturbed samples in general accordance with ASTM D 3080-90 to evaluate the shear strength characteristics of selected materials. The samples were inundated during shearing to represent adverse field conditions. The results are shown on Figures B-28 through B-39.

Expansion Index Tests

The expansion index of selected materials was evaluated in general accordance with U.B.C. Standard No. 18-2. Specimens were molded under a specified compactive energy at approximately 50 percent saturation (plus or minus 1 percent). The prepared 1-inch thick by 4-inch diameter specimens were loaded with a surcharge of 144 pounds per square foot and were inundated with tap water. Readings of volumetric swell were made for a period of 24 hours. The results of these tests are presented on Figure B-40.

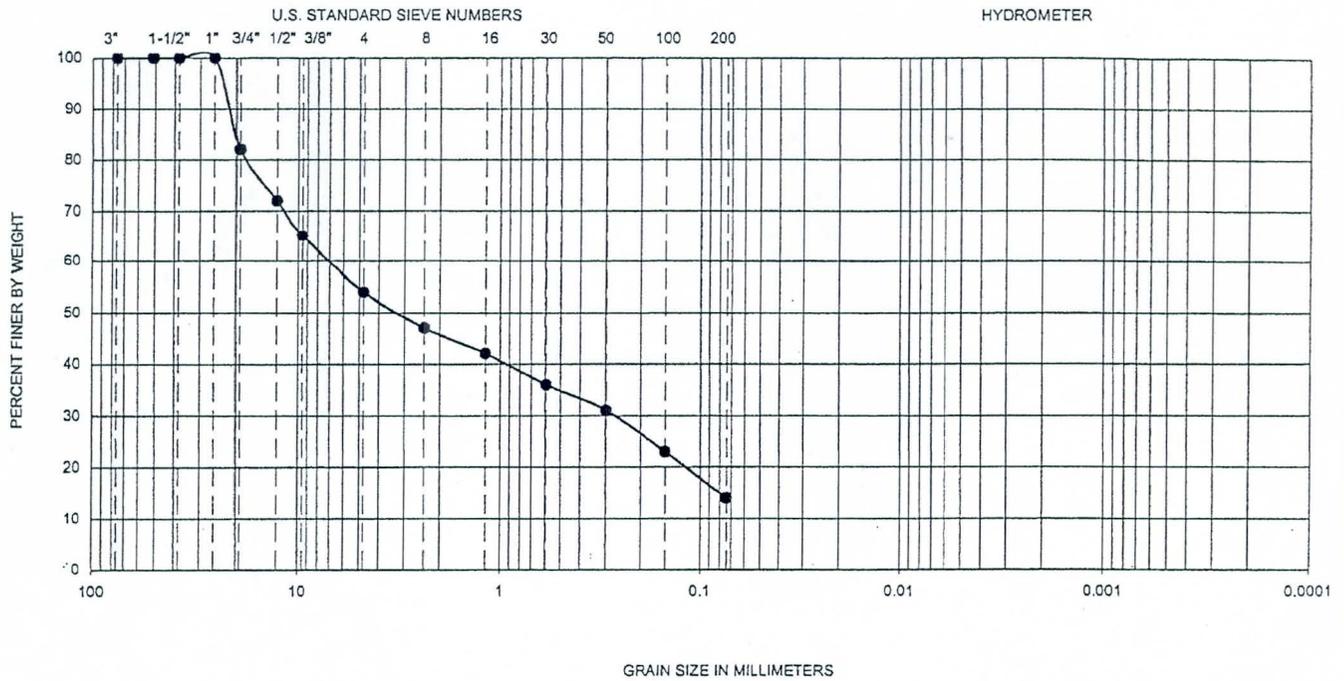
Maximum Dry Density and Optimum Moisture Content Tests

The maximum dry density and optimum moisture content of selected representative soil samples were evaluated in general accordance with ASTM D 1557-91. The results of these tests are summarized on Figures B-41 through B-45.

Soil Corrosivity Tests

Soil pH and minimum resistivity tests were performed on representative samples in general accordance with Arizona Test 236b. The chloride content of selected samples was evaluated in general accordance with Arizona Test 722. The sulfate content of selected samples was evaluated in general accordance with Arizona Test 733. The test results are presented on Figure B-46.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-1	2.5-4	--	--	--	--	--	--	--	--	14	GM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

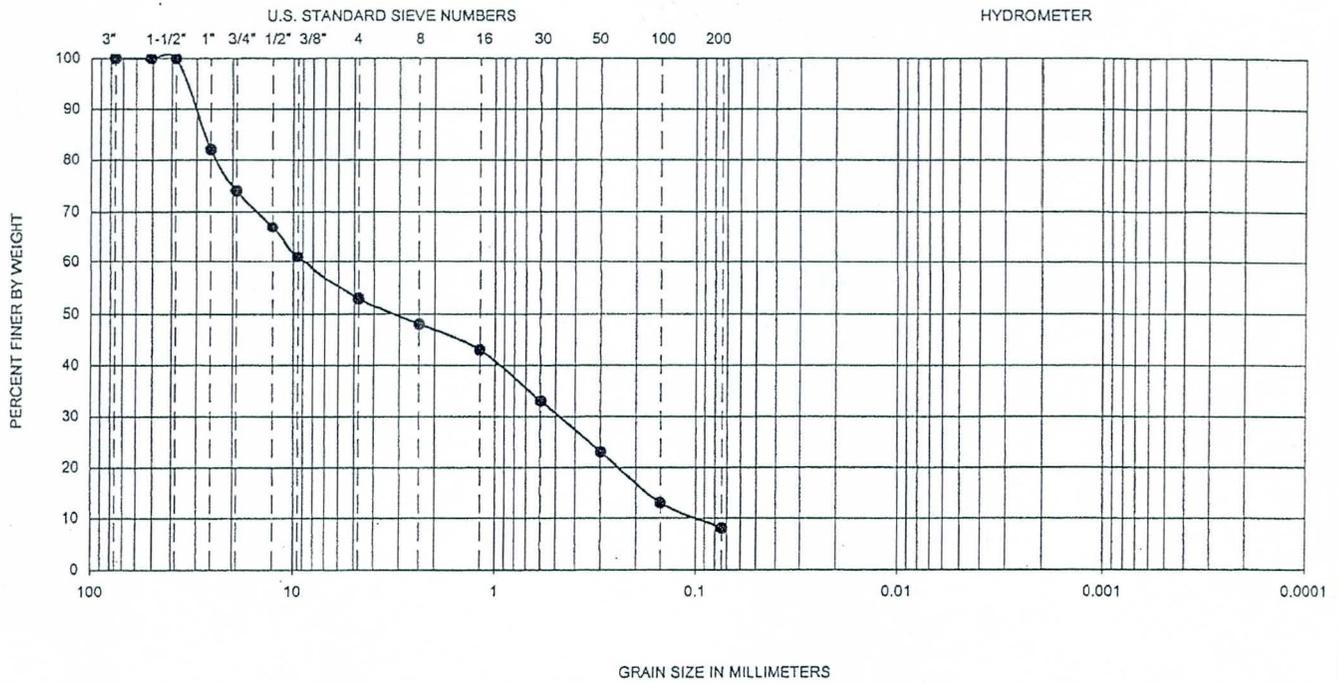


GRADATION TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVERN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.	DATE
600220001	10/2001

FIGURE
B-1

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-2	5-6.5	--	--	--	--	--	--	--	--	8	GP-GM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS

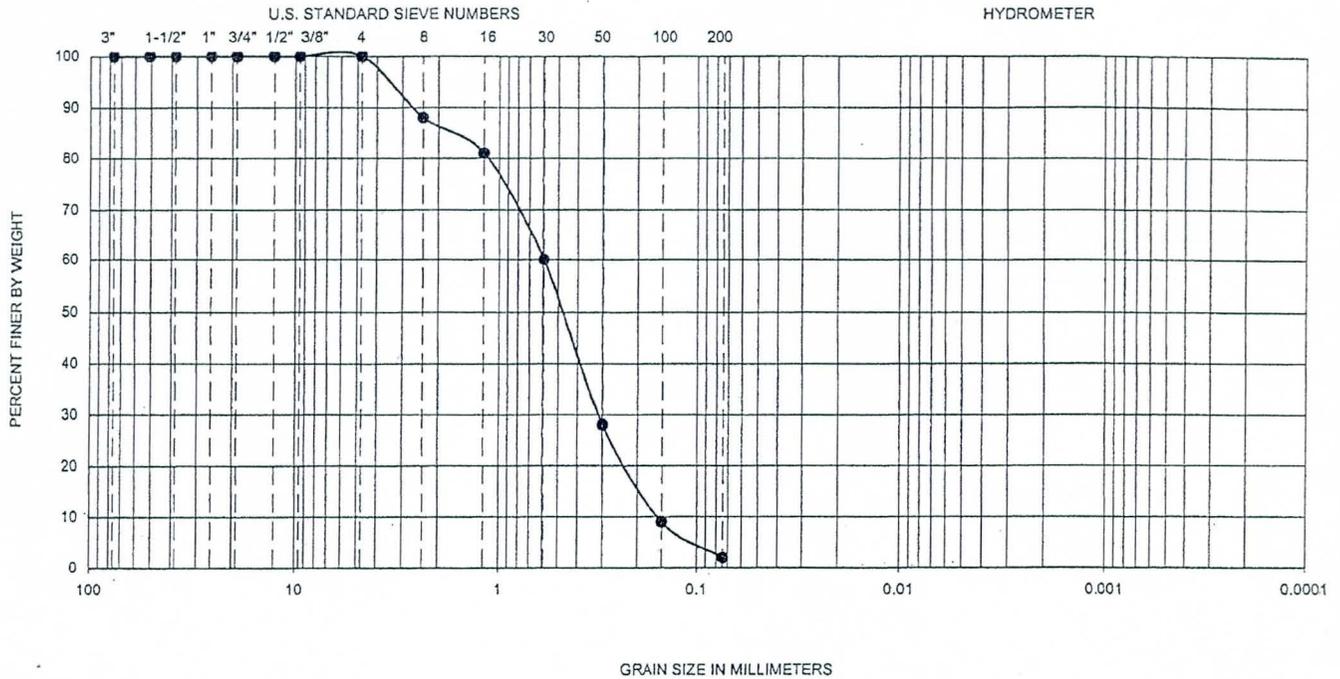
FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.
600220001

DATE
10/2001

FIGURE
B-3

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-2	10-11.5	--	--	--	--	--	--	--	--	2	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

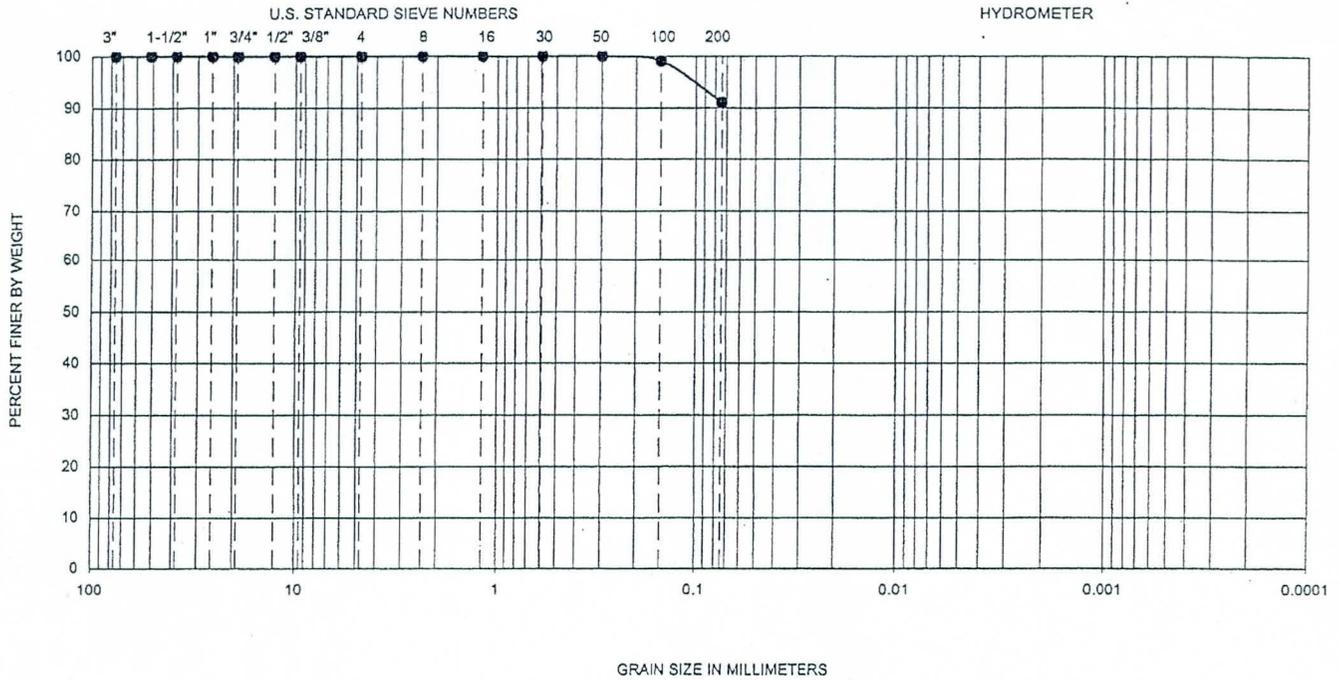
Ninyo & Moore

GRADATION TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.	DATE
600220001	10/2001

FIGURE
B-4

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-3	5-6.5	--	--	--	--	--	--	--	--	91	ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

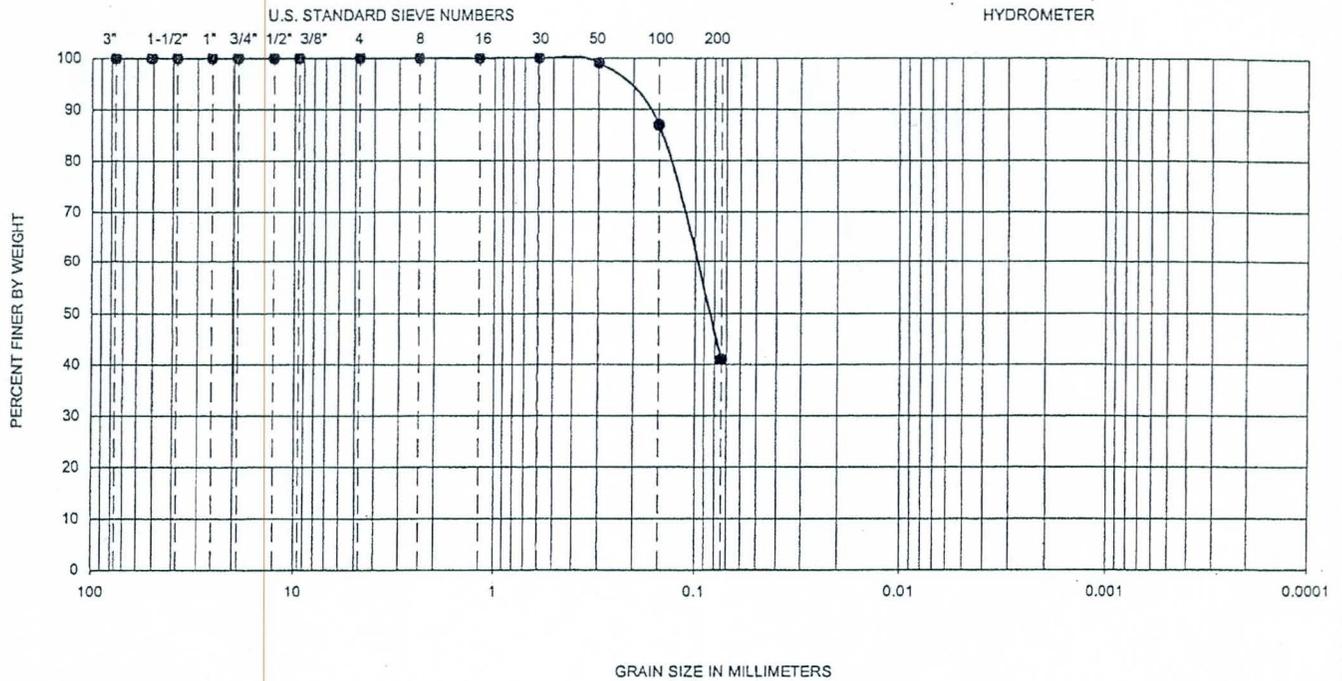
DATE

10/2001

FIGURE

B-5

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-4	10-11.5	--	--	--	--	--	--	--	--	41	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

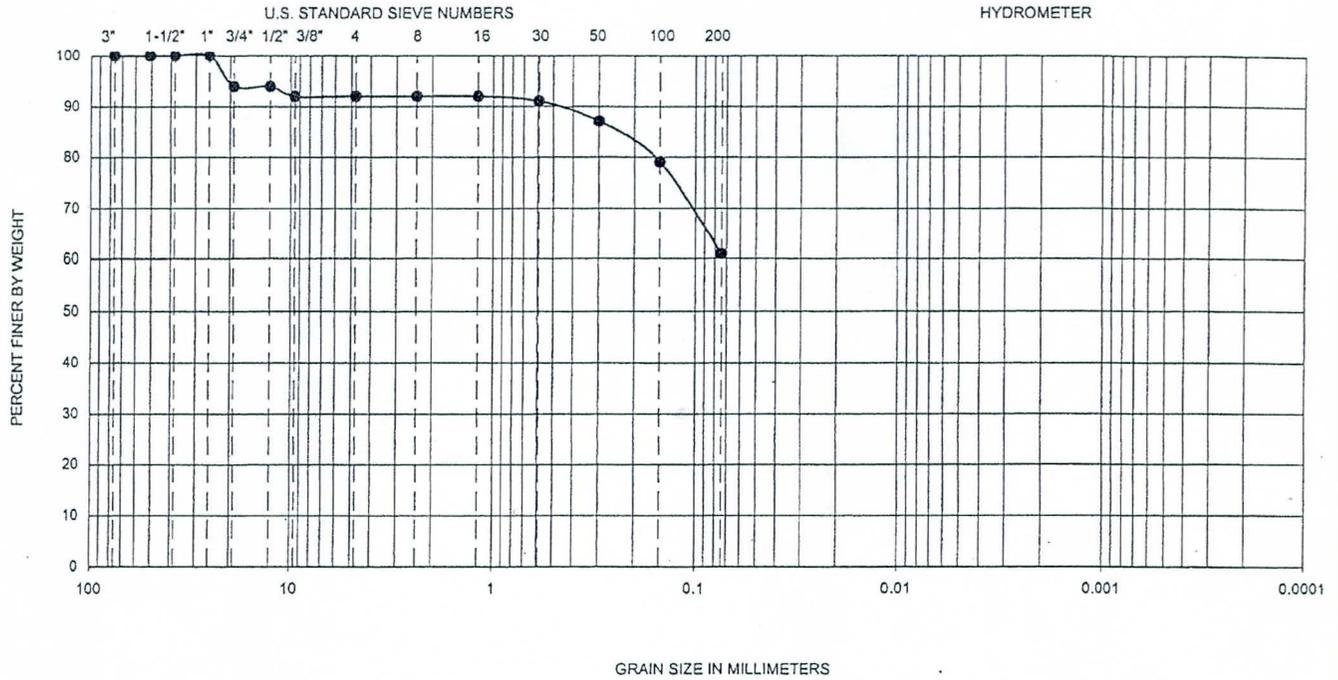
DATE

10/2001

FIGURE

B-6

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-5	5-6.5	--	--	--	--	--	--	--	--	61	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

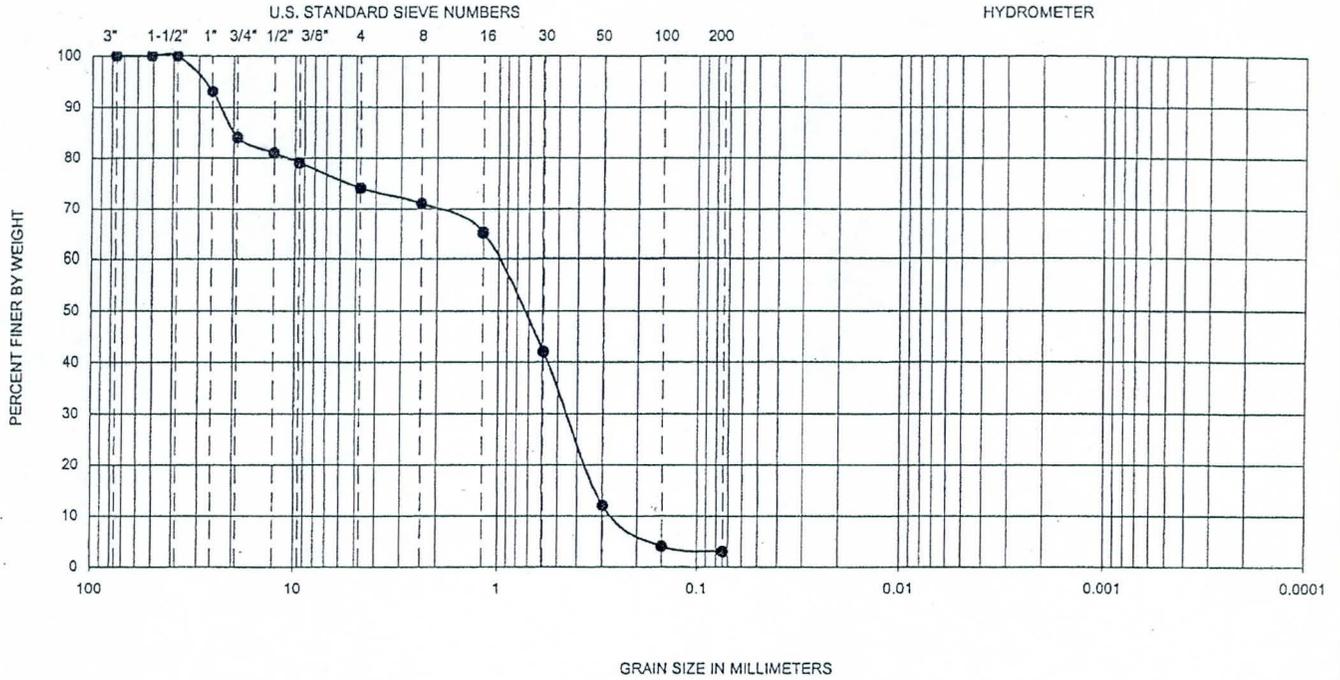
DATE

10/2001

FIGURE

B-7

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-5	20-21	--	--	--	--	--	--	--	--	3	SP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

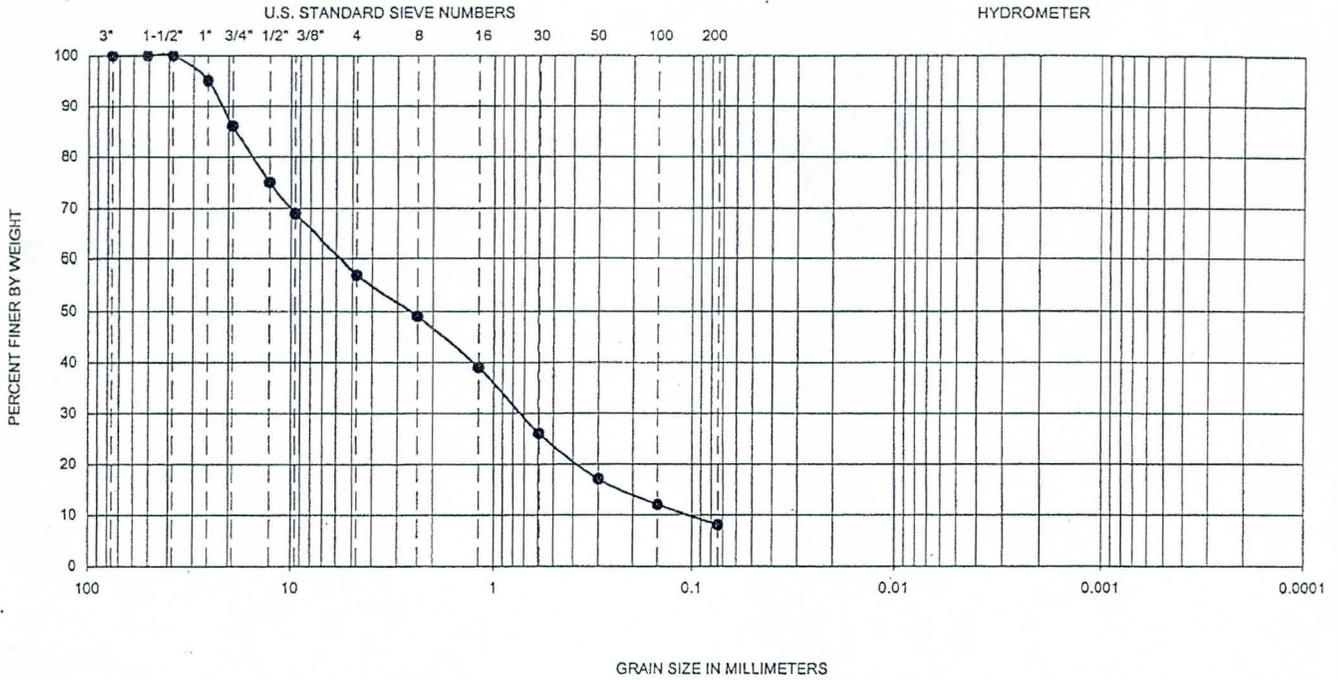
DATE

10/2001

FIGURE

B-8

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-6	15-15.8	--	--	--	--	--	--	--	--	8	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

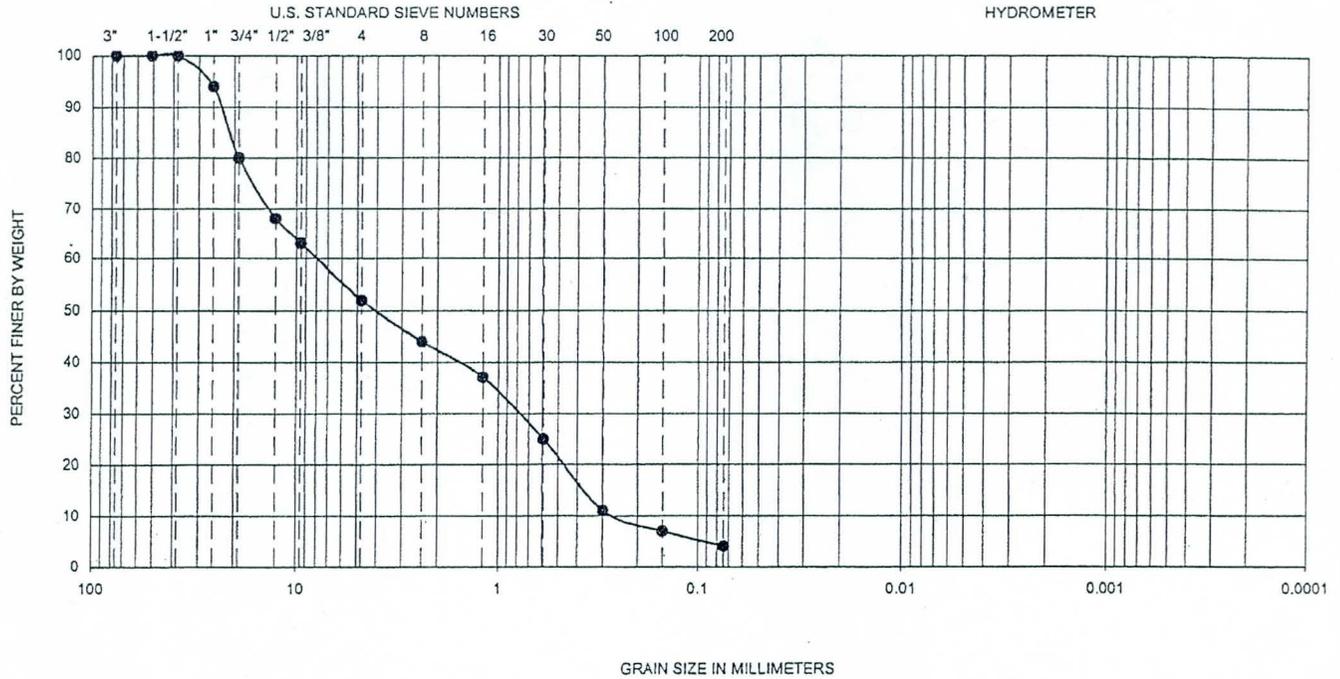
DATE

10/2001

FIGURE

B-9

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-6	30-31.5	--	--	--	--	--	--	--	--	4	GP

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

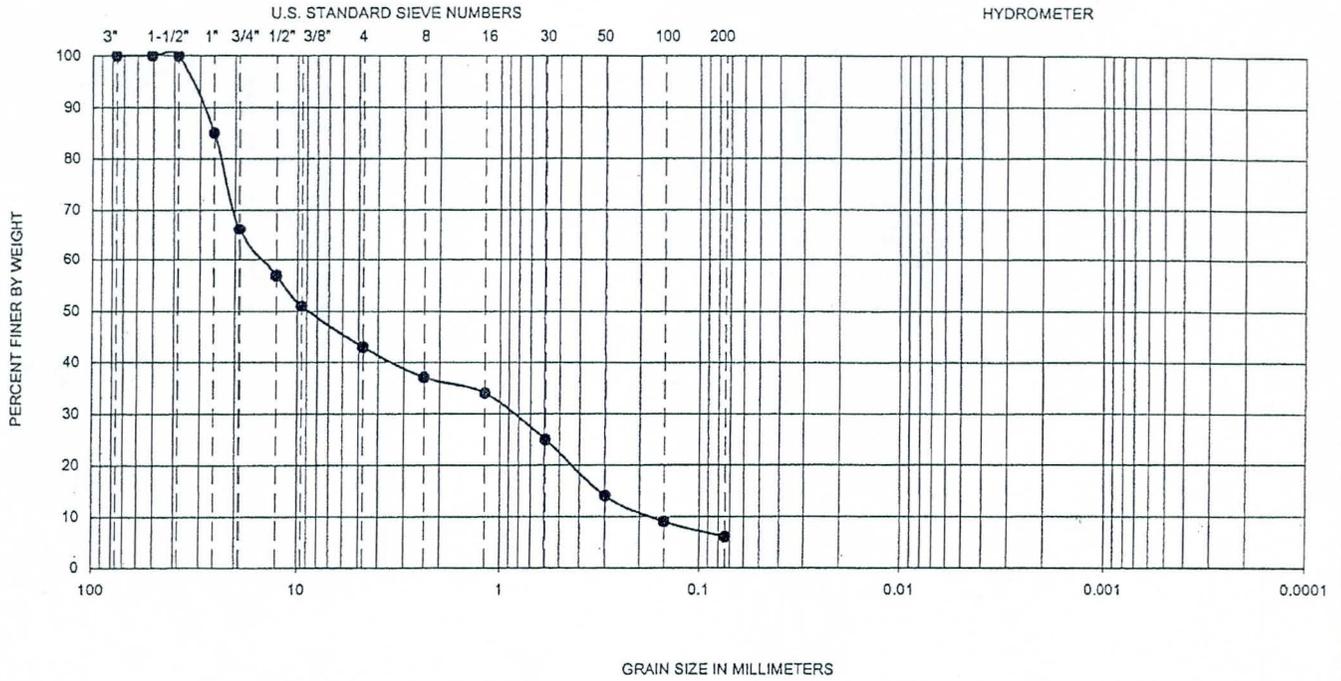
DATE

10/2001

FIGURE

B-10

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-8	20-21.5	--	--	--	--	--	--	--	--	6	GP-GM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

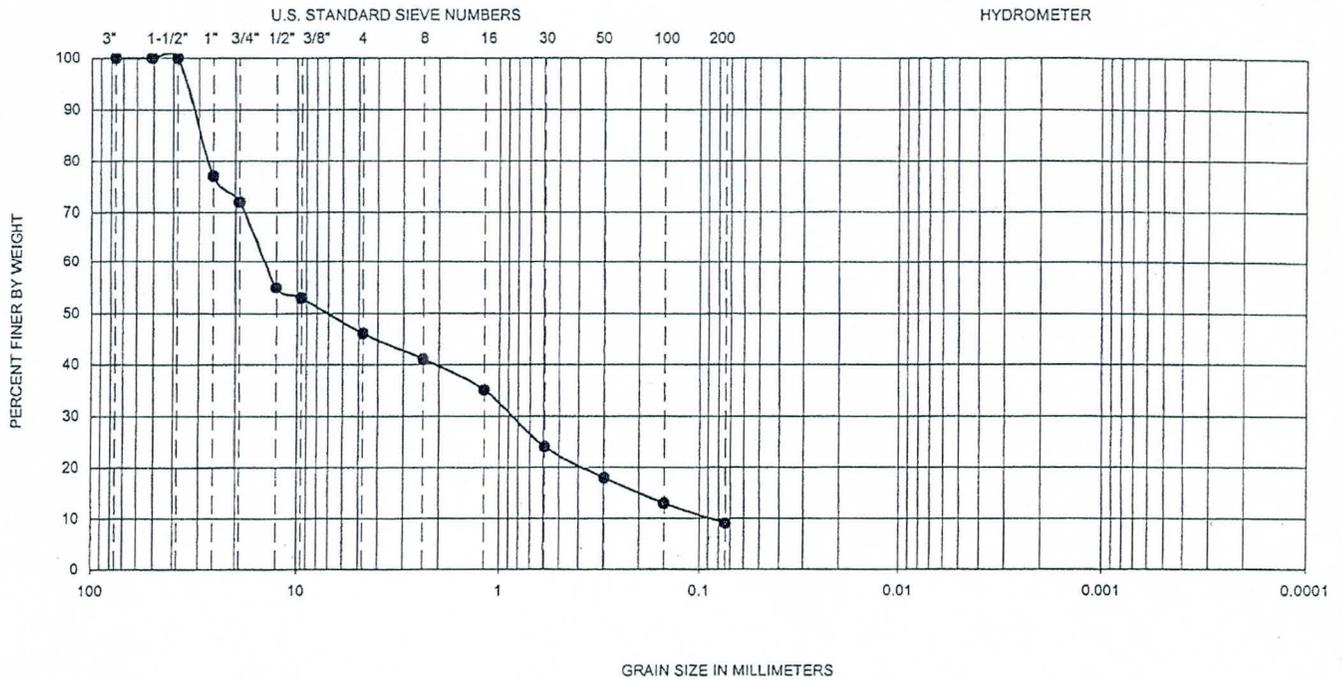
DATE

10/2001

FIGURE

B-11

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-10	15-16.5	--	--	--	--	--	--	--	--	9	GP-GC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

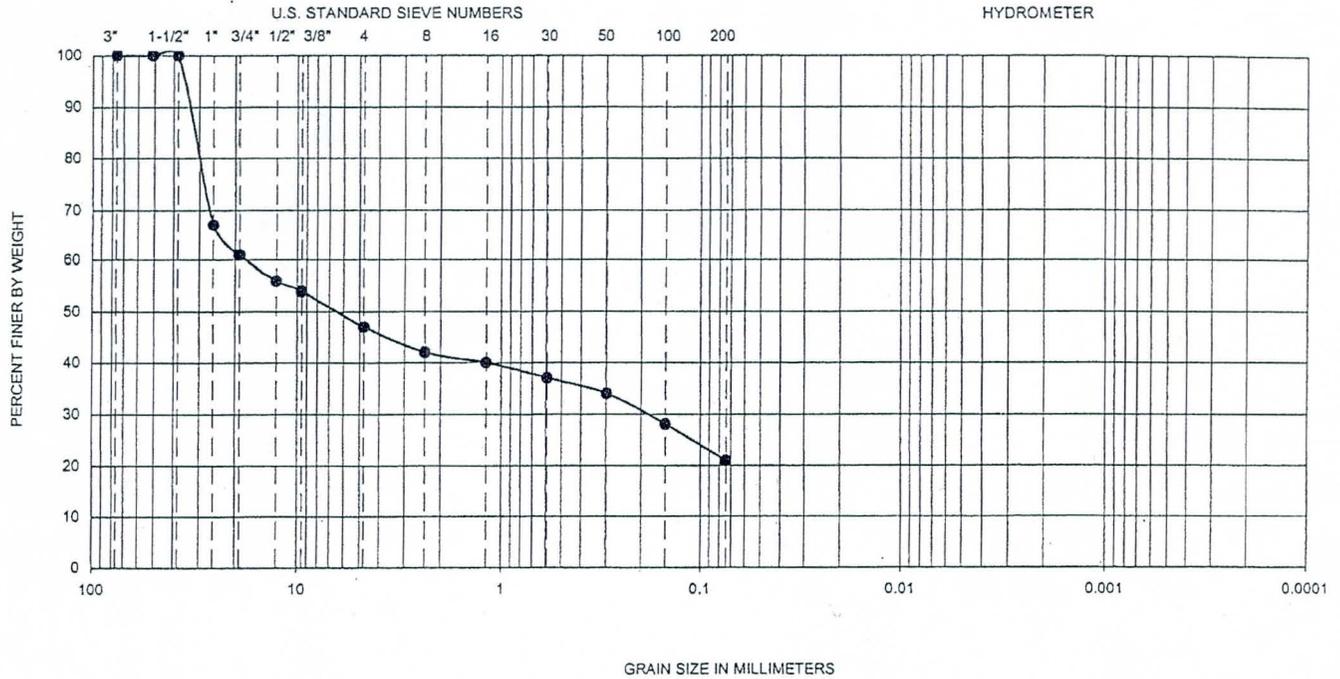
DATE

10/2001

FIGURE

B-12

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-13	7.5-8.5	--	--	--	--	--	--	--	--	21	GC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

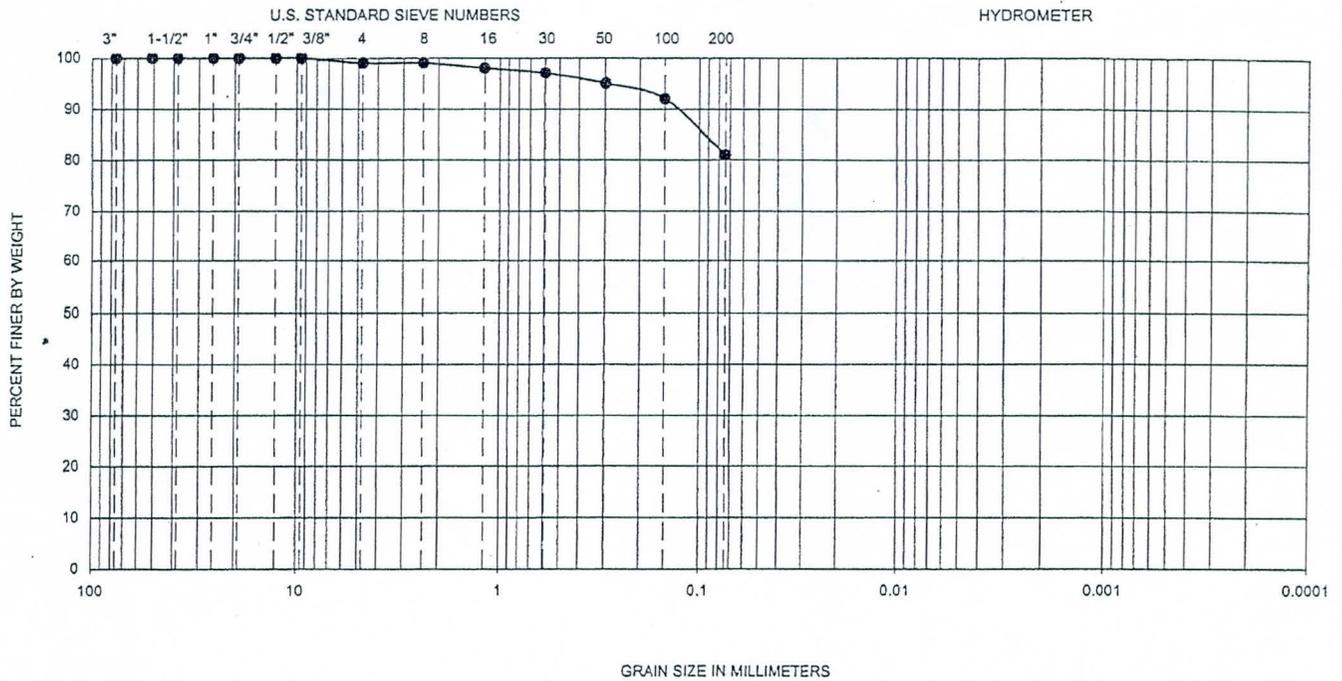
DATE

10/2001

FIGURE

B-14

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-15	2.5-4	--	--	--	--	--	--	--	--	81	ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

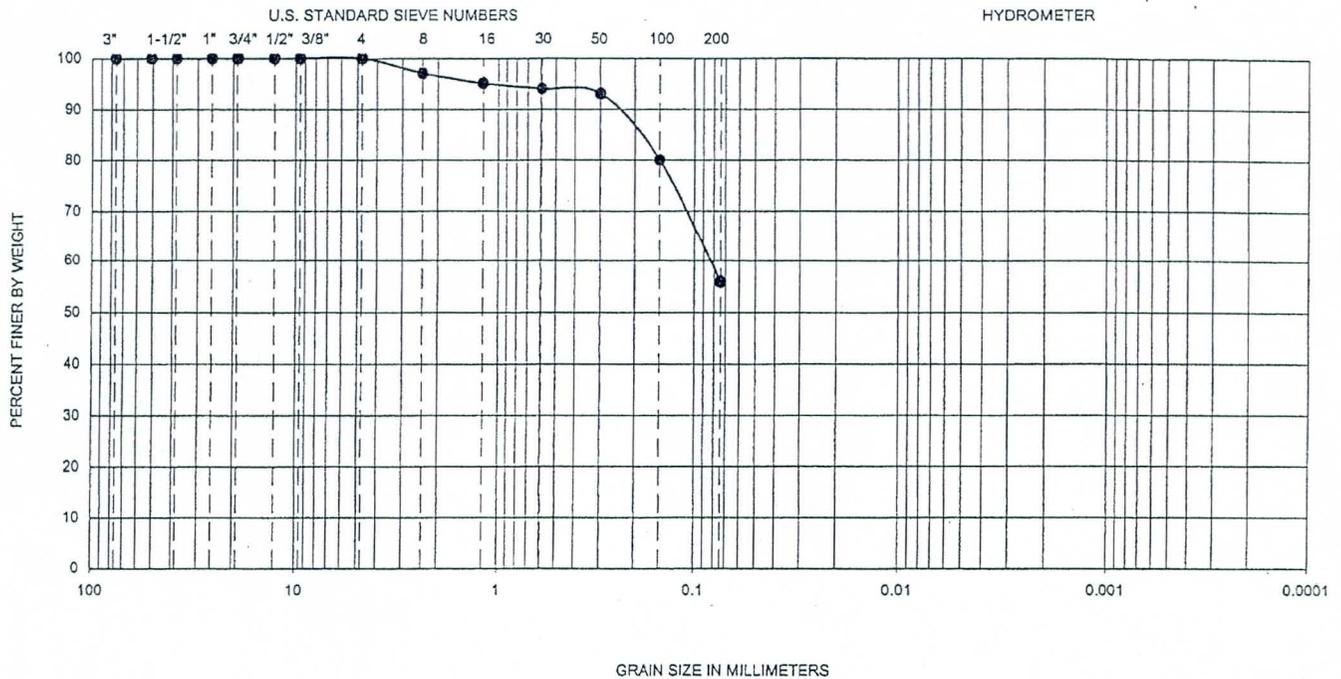
DATE

10/2001

FIGURE

B-15

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-15	7.5-9	--	--	--	--	--	--	--	--	56	ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

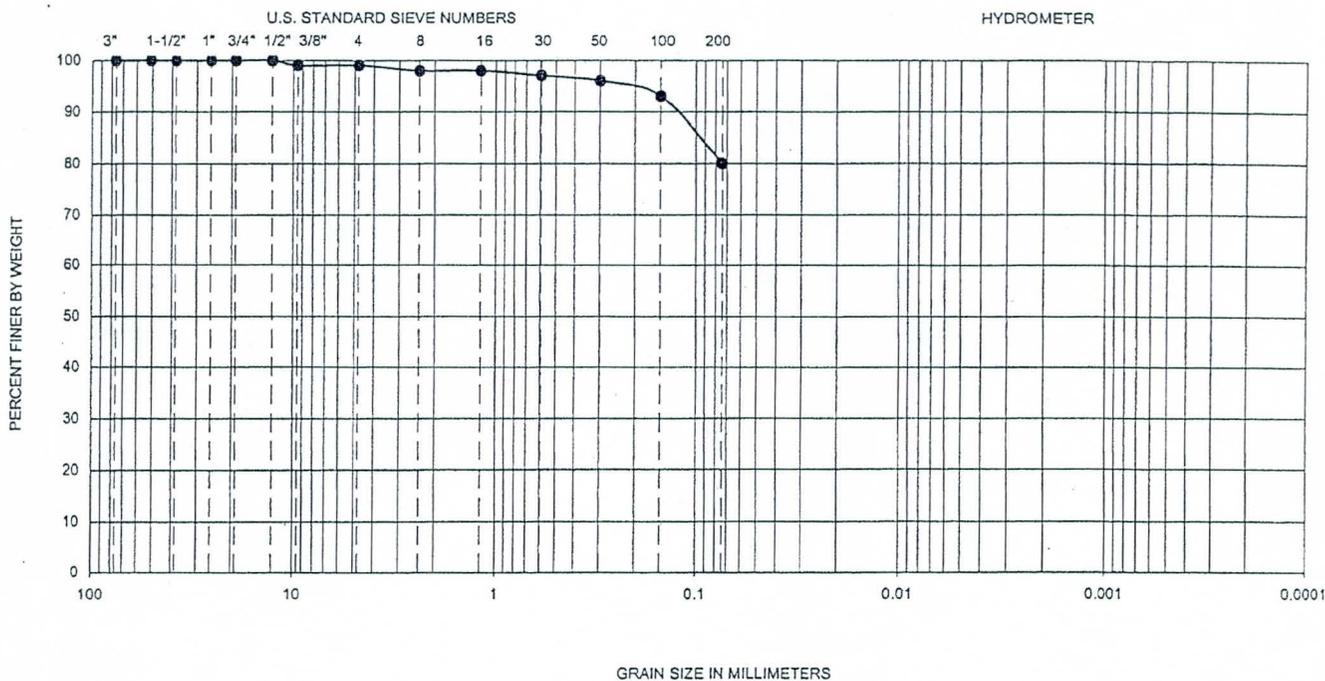
DATE

10/2001

FIGURE

B-16

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-18	2.5-4	--	--	--	--	--	--	--	--	80	ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

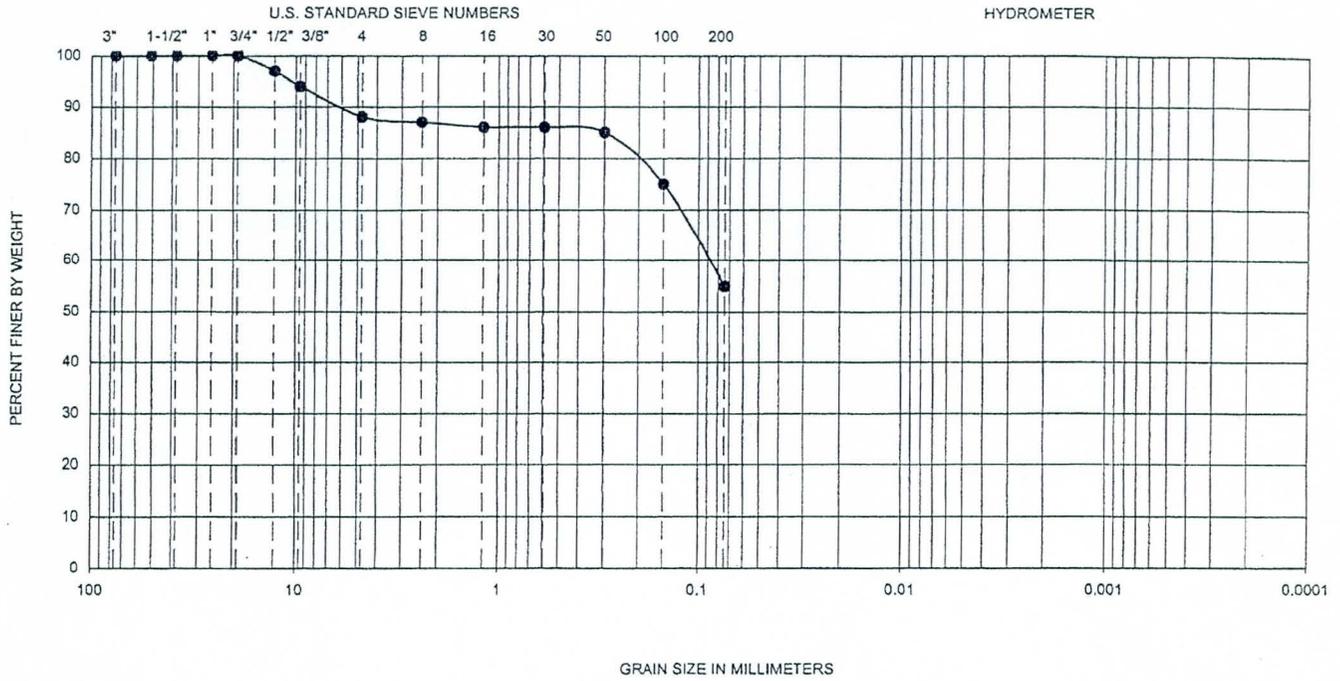
Ninyo & Moore

GRADATION TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.	DATE
600220001	10/2001

FIGURE
B-17

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-18	7.5-9	--	--	--	--	--	--	--	--	55	ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

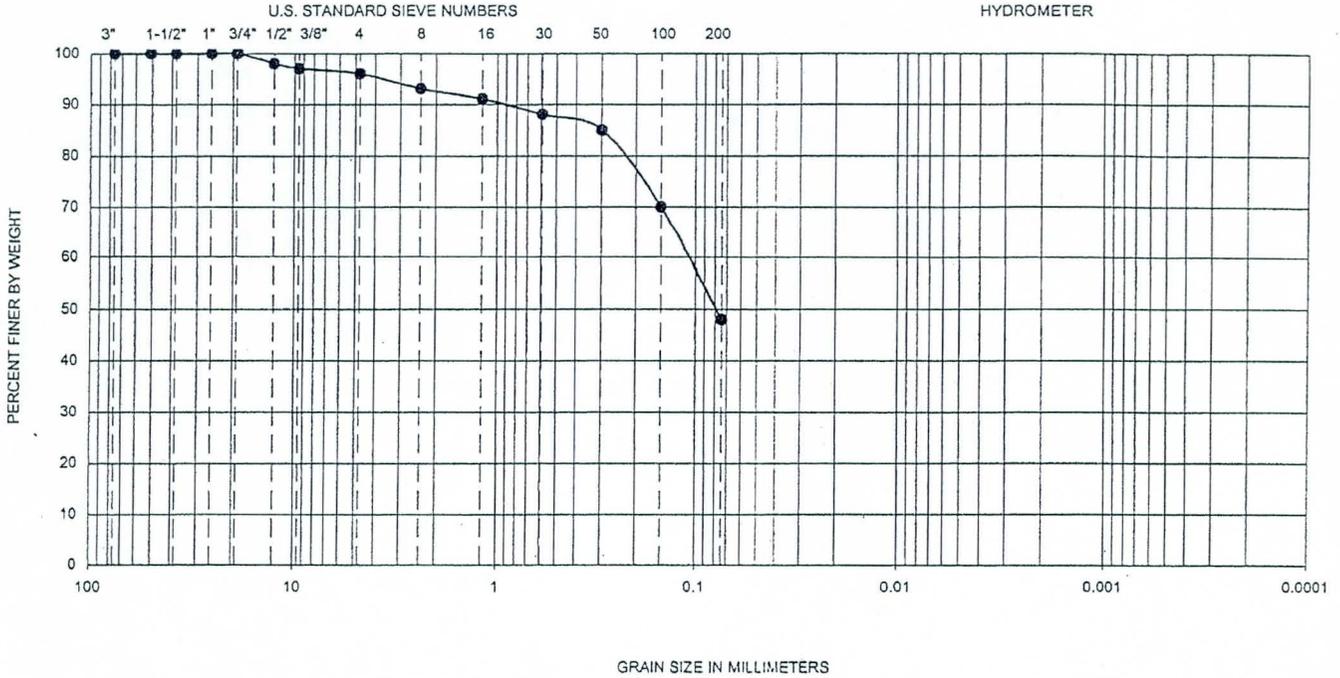
Ninyo & Moore

GRADATION TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.	DATE
600220001	10/2001

FIGURE
B-18

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-19	7.5-9	--	--	--	--	--	--	--	--	48	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

Ninyo & Moore

GRADATION TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

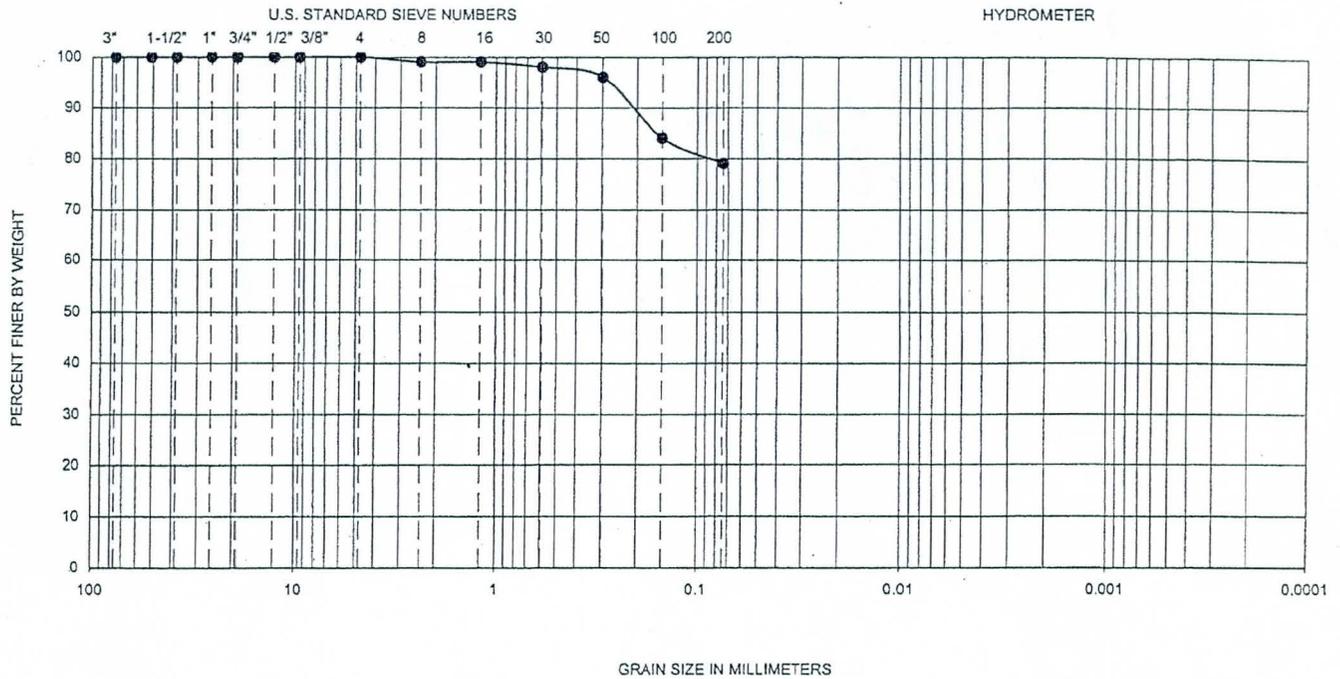
DATE

10/2001

FIGURE

B-19

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-20	2.5-4	--	--	--	--	--	--	--	--	79	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

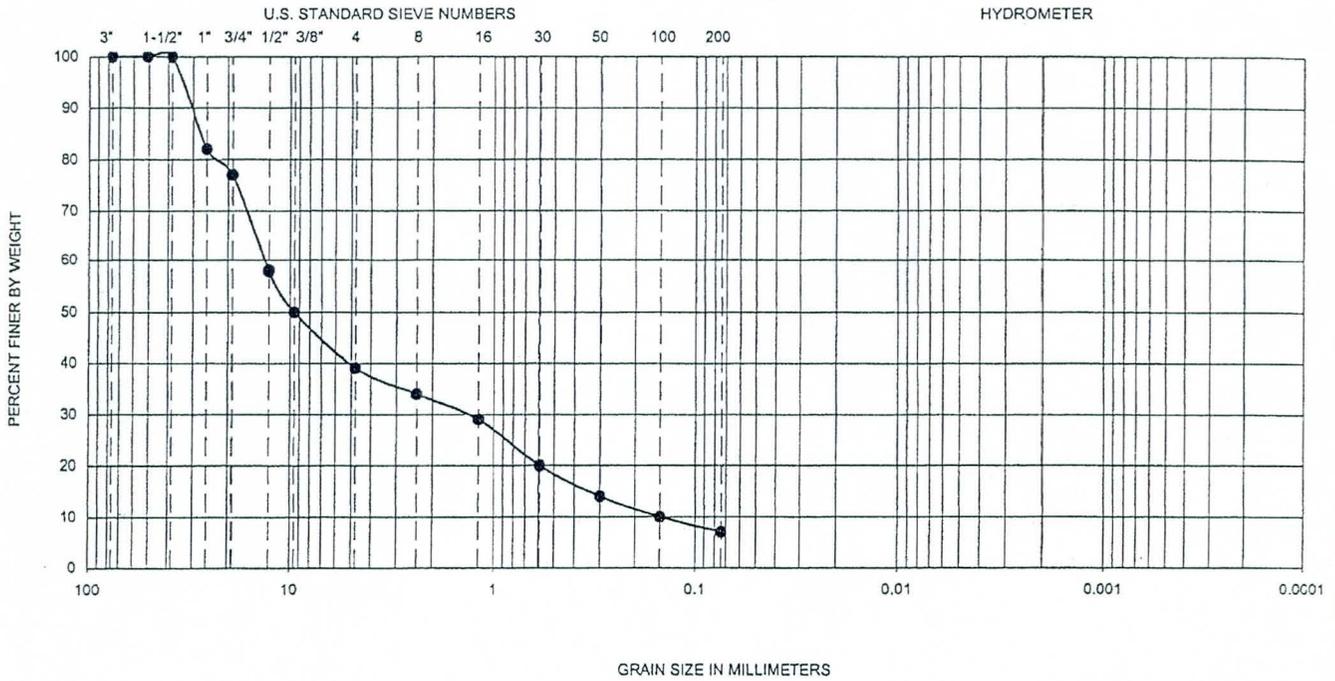
Ninyo & Moore

GRADATION TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.	DATE
600220001	10/2001

FIGURE
B-20

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-20	15-16.5	--	--	--	0.16	1.60	14.00	87.5	1.1	7	GW-GM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63

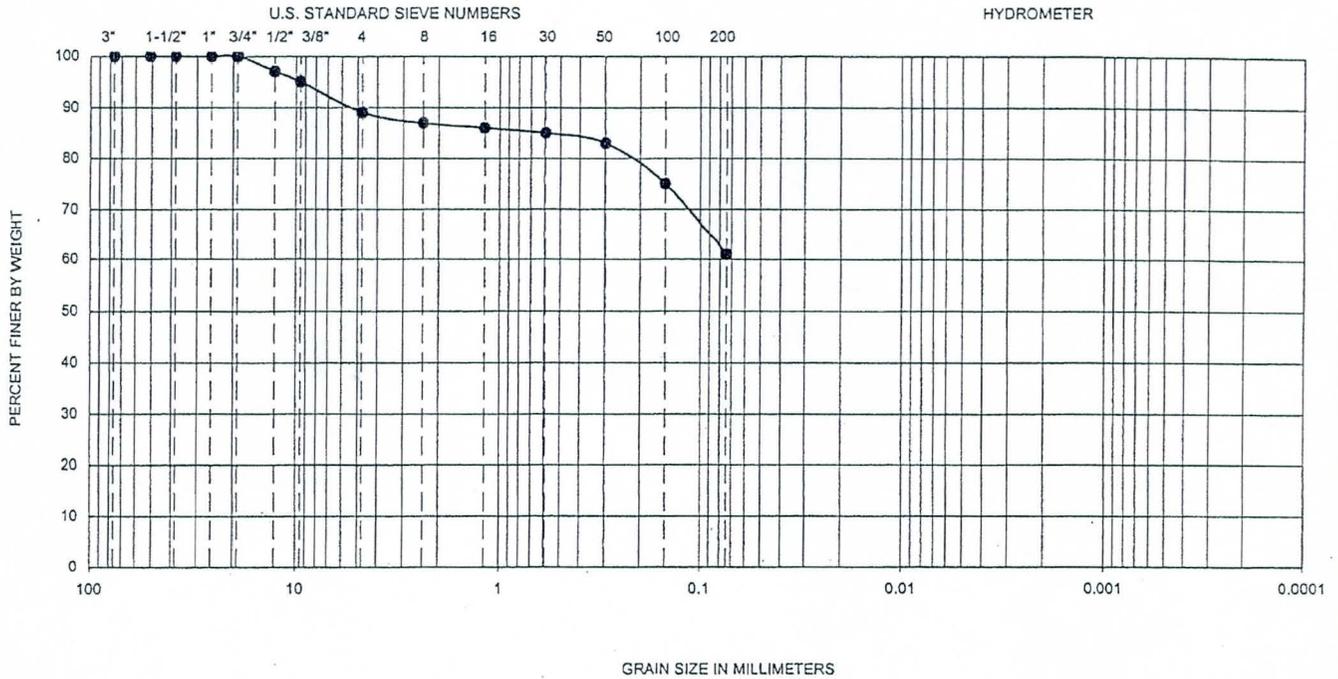


GRADATION TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.	DATE
600220001	10/2001

FIGURE
B-21

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D ₁₀	D ₃₀	D ₆₀	C _u	C _c	Passing No. 200 (%)	U.S.C.S
●	B-21	10-11.5	--	--	--	--	--	--	--	--	61	ML

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63



GRADATION TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.	DATE
600220001	10/2001

FIGURE
B-22

NO. 200 SIEVE ANALYSIS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	DESCRIPTION	PERCENT PASSING NO. 4	PERCENT PASSING NO. 200	USCS (TOTAL SAMPLE)
B-3	10-11.5	Fine sandy CLAY to clayey fine SAND	100	50	CL/SC
B-4	2.5-4	Silty CLAY	100	77	CL
B-6	2.5-4	Fine sandy CLAY	100	62	CL
B-8	7.5-9	Clayey SAND	100	18	SC
B-9	5-6.5	Silty CLAY	100	83	CL
B-9	11.5-13	Sandy CLAY	100	60	CL
B-10	5-6.5	Sandy SILT	100	70	ML
B-11	2.5-4	Silty CLAY	100	82	CL
B-11	7.5-9	Silty CLAY	100	76	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1140-97

Ninyo & Moore

200-WASH1

NO. 200 SIEVE ANALYSIS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

DATE

10/2001

FIGURE

B-23

NO. 200 SIEVE ANALYSIS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	DESCRIPTION	PERCENT PASSING NO. 4	PERCENT PASSING NO. 200	USCS (TOTAL SAMPLE)
B-12	7.5-9	Fine sandy CLAY	100	68	CL
B-13	2.5-4	SILT	100	92	ML
B-14	5-6.5	Silty CLAY	100	76	CL
B-16	2.5-4	Silty CLAY	100	96	CL
B-16	7.5-9	Silty CLAY	100	55	CL
B-17	5-6.5	Silty CLAY	100	76	CL
B-17	10-11.5	Fine sandy SILT	100	60	ML
B-19	2.5-4	SILT	100	79	ML
B-21	2.5-4	Silty CLAY	100	86	CL

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1140-97

Ninyo & Moore

200-WASH2

NO. 200 SIEVE ANALYSIS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

DATE

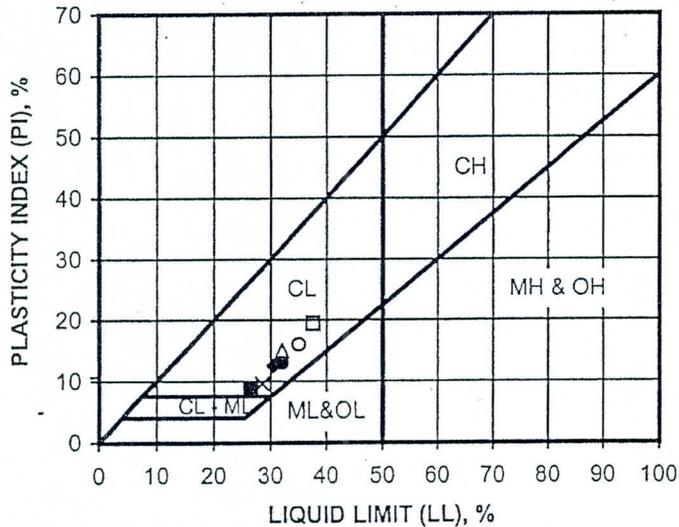
10/2001

FIGURE

B-24

SYMBOL	LOCATION	DEPTH (FT)	LL (%)	PL (%)	PI (%)	U.S.C.S. CLASSIFICATION (Minus No. 40 Sieve Fraction)	U.S.C.S. (Entire Sample)
•	B-3	10-11.5	32	19	13	CL	CL/SC
■	B-4	2.5-4	27	18	9	CL	CL
◆	B-5	5-6.5	31	18	13	CL	CL
○	B-6	2.5-4	35	19	16	CL	CL
□	B-8	7.5-9	38	18	20	CL	SC
△	B-9	5-6.5	32	17	15	CL	CL
X	B-9	11.5-13	29	19	10	CL	CL
+	B-10	5-6.5				NP	ML

NP - Indicates non-plastic



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318-98

Ninyo & Moore

ATTERBERG1

ATTERBERG LIMITS TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

DATE

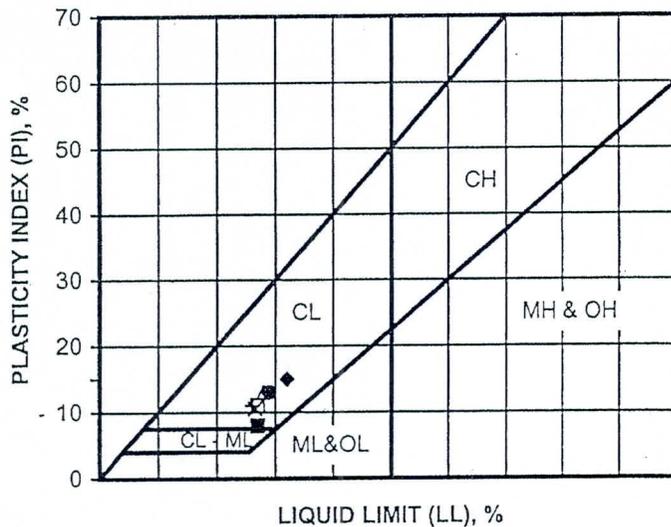
10/2001

FIGURE

B-25

SYMBOL	LOCATION	DEPTH (FT)	LL (%)	PL (%)	PI (%)	U.S.C.S. CLASSIFICATION (Minus No. 40 Sieve Fraction)	U.S.C.S. (Entire Sample)
•	B-11	2.5-4	29	16	13	CL	CL
■	B-11	7.5-9	27	19	8	CL	CL
◆	B-12	7.5-9	32	17	15	CL	CL
○	B-13	2.5-4				NP	ML
□	B-14	5-6.5	27	16	11	CL	CL
△	B-16	2.5-4	28	15	13	CL	CL
X	B-16	7.5-9	27	16	11	CL	CL
+	B-17	5-6.5	26	15	11	CL	CL

NP - Indicates non-plastic



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318-98

Ninyo & Moore

ATTERBERG2

ATTERBERG LIMITS TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

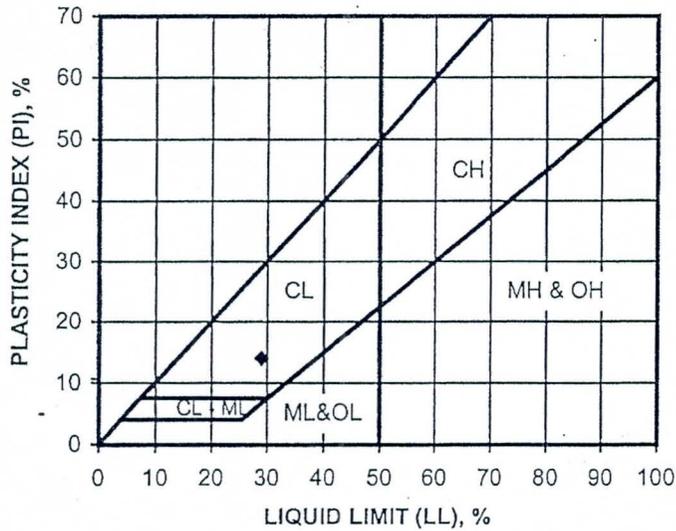
PROJECT NO.
600220001

DATE
10/2001

FIGURE
B-26

SYMBOL	LOCATION	DEPTH (FT)	LL (%)	PL (%)	PI (%)	U.S.C.S. CLASSIFICATION (Minus No. 40 Sieve Fraction)	U.S.C.S. (Entire Sample)
●	B-17	10-11.5				NP	ML
■	B-19	2.5-4				NP	ML
◆	B-21	2.5-4	29	15	14	CL	CL

NP - Indicates non-plastic



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318-98

Ninyo & Moore

ATTERBERG3

ATTERBERG LIMITS TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

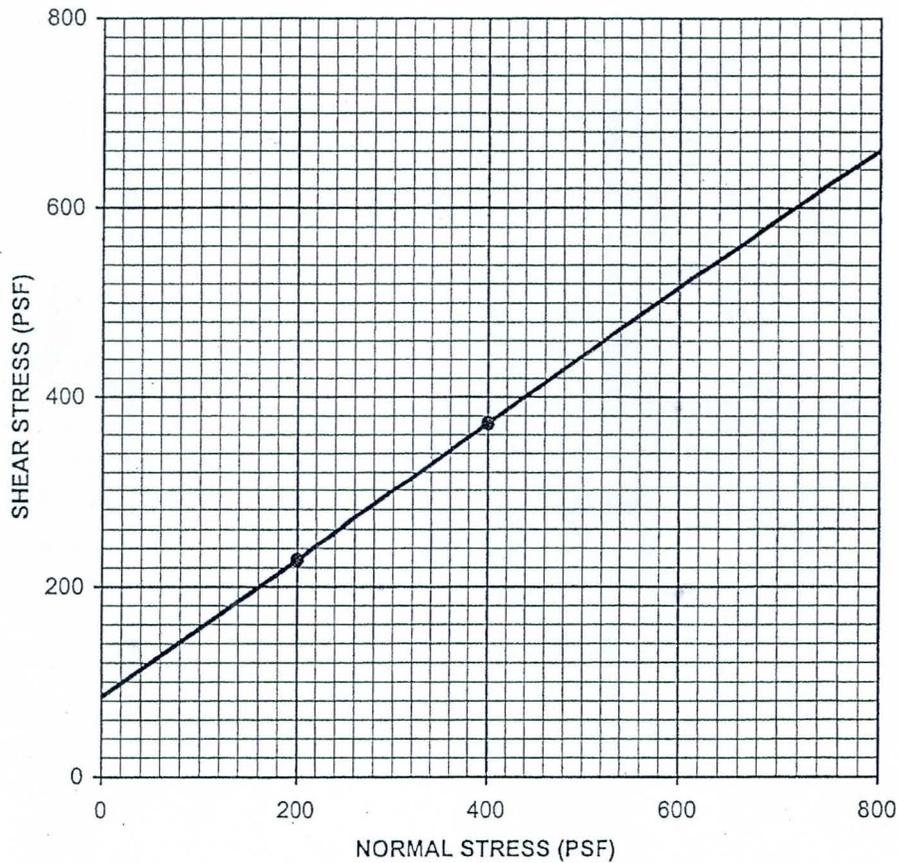
600220001

DATE

10/2001

FIGURE

B-27



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed	—●—	B-5	2.5-4	Peak	84	36	CL

Ninyo & Moore

DSHEAR B-5@2.5

DIRECT SHEAR TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

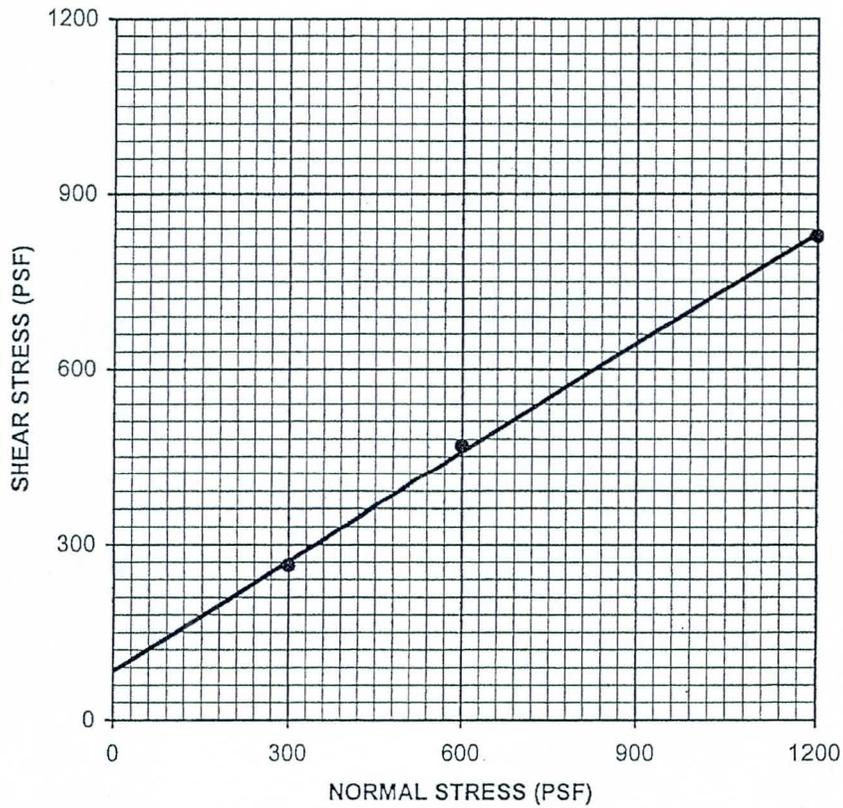
600220001

DATE

10/2001

FIGURE

B-28



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed	—●—	B-5	5-6.5	Peak	84	32	CL

Ninyo & Moore

DSHEAR B-5@5

DIRECT SHEAR TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

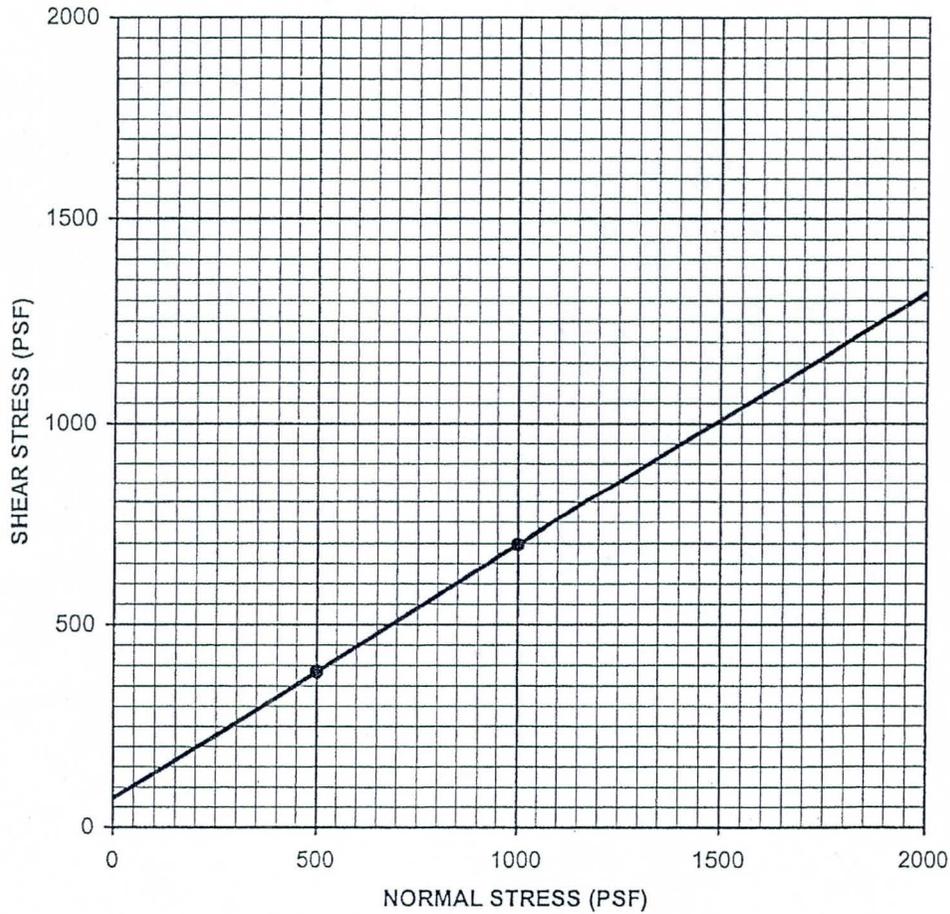
600220001

DATE

10/2001

FIGURE

B-29



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed	—●—	B-5	7.5-9	Peak	72	32	ML

Ningo & Moore

DSHEAR B-5@7.5

DIRECT SHEAR TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO
LAVEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

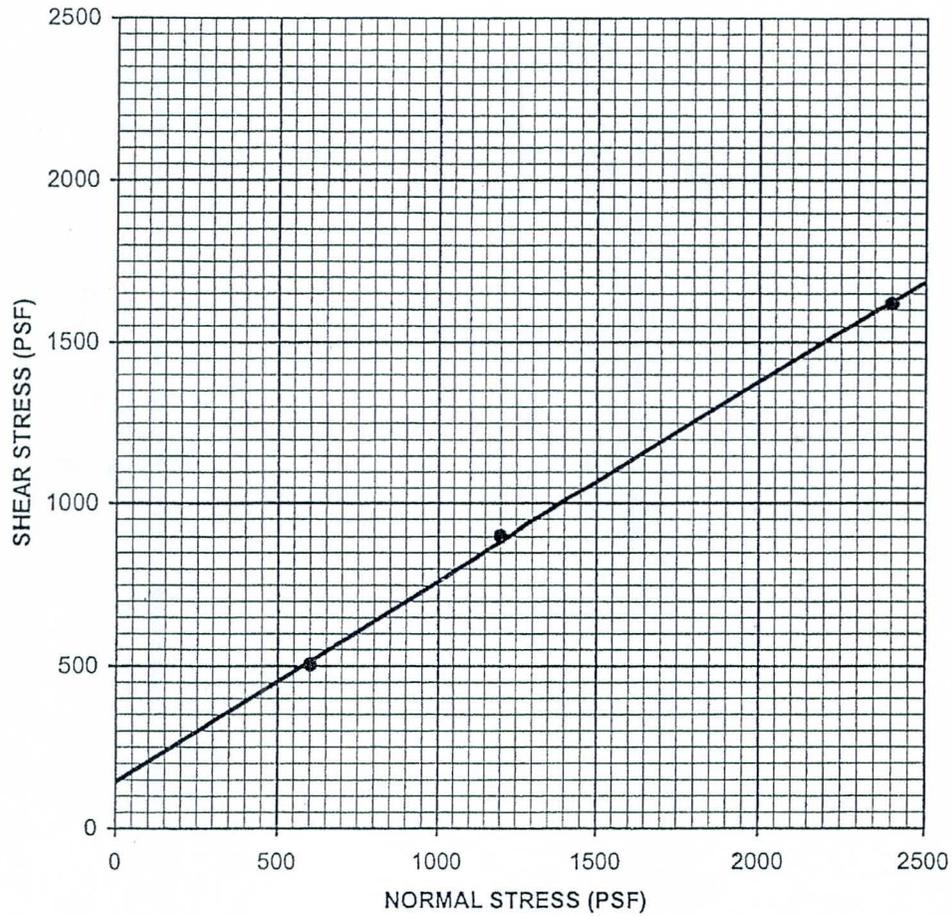
600220001

DATE

10/2001

FIGURE

B-30



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed	—●—	B-5	10-11.5	Peak	144	32	ML

Ninyo & Moore

DSHEAR B-5@10

DIRECT SHEAR TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

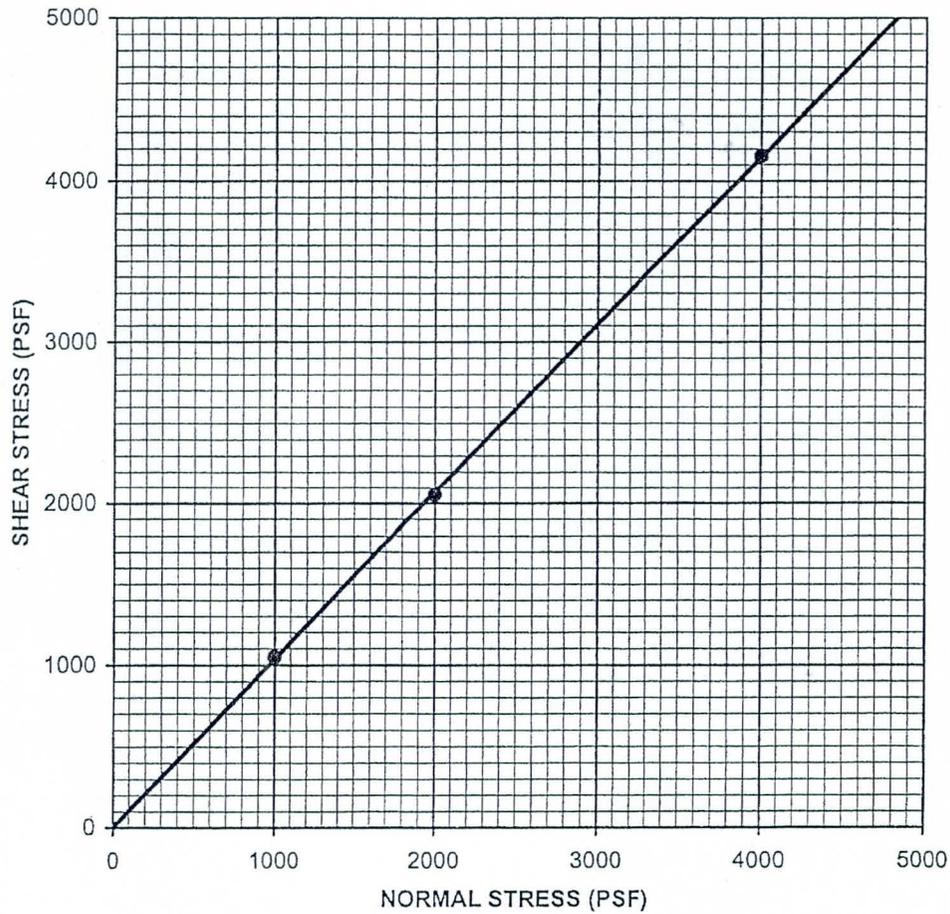
600220001

DATE

10/2001

FIGURE

B-31



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed	—●—	B-5	20-21	Peak	0	46	SP

Ninyo & Moore

DSHEAR B-5@20

DIRECT SHEAR TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.

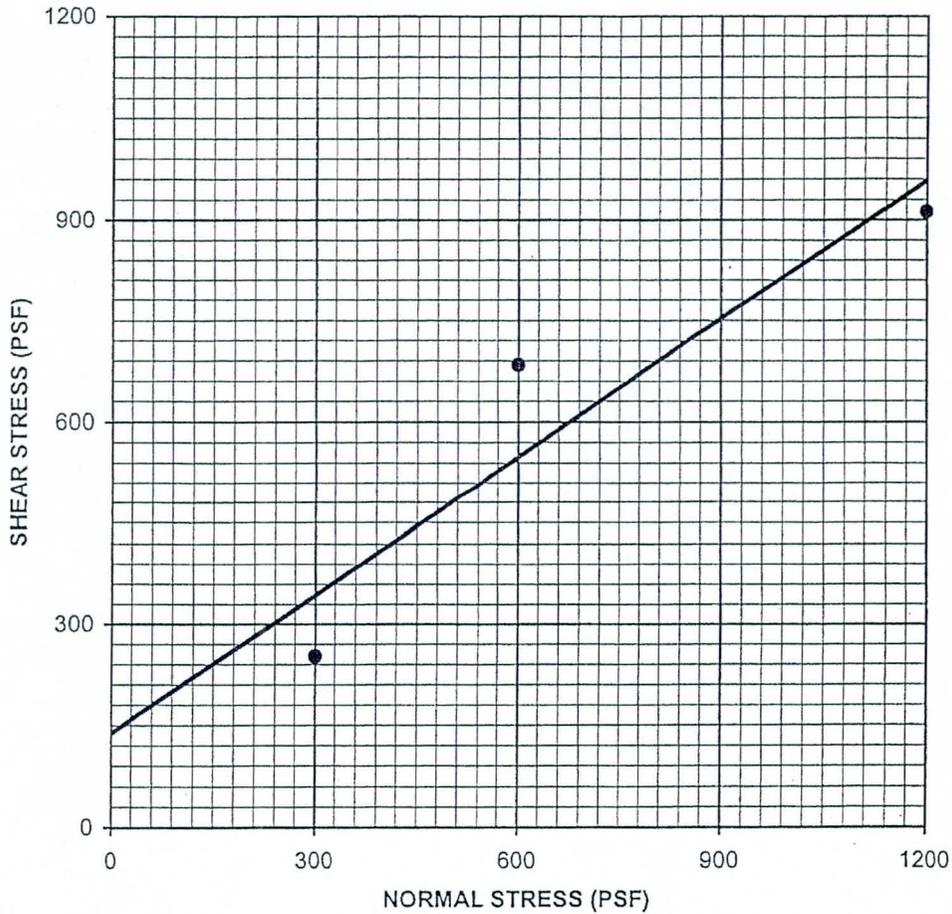
600220001

DATE

10/2001

FIGURE

B-32



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed	—●—	B-6	5-6.5	Peak	138	34	CL

Ningo & Moore

DSHEAR B-6@5

DIRECT SHEAR TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

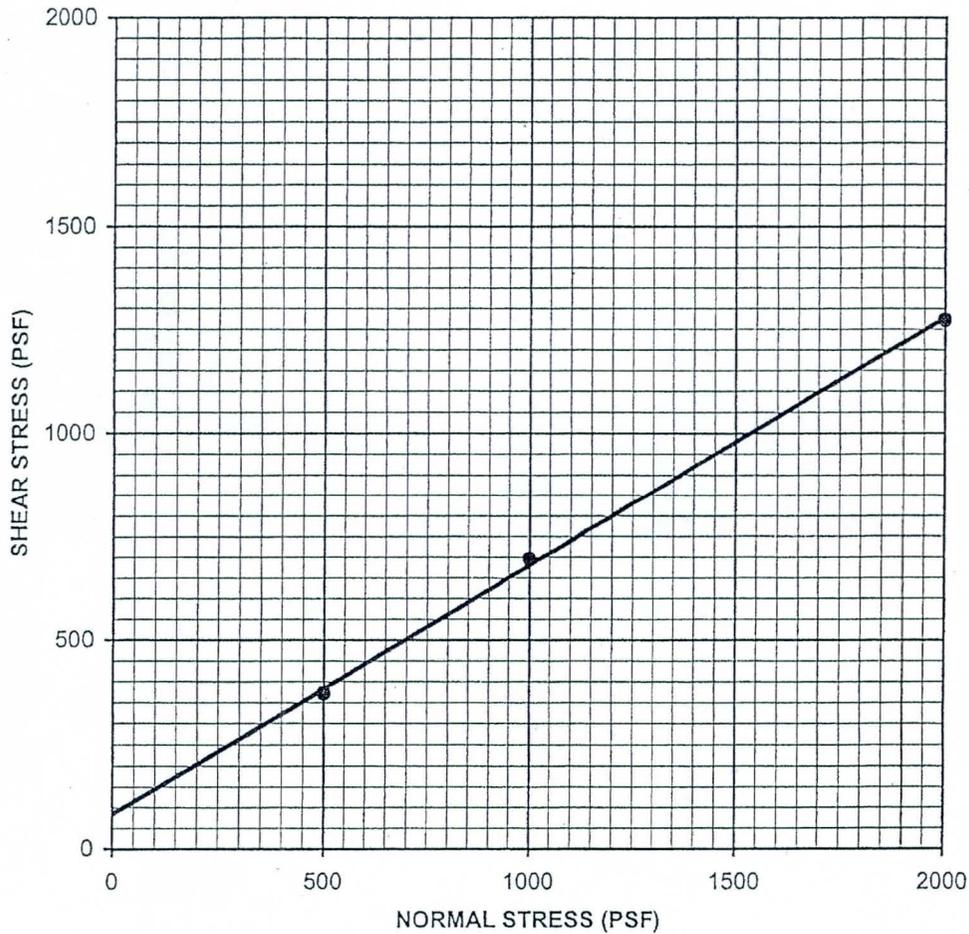
600220001

DATE

10/2001

FIGURE

B-33



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed	—●—	B-6	7.5-9	Peak	84	31	SM

Ninyo & Moore

DSHEAR B-6@7.5

DIRECT SHEAR TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

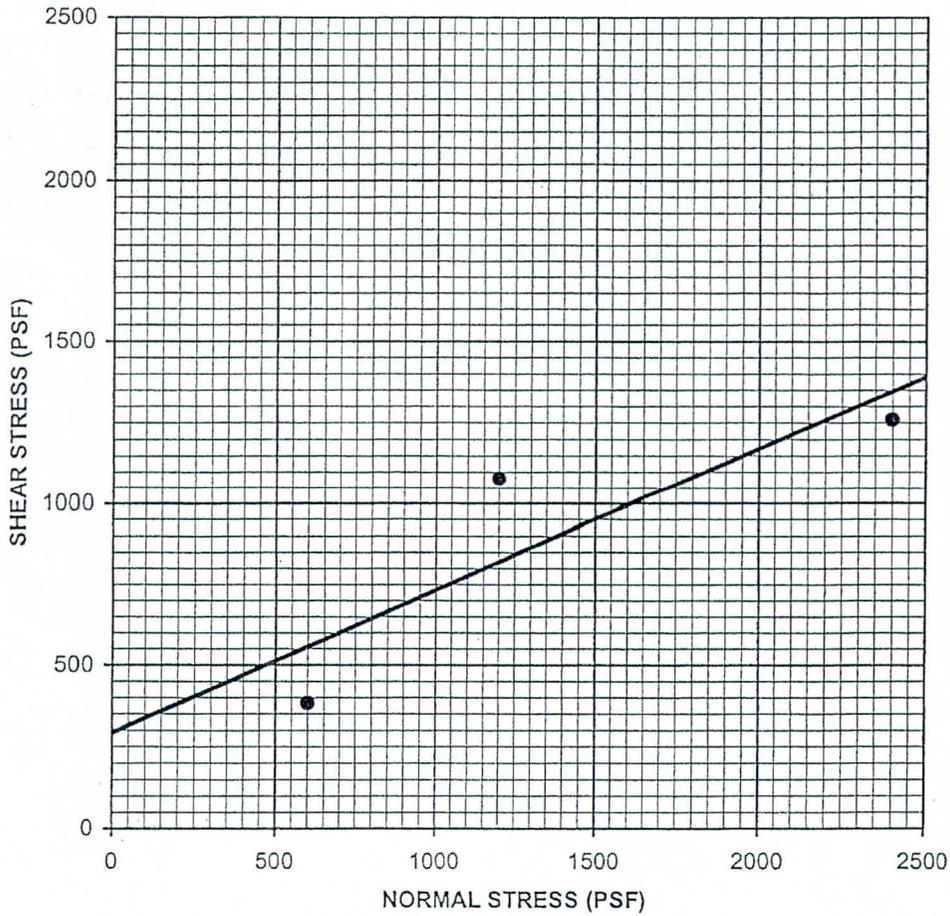
600220001

DATE

10/2001

FIGURE

B-34



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed	—●—	B-6	10-11.5	Peak	294	24	SP

Ninyo & Moore

DSHEAR B-6@10

DIRECT SHEAR TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO
LAVEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

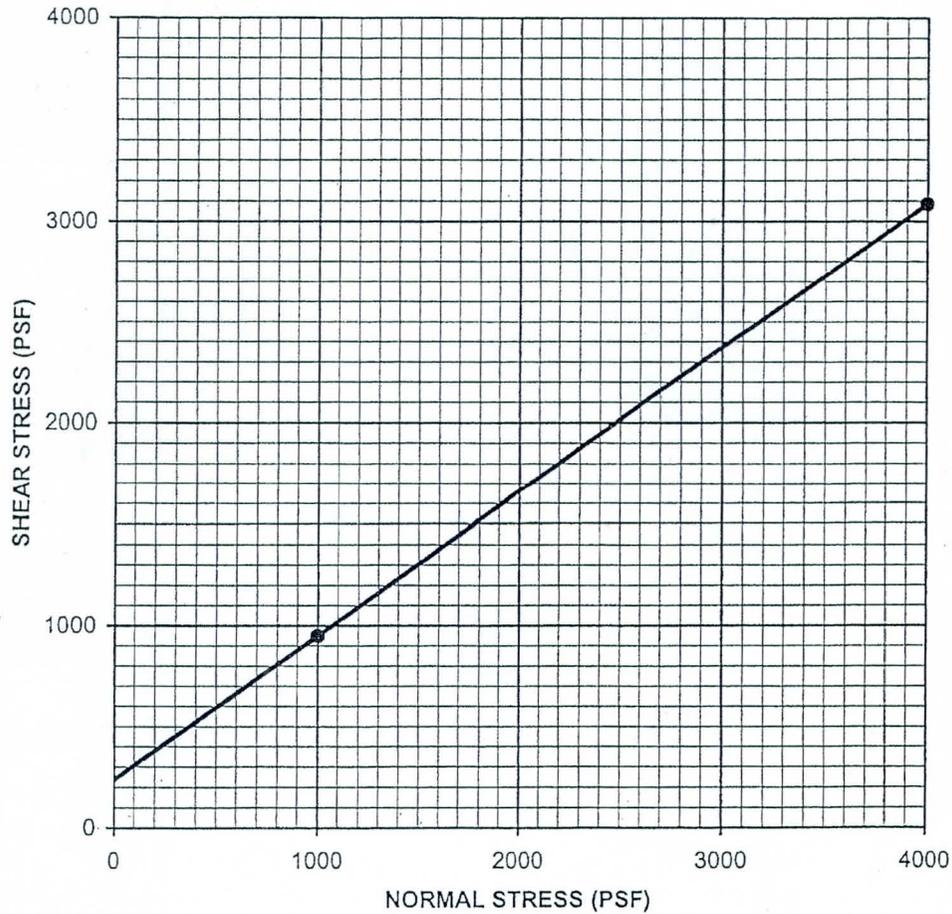
600220001

DATE

10/2001

FIGURE

B-35



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed		B-6	20-21.5	Peak	236	35	SP

Ninyo & Moore

DSHEAR B-6@20

DIRECT SHEAR TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

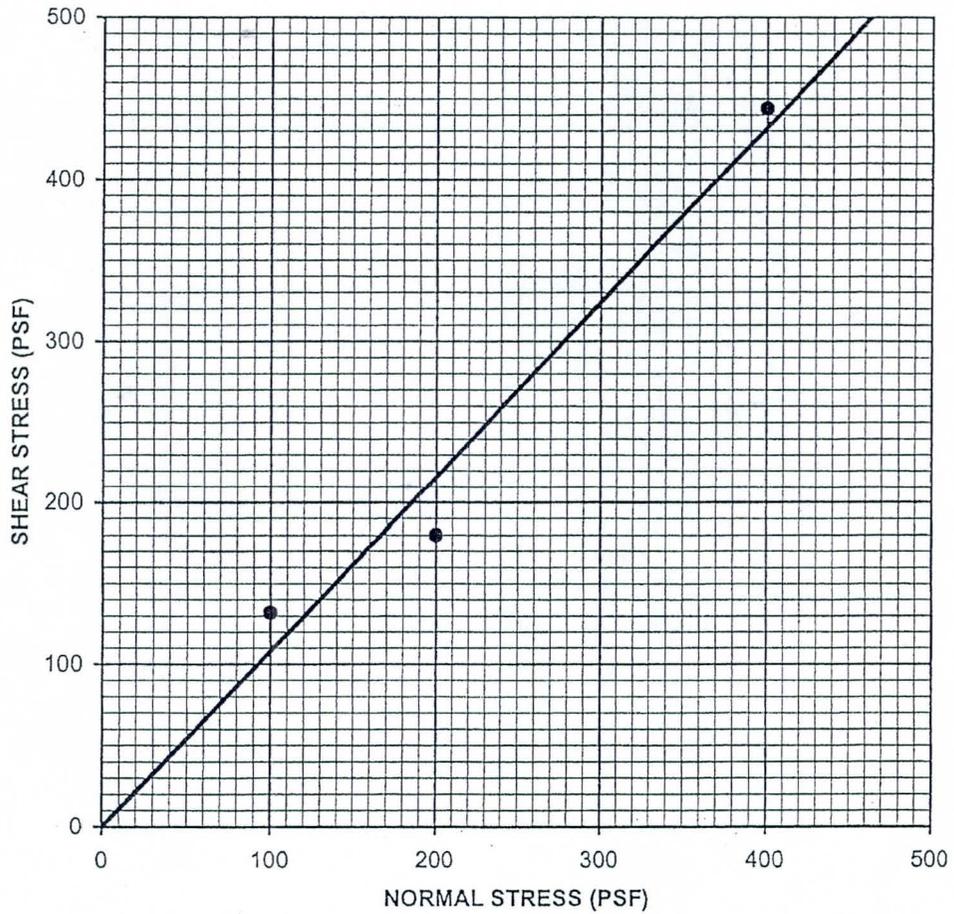
600220001

DATE

10/2001

FIGURE

B-36



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed	—●—	B-8	2.5-4	Peak	0	47	ML

Ninyo & Moore

DSHEAR B-8@2.5

DIRECT SHEAR TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

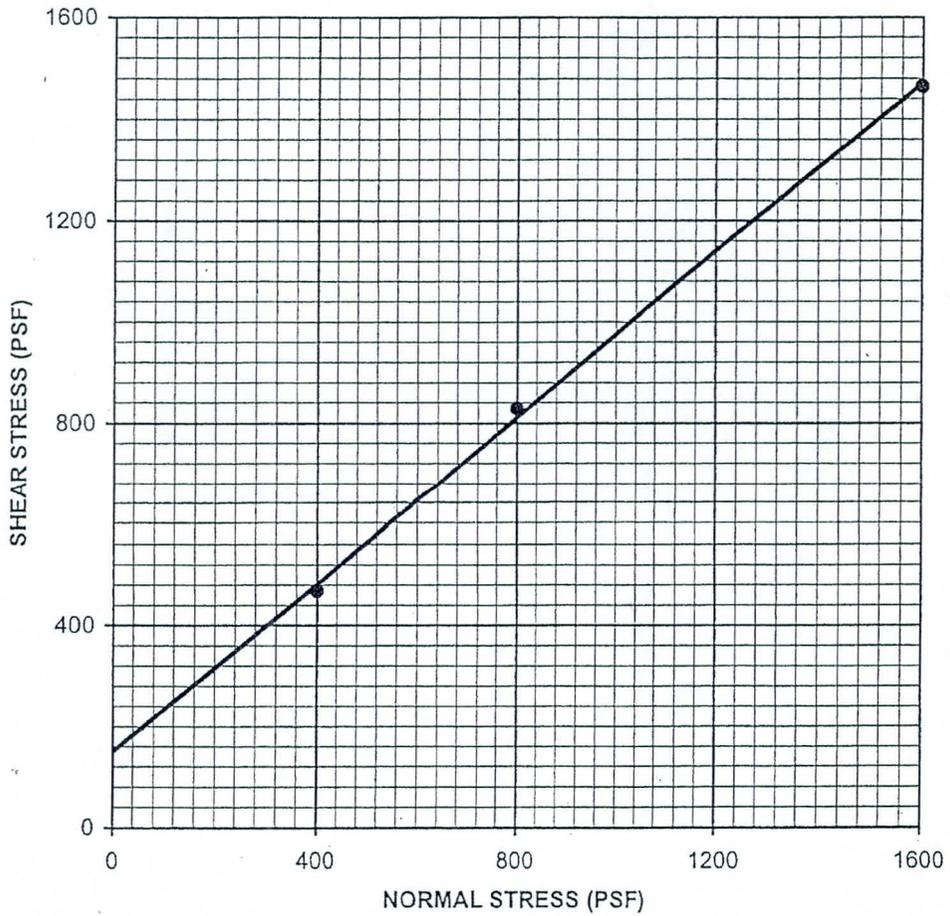
600220001

DATE

10/2001

FIGURE

B-37



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed		B-8	7.5-9	Peak	150	40	SC

Ninyo & Moore

DSHEAR B-8@7.5

DIRECT SHEAR TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO
LAVEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

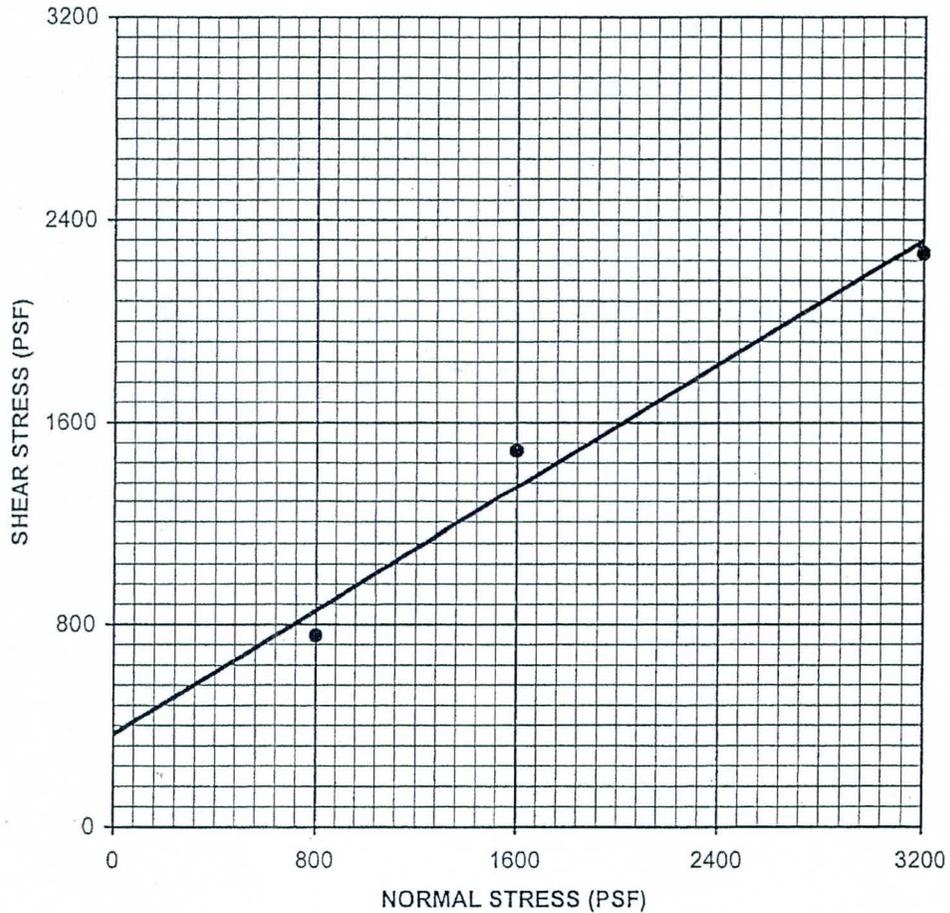
600220001

DATE

10/2001

FIGURE

B-38



Description	Symbol	Boring Number	Depth (ft)	Shear Strength	Cohesion (psf)	Friction Angle (deg)	Soil Type
Undisturbed	—●—	B-8	15-16.5	Peak	366	31	SP

Ninyo & Moore

DSHEAR B-8@15

DIRECT SHEAR TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

DATE

10/2001

FIGURE

B-39

EXPANSION INDEX TEST RESULTS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (PCF)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (IN)	EXPANSION INDEX	EXPANSION POTENTIAL
B-4	0-5	9.7	101.5	24.3	0.0315	27	Low
B-6	0-5	10.2	102.9	25.3	0.043	40	Low
B-13	0-5	9.5	107.3	18.8	0.014	12	Very Low
B-19	0-5	10.0	103.7	21.3	0.0061	4	Very Low
B-21	0-5	9.5	106.6	20.9	0.0194	17	Very Low

PERFORMED IN GENERAL ACCORDANCE WITH UBC STANDARD 18-2

Ninyo & Moore

ASTM-E11.xls

EXPANSION INDEX TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

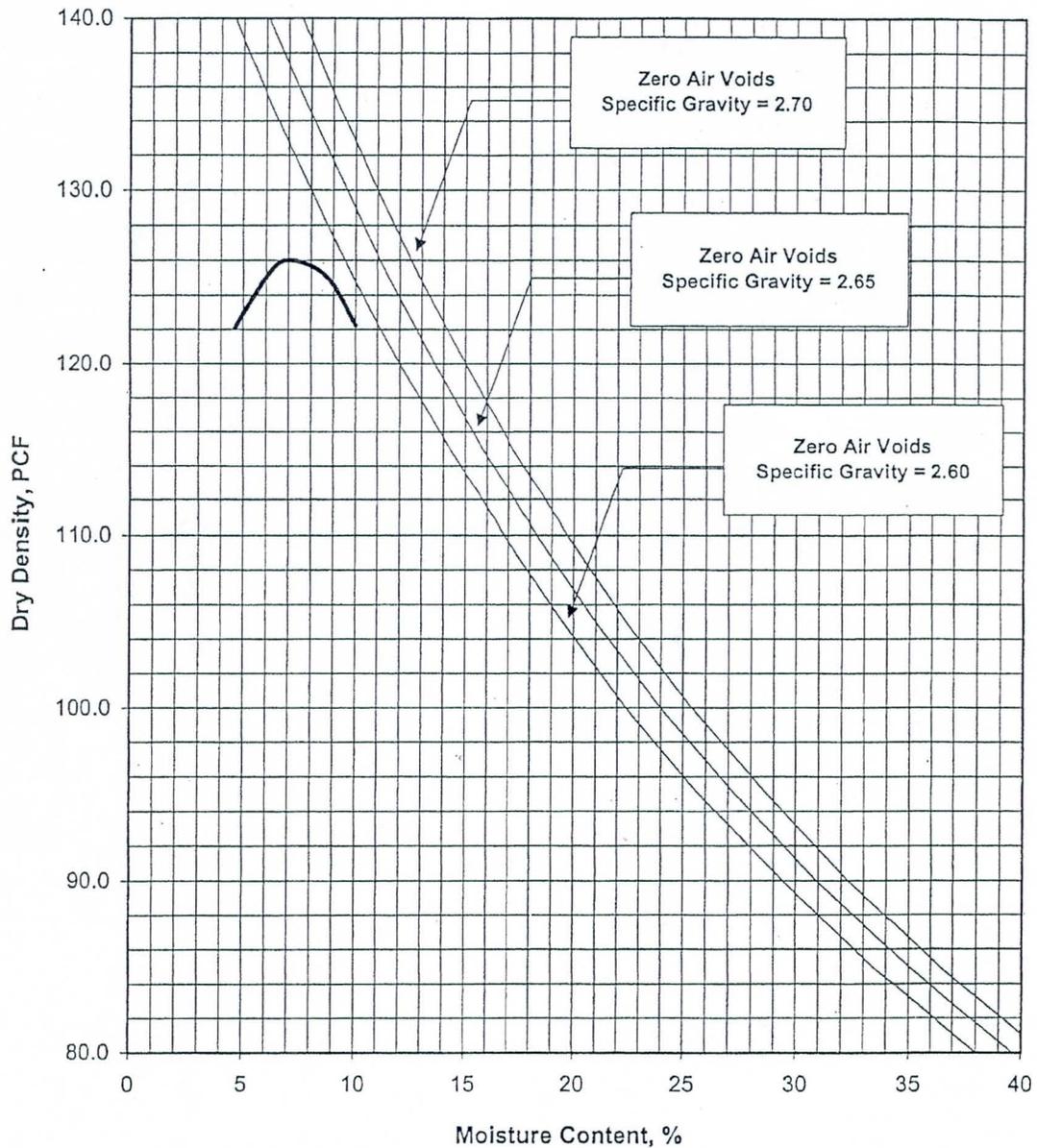
600220001

DATE

10/2001

FIGURE

B-40



SAMPLE LOCATION	DEPTH (FT)	SOIL DESCRIPTION	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)
B-1	0-5	Silty GRAVEL	126.0	7.0

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 698-00a METHOD "C"

Ninyo & Moore

MAXDENSITY B-1(0-5)

MAXIMUM DENSITY TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.

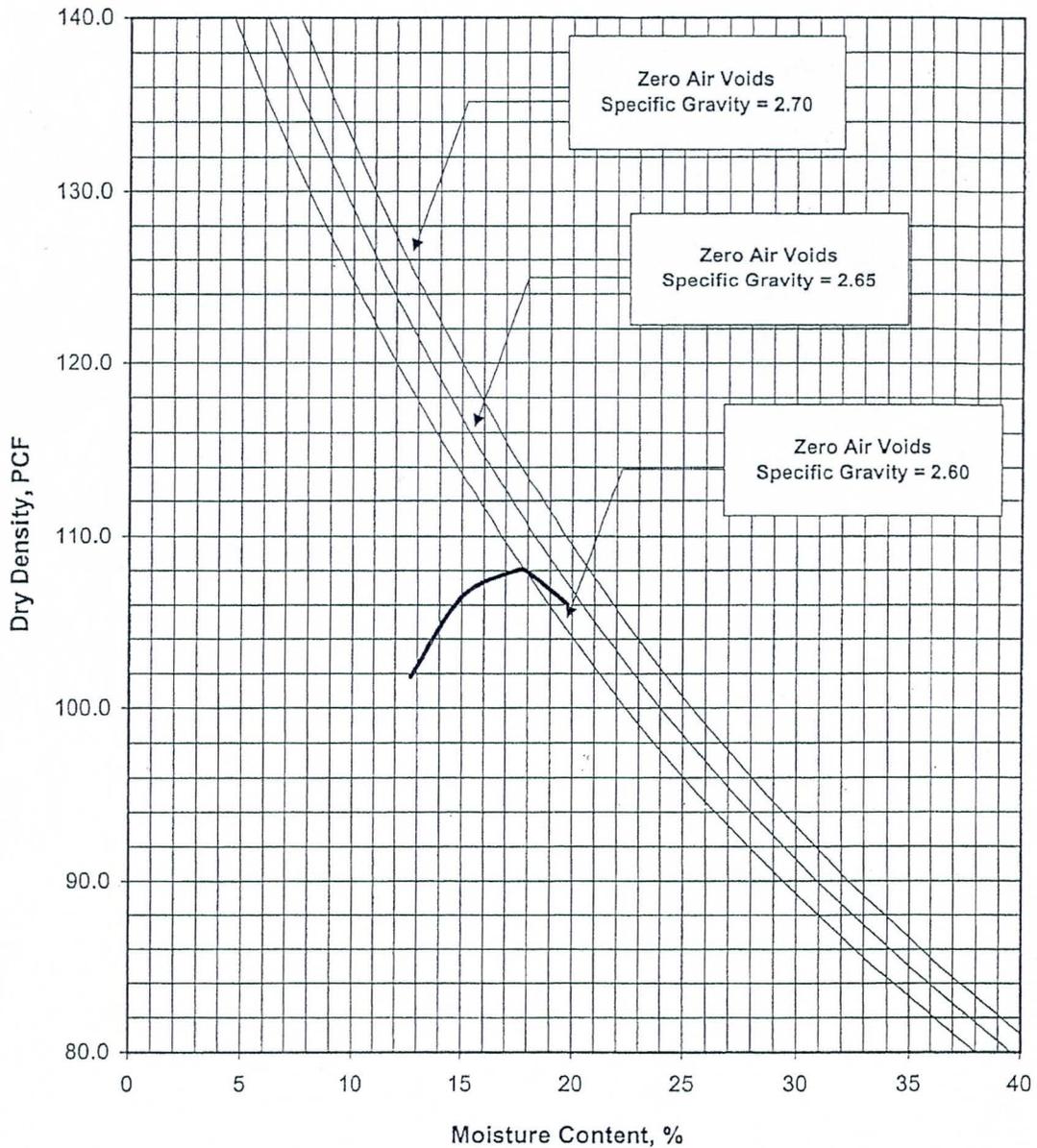
600220001

DATE

10/2001

FIGURE

B-41



SAMPLE LOCATION	DEPTH (FT)	SOIL DESCRIPTION	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)
B-6	0-5	Fine sandy CLAY	108.0	17.5

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 698-00a METHOD "A"

Ninyo & Moore

MAXDENSITY B-6(0-5).xls

MAXIMUM DENSITY TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.

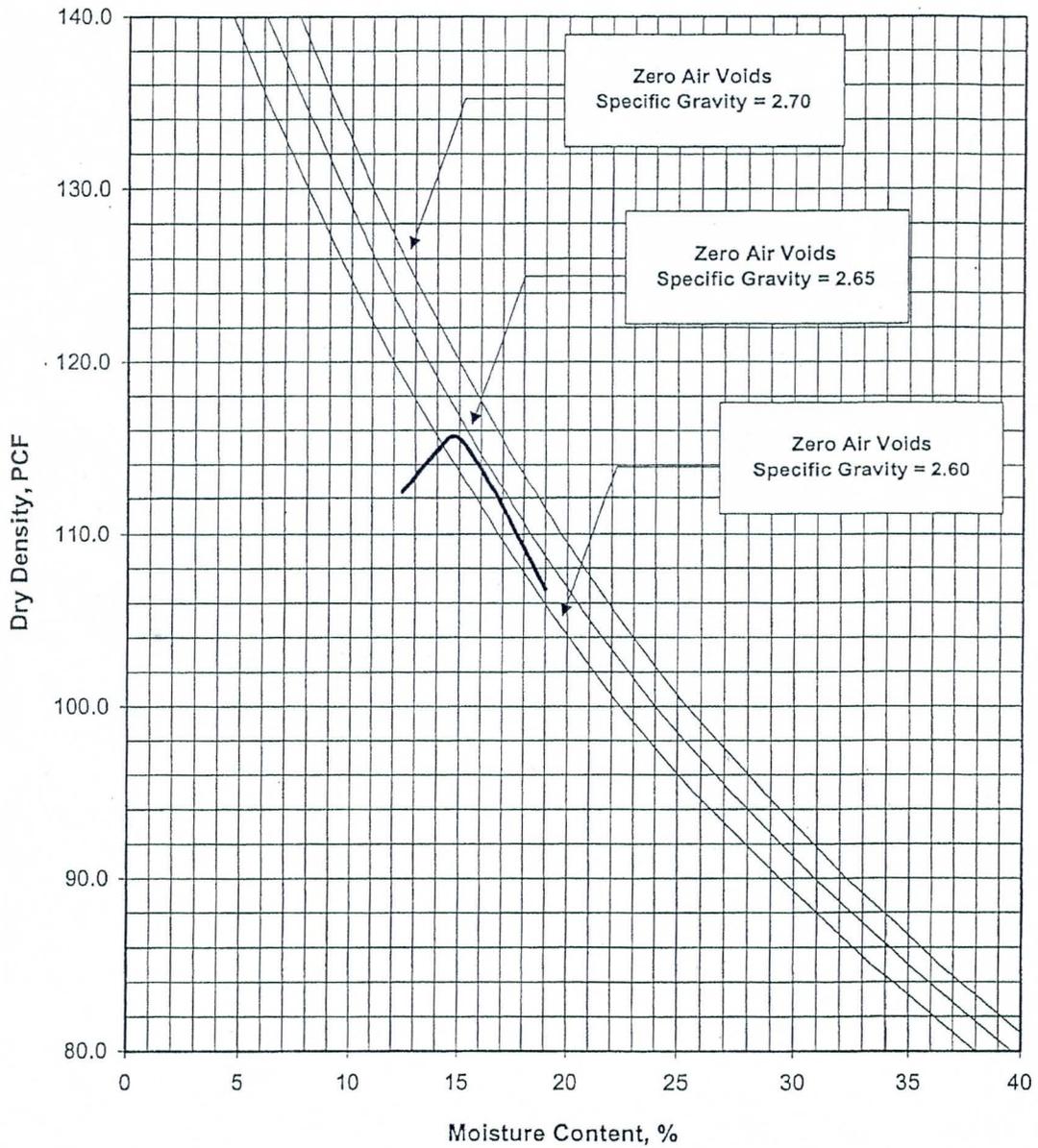
600220001

DATE

10/2001

FIGURE

B-42



SAMPLE LOCATION	DEPTH (FT)	SOIL DESCRIPTION	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)
B-13	0-5	SILT	115.5	15.0

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 698 - 00a METHOD "A"

Ningo & Moore

MAXDENSITY B-13(0-5).xls

MAXIMUM DENSITY TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.

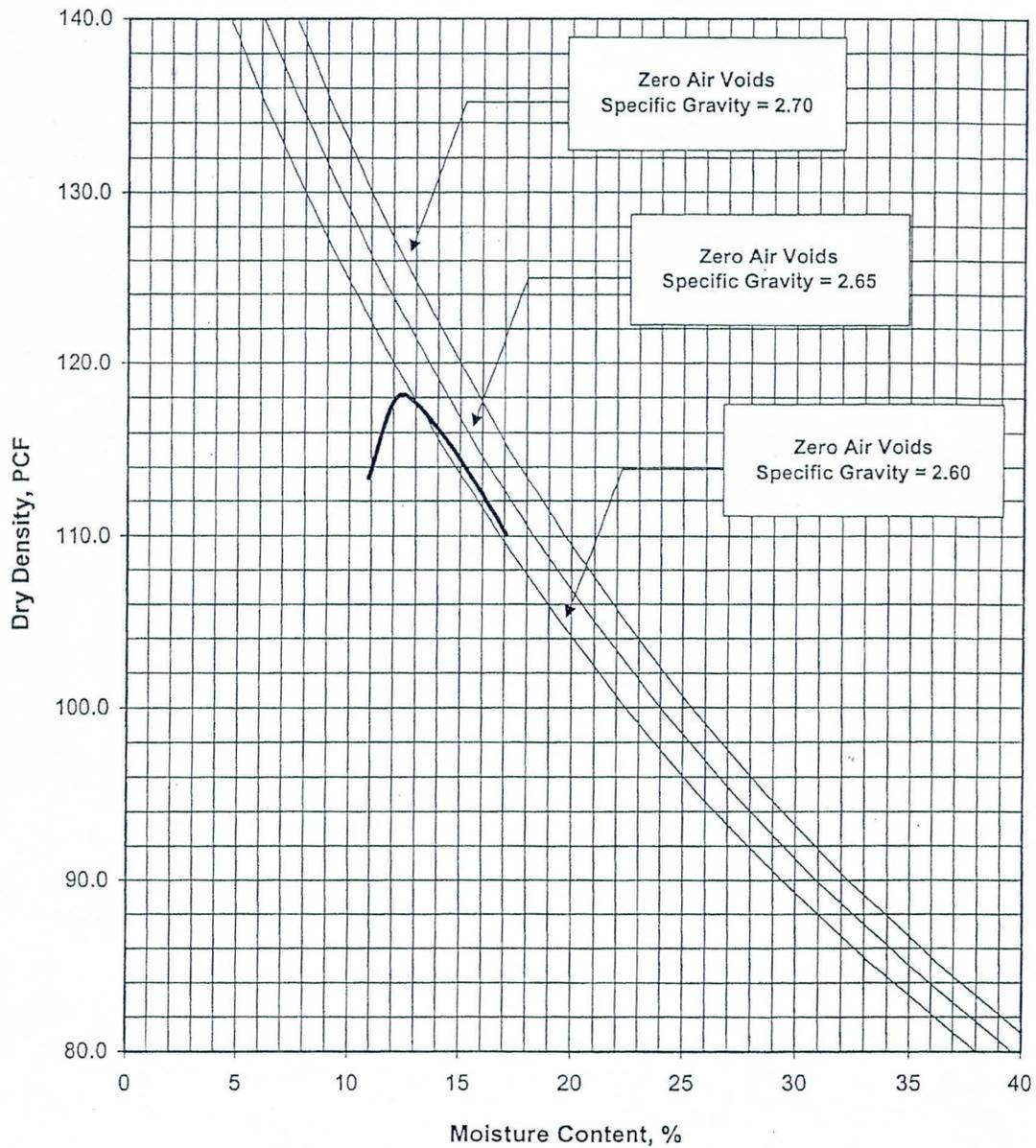
600220001

DATE

10/2001

FIGURE

B-43



SAMPLE LOCATION	DEPTH (FT)	SOIL DESCRIPTION	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)
B-19	0-5	SILT	118.0	12.5

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 698 - 00a METHOD "A"

Ninyo & Moore

MAXDENSITY B-19(0-5)

MAXIMUM DENSITY TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.

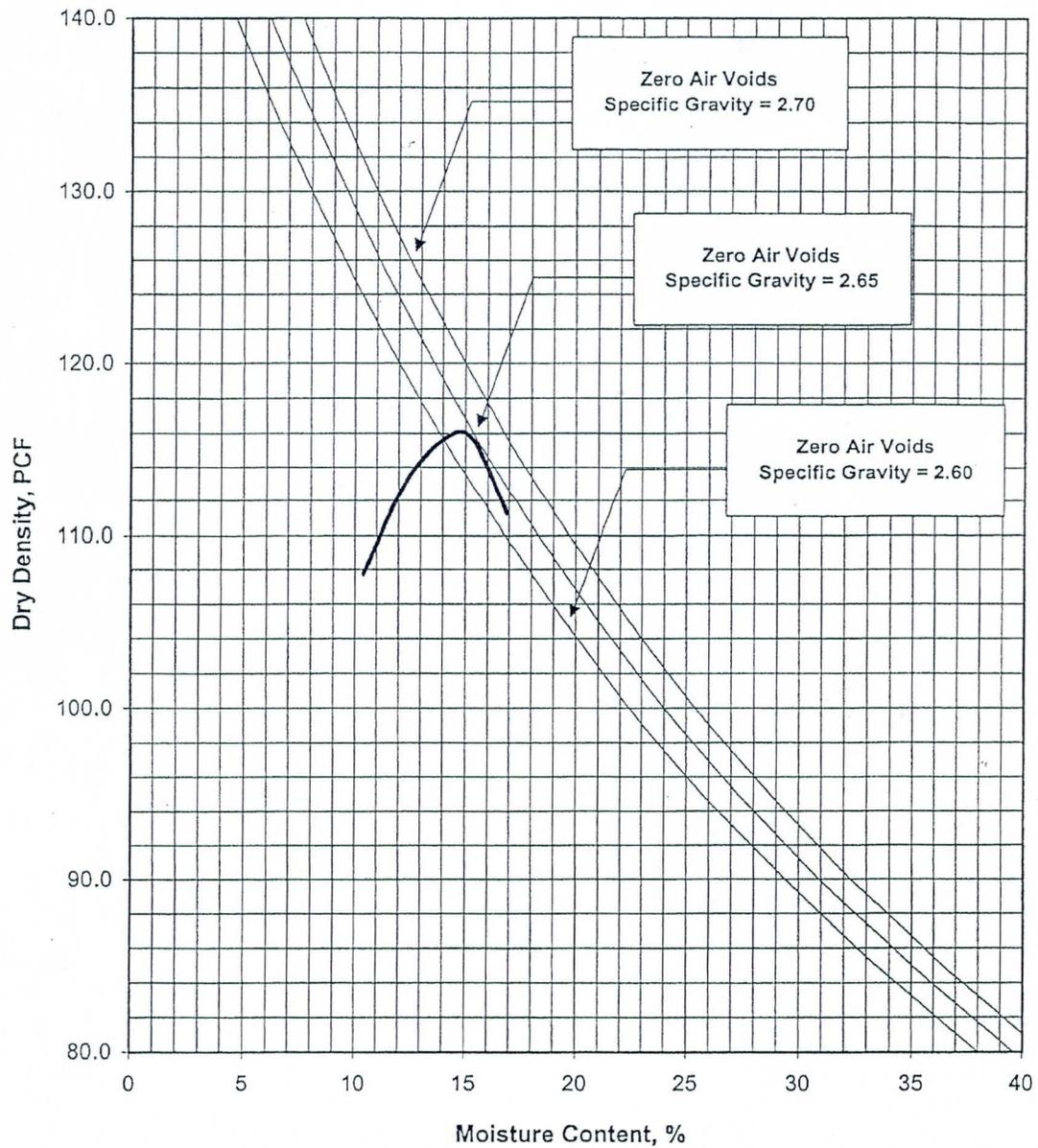
600220001

DATE

10/2001

FIGURE

B-44



SAMPLE LOCATION	DEPTH (FT)	SOIL DESCRIPTION	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)
B-21	0-5	Silty CLAY	116.0	14.5

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 698 - 00a METHOD "A"

Ninyo & Moore

MAXDENSITY B-21(0-5)

MAXIMUM DENSITY TEST RESULTS
 FLOOD CONTROL DISTRICT OF MARICOPA CO.
 LAVEEN AREA CONVEYANCE CHANNEL
 MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

DATE

10/2001

FIGURE

B-45

CORROSIVITY TEST RESULTS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	pH *	RESISTIVITY * (ohm-cm)	WATER-SOLUBLE SULFATE CONTENT IN SOIL ** (%)	CHLORIDE CONTENT *** (ppm)
B-5	0-5	7.1	107	0.230	1900
B-19	0-5	8.1	671	0.008	104

* PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 236b

** PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 733

*** PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 736

Ninyo & Moore

CORROSIVITY1

CORROSIVITY TEST RESULTS

FLOOD CONTROL DISTRICT OF MARICOPA CO.
LAVEEN AREA CONVEYANCE CHANNEL
MARICOPA COUNTY, ARIZONA

PROJECT NO.

600220001

DATE

10/2001

FIGURE

B-46

SPECIAL PROVISIONS

APPENDIX "B"

**DUCTILE IRON PIPE
PLANS AND SPECIFICATIONS**

**Contract FCD 2002C031
Laveen Area Conveyance Channel**

PCN 117.08.31

SALT RIVER PROJECT

IRRIGATION IMPROVEMENTS

SRP ENGINEERING FILE NO. RD-12359

LAVEEN AREA CONVEYANCE CHANNEL

SRP ENGINEER: DONOVAN NEESE
 STANTEC CONSULTING
 TEL. (602) 438-2200
 SRP COORDINATOR: BOB PADILLA
 TEL. (602) 236-4648
 SRP INSPECTOR: FLOYD PETERS
 TEL. (602) 236-5664

CUSTOMER: FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 CUSTOMER'S ENGINEER: BOBBIE OHLER (FCDMC)
 TEL. (602) 506-2943

LEGEND

GENERAL NOTES

KEY PLAN

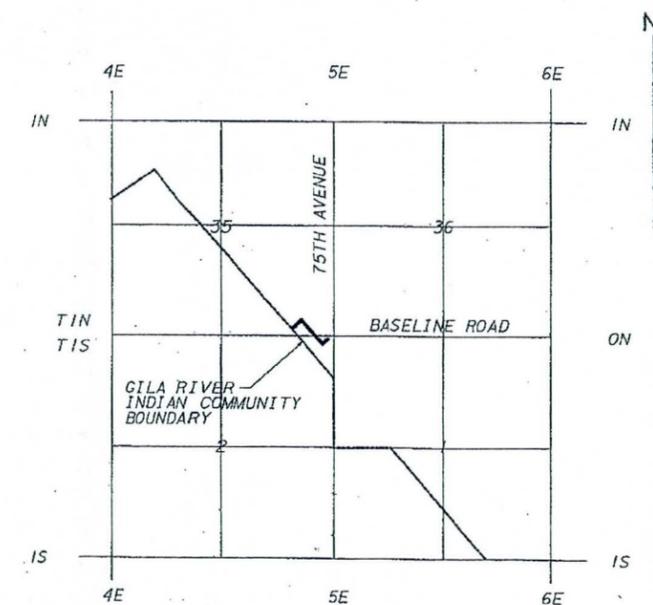
PLAN SYMBOLS

	BENCHMARK		EXISTING MANHOLE
	SECTION CORNER		PROPOSED MANHOLE
	SURVEY POINT (CALLOUT)		FIRE HYDRANT
	SECTION LINE		WATER VALVE
	CONSTRUCTION BASELINE		METER (WATER-W / GAS-G)
	PROPERTY OR RIGHT OF WAY LINE		WATER LINE
	EASEMENT LINE		SEWER LINE
	CENTERLINE		GAS LINE
	EXISTING EDGE OF PAVEMENT		TELEPHONE (DUCT OR CABLE)
	PROPOSED EDGE OF PAVEMENT		UNDERGROUND ELEC (DUCT OR CABLE)
	SLIPPFORM LINING		MANHOLE (NON WUA)
	EXISTING DITCH		STORM DRAIN
	EXISTING PIPE		CATCH BASIN
	PROPOSED PIPE		UTILITY POLE
	EXISTING HEADWALL WITH AND WITHOUT SLIPPFORM		DOWN GUY
	PROPOSED HEADWALL WITH SLIPPFORM		FENCE (WOOD)
	EXISTING HEADWALL/TRASHRACK WITH AND WITHOUT SLIPPFORM		FENCE (WIRE/NOT SPECIFIED)
	PROPOSED HEADWALL/TRASHRACK WITH SLIPPFORM		FENCE (MASONRY)
	EXISTING TURNOUT STRUCTURE		PALM TREE
	PROPOSED TURNOUT STRUCTURE		TREE (TYPE)
	EXISTING FACILITIES (CALLOUT)		STUMP
	PROPOSED FACILITIES (CALLOUT)		MAIL BOX

PROFILE SYMBOLS

	LOW BANK		CENTERLINE OF ROAD
	BED		BED (DRAIN DITCH)
	AVERAGE GROUND LEFT		CATCH BASIN
	AVERAGE GROUND RIGHT		PROPOSED UTILITY
	AVERAGE GROUND (ONE GIVEN)		EXISTING UTILITY
	HIGH WATER		POTHOLED UTILITY
	BED (PRIVATE DELIVERY)		PROPOSED PIPE
	HIGH GROUND		
	LOW GROUND		

- THE CUSTOMER/CONTRACTOR IS RESPONSIBLE TO OBTAIN A PERMIT FOR WORK WITHIN PUBLIC AGENCY R/W AND ASSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL SAFETY REGULATIONS.
- THE WORK SPECIFIED ON THESE PLANS MAY INVOLVE THE USE OF AREAS LOCATED BOTH WITHIN SRP RIGHTS-OF-WAY AND PUBLIC AGENCY RIGHTS-OF-WAY. IF THE PUBLIC AGENCY ISSUES A PERMIT FOR WORK WITHIN ITS RIGHTS-OF-WAY, IT WILL APPLY ONLY TO THE AREA WITHIN THE PUBLIC AGENCY RIGHTS-OF-WAY. SUCH PERMIT SHALL NOT APPLY TO WORK WITHIN SRP RIGHTS-OF-WAY HAVING PRIOR RIGHTS.
- THE CONTRACTOR SHALL CONTACT BLUE STAKE AT (602) 263-1100 AND SUCH OTHER LOCATORS/UTILITIES AS NECESSARY TO LOCATE AND FLAG ALL EXISTING UNDERGROUND UTILITIES BEFORE FIELD CONSTRUCTION BEGINS.
- THE CUSTOMER'S CONTRACTOR IS REQUIRED TO CALL THE SRP INSPECTOR FOR A PRECONSTRUCTION CONFERENCE IN ACCORDANCE WITH THE APPLICABLE SRP LICENSE OR CONSTRUCTION AGREEMENT BEFORE OBTAINING CONSTRUCTION CLEARANCE AND STARTING CONSTRUCTION. CONTRACTOR MUST SIGN A TEMPORARY IRRIGATION OUTAGE AGREEMENT, IF REQUIRED, BEFORE CONSTRUCTION CAN BEGIN.
- ALL CONSTRUCTION WATER AND POWER SHALL BE OBTAINED, HANDLED, AND PAID FOR BY THE CONTRACTOR. THE CONTRACTOR SHALL MAKE ARRANGEMENTS TO PROCURE AND TRANSPORT WATER TO THE CONSTRUCTION SITE. ALL TEMPORARY FACILITIES SHALL BE REMOVED BEFORE FINAL ACCEPTANCE BY SRP.
- ANY QUESTIONS RELATIVE TO THE ACCURACY OF THE IMPROVEMENT INSTALLATION SHALL BE SUBMITTED IN WRITING IMMEDIATELY AND BEFORE COMPLETION OF THE WORK. IF ALL SURVEY STAKES ARE MAINTAINED INTACT AS ORIGINALLY PLACED, SHOULD SUCH STAKES NOT BE PRESENT AND VERIFIED AS TO THEIR ORIGIN, NO CLAIM FOR ADDITIONAL COMPENSATION FOR CORRECTION SHALL BE PRESENTED TO ANY PARTY AND SUCH WORK SHALL BE CORRECTED AND PAID FOR BY THE CONTRACTOR.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL QUANTITIES AND ANY OTHER ITEMS AFFECTING THE BID TO COMPLETE THE WORK SHOWN ON THE PLANS, AND TO BASE THE BID SOLELY UPON VERIFIED QUANTITIES, IRRESPECTIVE OF THE INFORMATION FURNISHED AS NOTED ABOVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE SRP INSPECTOR BEFORE CONSTRUCTION OF ANY SIGNIFICANT DISCREPANCIES BETWEEN THE CONTRACTOR'S ESTIMATED QUANTITIES AND THOSE SHOWN ON THE PLANS.
- THE CUSTOMER IS RESPONSIBLE FOR CLEARING THE PROPOSED SRP IRRIGATION SYSTEM ALIGNMENT BEFORE SRP CONSTRUCTION BEGINS. CLEARING SHALL INCLUDE REMOVAL OF PAVEMENT, CURBS, GUTTERS, SIDEWALKS, SIGNS, UTILITY POLES, STREETLIGHTS, FENCING AND ANY OTHER EXISTING CONFLICTS.
- CONTACT SRP CUSTOMER SERVICE AT (602) 236-8888 FOR REQUIREMENTS FOR PROTECTING, RELOCATING OR REMOVING SRP POWER POLES (INCLUDING DOWN GUYS), UNDERGROUND POWER LINES AND OTHER ELECTRICAL EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR ALL COSTS OF COMPLYING WITH THESE REQUIREMENTS.
- FOR IRRIGATION OUTAGE INFORMATION, CONTACT THE SRP INSPECTOR.
- IF THERE ARE CONFLICTS BETWEEN SRP'S PLANS AND SPECIFICATIONS AND LOCAL GOVERNING REQUIREMENTS, THE MOST STRINGENT REQUIREMENT SHALL APPLY, AS DETERMINED BY THE SRP INSPECTOR.
- ALL TRENCHING SHALL BE DONE IN ACCORDANCE WITH OSHA CONSTRUCTION STANDARDS FOR EXCAVATIONS.
- ALL DELIVERY STRUCTURES WILL BE INSTALLED BY SRP FORCES. ALLOW A MINIMUM OF 30 DAYS BETWEEN ISSUANCE OF THE SRP LICENSE OR NOTICE TO PROCEED, AND THE INSTALLATION OF THE STRUCTURE.
- PIPE BEDDING SHALL BE CLASS "C" OR BETTER, AND BACKFILL SHALL BE PER SRP SPECIFICATIONS FOR PRECAST PIPE, UNLESS OTHERWISE NOTED.
- ALL PRECAST CONCRETE PIPE SHALL BE IN ACCORDANCE WITH ASTM C76 CLASS III WALL B UNLESS OTHERWISE NOTED, AND MEET SRP SPECIFICATIONS FOR PRECAST PIPE.
- ALL EXISTING IRRIGATION FACILITIES DISTURBED BY NEW CONSTRUCTION SHALL BE RECONSTRUCTED TO CURRENT SRP STANDARDS.
- ALL WORK AND MATERIALS THAT DO NOT CONFORM TO THESE PLANS, SPECIFICATIONS AND SRP LICENSES/CONSTRUCTION AGREEMENTS, ARE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
- ALL DUST AND TRAFFIC CONTROLS REQUIRED BY THE LOCAL GOVERNING AGENCY WILL BE OBTAINED, COORDINATED, AND PAID FOR BY THE CONTRACTOR.
- SRP DOES NOT GUARANTEE THE LOCATION OR ELEVATION OF UTILITIES AND WILL NOT BE RESPONSIBLE FOR THEIR RELOCATION.
- THE UTILITIES IDENTIFIED ON THE PLANS MAY NOT REPRESENT ALL EXISTING AND/OR CONFLICTING UTILITIES WITHIN THE PROJECT LIMITS.
- ALL UTILITIES WHICH HAVE BEEN POTHOLED (GENERALLY ALL PIPES OR CONDUITS 2 INCHES OR LARGER IN DIAMETER AND ALL CABLES WITH 25 PAIRS OR GREATER) ARE DESIGNATED IN THE PROFILE WITH THE TERM "PH".
- ALL UTILITIES MUST UNDERCROSS THE PROPOSED SRP PIPELINE AND MAINTAIN A MINIMUM CLEARANCE OF ONE FOOT, UNLESS NOTED OTHERWISE.
- ALL UTILITIES PARALLELING THE PROPOSED SRP PIPELINE MUST MAINTAIN A MINIMUM OF TWO FEET HORIZONTAL CLEARANCE BETWEEN THE OUTSIDE OF THE SRP PIPELINE AND THE OPEN EXCAVATION FOR THE UTILITY.
- LOCATION AND ELEVATION OF ALL BLUE STAKED UTILITIES ARE TO BE FIELD VERIFIED. ALL CONFLICTING UTILITIES ARE TO BE RELOCATED PRIOR TO SRP PIPE INSTALLATION. CONTACT THE UTILITY COMPANY FOR COST AND SCHEDULE REQUIREMENTS FOR RELOCATION.
- VERTICAL CONTROLS ARE BASED ON SEA LEVEL DATUM AS DEFINED BY THE BENCHMARK ON EACH PLAN/PROFILE. VERTICAL CONTROLS MAY DIFFER BETWEEN PLAN/PROFILES. CHECK PLANS FOR ELEVATION EQUATIONS.
- STATIONS SHOWN ON THE PLAN/PROFILE ARE ALONG THE SECTION LINE, UNLESS OTHERWISE NOTED.
- DIMENSIONS LOCATING IRRIGATION MANHOLES AND DELIVERY STRUCTURES ARE FROM THE SECTION LINE TO THE CENTERLINE OF THE MANHOLE, AND TO THE FACE OF THE DELIVERY STRUCTURE RESPECTIVELY, UNLESS OTHERWISE NOTED.
- FACILITIES WHICH ARE NOT SPECIFICALLY LOCATED WITH ACTUAL HORIZONTAL AND VERTICAL CONTROLS ARE LOCATED ONLY APPROXIMATELY AND WITH THE BEST AVAILABLE KNOWLEDGE.
- ALL STAKING CONTROLS SHALL BE LEFT UNDISTURBED. THE CONTRACTOR SHALL CALL THE SRP INSPECTOR TO REFERENCE AND RESET ANY CONTROL POINTS THAT HAVE TO BE DISTURBED. THE CONTRACTOR WILL BE CHARGED FOR RESTAKING COSTS IF ANY STAKES ARE DESTROYED AND REQUIRE REPLACEMENT.
- ELEVATIONS SHOWN FOR IRRIGATION MANHOLES ARE AT THE TOP OF THE PROPOSED SIDEWALK OR FINISHED ROADWAY GRADE AT THE CENTERLINE OF THE MANHOLE (TWO CORNER POINTS FOR THE 5-SIDED MANHOLE), UNLESS OTHERWISE NOTED. THE TOP OF THE MANHOLE SHALL BE STAKED BY THE CUSTOMER'S ENGINEER, AND THE HORIZONTAL OFFSET CHECKED TO VERIFY THAT THE LOCATION IS IN CONFORMANCE WITH THE LATEST REVISIONS TO THE GOVERNING AUTHORITY'S PAVING PLANS. ALL OTHER SRP IRRIGATION STAKING SHALL BE BY SRP FORCES, UNLESS OTHERWISE NOTED.
- THE CUSTOMER'S ENGINEER SHALL VERIFY OR RE-ESTABLISH SECTION CORNERS TO BE USED AS THE BASELINE FOR IRRIGATION FACILITIES AND ALSO STAKE RIGHT-OF-WAY LINES AND TEMPORARY CONSTRUCTION AND PERMANENT EASEMENT LINES. SIDEWALKS AND BACK OF CURBS SHALL BE STAKED AT PROPOSED SRP MANHOLES AND STRUCTURES. ALL STAKING SHALL BE DONE PRIOR TO SRP STAKING NEW IRRIGATION FACILITIES. THE CUSTOMER'S ENGINEER SHALL MAINTAIN REFERENCE STAKES AS REQUIRED FOR THE DURATION OF SRP IRRIGATION SYSTEM CONSTRUCTION.



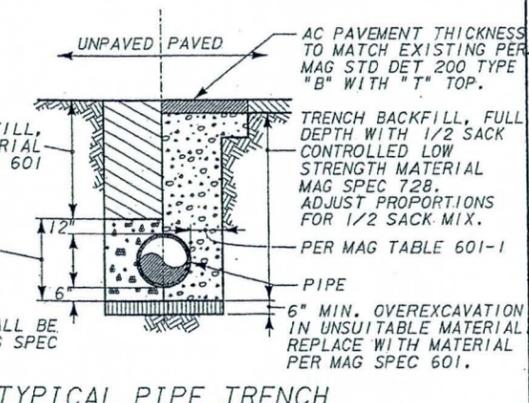
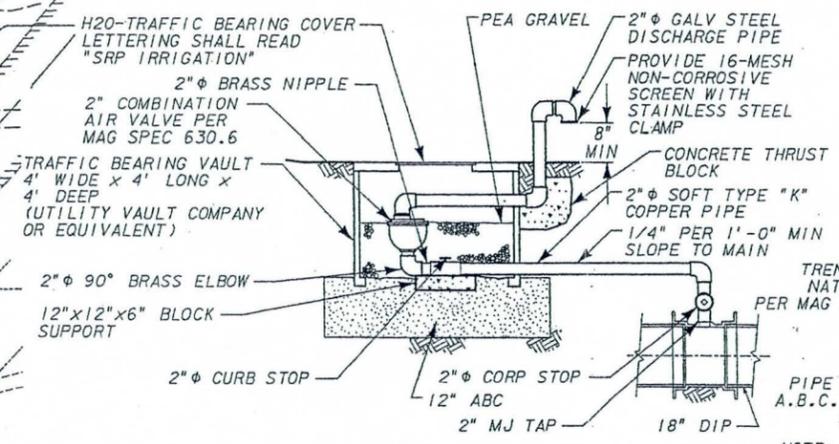
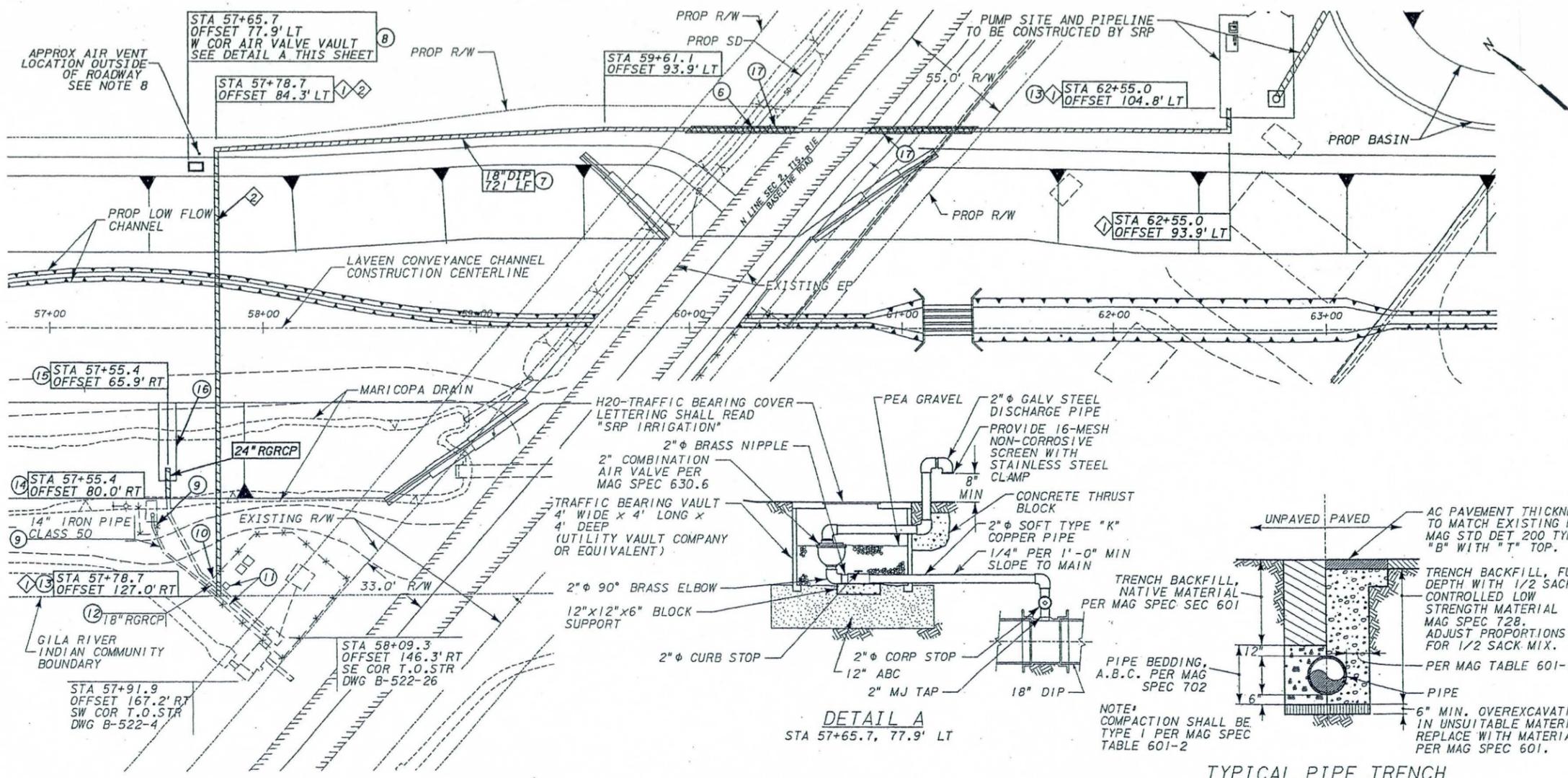
PLAN INDEX

PLAN/PROFILE(S) SHEET 2

DESIGN FOR CONSTRUCTION						
0	RD-12359	DLN	DLN	TRK	BMP	2/20/03
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE
SRP SALT RIVER PROJECT WATER ENGINEERING PHOENIX, ARIZONA						
LAVEEN AREA CONVEYANCE CHANNEL BOOSTER PUMP PIPELINE SEC 2, TIS, RIE NE COR						
SCALE: NONE		TEMPORARY - 12359FSH1.DGN			SHEET NO.	
SUBJ CODE	DIST CODE	DWG SIZE	12359FSH1		1	
CV	Y3	22X34				

C:\1201211\IRRIG.PLS.WDF

RD-12359.DGN
 REF #3: RD12359.DGN
 REF #4: RD12359.DGN
 DATE: 09/22/11
 BY: [REDACTED]
 CHECKED: [REDACTED]
 APPROVED: [REDACTED]
 WDF-PPSNG

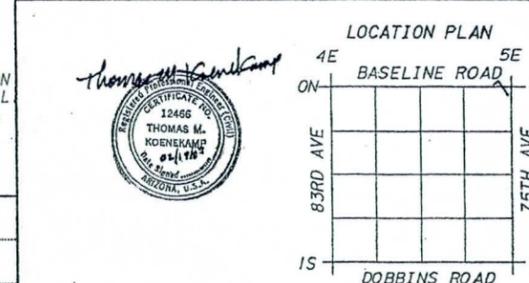


CONSTRUCTION NOTES

- 6 UTILITY CROSSING. SEE GENERAL NOTES FOR REQUIREMENTS CONCERNING BLUE STAKING OF EXISTING UTILITIES. MINIMUM CLEARANCES FROM SRP IRRIGATION FACILITIES AND RELOCATION OF CONFLICTING UTILITIES.
- 7 INSTALL DUCTILE IRON PIPE PRESSURE CLASS 250 PER MAG SPEC 610 DISREGARDING 610.10, 15, 17, 18. PIPE SHALL BE PROTECTED FROM CORROSION BY ENCASEMENT WITH POLYWRAP PER MAG STANDARD SPECIFICATION 610.5. SEE TYPICAL PIPE TRENCH THIS SHEET. STEEL CYLINDER PIPE SHALL NOT BE SUBSTITUTED.
- 8 INSTALL TYPE 2 OBJECT MARKER PER MUTCD, NEAR AIR VENT. AIR VENT TO BE LOCATED OUTSIDE PAVED SURFACE.
- 9 SRP TO REMOVE AND DISPOSE OF PUMP, STATION STRUCTURES, FENCING AND UNDERGROUND IRON PIPE BETWEEN PUMP AND DISCHARGE BOX. PUMPING EQUIPMENT TO BE SALVAGED BY SRP. CONTACT RICH HAAS WITH SRP GROUNDWATER AT (602) 236-5192 14 WORKING DAYS PRIOR TO DEMOLITION OF STATION STRUCTURES AND FENCING.
- 10 TEMPORARILY REMOVE FENCING. INSTALL TEMPORARY FENCING TO ENSURE SECURITY OF SRP FACILITIES. ORIGINAL FENCING TO BE REINSTALLED AFTER CONSTRUCTION OF NEW 18" SRP PIPELINE SYSTEM IS COMPLETE.
- 11 CONTACT RICH HAAS WITH SRP GROUNDWATER AT (602) 236-5192 14 WORKING DAYS PRIOR TO PIPELINE CONSTRUCTION TO RELOCATE SCADA AND ABOVE GRADE PIPE.
- 12 PROTECT IN PLACE.
- 13 INSTALL 18" DIA BLIND FLANGE 6" ABOVE FINISHED GRADE FOR FUTURE CONNECTION BY SRP.
- 14 SRP TO SAWCUT EXISTING PIPE, CONNECT TO NEW EXTENSION PIPE AND INSTALL PIPE COLLAR PER SRP STANDARD DRAWING WES-30300-003. MATCH EXISTING PIPE SLOPE.
- 15 SRP TO STUB PIPE THROUGH AND CUT OFF FLUSH WITH CHANNEL FINISH GRADE.
- 16 SRP TO CONSTRUCT 3" MIN PLASTER BANK 8' X 38' OVER 4X4-W2.9 X W2.9 HWF. TIE TO CHANNEL FINISH GRADE WITH MIN 12" CUT OFF WALL FULL PERIMETER.
- 17 BACKFILL TRENCH WITH FULL DEPTH CLSM TO PROVIDE FOR FUTURE ROADWAY IMPROVEMENTS.

MATERIAL LIST

- 1 18" DIP 90° ELBOW
- 2 18" DIP 11.25° ELBOW



BENCHMARK:
 RB AND CAP AT CORNER OF
 75TH AVE AND BASELINE RD
 ELEV. 986.97
 FCDMC PROJECT No. 1170831

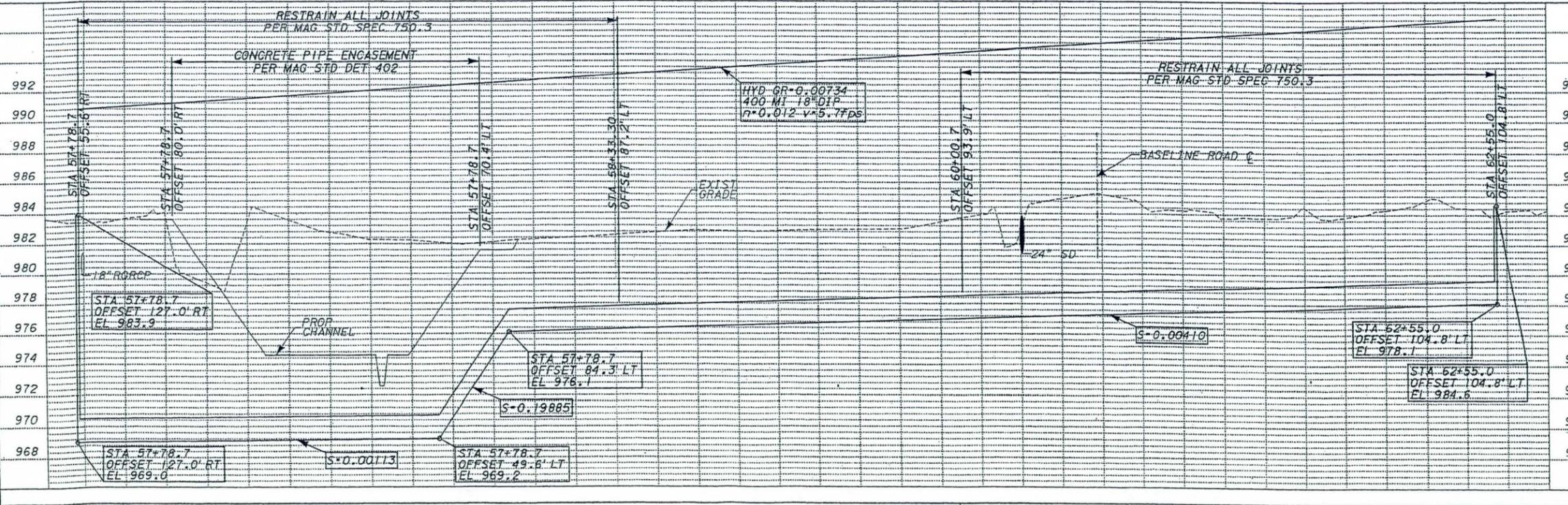
DESIGN FOR CONSTRUCTION BY STANTEC
 STA 57+55.44 TO STA 62+55.00

REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE
0	RD-12359	DLN	DLN	TMK	BMP	2/20/03



**LAVEEN AREA
 CONVEYANCE CHANNEL
 BOOSTER PUMP PIPELINE
 SEC 2, T1S, R1E
 NE COR**

SCALE: PLAN 1"=30', PROFILE 1"=4' | C120, 1173B1120683.DGN
 SUBJ CODE: DIST CODE: DWG SIZE: PP Y2 22X34
 SHEET NO. B-112-0683 2



SPECIAL PROVISIONS

APPENDIX "C"

**IRRIGATION SLEEVING
PLANS AND SPECIFICATIONS**

**Contract FCD 2002C031
Laveen Area Conveyance Channel**

PCN 117.08.31

SECTION 440- LANDSCAPE IRRIGATION SYSTEM SLEEVE AND PIPE INSTALLATION

Landscape irrigation system installation shall reference the latest MAG Uniform Standard Specifications Section 440 and shall conform to the latest City of Phoenix (COP) Supplement Specification Section 440 except as modified herein.

Subsection 440.1 - General

Add the following to this subsection:

The work shall consist of the installation of pipe and sleeves as shown on the plans for the future Irrigation System.

The Contractor shall install all irrigation mainlines, sub-main lines, and sleeves as shown on the plans. All new materials and fittings for irrigation lines, sleeves, etc. shall satisfy the requirements of MAG Section 440 and MAG Section 757. All ductile iron pipe shall satisfy the requirements of MAG Section 750.

Subsection 440.1.2 - Work by the Power Company

Add the following to this subsection:

The Contractor shall coordinate with SRP to provide the future electrical service for the irrigation system.

Subsection 440.4.2 - Record Drawings

Add the following to this subsection:

The Contractor shall maintain an accurate set of as-built plans on site. At the end of each day work accomplished shall be updated on the as-built plans. The Contractor shall verify the station and offsets as shown on the plans, any deviations shall be corrected on the as-built plans for the following:

- A. Main line and sub-main line pipes
- B. PVC Sleeves

Subsection 440.5 - Permits

Add the following to this subsection:

All permits for installation or construction of the work included under this section, which are required by legally constituted authorities having jurisdiction, shall be obtained and paid for by the Contractor, each at the proper time (except for permits required by the City of Phoenix, which shall be obtained by the Contractor and paid for by others). He shall also arrange for and pay all costs in connection with any inspections and examinations required by these authorities.

Subsection 440.6.1 - Staking

Add the following to this subsection:

Contractor shall provide construction stakes locating the pipes and sleeves as stationed on the plans.



Subsection 440.6.2 - Trench Excavation

Add the following to this subsection:

All trench widths and minimum cover shall comply with the Utility Pack Details as shown on the plans.

Grading and Stockpiling of trenched materials shall comply with Section 601.2.8.

Subsection 440.6.3 - Sleeving

Add the following to this subsection:

Piping located under asphalt, concrete, or other pavements shall be sleeved, size and schedule as noted on the plan. If not noted, sleeves shall be Schedule 40, sized to easily accommodate piping. Use separate sleeve for wiring. Install a 2x4 pressure treated stake and both ends of all sleeves and pipes. The stake shall extend above grade a minimum of 12" and the tops shall be painted orange.

Subsection 440.6.4 - Piping

Add the following to this subsection:

Provide pipes, schedule and size as shown on the drawings and per Section 757, with the exception of ductile iron pipe that shall conform to Section 750.

Subsection 440.6.9 - Bedding, Backfilling and Compaction

Add the following to this subsection:

Pipe shall be bedded in at least 6-inches of finely graded native soil or sand to provide a firm, uniform bearing. After laying, the pipe shall be surrounded with additional finely grained native soil or sand to at least 4 inches over the top of the pipe.

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

Thrust blocking shall be formed against a solid trench wall that has been hand excavated. The size and type of the thrust blocking shall be as per the drawings. Control wire shall not be concealed within the thrust blocking.

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

Trenches and excavations shall be backfilled with clean material from excavations. Remove organic material as well as rocks larger than 1 inch in diameter. Place acceptable backfill material in lifts, the height of which shall not exceed that which can be effectively compacted, depending on the type of equipment and methods used. Trenches and excavations shall be backfilled so that the specified thickness of topsoil is restored to the upper part of the trench. Compaction shall be in accordance with Section 301. Water settling of the trenches will not be permitted unless approved by the Engineer.

Subsection 440.11 - Measurement and Payment

Add the following to this subsection:

Payment for the irrigation system sleeving and piping shall be made on the basis of the linear foot price bid. This price shall be full compensation for all labor, materials, and equipment required to complete the installation of the irrigation system sleeves and pipes according to the plans.

- ITEM 440-1 – 2” SCH 40 PVC SLEEVE**
- ITEM 440-2 – 4” SCH 40 PVC SLEEVE**
- ITEM 440-3 – 8” SCH 40 PVC SLEEVE**
- ITEM 440-4 – UTILITY PACK #1 W/ 8” DIP MAINLINE**
- ITEM 440-5 – UTILITY PACK #1 W/ 12” DIP MAINLINE**
- ITEM 440-6 – UTILITY PACK #2**
- ITEM 440-7 – UTILITY PACK #3**
- ITEM 440-8 – UTILITY PACK #4**
- ITEM 440-9 – UTILITY PACK #5**
- ITEM 440-10 – UTILITY PACK #5A**
- ITEM 440-11 – UTILITY PACK #6**
- ITEM 440-12 – UTILITY PACK #7**
- ITEM 440-13 – UTILITY PACK #8**
- ITEM 440-14 – UTILITY PACK #9**
- ITEM 440-15 – UTILITY PACK #10**
- ITEM 440-16 – UTILITY PACK #11**
- ITEM 440-17 – 6” DIP CHANNEL CROSSING COMPLETE**
- ITEM 440-18 – 8” DIP CHANNEL CROSSING COMPLETE**
- ITEM 440-19 – 12” DIP CHANNEL CROSSING COMPLETE**
- ITEM 440-20 – ELECTRICAL PULL BOXES**

S L E E V I N G Q U A N T I T Y S U M M A R Y

ITEM NO.	ITEM DESCRIPTION	UNIT	SHEET NUMBERS							TOTAL QUANTITY
			SL2	SL3	SL4	SL5	SL6	SL7		
440-1	2" SCH 40 PVC SLEEVE	LF	62	44	76	78	126	54		440
440-2	4" SCH 40 PVC SLEEVE	LF	514	540	534	516	338	392		2,834
440-3	8" SCH 40 PVC SLEEVE	LF				14				14
440-4	UTILITY PACK #1 W/ 8" DIP MAINLINE	LF	92							92
440-5	UTILITY PACK #1 W/ 12" DIP MAINLINE	LF			40	120				160
440-6	UTILITY PACK #2	LF	92		40	120	138			390
440-7	UTILITY PACK #3	LF	92							92
440-8	UTILITY PACK #4	LF				70	65			135
440-9	UTILITY PACK #5	LF				75	65			135
440-10	UTILITY PACK #5A	LF				125				125
440-11	UTILITY PACK #6	LF					138			138
440-12	UTILITY PACK #7	LF			40					40
440-13	UTILITY PACK #8	LF					138			138
440-14	UTILITY PACK #9	LF			20					20
440-15	UTILITY PACK #10	LF					40			40
440-16	UTILITY PACK #11	LF				52				52
440-17	6" DIP CHANNEL CROSSING	LF	351	158	160	164	136	142		1273
440-18	8" DIP CHANNEL CROSSING	LF			162					162
440-19	12" DIP CHANNEL CROSSING	LF				288				288
440-20	ELECTRICAL PULL BOXES	EA	4		4	2	4			14



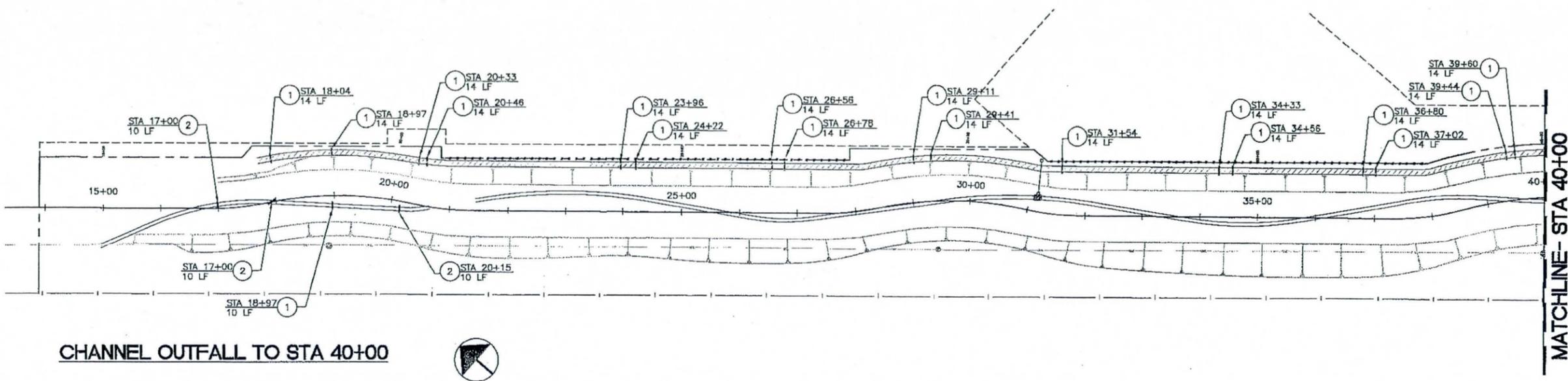
3	-	-	-
2	-	-	-
1	-	-	-
NO.	REVISION	BY	DATE

**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY**
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1-7.08.31

	DESIGNED	JSP	3/03
	DRAWN	JSP	3/03
	CHECKED	APP	3/03
URS		<small>7720 N. 16TH STREET, SUITE 100 PHOENIX, ARIZONA 85008 602.234.1500 FAX 602.230.9188 FAX</small>	

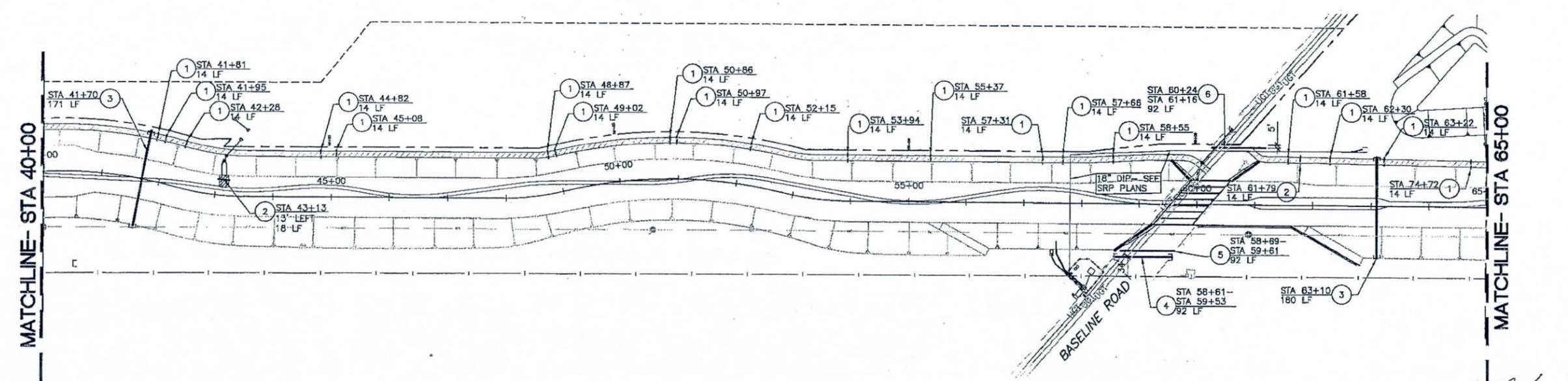
CONSTRUCTION NOTES

- ① INSTALL (1) 4" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SLB- LENGTH AND LOCATION PER PLAN
- ② INSTALL (1) 2" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SLB- LENGTH AND LOCATION PER PLAN
- ③ INSTALL 6" IRRIGATION MAINLINE CHANNEL CROSSING, PER DETAIL 1, SHEET SLB.
- ④ INSTALL UTILITY PACK #1 W/ 8" DUCTILE IRON IRRIGATION MAINLINE PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN
- ⑤ INSTALL UTILITY PACK #2 PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN
- ⑥ INSTALL UTILITY PACK #3 PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN



CHANNEL OUTFALL TO STA 40+00

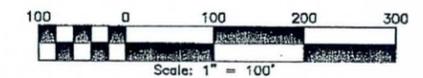
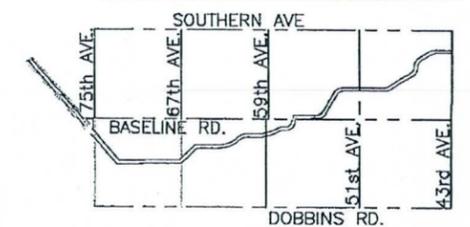
MATCHLINE- STA 40+00



STA 40+00 TO STA 65+00

MATCHLINE- STA 65+00

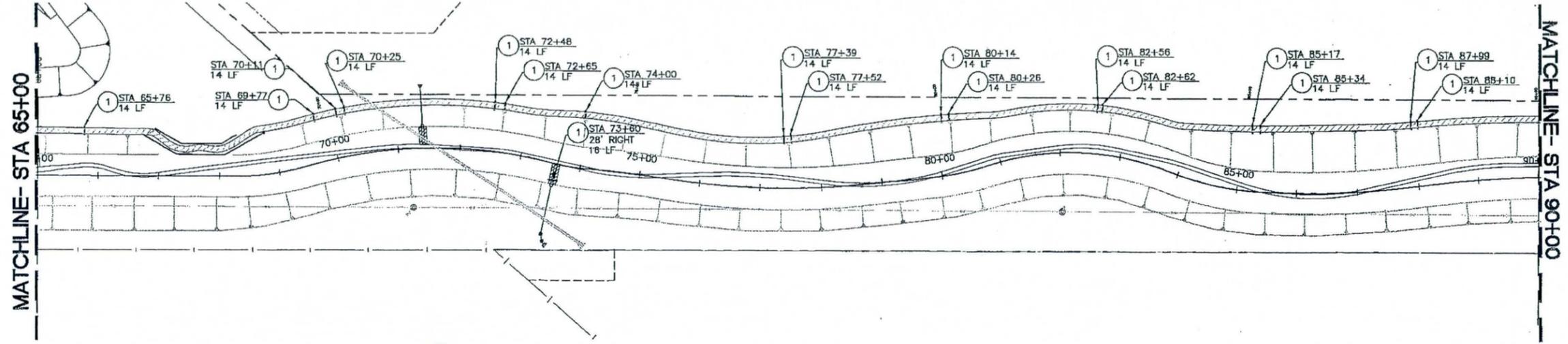
KEY MAP



3	-	-	-
2	-	-	-
1	-	-	-
NO.	REVISION	BY	DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY LAVEEN AREA CONVEYANCE CHANNEL FCD PROJECT NO. 147.08.31			

	DESIGNED	AKR, JSP	3/03
	DRAWN	CJW	3/03
	CHECKED	AKR	3/03
	URS 7700 N. 158th STREET, SUITE 100 PHOENIX, ARIZONA 85020 602.234.1290 FAX 602.234.9999		
DRAWING NO.	SLEEVING PLAN		SHEET OF
SL2			2 - 10



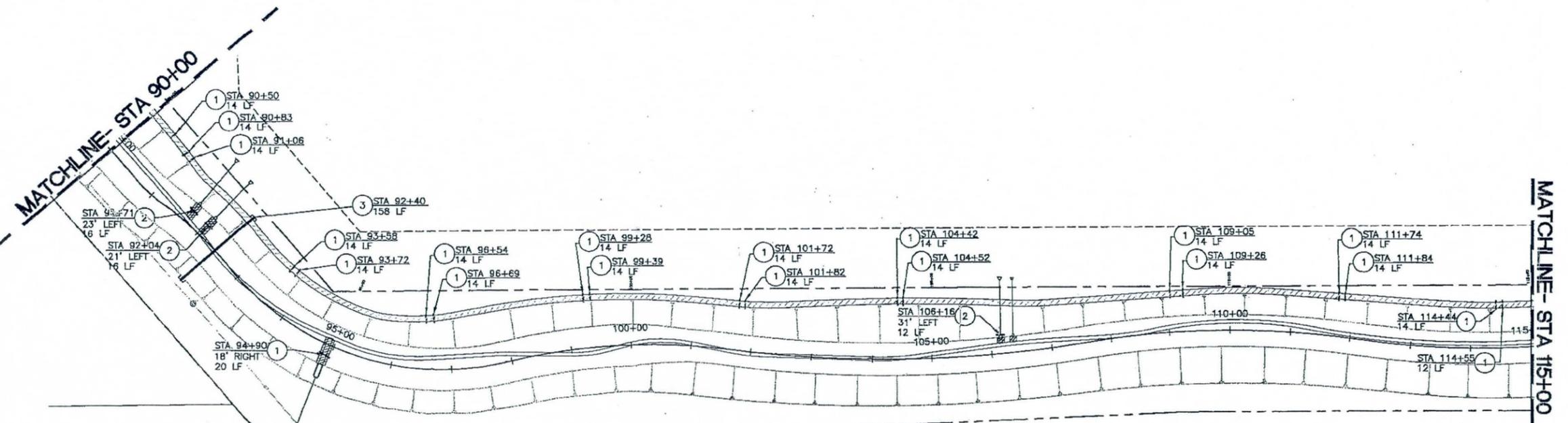


STA 65+00 TO STA 90+00



CONSTRUCTION NOTES

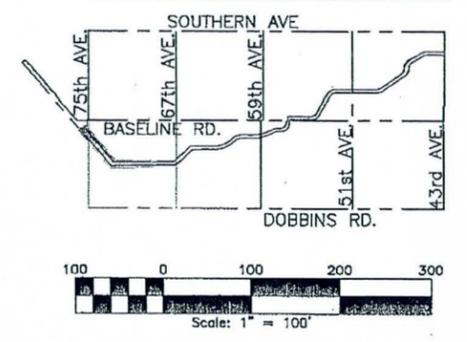
- ① INSTALL (1) 4" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SL8- LENGTH PER PLAN
- ② INSTALL (1) 2" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SL8- LENGTH PER PLAN
- ③ INSTALL 6" IRRIGATION MAINLINE CHANNEL CROSSING, PER DETAIL 1, SHEET SL8.



STA 90+00 TO STA 115+00



KEY MAP



NO.	REVISION	BY	DATE
3			
2			
1			

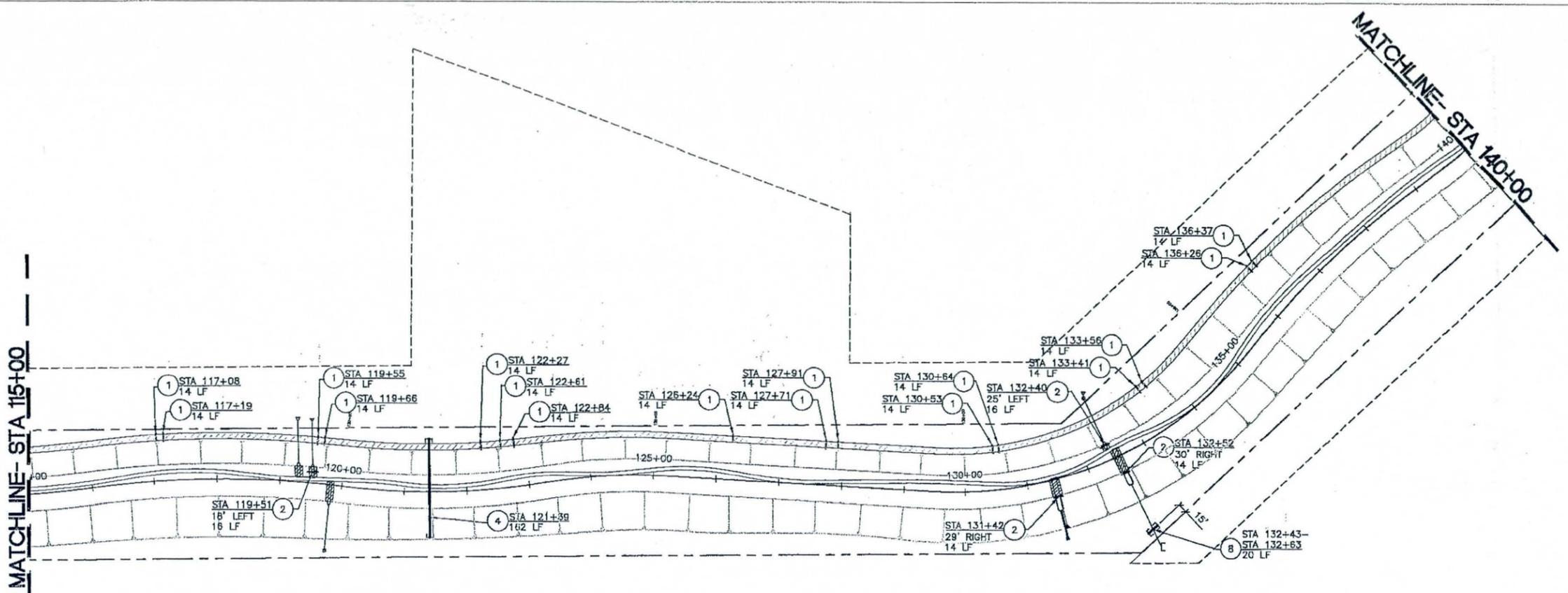
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 147.08.31

	BY	DATE
DESIGNED	AKR, JSP	3/03
DRAWN	CJW	3/03
CHECKED	AKR	3/03

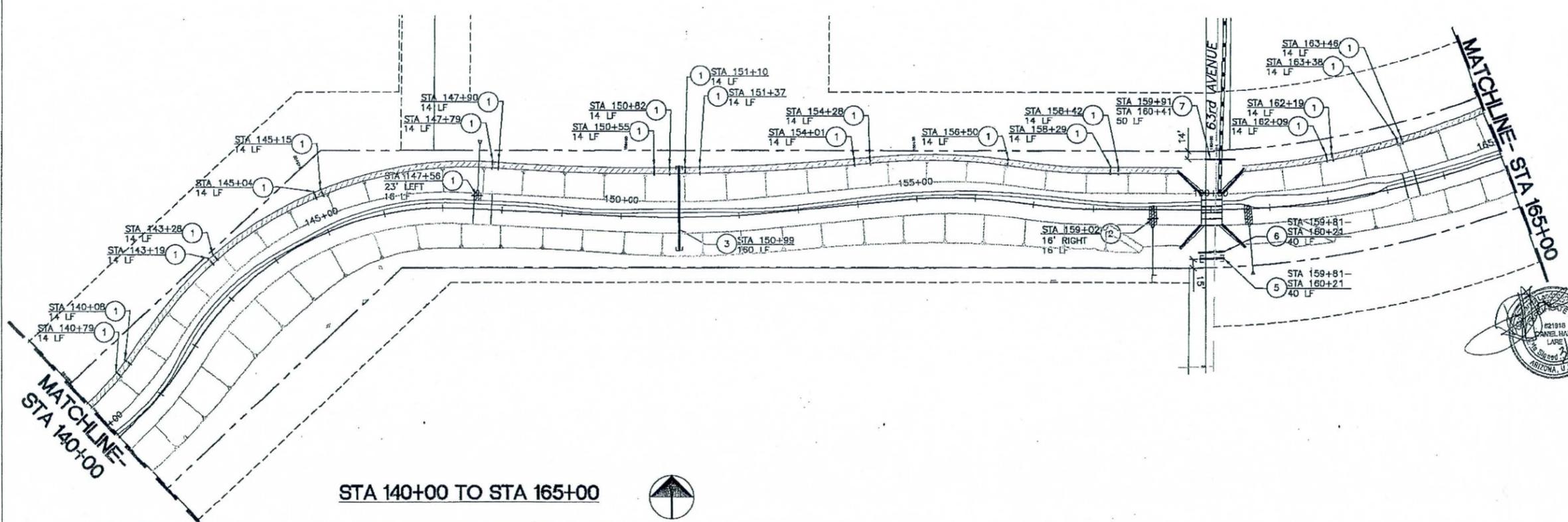
URS
 7720 N. 16TH STREET, SUITE 100
 PHOENIX, ARIZONA 85028
 602.224.1200 TEL
 602.224.1205 FAX

ENGINEERING TRANSPORTATION
 PLANNING/ARCHITECTURE
 LANDSCAPE ARCHITECTURE

DRAWING NO. SL3	SLEEVENING PLAN	SHEET OF 3 - 10
--------------------	-----------------	--------------------



STA 115+00 TO STA 140+00



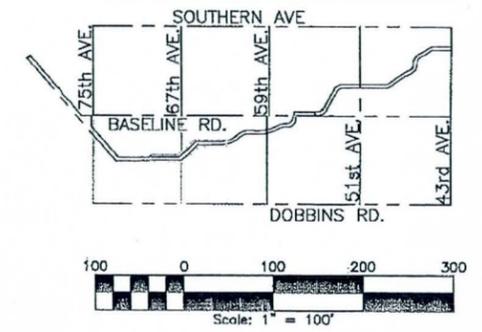
STA 140+00 TO STA 165+00



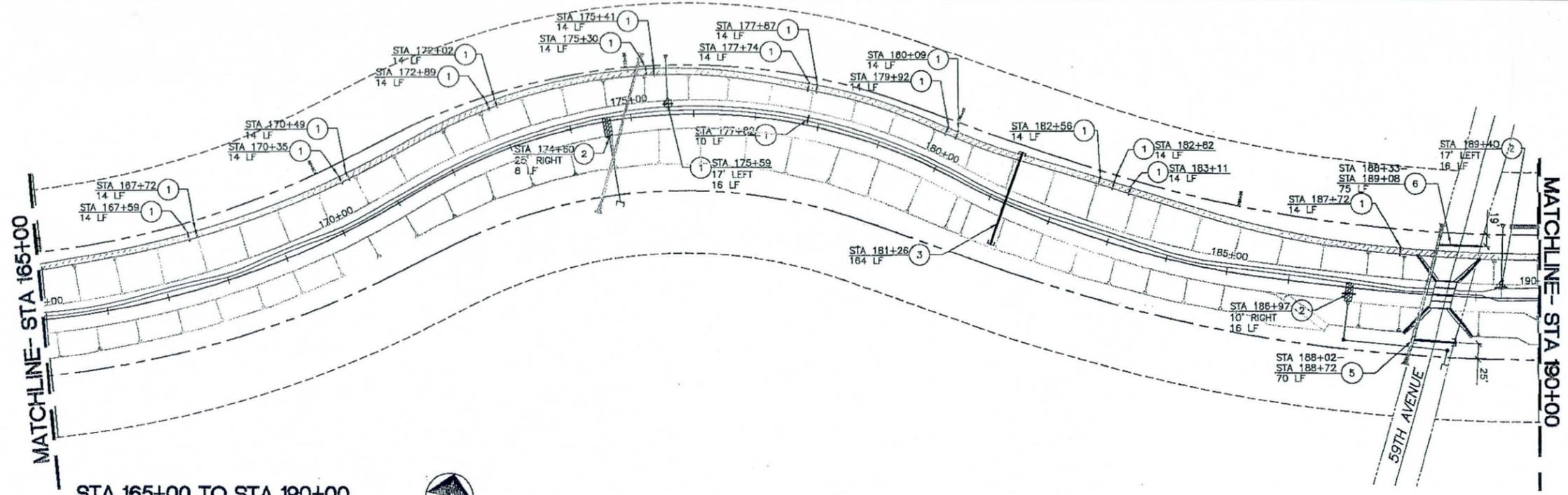
CONSTRUCTION NOTES

- ① INSTALL (1) 4" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SL8- LENGTH PER PLAN
- ② INSTALL (1) 2" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SL8- LENGTH PER PLAN
- ③ INSTALL 6" IRRIGATION MAINLINE CHANNEL CROSSING, PER DETAIL 1, SHEET SL8.
- ④ INSTALL 8" IRRIGATION MAINLINE CHANNEL CROSSING, PER DETAIL 1, SHEET SL8.
- ⑤ INSTALL UTILITY PACK #1 W/ 12" DUCTILE IRON IRRIGATION MAINLINE PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN
- ⑥ INSTALL UTILITY PACK #2 PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN
- ⑦ INSTALL UTILITY PACK #7 PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN
- ⑧ INSTALL UTILITY PACK #9 W/ 12" C900 PVC IRRIGATION MAINLINE PER DETAIL 6, SHEET SL10. LENGTH AND LOCATION PER PLAN.

KEY MAP



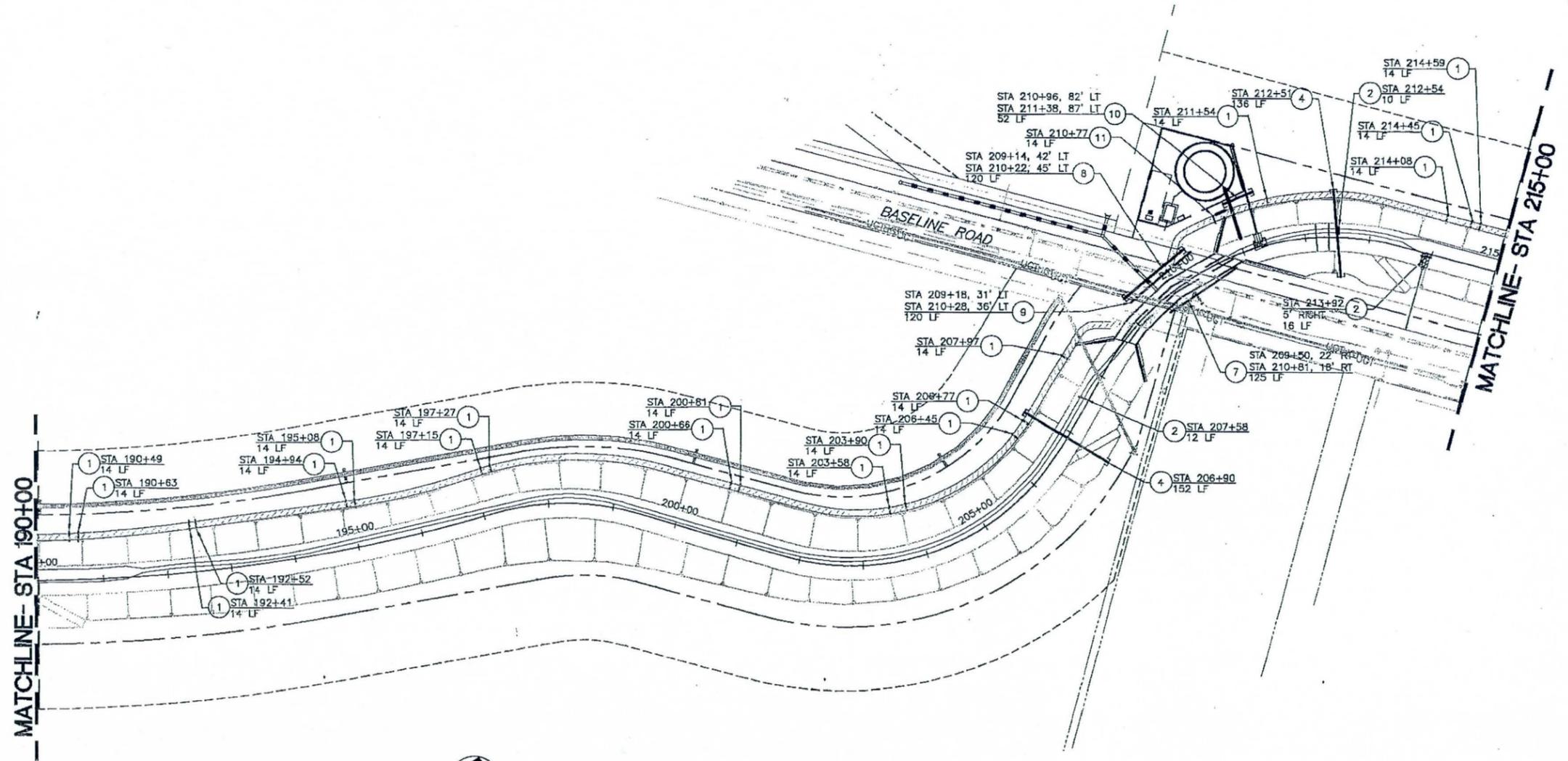
3	-	-	-
2	-	-	-
1	-	-	-
NO.	REVISION	BY	DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY LAVEEN AREA CONVEYANCE CHANNEL FCD PROJECT NO. 147.08.31			
	DESIGNED	AKR, JSP	3/03
	DRAWN	CJW	3/03
	CHECKED	AKR	3/03
<small>7720 N. 16TH STREET, SUITE 1000 PHOENIX, ARIZONA 85020 602.234.1599 TEL 602.234.1688 FAX</small>		<small>ENGINEERING TRANSPORTATION PLANNING/PROGRAM DESIGN LANDSCAPE ARCHITECTURE</small>	
DRAWING NO. SL4	SLEEVING PLAN		SHEET OF 4 - 10



STA 165+00 TO STA 190+00

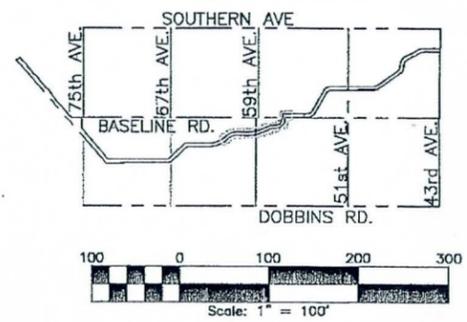
CONSTRUCTION NOTES

- ① INSTALL (1) 4" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SL8- LENGTH PER PLAN
- ② INSTALL (1) 2" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SL8- LENGTH PER PLAN
- ③ INSTALL 6" IRRIGATION MAINLINE CHANNEL CROSSING, PER DETAIL 1, SHEET S8.
- ④ INSTALL 12" IRRIGATION MAINLINE CHANNEL CROSSING, PER DETAIL 1, SHEET SL8.
- ⑤ INSTALL UTILITY PACK #4 W/ 12" DUCTILE IRON IRRIGATION MAINLINE PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN
- ⑥ INSTALL UTILITY PACK #5 PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN
- ⑦ INSTALL UTILITY PACK #5A PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN
- ⑧ INSTALL UTILITY PACK #1 W/ 12" DUCTILE IRON IRRIGATION MAINLINE PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN.
- ⑨ INSTALL UTILITY PACK #2 PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN.
- ⑩ INSTALL UTILITY PACK #11 W/ 12" C900 PVC IRRIGATION MAINLINE PER DETAIL 6, SHEET SL10. LENGTH AND LOCATION PER PLAN.
- ⑪ INSTALL (1) 8" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SL8- LENGTH PER PLAN



STA 190+00 TO STA 215+00

KEY MAP



NO.	REVISION	BY	DATE
3			
2			
1			

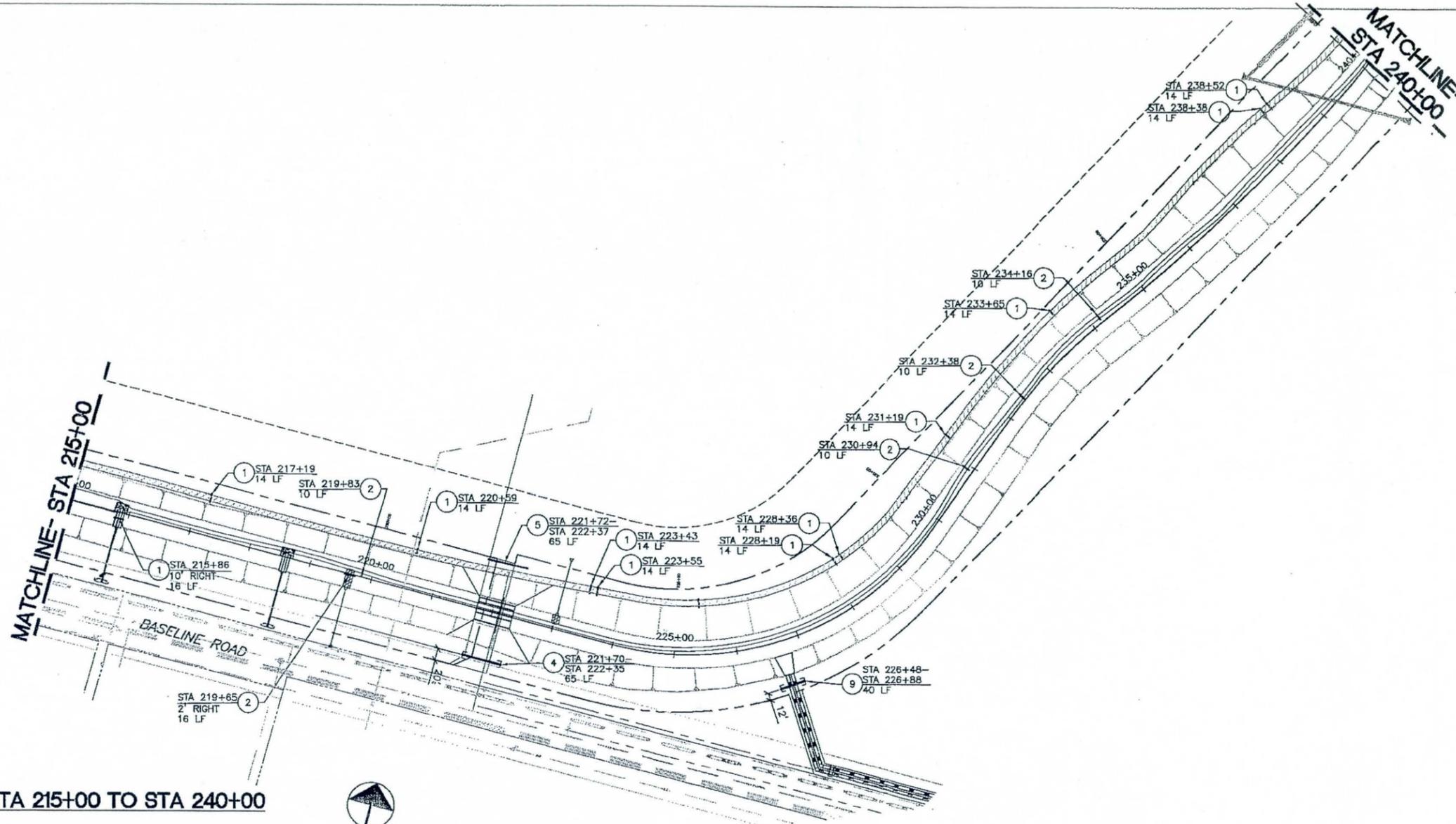
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 147.08.31

	BY	DATE
DESIGNED	AKR, JSP	3/03
DRAWN	CJW	3/03
CHECKED	AKR	3/03

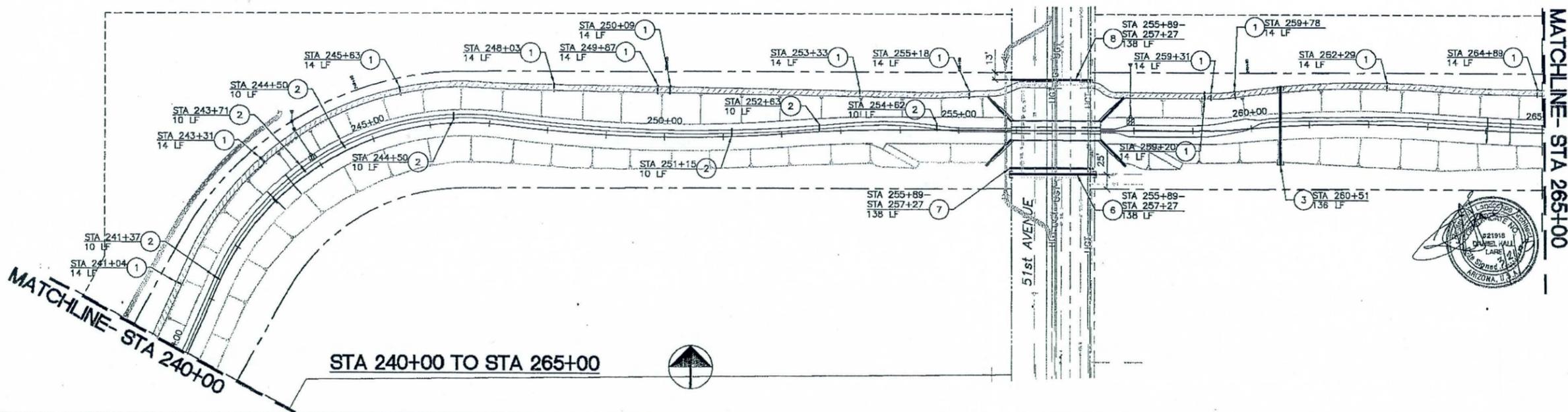
URS
 7720 N. 16TH STREET, SUITE 100
 PHOENIX, ARIZONA 85020
 602.234.1511 FAX
 602.234.1510 FAX

ENGINEERING TRANSPORTATION
 PLANNING/URBAN DESIGN
 LANDSCAPE ARCHITECTURE

DRAWING NO. SL5 SLEEVING PLAN SHEET OF 5 - 10



STA 215+00 TO STA 240+00

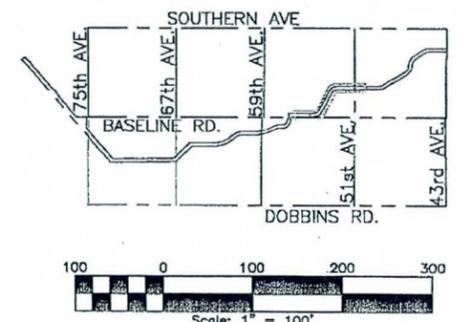


STA 240+00 TO STA 265+00

CONSTRUCTION NOTES

- ① INSTALL (1) 4" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SL6- LENGTH PER PLAN
- ② INSTALL (1) 2" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SL6- LENGTH PER PLAN
- ③ INSTALL 6" IRRIGATION MAINLINE CHANNEL CROSSING, PER DETAIL 1, SHEET SL6.
- ④ INSTALL UTILITY PACK #4 W/ 12" DUCTILE IRON IRRIGATION MAINLINE PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN.
- ⑤ INSTALL UTILITY PACK #5 PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN.
- ⑥ INSTALL UTILITY PACK #6 W/ 12" DUCTILE IRON IRRIGATION MAINLINE PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN.
- ⑦ INSTALL UTILITY PACK #2 PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN.
- ⑧ INSTALL UTILITY PACK #8 PER DETAIL 5, SHEET SL9. LENGTH AND LOCATION PER PLAN.
- ⑨ INSTALL UTILITY PACK #10 W/ 12" C900 PVC IRRIGATION MAINLINE PER DETAIL 6, SHEET SL10. LENGTH AND LOCATION PER PLAN.

KEY MAP

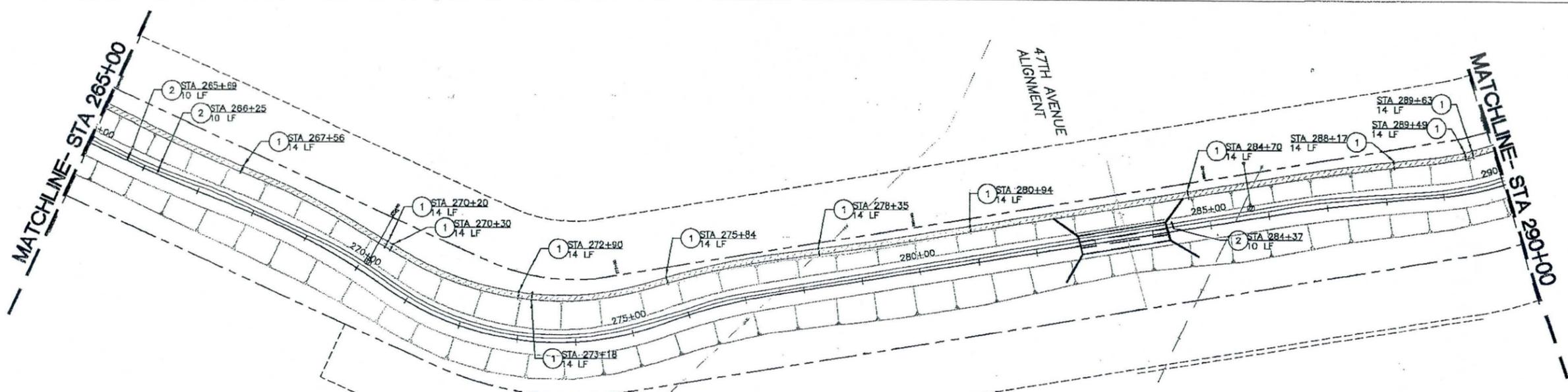


NO.	REVISION	BY	DATE
3			
2			
1			

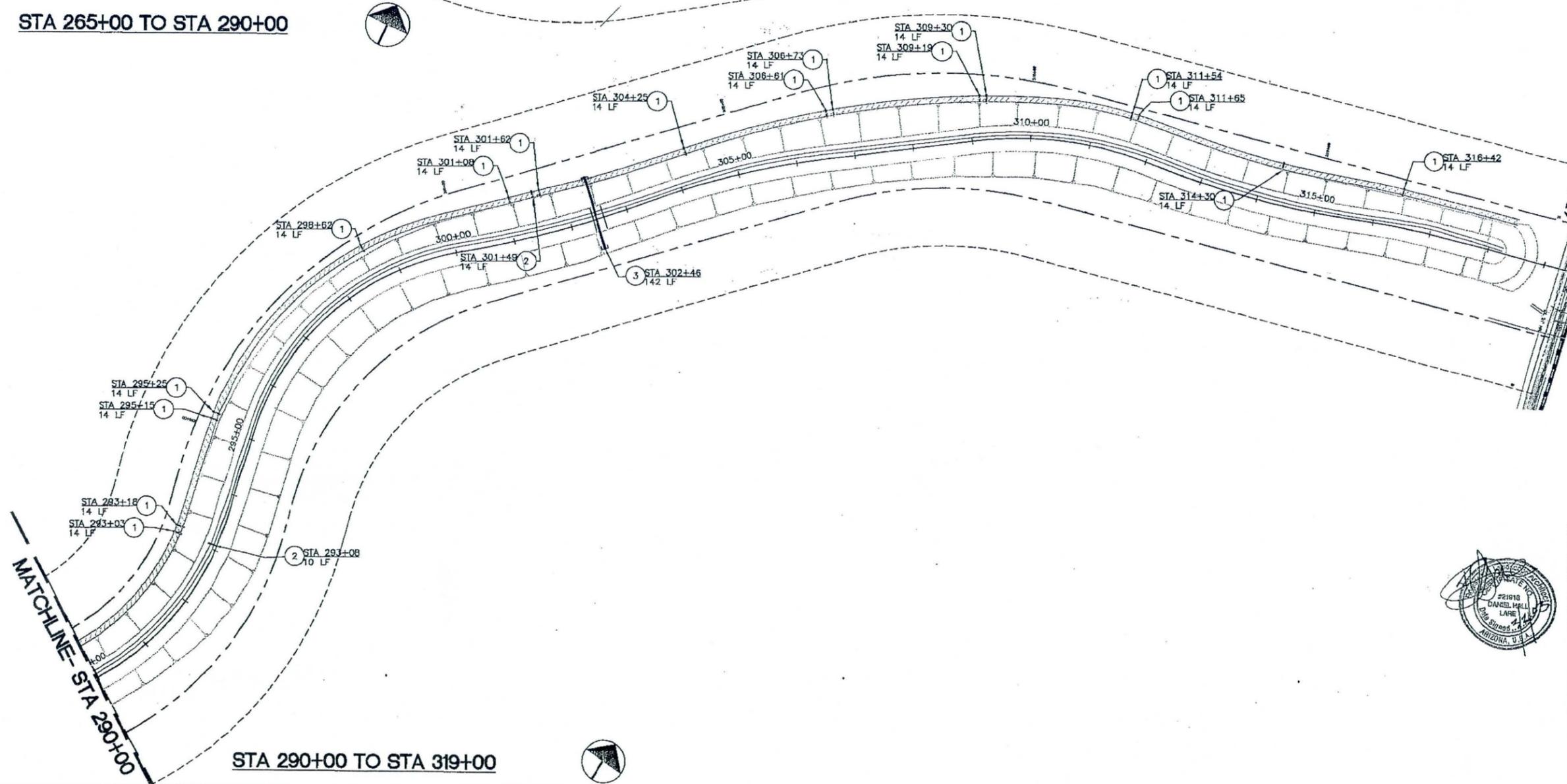
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 147.08.31

	BY	DATE
DESIGNED	AKR, JSP	3/03
DRAWN	CJV	3/03
CHECKED	AKR	3/03

URS
 7700 N. 163RD STREET, SUITE 400
 PHOENIX, ARIZONA 85020
 482.234.1500 TEL
 482.230.8888 FAX



STA 265+00 TO STA 290+00

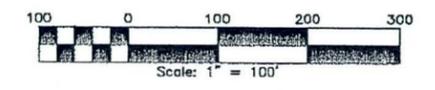
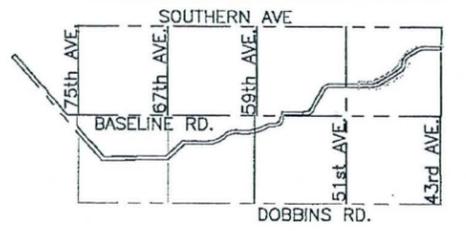


STA 290+00 TO STA 319+00

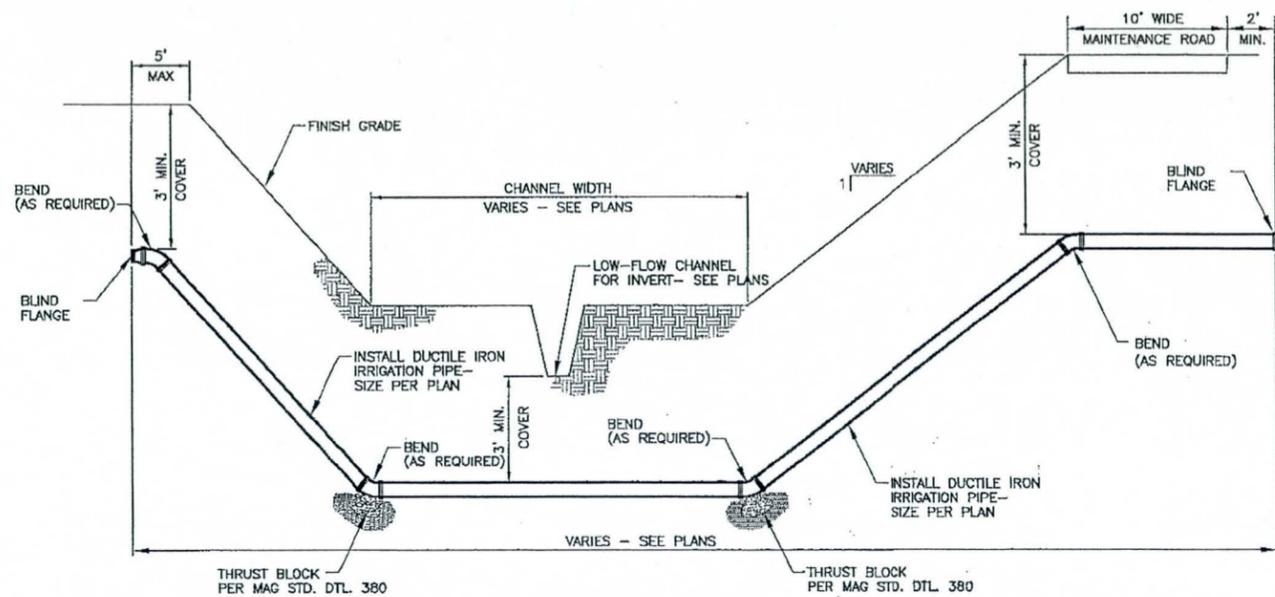
CONSTRUCTION NOTES

- ① INSTALL (1) 4" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SL8- LENGTH PER PLAN
- ② INSTALL (1) 2" SCH 40 PVC SLEEVE PER DETAIL 4, SHEET SL8- LENGTH PER PLAN
- ③ INSTALL 6" IRRIGATION MAINLINE CHANNEL CROSSING, PER DETAIL 1, SHEET SL8.

KEY MAP

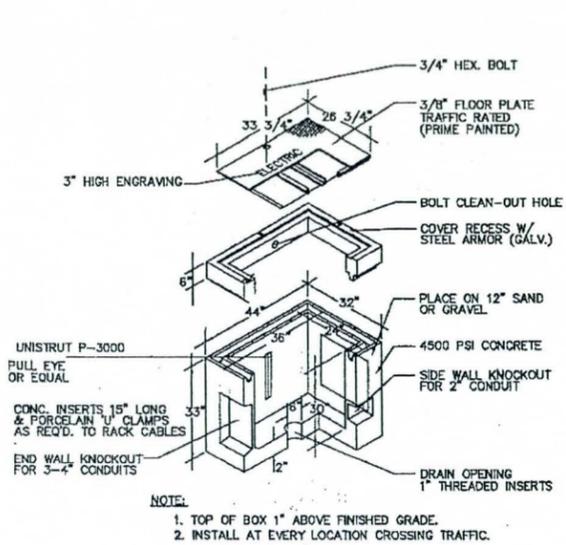


3	-	-	-
2	-	-	-
1	-	-	-
NO.	REVISION	BY	DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY			
LAVEEN AREA CONVEYANCE CHANNEL			
FCD PROJECT NO. 14-7.08.31			
	DESIGNED	AKR, JSP	3/03
	DRAWN	JSP	3/03
	CHECKED	AKR	3/03
	URS		<small>7725 N. WITH STREET, SUITE 100 PHOENIX, ARIZONA 85020 602.254.1591 TEL. 602.254.1788 FAX</small>
DRAWING NO. SL7	SLEEVING PLAN		SHEET OF 7 - 10



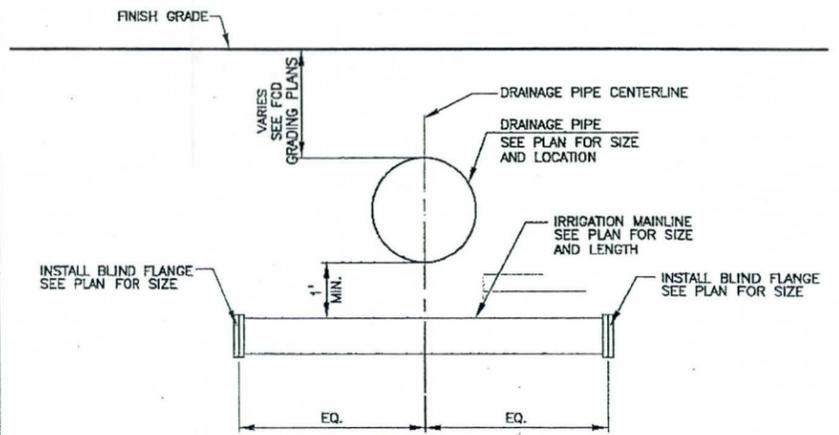
IRRIGATION MAINLINE CHANNEL CROSSING
N.T.S.

SLEEVING DETAIL 1



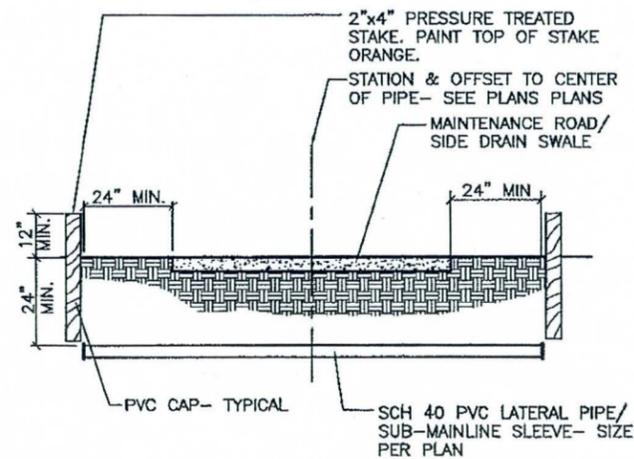
ELECTRICAL PULL BOX
N.T.S.

SLEEVING DETAIL 2



TYPICAL VERTICAL ALIGNMENT OF IRRIGATION PIPE
N.T.S.

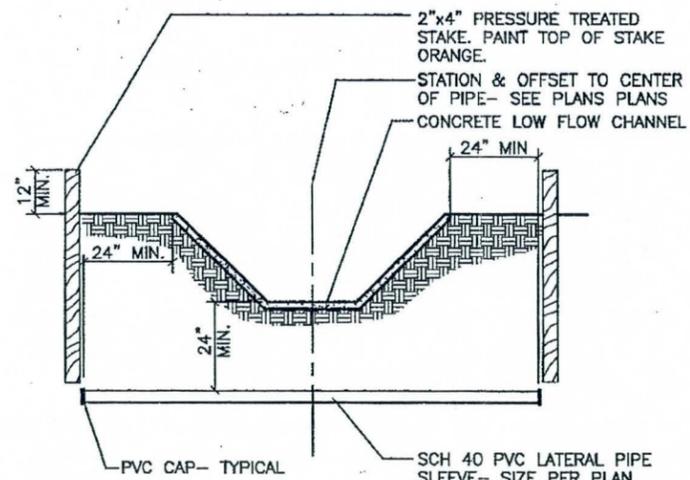
SLEEVING DETAIL 3



NOTES:
1. ALL JOINTS TO BE SOLVENT WELDED AND WATERTIGHT.
2. MECHANICALLY TAMP TO 95% PROCTOR.

A SLEEVING DETAIL
N.T.S.

02810-04



NOTES:
1. ALL JOINTS TO BE SOLVENT WELDED AND WATERTIGHT.
2. MECHANICALLY TAMP TO 95% PROCTOR.

B LOW FLOW SLEEVING DETAIL
N.T.S.

02810-05

SLEEVING DETAIL 4



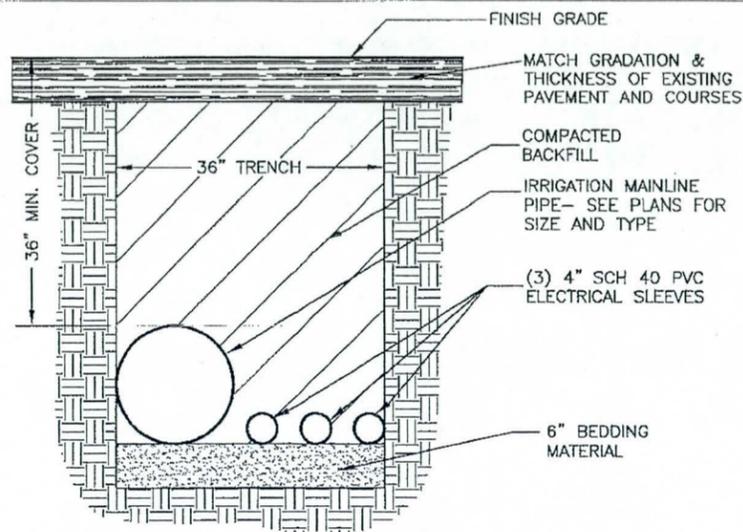
3	-	-	-
2	-	-	-
1	-	-	-
NO.	REVISION	BY	DATE

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
LAVEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 147.08.31

DESIGNED	JSP, AKR	3/03
DRAWN	JSP	3/03
CHECKED	AKR	3/03

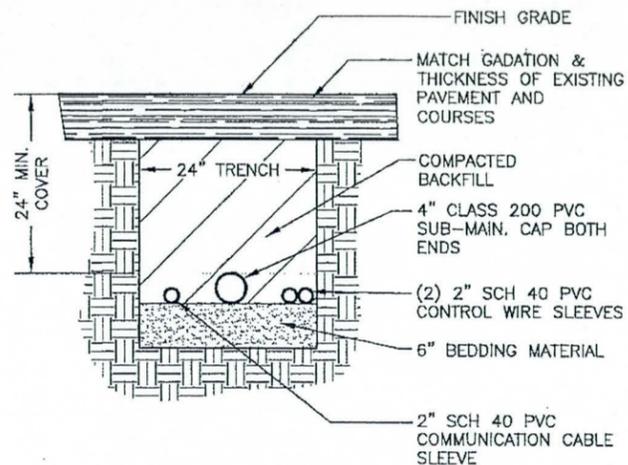
URS
7720 N. 16TH STREET, SUITE 100
PHOENIX, ARIZONA 85020
602.234.1999 TEL. 602.230.9188 FAX
ENGINEERING TRANSPORTATION PLANNING/ARCHITECTURE
LANDSCAPE ARCHITECTURE

DRAWING NO. SL8	SLEEVING DETAILS	SHEET OF 8 - 10
--------------------	------------------	--------------------

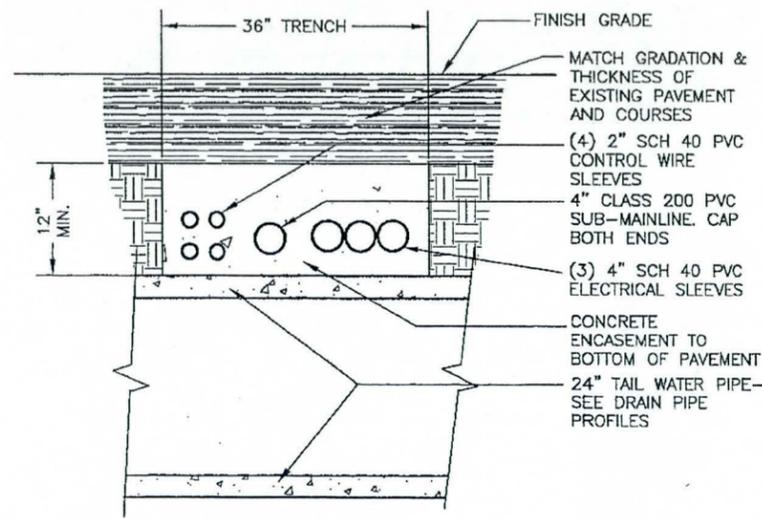


NOTE:
INSTALL ELECTRICAL PULL BOX ON EACH END OF THE
ELECTRICAL SLEEVES. SEE DETAIL 2, SHEET SL8

(A) UTILITY PACK #1 (TYPICAL)
NTS UP-1

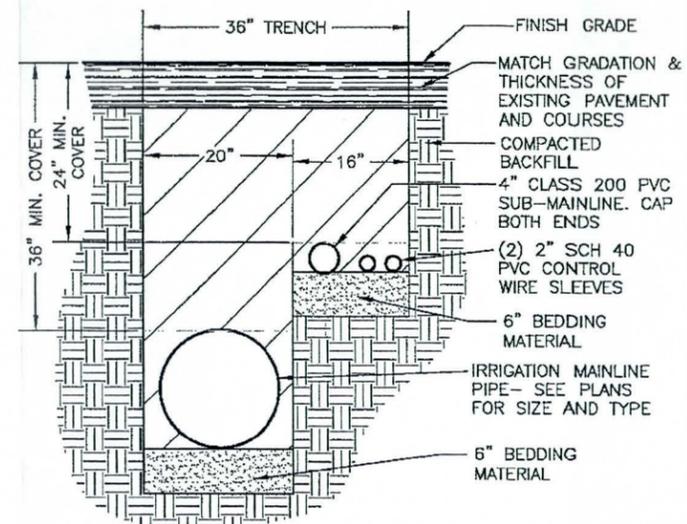


(B) UTILITY PACK #2 (TYPICAL)
NTS UP-2

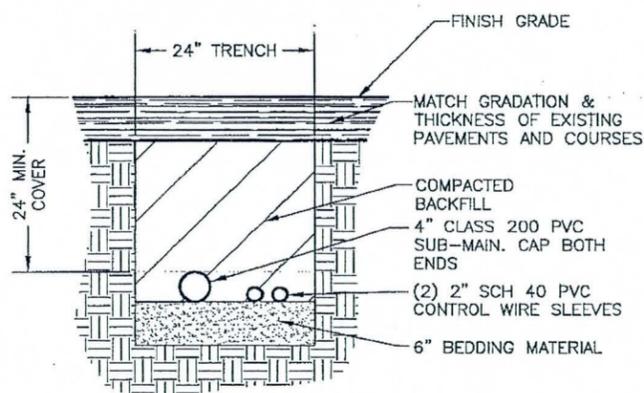


NOTE:
INSTALL ELECTRICAL PULL BOX ON EACH END OF THE
ELECTRICAL SLEEVES. SEE DETAIL 2, SHEET SL8

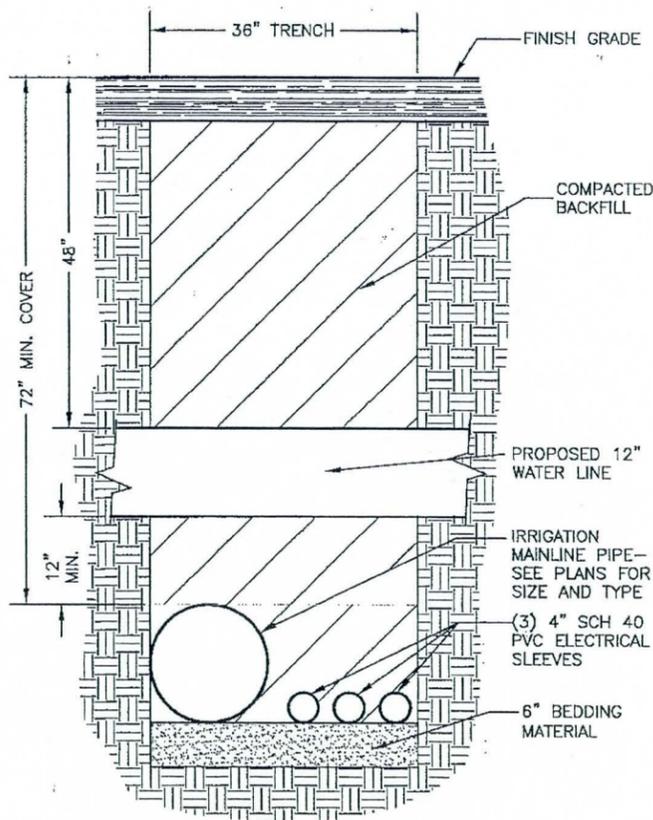
(C) UTILITY PACK #3 (BASELINE + 75TH AVE)
NTS UP-3



(D) UTILITY PACK #4 (TYPICAL)
NTS UP-4

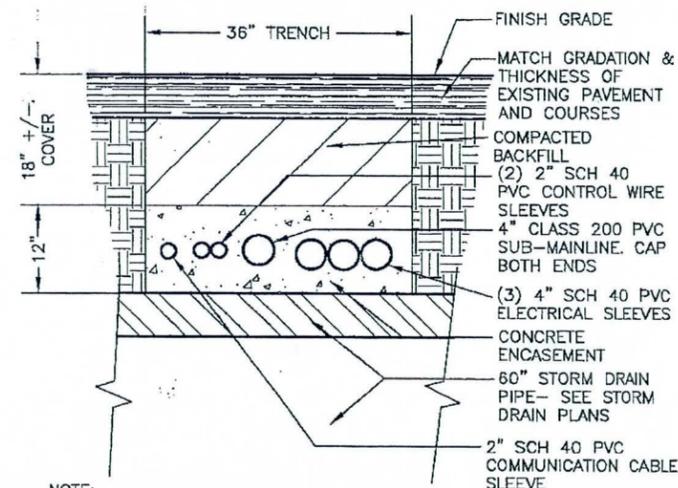


(E) UTILITY PACK #5 (TYPICAL)
NTS UP-5



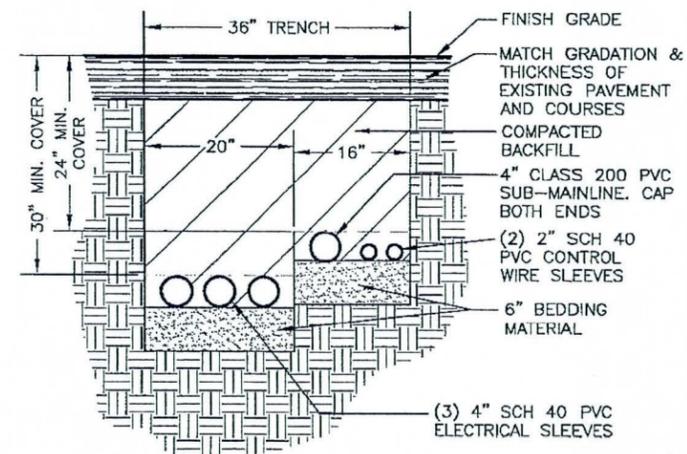
NOTE:
INSTALL ELECTRICAL PULL BOX ON EACH END OF THE
ELECTRICAL SLEEVES. SEE DETAIL 2, SHEET SL8

(G) UTILITY PACK #6 (51st AVE)
NTS UP-6



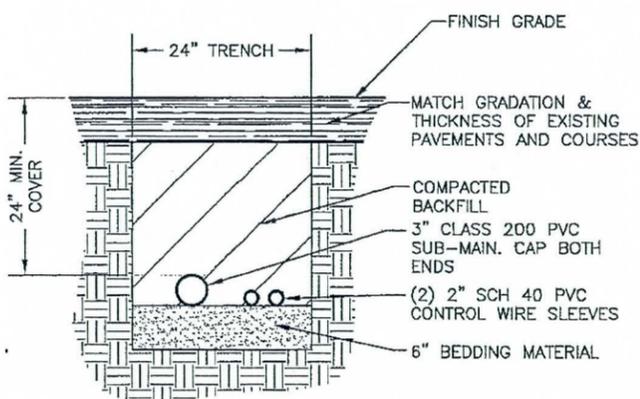
NOTE:
INSTALL ELECTRICAL PULL BOX ON EACH END OF THE
ELECTRICAL SLEEVES. SEE DETAIL 2, SHEET SL8

(H) UTILITY PACK #7 (63rd AVE)
NTS UP-7



NOTE:
INSTALL ELECTRICAL PULL BOXES ON EACH END OF THE
ELECTRICAL SLEEVES PER DETAIL 2, SHEET SL8.

(I) UTILITY PACK #8 (51st AVE)
NTS UP-8



(F) UTILITY PACK #5A (BASELINE + 57th AVE)
NTS UP-5A

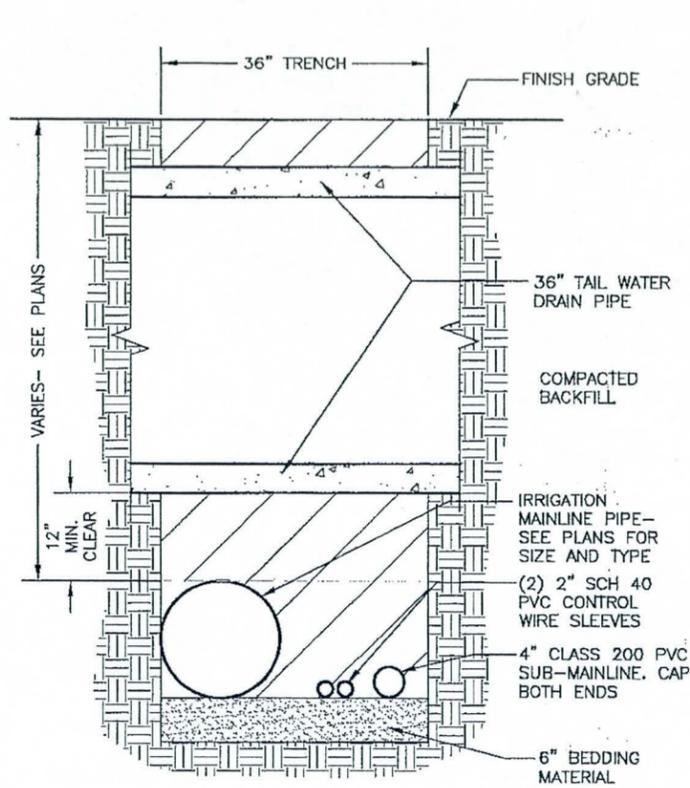


3	-	-	-
2	-	-	-
1	-	-	-
NO.	REVISION	BY	DATE

**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY**
LAVEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 147.08.31

	DESIGNED	JSP, AKR	3/03
	DRAWN	JSP	3/03
	CHECKED	AKR	3/03
DRAWING NO. SL9		SLEEVE DETAILS	
SHEET OF 9 - 10		BY DATE	

SLEEVE DETAIL 5

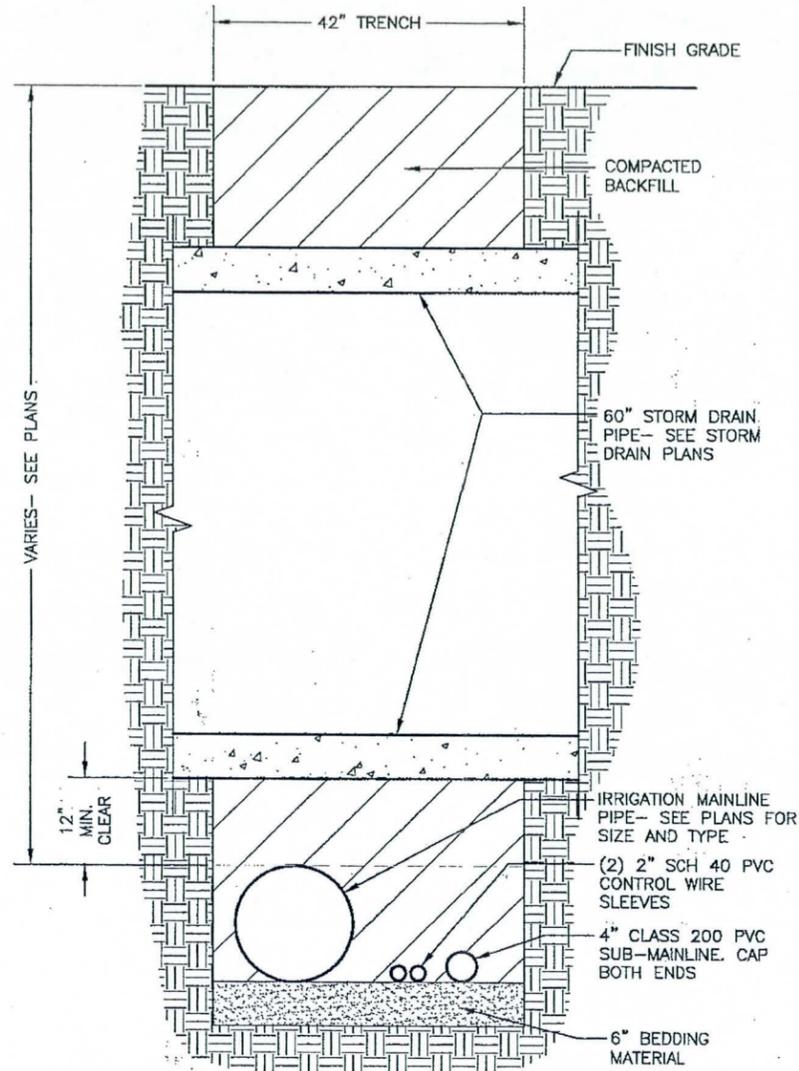


NOTE:
FOR VERTICAL ALIGNMENT INFORMATION SEE DETAIL 3, SHEET SL8

A UTILITY PACK #9 (STA 132+50)

NTS

UP-9

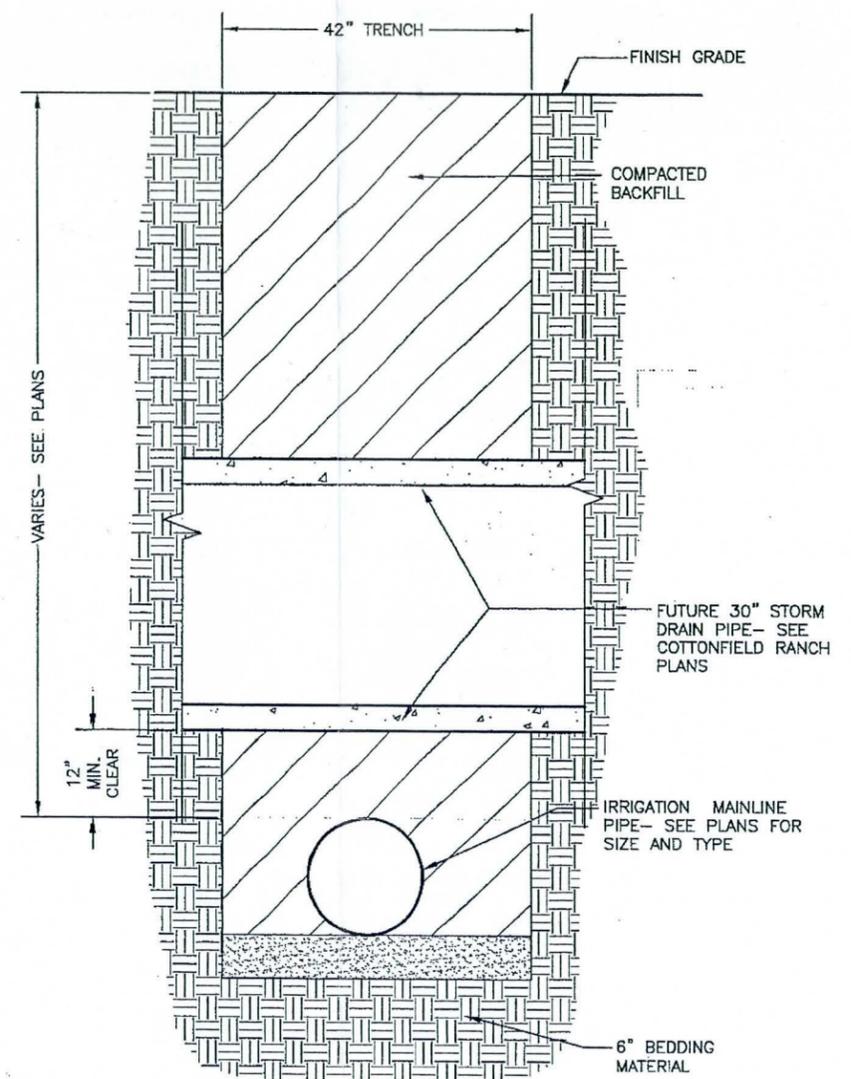


NOTE:
FOR VERTICAL ALIGNMENT DETAIL SEE DETAIL 3, SHEET SL8

B UTILITY PACK #10 (STA 226+50)

NTS

UP-10



NOTE:
FOR VERTICAL ALIGNMENT DETAIL SEE DETAIL 3, SHEET SL8

C UTILITY PACK #11 (STA 211+25)

NTS

UP-11



SLEEVING DETAIL 6

3	-	-	-
2	-	-	-
1	-	-	-
NO.	REVISION	BY	DATE
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY			
LAVEEN AREA CONVEYANCE CHANNEL			
FCD PROJECT NO. 14-7.08.31			
		BY	DATE
	DESIGNED	JSP, AKR	3/03
	DRAWN	JSP	3/03
	CHECKED	AKR	3/03
URS		7720 N. 14TH STREET, SUITE 100 PHOENIX, ARIZONA 85020 602.254.1500 TEL. 602.254.0989 FAX	
DRAWING NO. SL10		SLEEVING DETAILS	
		SHEET OF 10 - 10	

SPECIAL PROVISIONS

APPENDIX "D"

SALT RIVER PROJECT CONSTRUCTION – FOR INFORMATION ONLY

**Contract FCD 2002C031
Laveen Area Conveyance Channel**

PCN 117.08.31

SALT RIVER PROJECT

IRRIGATION IMPROVEMENTS

SRP ENGINEERING FILE NO. RD-12359

LAVEEN AREA CONVEYANCE CHANNEL

SRP ENGINEER: DONOVAN NEESE
 STANTEC CONSULTING
 TEL. (602) 438-2200

SRP COORDINATOR: BOB PADILLA
 TEL. (602) 236-4648

SRP INSPECTOR: FLOYD PETERS
 TEL. (602) 236-5664

CUSTOMER: FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 CUSTOMER'S ENGINEER: BOBBIE OHLER (FCDMC)
 TEL. (602) 506-2943

For Information Only

LEGEND

PLAN SYMBOLS

	BENCHMARK		EXISTING MANHOLE
	SURVEY CORNER		PROPOSED MANHOLE
	SECTION LINE		FIRE HYDRANT
	CONSTRUCTION BASELINE		WATER VALVE
	PROPERTY OF RIGHT OF WAY LINE		METER (WATER-W / GAS-G)
	EASEMENT LINE		WATER LINE
	CENTERLINE		SEWER LINE
	EXISTING EDGE OF PAVEMENT		GAS LINE
	PROPOSED EDGE OF PAVEMENT		TELEPHONE (DUCT OR CABLE)
	SLIPFORM LINING		UNDERGROUND ELEC (DUCT OR CABLE)
	EXISTING DITCH		MANHOLE (NON WUA)
	EXISTING PIPE		STORM DRAIN
	PROPOSED PIPE		CATCH BASIN
	EXISTING HEADWALL WITH AND WITHOUT SLIPFORM		UTILITY POLE
	PROPOSED HEADWALL WITH SLIPFORM		DOWN GUY
	EXISTING HEADWALL/TRASHRACK WITH AND WITHOUT SLIPFORM		FENCE (WOOD)
	PROPOSED HEADWALL/TRASHRACK WITH SLIPFORM		FENCE (WIRE/NOT SPECIFIED)
	EXISTING TURNOUT STRUCTURE		FENCE (MASONRY)
	PROPOSED TURNOUT STRUCTURE		PALM TREE
			TREE (TYPE)
			STUMP
			MAIL BOX
			EXISTING FACILITIES (CALLOUT)
			PROPOSED FACILITIES (CALLOUT)

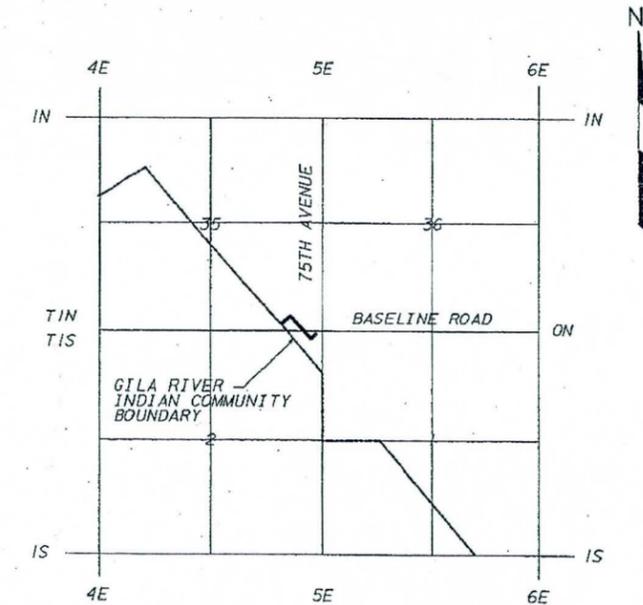
PROFILE SYMBOLS

	LOW BANK		CENTERLINE OF ROAD
	BED		BED (DRAIN DITCH)
	AVERAGE GROUND LEFT		CATCH BASIN
	AVERAGE GROUND RIGHT		PROPOSED UTILITY
	AVERAGE GROUND (ONE GIVEN)		EXISTING UTILITY
	HIGH WATER		POTHOLED UTILITY
	BED (PRIVATE-DELIVERY)		PROPOSED PIPE
	HIGH GROUND		
	LOW GROUND		

GENERAL NOTES

- THE CUSTOMER/CONTRACTOR IS RESPONSIBLE TO OBTAIN A PERMIT FOR WORK WITHIN PUBLIC AGENCY R/W AND ASSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL SAFETY REGULATIONS.
- THE WORK SPECIFIED ON THESE PLANS MAY INVOLVE THE USE OF AREAS LOCATED BOTH WITHIN SRP RIGHTS-OF-WAY AND PUBLIC AGENCY RIGHTS-OF-WAY. IF THE PUBLIC AGENCY ISSUES A PERMIT FOR WORK WITHIN ITS RIGHTS-OF-WAY, IT WILL APPLY ONLY TO THE AREA WITHIN THE PUBLIC AGENCY RIGHTS-OF-WAY. SUCH PERMIT SHALL NOT APPLY TO WORK WITHIN SRP RIGHTS-OF-WAY HAVING PRIOR RIGHTS.
- THE CONTRACTOR SHALL CONTACT BLUE STAKE AT (602) 263-1100 AND SUCH OTHER LOCATORS/UTILITIES AS NECESSARY TO LOCATE AND FLAG ALL EXISTING UNDERGROUND UTILITIES BEFORE FIELD CONSTRUCTION BEGINS.
- THE CUSTOMER'S CONTRACTOR IS REQUIRED TO CALL THE SRP INSPECTOR FOR A PRECONSTRUCTION CONFERENCE IN ACCORDANCE WITH THE APPLICABLE SRP LICENSE OR CONSTRUCTION AGREEMENT BEFORE OBTAINING CONSTRUCTION CLEARANCE AND STARTING CONSTRUCTION. CONTRACTOR MUST SIGN A TEMPORARY IRRIGATION OUTAGE AGREEMENT, IF REQUIRED, BEFORE CONSTRUCTION CAN BEGIN.
- ALL CONSTRUCTION WATER AND POWER SHALL BE OBTAINED, HANDLED, AND PAID FOR BY THE CONTRACTOR. THE CONTRACTOR SHALL MAKE ARRANGEMENTS TO PROCURE AND TRANSPORT WATER TO THE CONSTRUCTION SITE. ALL TEMPORARY FACILITIES SHALL BE REMOVED BEFORE FINAL ACCEPTANCE BY SRP.
- ANY QUESTIONS RELATIVE TO THE ACCURACY OF THE IMPROVEMENT INSTALLATION SHALL BE SUBMITTED IN WRITING IMMEDIATELY AND BEFORE COMPLETION OF THE WORK IF ALL SURVEY STAKES ARE MAINTAINED INTACT AS ORIGINALLY PLACED. SHOULD SUCH STAKES NOT BE PRESENT AND VERIFIED AS TO THEIR ORIGIN, NO CLAIM FOR ADDITIONAL COMPENSATION FOR CORRECTION SHALL BE PRESENTED TO ANY PARTY AND SUCH WORK SHALL BE CORRECTED AND PAID FOR BY THE CONTRACTOR.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL QUANTITIES AND ANY OTHER ITEMS AFFECTING THE BID TO COMPLETE THE WORK SHOWN ON THE PLANS, AND TO BASE THE BID SOLELY UPON VERIFIED QUANTITIES. IRRESPECTIVE OF THE INFORMATION FURNISHED AS NOTED ABOVE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE SRP INSPECTOR BEFORE CONSTRUCTION, OF ANY SIGNIFICANT DISCREPANCIES BETWEEN THE CONTRACTOR'S ESTIMATED QUANTITIES AND THOSE SHOWN ON THE PLANS.
- THE CUSTOMER IS RESPONSIBLE FOR CLEARING THE PROPOSED SRP IRRIGATION SYSTEM ALIGNMENT BEFORE SRP CONSTRUCTION BEGINS. CLEARING SHALL INCLUDE REMOVAL OF PAVEMENT, CURBS, GUTTERS, SIDEWALKS, STONE, UTILITY POLES, STREETLIGHTS, FENCING AND ANY OTHER EXISTING CONFLICTS.
- CONTACT SRP CUSTOMER SERVICE AT (602) 236-8888 FOR REQUIREMENTS FOR PROTECTING, RELOCATING OR REMOVING SRP POWER POLES (INCLUDING DOWN GUYS), UNDERGROUND POWER LINES AND OTHER ELECTRICAL EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR ALL COSTS OF COMPLYING WITH THESE REQUIREMENTS.
- FOR IRRIGATION OUTAGE INFORMATION, CONTACT THE SRP INSPECTOR.
- IF THERE ARE CONFLICTS BETWEEN SRP'S PLANS AND SPECIFICATIONS AND LOCAL GOVERNING REQUIREMENTS, THE MOST STRINGENT REQUIREMENT SHALL APPLY, AS DETERMINED BY THE SRP INSPECTOR.
- ALL TRENCHING SHALL BE DONE IN ACCORDANCE WITH OSHA CONSTRUCTION STANDARDS FOR EXCAVATIONS.
- ALL DELIVERY STRUCTURES WILL BE INSTALLED BY SRP FORCES. ALLOW A MINIMUM OF 30 DAYS BETWEEN ISSUANCE OF THE SRP LICENSE OR NOTICE TO PROCEED, AND THE INSTALLATION OF THE STRUCTURE.
- PIPE BEDDING SHALL BE CLASS "C" OR BETTER, AND BACKFILL SHALL BE PER SRP SPECIFICATIONS FOR PRECAST PIPE, UNLESS OTHERWISE NOTED.
- ALL PRECAST CONCRETE PIPE SHALL BE IN ACCORDANCE WITH ASTM C76 CLASS III WALL B UNLESS OTHERWISE NOTED, AND MEET SRP SPECIFICATIONS FOR PRECAST PIPE.
- ALL EXISTING IRRIGATION FACILITIES DISTURBED BY NEW CONSTRUCTION SHALL BE RECONSTRUCTED TO CURRENT SRP STANDARDS.
- ALL WORK AND MATERIALS THAT DO NOT CONFORM TO THESE PLANS, SPECIFICATIONS AND SRP LICENSES/CONSTRUCTION AGREEMENTS, ARE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
- ALL DUST AND TRAFFIC CONTROLS REQUIRED BY THE LOCAL GOVERNING AGENCY WILL BE OBTAINED, COORDINATED, AND PAID FOR BY THE CONTRACTOR.
- SRP DOES NOT GUARANTEE THE LOCATION OR ELEVATION OF UTILITIES AND WILL NOT BE RESPONSIBLE FOR THEIR RELOCATION.
- THE UTILITIES IDENTIFIED ON THE PLANS MAY NOT REPRESENT ALL EXISTING AND/OR CONFLICTING UTILITIES WITHIN THE PROJECT LIMITS.
- ALL UTILITIES WHICH HAVE BEEN POTHOLED (GENERALLY ALL PIPES OR CONDUITS 2 INCHES OR LARGER IN DIAMETER AND ALL CABLES WITH 25 PAIRS OR GREATER) ARE DESIGNATED IN THE PROFILE WITH THE TERM "PH".
- ALL UTILITIES MUST UNDERCROSS THE PROPOSED SRP PIPELINE AND MAINTAIN A MINIMUM CLEARANCE OF ONE FOOT, UNLESS NOTED OTHERWISE.
- ALL UTILITIES PARALLELING THE PROPOSED SRP PIPELINE MUST MAINTAIN A MINIMUM OF TWO FEET HORIZONTAL CLEARANCE BETWEEN THE OUTSIDE OF THE SRP PIPELINE AND THE OPEN EXCAVATION FOR THE UTILITY.
- LOCATION AND ELEVATION OF ALL BLUE STAKED UTILITIES ARE TO BE FIELD VERIFIED. ALL CONFLICTING UTILITIES ARE TO BE RELOCATED PRIOR TO SRP PIPE INSTALLATION. CONTACT THE UTILITY COMPANY FOR COST AND SCHEDULE REQUIREMENTS FOR RELOCATION.
- VERTICAL CONTROLS ARE BASED ON SEA LEVEL DATUM AS DEFINED BY THE BENCHMARK ON EACH PLAN/PROFILE. VERTICAL CONTROLS MAY DIFFER BETWEEN PLAN/PROFILES. CHECK PLANS FOR ELEVATION EQUATIONS.
- STATIONS SHOWN ON THE PLAN/PROFILE ARE ALONG THE SECTION LINE, UNLESS OTHERWISE NOTED.
- DIMENSIONS LOCATING IRRIGATION MANHOLES AND DELIVERY STRUCTURES ARE FROM THE SECTION LINE TO THE CENTERLINE OF THE MANHOLE, AND TO THE FACE OF THE DELIVERY STRUCTURE RESPECTIVELY, UNLESS OTHERWISE NOTED.
- FACILITIES WHICH ARE NOT SPECIFICALLY LOCATED WITH ACTUAL HORIZONTAL AND VERTICAL CONTROLS ARE LOCATED ONLY APPROXIMATELY AND WITH THE BEST AVAILABLE KNOWLEDGE.
- ALL STAKING CONTROLS SHALL BE LEFT UNDISTURBED. THE CONTRACTOR SHALL CALL THE SRP INSPECTOR TO REFERENCE AND RESET ANY CONTROL POINTS THAT HAVE TO BE DISTURBED. THE CONTRACTOR WILL BE CHARGED FOR RESTAKING COSTS IF ANY STAKES ARE DESTROYED AND REQUIRE REPLACEMENT.
- ELEVATIONS SHOWN FOR IRRIGATION MANHOLES ARE AT THE TOP OF THE PROPOSED SIDEWALK OR FINISHED ROADWAY GRADE AT THE CENTERLINE OF THE MANHOLE (TWO CORNER POINTS FOR THE 5-SIDED MANHOLE), UNLESS OTHERWISE NOTED. THE TOP OF THE MANHOLE SHALL BE STAKED BY THE CUSTOMER'S ENGINEER, AND THE HORIZONTAL OFFSET CHECKED TO VERIFY THAT THE LOCATION IS IN CONFORMANCE WITH THE LATEST REVISIONS TO THE GOVERNING AUTHORITY'S PAVING PLANS. ALL OTHER SRP IRRIGATION STAKING SHALL BE BY SRP FORCES, UNLESS OTHERWISE NOTED.
- THE CUSTOMER'S ENGINEER SHALL VERIFY OR RE-ESTABLISH SECTION CORNERS TO BE USED AS THE BASELINE FOR IRRIGATION FACILITIES AND ALSO STAKE RIGHT-OF-WAY LINES AND TEMPORARY CONSTRUCTION AND PERMANENT EASEMENT LINES. SIDEWALKS AND BACK OF CURBS SHALL BE STAKED AT PROPOSED SRP MANHOLES AND STRUCTURES. ALL STAKING SHALL BE DONE PRIOR TO SRP STAKING NEW IRRIGATION FACILITIES. THE CUSTOMER'S ENGINEER SHALL MAINTAIN REFERENCE STAKES AS REQUIRED FOR THE DURATION OF SRP IRRIGATION SYSTEM CONSTRUCTION.

KEY PLAN



PLAN INDEX

- PLAN/PROFILE(S) SHEET [2] THRU SHEET [3]
- MODIFIED HEADWALL W/TRASHRACK(S) SHEET [4] THRU SHEET [5]
- PUMP / SUMP SHEET [6]
- BROAD CRESTED WEIR SHEET [7]
- STILLING WELL SHEET [8]
- TURNOUT STRUCTURE(S) DETAILS SHEET [9] THRU SHEET [17]

For Information Only

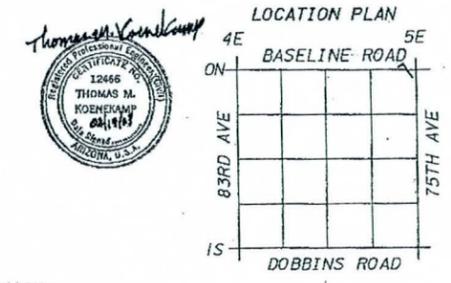
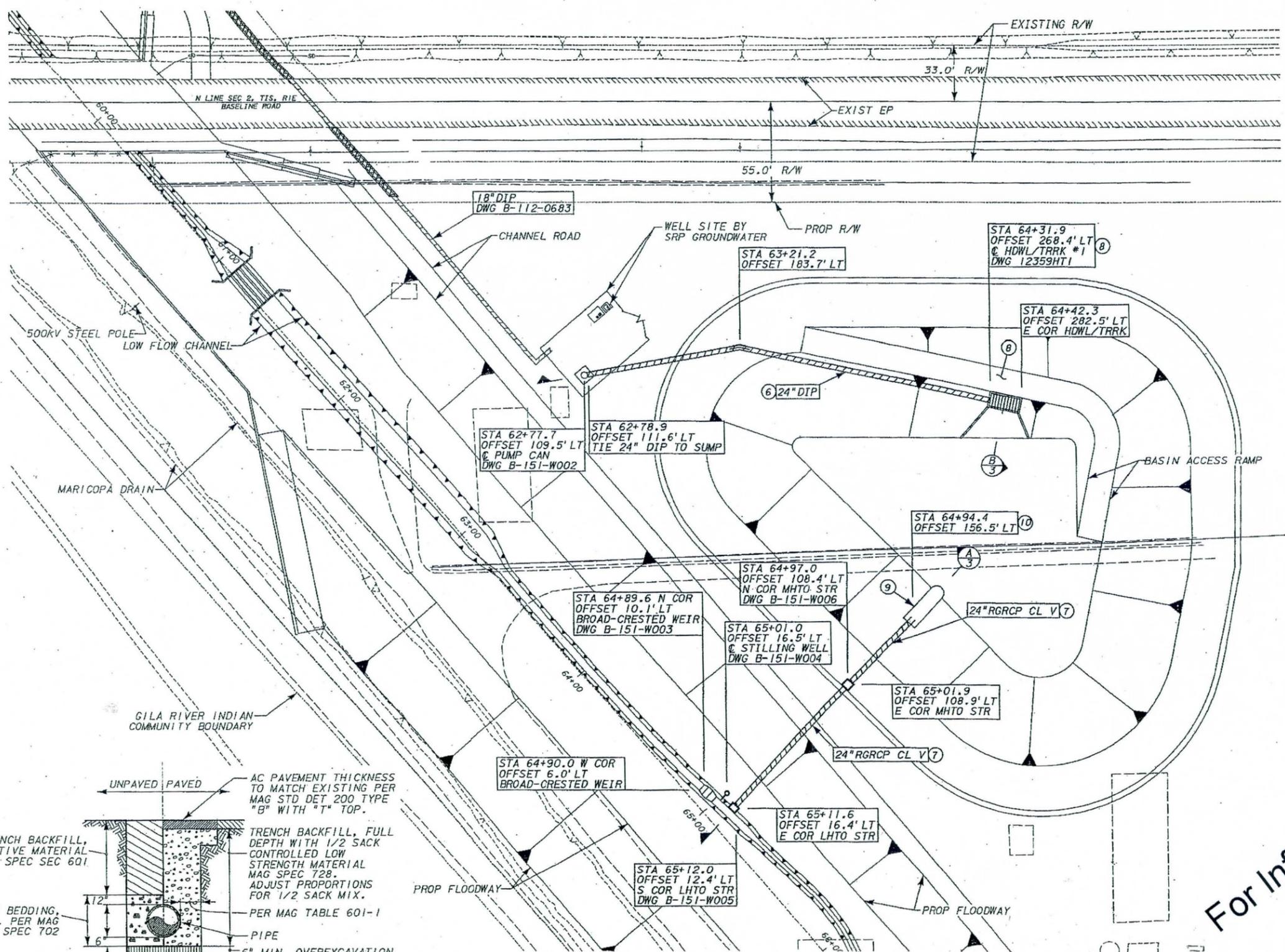
DESIGN FOR CONSTRUCTION						
0	RD-12359	DLN	DLN	TMK	BMP	2/20/09
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE
 SALT RIVER PROJECT WATER ENGINEERING PHOENIX, ARIZONA						
LAVEEN AREA CONVEYANCE CHANNEL BASIN DIVERSION SEC 2, T1S, R1E NE COR						
SCALE: NONE	TEMPORARY - 12359FSH2.DGN				SHEET NO.	
SUBJ CODE	DIST CODE	DWG SIZE	12359FSH2		1	
CV	Y3	22X34				

C:\120121\IRRIGFS.WDF
 WDF-IRRIGFS

REF #1: RD12359.DGN
 REF #2:
 REF #3:
 REF #4:

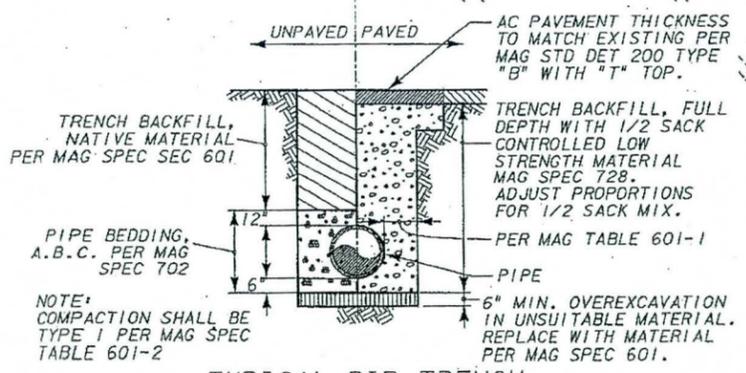
CONSTRUCTION NOTES

- ⑥ INSTALL DUCTILE IRON PIPE PRESSURE CLASS 250 PER MAG SPEC 610 DISREGARDING 610.10, 15, 17, 18. PIPE SHALL BE PROTECTED FROM CORROSION BY ENCASING WITH POLYWRAP PER MAG STANDARD SPECIFICATION 610.5. SEE TRENCH DETAIL. THIS SHEET FOR TRENCH DETAIL. STEEL CYLINDER PIPE SHALL NOT BE SUBSTITUTED.
- ⑦ INSTALLATION OF PIPE SHALL CONFORM TO SRP STANDARD SPECIFICATION WTR 02614 FOR PRECAST CONCRETE PIPE.
- ⑧ FIELD ADJUST BASIN ACCESS RAMP TO PROVIDE LEVEL GRADE BEHIND HEADWALL.
- ⑨ 3" MIN PLASTER BANK 8' X 27" OVER 4X4 - W2.9 X W.29 HWF. TIE CHANNEL FINISH GRADE WITH MIN 12" CUT OFF WALL.
- ⑩ PIPE TO BE STUBBED THROUGH AND CUT OFF FLUSH WITH CHANNEL FINISH GRADE.



BENCHMARK:
 RB AND CAP AT CORNER OF
 75TH AVE AND BASELINE RD
 ELEV. 986.97
 FCDMC PROJECT No. 1170831

For Information Only



TYPICAL DIP TRENCH

DESIGN FOR CONSTRUCTION

0	RD-12359	DLN	DLN	TMK	BMP	2/20/03
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE

SALT RIVER PROJECT
 WATER ENGINEERING ♦ PHOENIX, ARIZONA

LAVEN AREA
 CONVEYANCE CHANNEL
 BASIN DIVERSION
 SEC 2, TIS, RIE
 NE COR

SCALE: PLAN 1"=30', PROFILE 1"=4' | C120,1173B1120686.DGN | SHEET NO.

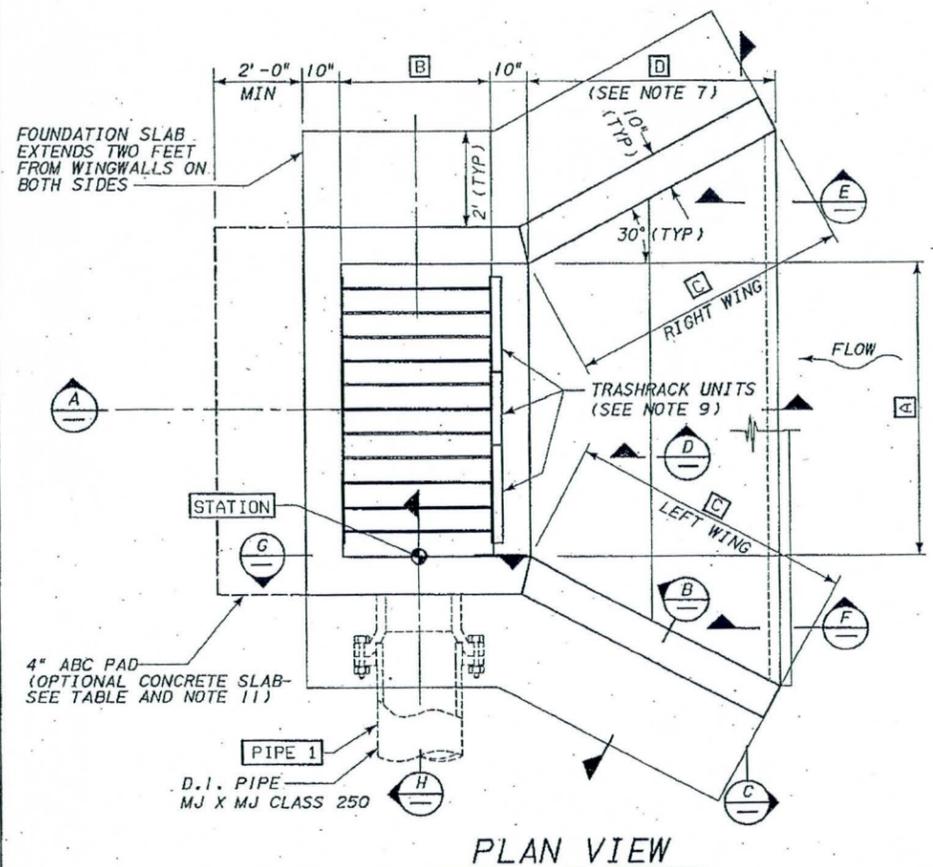
PP	Y2	22X34	B-112-0686	2
----	----	-------	------------	---

[120121]PPSNG.WDF
 WDF-PPSNG

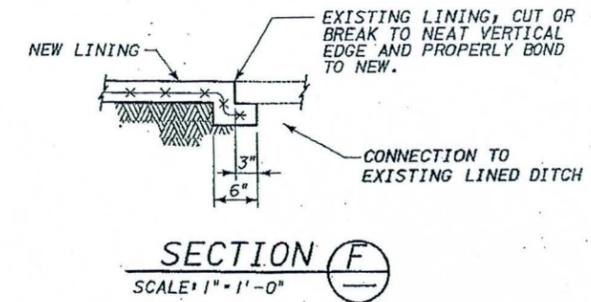
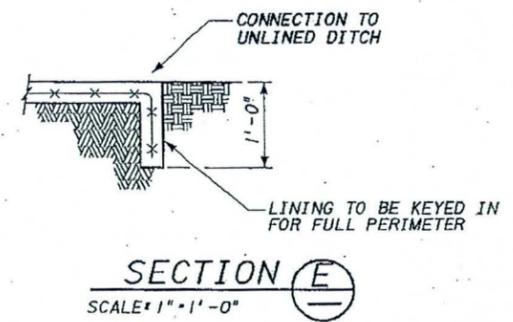
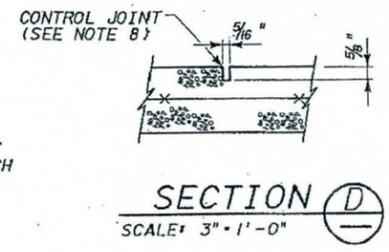
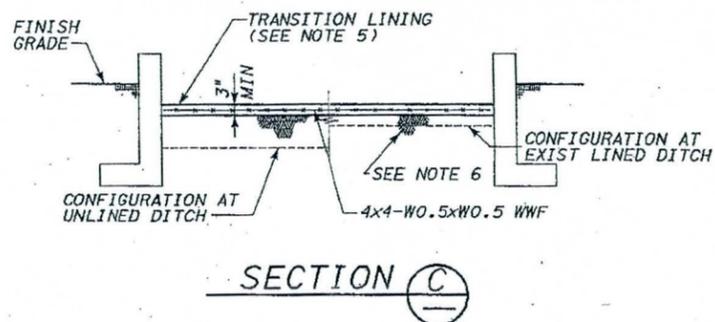
CONSTRUCTION DATA FOR HEADWALL WITH TRASHRACK

HOWL No.	STATION	PLAN/PROFILE REF DWG	PIPE 1	PIPE 2	PIPE 3	EL. 1	EL. 2	EL. 3	EL. 4		EL. 5	EL. 6	A	B	C		D	E	F	ABC FILL BEHIND HEADWALL	4" CONC SLAB BEHIND HEADWALL
									LT	RT					LT	RT					
1	64+31.9	B-112-0686	24" DIP			976.4	963.0	964.0	972.7	971.0	964.0	963.5	16'-0"	7'-1 3/4"	23'-8"	15'-4"	15'-10"	13'-7 3/4"	1'-3"		X

- ### NOTES:
- SEE PLAN/PROFILE DRAWING(S) FOR ORIENTATION OF HEADWALL(S).
 - UNLESS OTHERWISE NOTED, CONCRETE SHALL BE 3000 PSI (MAG A). SPRAY CONCRETE WITH WHITE CURING COMPOUND.
 - REINFORCING STEEL TO BE ASTM A615 GRADE 60.
 - CONCRETE FILLER TO MATCH INVERT ELEVATION AT (EL. 2) AND MATCH SLOPE OF PIPE.
 - TRANSITION TO DRAIN AWAY FROM HEADWALL ACCORDING TO EL. 3 AND EL. 4. EXTEND WIDTH OF TRANSITION LINING TO WINGWALLS EITHER SIDE.
 - SHAPE AND COMPACT TRANSITION LINING SUBGRADE FROM HEADWALL TO 3 FT PAST UNDISTURBED UNLINED DITCH, OR TO UPSTREAM END OF TRANSITION, WHICHEVER IS GREATER.
 - EXTEND TRANSITION LINING FROM CREST WALL TO BASIN INVERT BY LENGTH D, AND MATCH FINISH GRADE.
 - IF TRANSITION LENGTH (D) EXCEEDS 10 FT, TRANSVERSE CONTROL JOINTS ARE REQUIRED AT EQUAL SPACING NOT TO EXCEED 10 FT.
 - TRASHRACKS MAY BE INSTALLED IN ANY SEQUENCE OR ORDER, MAINTAINING THE MINIMUM 2 1/4" SPACING BETWEEN BARS OF ADJACENT UNITS AND EQUAL DISTANCE FROM EACH SIDE OF THE HEADWALL. SEE TRASHRACK DRAWING 12359TRK.
 - INSTALL TRASHRACKS WITH 1/2" DIA X 3 3/4" EXPANSION ANCHORS, USING THE SLOTTED HOLES AS A TEMPLATE.
 - OPTIONAL CONC SLAB - 4" THICK, MIN 2'-0" WIDE, LENGTH TO MATCH HEADWALL, BROOM FINISH. SLOPE SLAB TO DRAIN AWAY FROM HEADWALL. TOP OF SLAB TO BE LEVEL WITH ADJACENT FIN GRADE.
 - HOOK REINFORCING BAR(S) AS REQUIRED TO MAINTAIN CLEARANCE AND DEVELOPED LENGTH (TYPICAL).
 - WATERSTOPS SHALL BE ADEKA MC-2010M, 3/4" X 3/8", WITH ADEKA P-201 ELASTIC SEALANT.



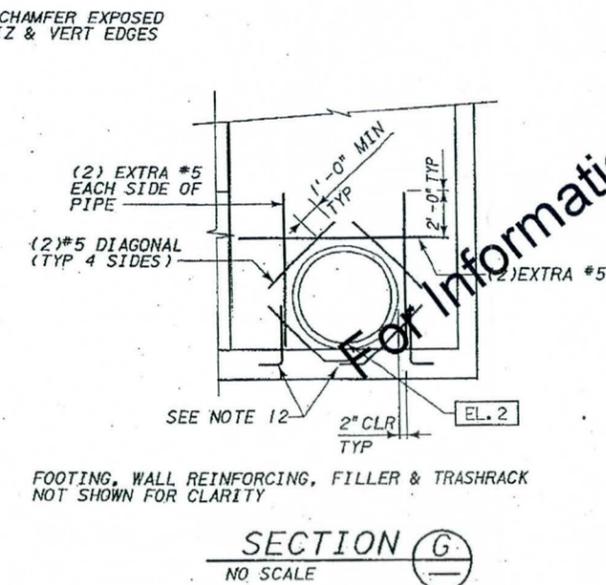
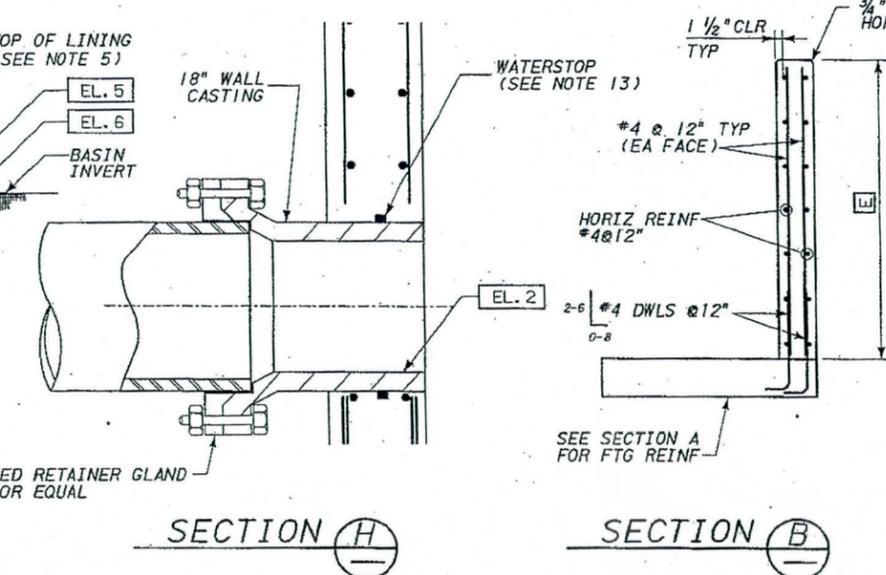
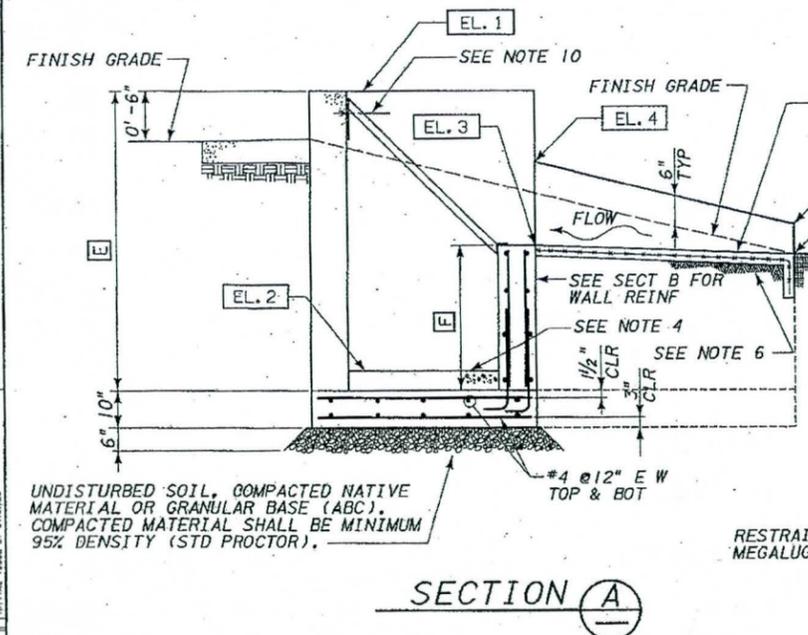
SRP WESTSIDE MAINTENANCE TO INSTALL HARDWARE FOR STORAGE OF TRASH RAKE ON HEADWALL.



CONTRACTOR NOTE:

TRASHRACK(S) MUST BE MANUFACTURED PRIOR TO REQUESTING A "CONSTRUCTION CLEARANCE" FOR THIS JOB.

TRASHRACKS AND ASSOCIATED HARDWARE CAN BE SUPPLIED BY SALT RIVER PROJECT UPON REQUEST. PLEASE CALL THE MECHANICAL CONSTRUCTION & MAINTENANCE DIVISION OF SRP FOR PRICE QUOTES! (602)236-4154.



For Information Only

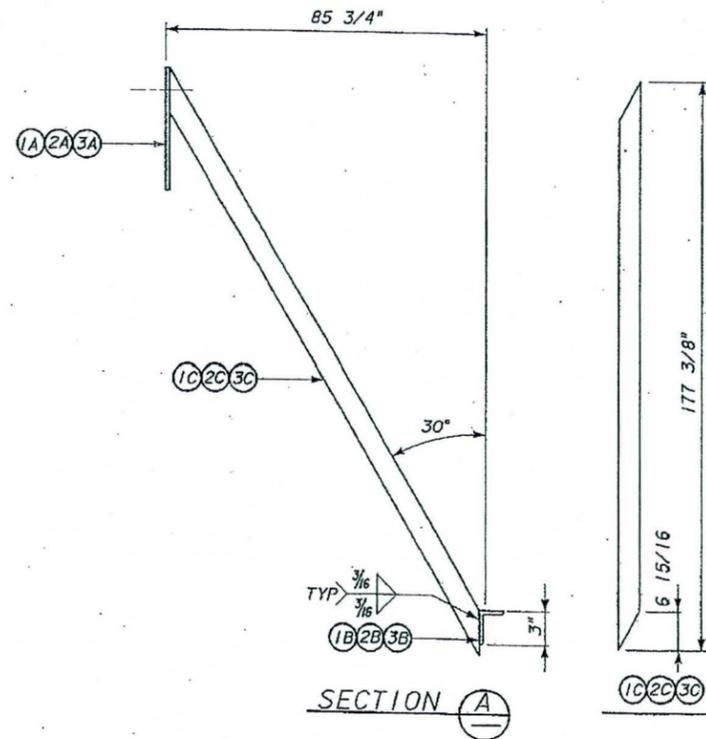
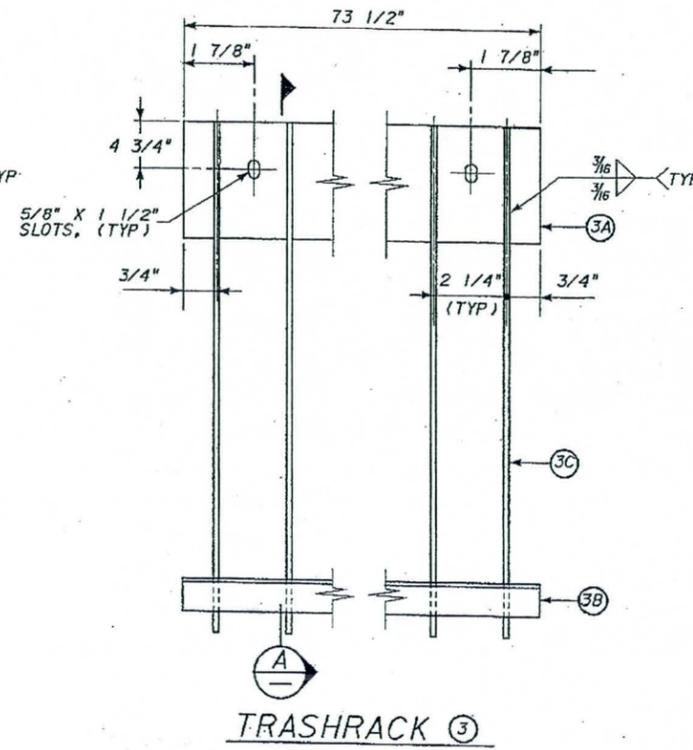
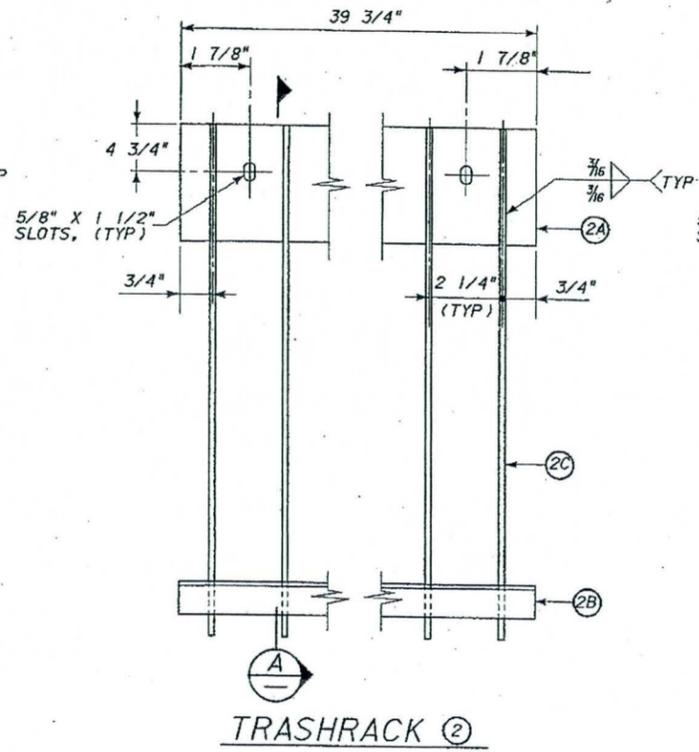
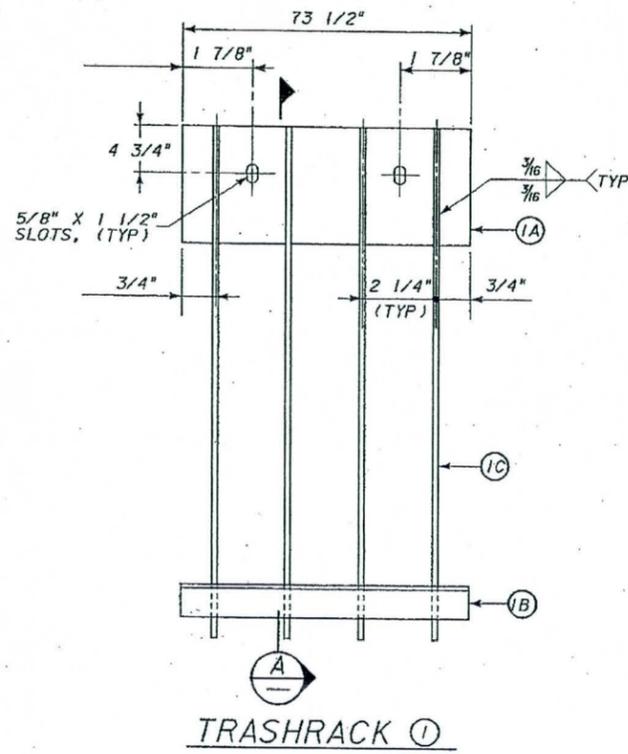
DESIGN FOR CONSTRUCTION						
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE
0	RD-12359	DLN	DLN	TMK	BMP	2/20/03

SALT RIVER PROJECT
WATER ENGINEERING PHOENIX, ARIZONA

MODIFIED 10" STRUCTURAL HEADWALL TRASHRACK

SCALE:	TEMPORARY:	SHEET NO.
1/2" = 1'-0" U.N.	12359HT1.DGN	4

P02: [120, 121] HDR1216.WDF



BILL OF MATERIAL

ITEM	NO. REQ'D.	DESCRIPTION	LENGTH INCHES	STOCK CODE NO.
1	1	FISH RACK		
1A	1	PL 1/4 X 11 ASTM A36	73 1/2	
1B	1	L 3 X 2 X 1/4 ASTM A36	73 1/2	
1C	33	BAR 4" X 1/2" ASTM A36	177 3/8	
2	1	FISH RACK		
2A	1	PL 1/4 X 11 ASTM A36	39 3/4	
2B	1	L 3 X 2 X 1/4 ASTM A36	39 3/4	
2C	18	BAR 4" X 1/2" ASTM A36	177 3/8	
3	1	FISH RACK		
3A	1	PL 1/4 X 11 ASTM A36	73 1/2	
3B	1	L 3 X 2 X 1/4 ASTM A36	73 1/2	
3C	33	BAR 4" X 1/2" ASTM A36	177 3/8	



For Information Only

REFERENCE DRAWINGS

PLAN/PROFILE B-112-0686 STA 64+31.9

HEADWALL/TRASHRACK DWG. 12359HT1

FISH/TRASH RACK NOTE

1. SANDBLAST TO NEAR WHITE FINISH AND ZINC METAL SPRAY OR HOT DIP GALVANIZE 5-7 MILS AFTER FABRICATION.

SUBMIT FOR CONSTRUCTION					
0	RD-12359	BMP	DLN	TMC	BMP
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH
					DATE

SRP SALT RIVER PROJECT
WATER ENGINEERING PHOENIX, ARIZONA

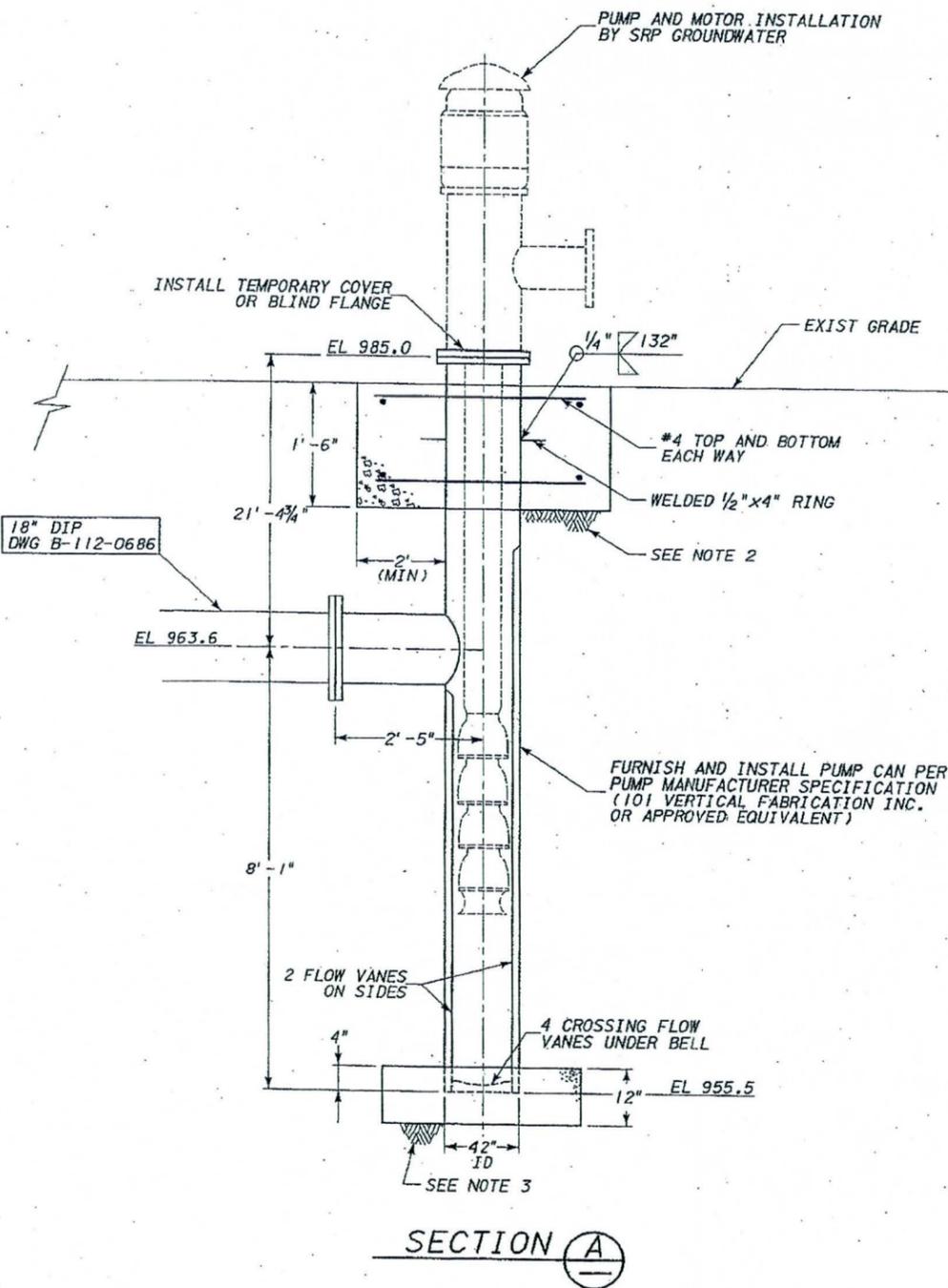
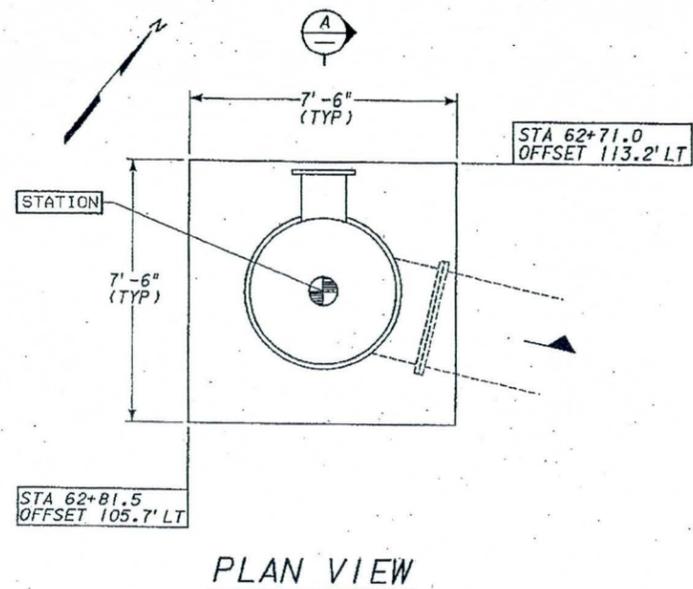
TRASHRACK FABRICATION DETAILS

SCALE:	TEMPORARY:	SHEET NO.
NONE	12359TRK.DGN	5
SUBJ CODE	DIST CODE	DWG SIZE
LH	Y3	22X34

REV	LOG/LOG NO.	DATE	BY	CHK	APPD	AUTH

NOTES

1. EXCAVATION FOR THE STRUCTURE SHALL BE IN ACCORDANCE WITH THE SRP "EXCAVATION SAFETY RESOURCE MANUAL".
2. THE MINIMUM REQUIREMENT FOR COMPACTION SHALL BE 95% OF MAXIMUM DENSITY PER ASTM D698 AT +2% TO -4% OF OPTIMUM MOISTURE CONTENT.
3. THE NATIVE MATERIAL BELOW THE ABC PAD SHALL BE COMPACTED AS INDICATED IN NOTE 2.
4. STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH (F_c) 3000PSI.
5. REINFORCING BARS SHALL BE ASTM A615, GRADE 60.



REFERENCE DRAWINGS

PLAN/PROFILE B-112-0686 STA 62+77.7 SH# 2

DESIGN FOR CONSTRUCTION

0	RD-12359	DLN	DLN	TMC	BMP	2/20/03
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE

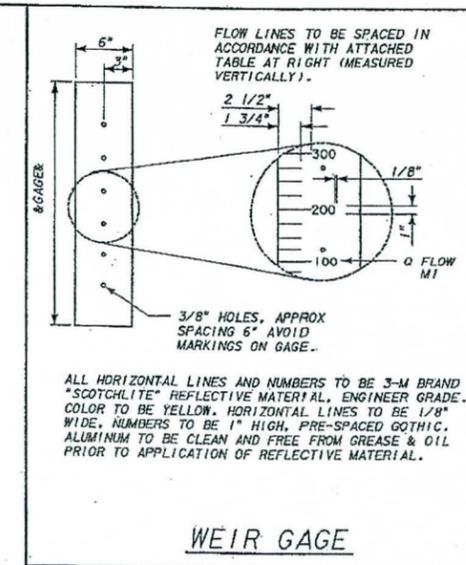
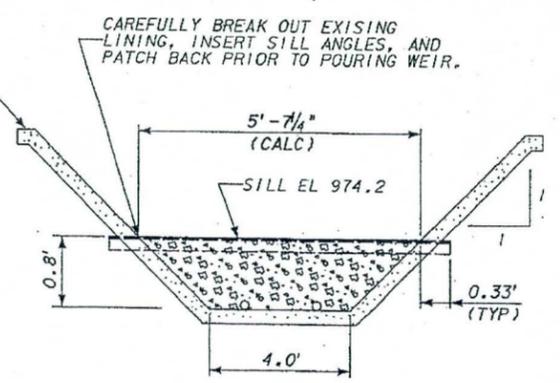
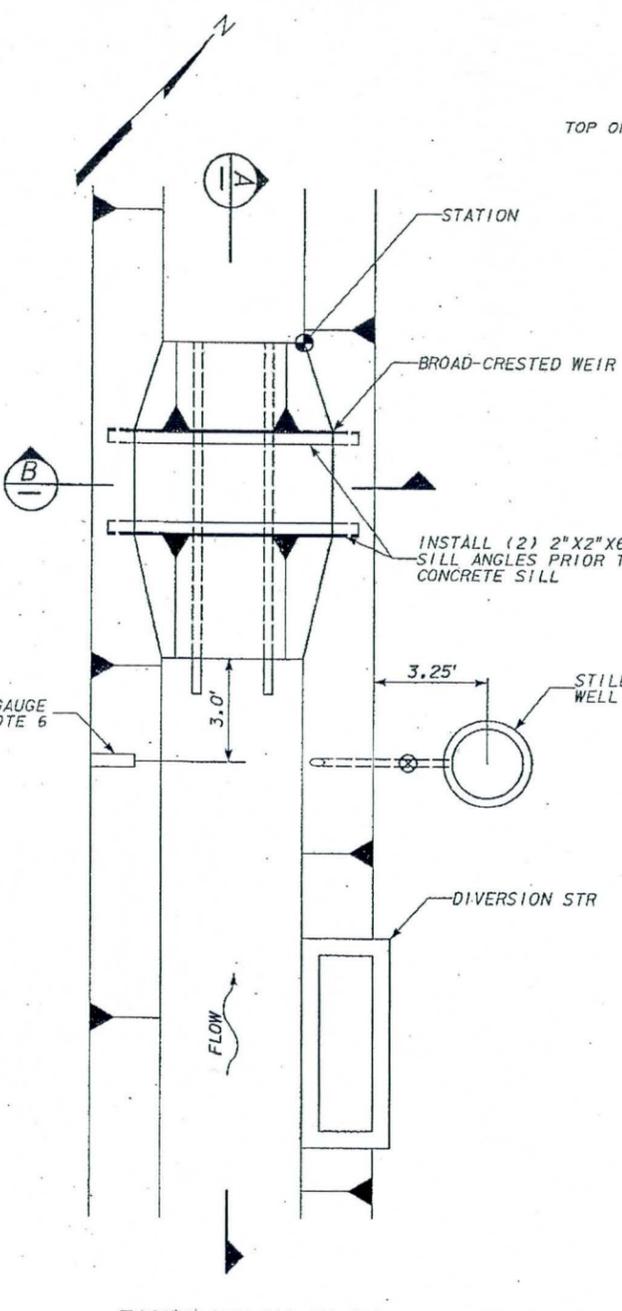
SALT RIVER PROJECT
WATER ENGINEERING PHOENIX, ARIZONA

LACC
SEC. 2, TIS, RIE
BASIN BOOSTER PUMP
PUMP CAN INSTALLATION DETAILS

SCALE: NONE	C120, 1173 B151W002.DGN	SHEET NO.
SUBJ CODE: PT	DIST CODE: Y3	DWG SIZE: 22X34
B-151-W002		6

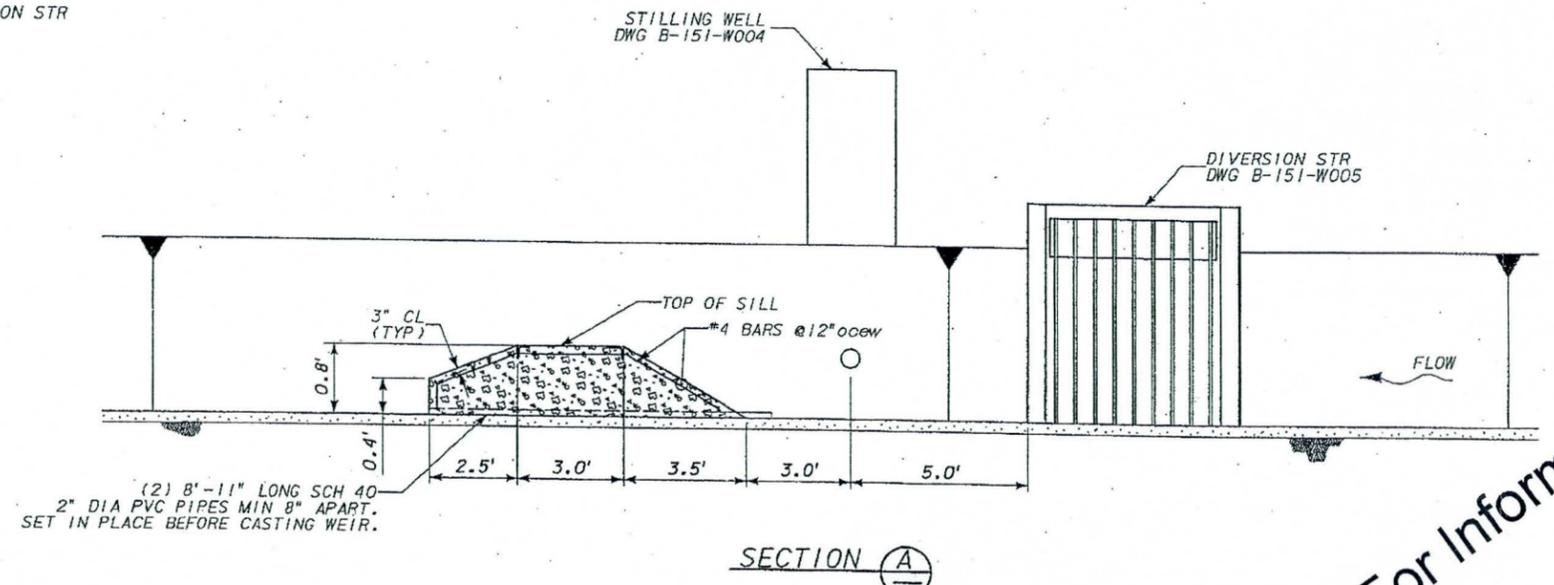
For Information Only

REV	DATE	BY	CHKD	APPD	ISSUE
1	09/02	DLR	TMC	BMP	INITIAL ISSUE BY STANTEC
2					
3					
4					
5					



Q. FLOW MI	Y1 ABOVE CREST
200	0.421
250	0.483
300	0.540
350	0.593
400	0.642
450	0.689
500	0.734
550	0.777
600	0.817
650	0.857
700	0.895
750	0.931
800	0.967
850	1.002
900	1.035
950	1.068
1000	1.100

- NOTES**
- REINFORCING BARS SHALL BE ASTM A615, GRADE 60.
 - STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH (f_c') 3000 PSI.
 - SILL OF WEIR SHALL BE LEVEL IN ALL DIRECTIONS. STEEL TROWEL FINISH.
 - CONCRETE SHALL BE PLACED WITH NO COLD JOINTS. ALL CONCRETE SHALL BE VIBRATED DURING PLACEMENT.
 - CURE CONCRETE WITH WHITE PIGMENTED CURING COMPOUND.
 - ATTACH WEIR GAUGE TO SLIPFORM BANK WITH 1/4" DIA. 1 1/4" LNG HEX HD. WEJITS OR EQUAL. FIELD DRILL SLIPFORM BANK TO MATCH HOLES IN GAUGE. POSITION GAUGE SO 500 MI MARK IS EXACTLY 0.421' ABOVE WIER CREST (MEASURED VERTICALLY).



REFERENCE DRAWINGS
 PLAN/PROFILE B-112-0686 STA 64+89.6 SHT 2

For Information Only

DESIGN FOR CONSTRUCTION

0	RD-12359	DLN	DLN	TRK	BMP	2/12/03
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE

SRP SALT RIVER PROJECT
 WATER ENGINEERING PHOENIX, ARIZONA

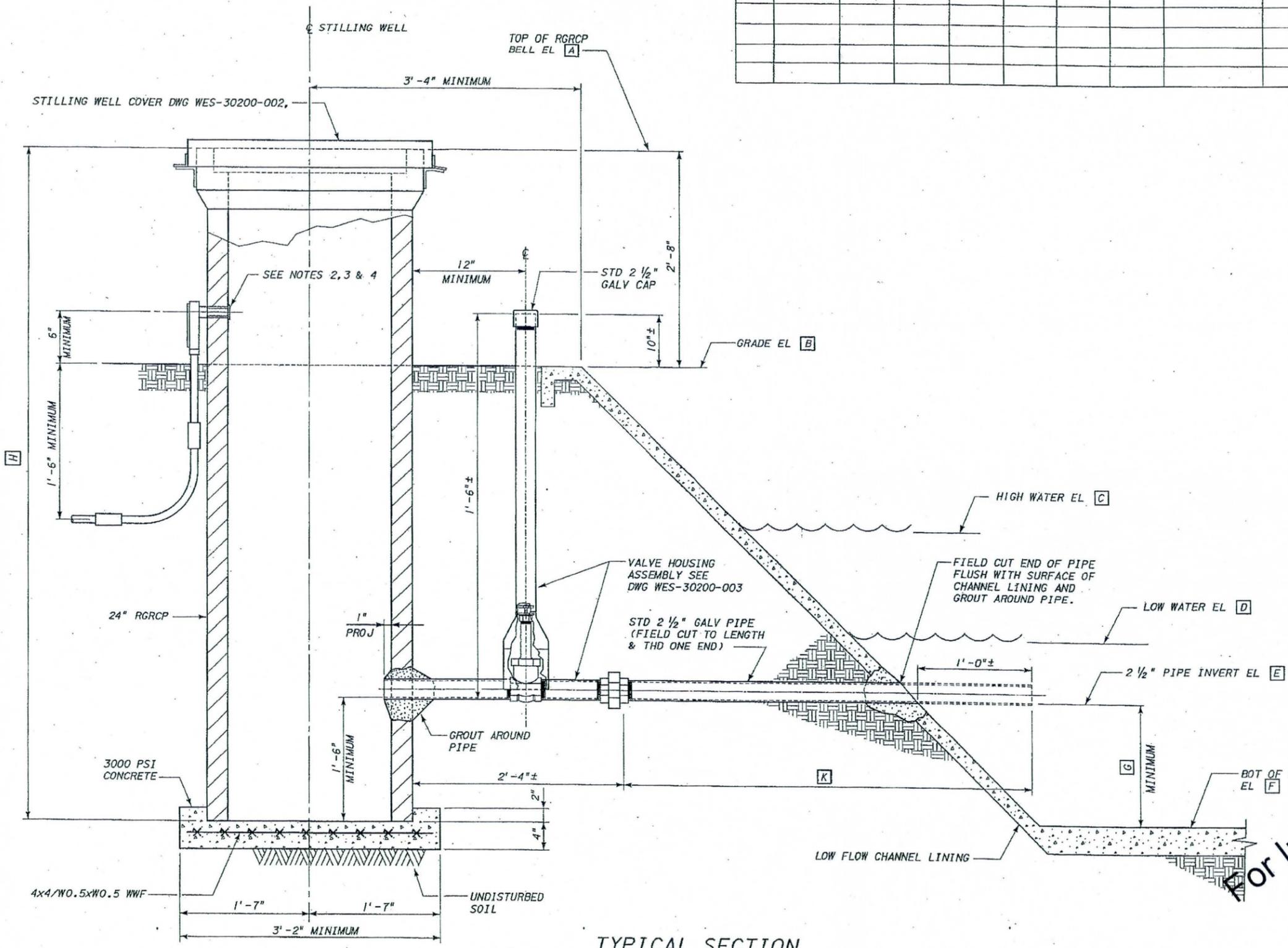
LACC LOW FLOW CHANNEL
BROAD CRESTED WEIR & GAUGE
 SEC. 2, TIS, RIE
 SW/O NE COR COORD= 4.9E-0.1S

SCALE: NONE	C120,1173 B151W003.DGN	SHEET NO.
SUBJ CODE	DIST CODE	DWG SIZE
PT	Y3	22X34
B-151-W003		7

REV	DATE	BY	CHK	APP
0	10-12-03	DLN	DLN	TRK

CONSTRUCTION DATA FOR STILLINGWELL

WELL NO.	STATION	ELEVATIONS (SEE NOTE 1)						DIMENSIONS				INSTALL		
		A	B	C	D	E	F	G	H	J	K	COVER	BOX	SHELTER
1	65+01.0	977.4	975.4	975.3	974.2	973.9	973.4	0'-8 1/4"	5'-0"	N/A	2'-2"	X		



TYPICAL SECTION



NOTES:

1. ALL ELEVATIONS INDICATED ARE ALONG THE STILLING WELL STATION Q.
2. CONDUIT NOT ALWAYS REQUIRED. SEE SITE PLAN OR CONDUIT PLAN FOR SPECIFIC REQUIREMENTS AND CONDUIT LOCATION.
3. DRILL 1 3/4" DIA HOLE FOR 1" x 4" CONDUIT NIPPLE. EPOXY NIPPLE IN PLACE.
4. PULL WIRES THRU NIPPLE. CAULK AROUND WIRES IN NIPPLE WITH 1/2" MINIMUM CAULKING COMPOUND (DOW 781 OR EQUAL) TO MAKE WATERTIGHT JOINT.
5. INSTALL STILLING WELL COVER, INSTRUMENTATION BOX OR INSTRUMENTATION SHELTER AS INDICATED.
6. REPLACE DISTURBED CANAL BANK/LINING IN ACCORDANCE WITH CES-30100-006.

For Information Only

DESIGN FOR CONSTRUCTION						
0	RD-12359	DLN	DLN	TMK	BMP	2/20/03
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE

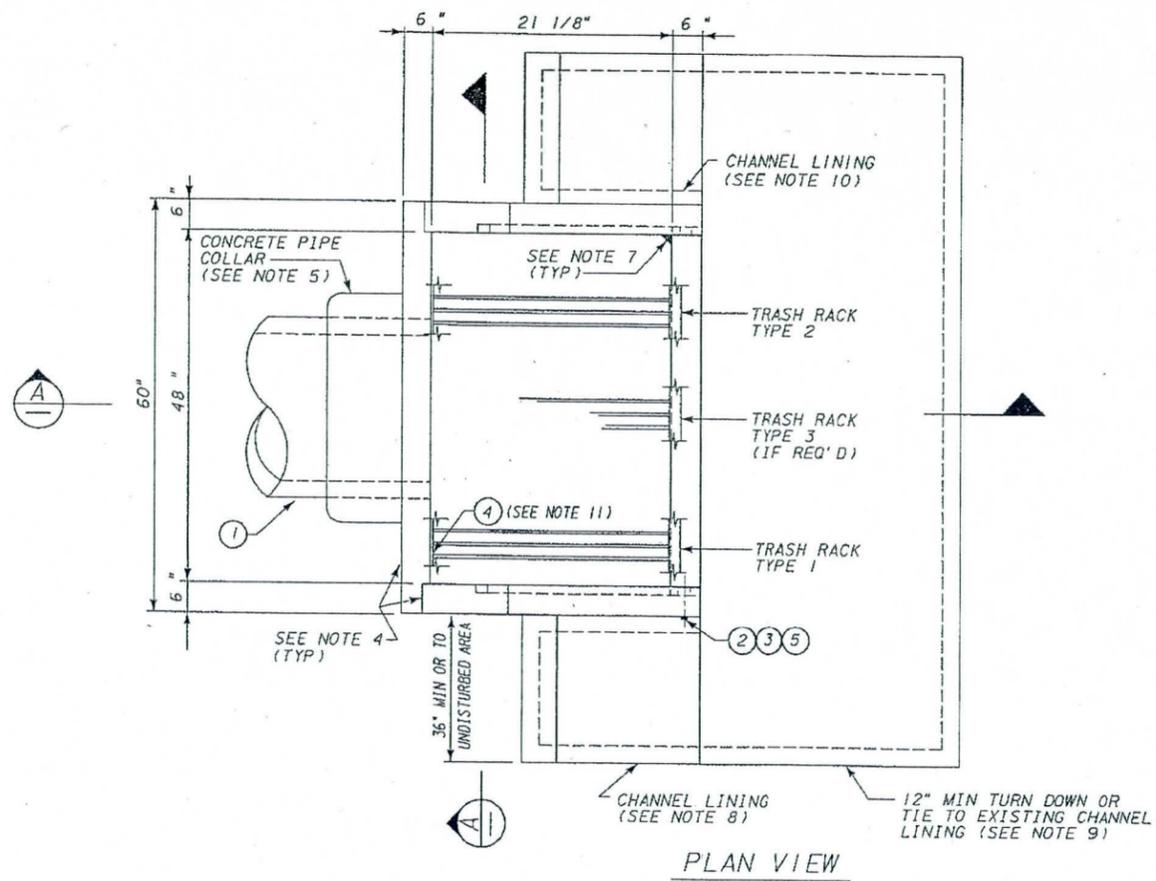
SALT RIVER PROJECT
WATER ENGINEERING ♦ PHOENIX, ARIZONA

LACC
SEC. 2, TIS, RIE
SW/O NE CORNER
BROAD CRESTED WEIR
STILLING WELL DETAILS

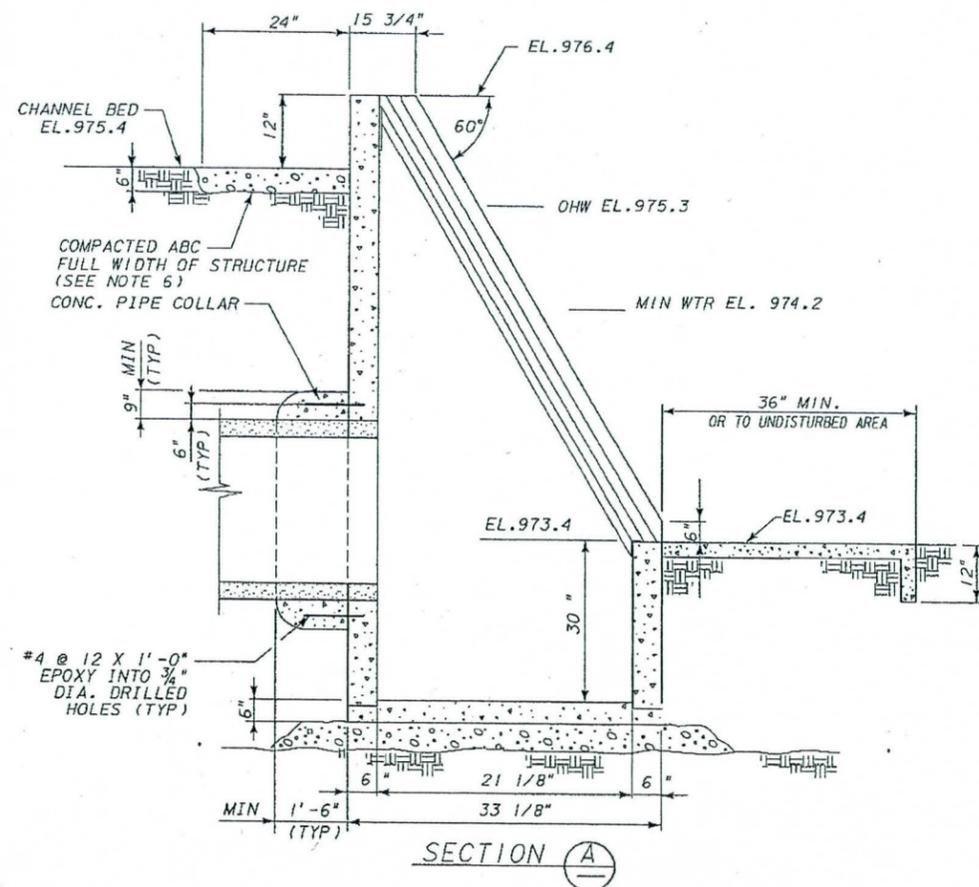
SCALE: 1/2" = 1'-0"	PROJECT: C120, 1173B151W004, DGN	SHEET NO.
SUBJ CODE: SW	DIST CODE: Y3	DWG SIZE: 22X34
B-151-W004		8

*****SYTIME*****

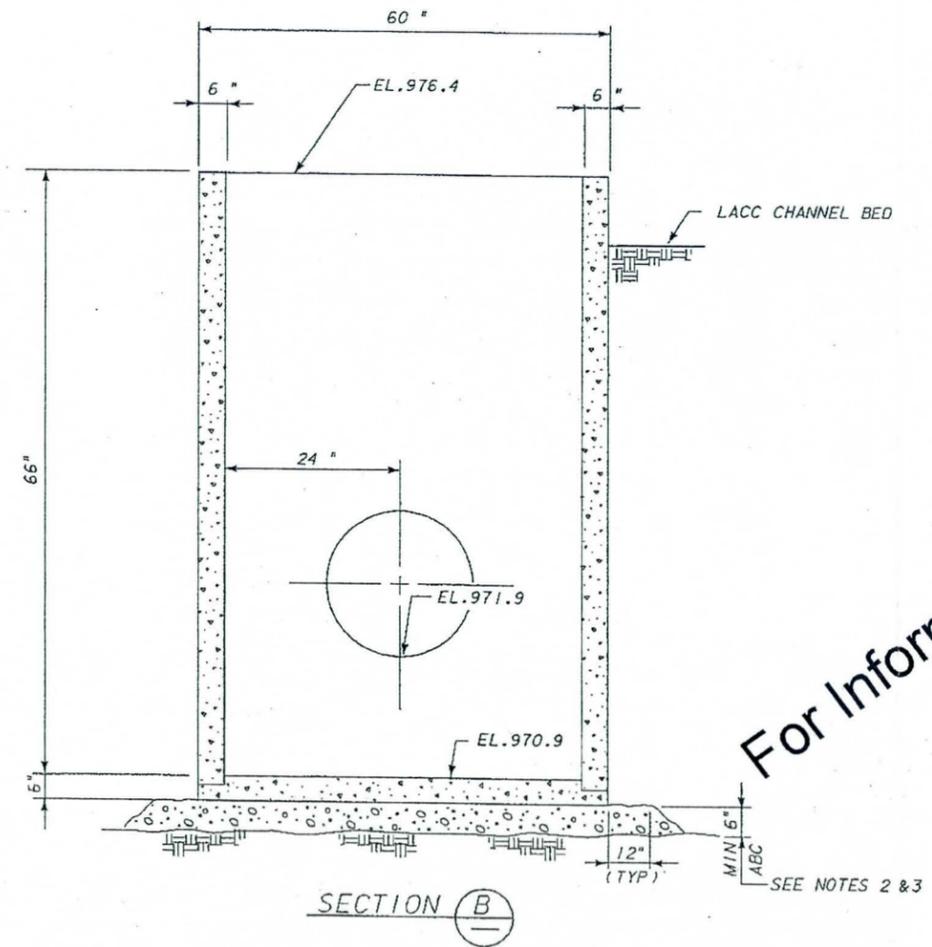
C:\2012\12\24\STL.WEL.WDF
 W04-24STL.WEL



PLAN VIEW



SECTION A



SECTION B

BILL OF MATERIAL					
ITEM	NO. REQ'D.	DESCRIPTION	LENGTH		STOCK CODE NO.
			FT	IN	
1	1	24" RGRCP, CLASS V	8	0	
2	12	1/2" DIA. COIL BOLT	0	6"	
3	16	1/2" DIA. FLAT WASHER			058-9660
4	4	1/2" DIA. HEX HEAD, CONC. EXP. BOLT	0	3 3/4"	
5	12	1/2" DIA. SQUARE WASHER			058-9870

- NOTES**
- EXCAVATION FOR THE STRUCTURE SHALL BE IN ACCORDANCE WITH THE SRP "EXCAVATION SAFETY RESOURCE MANUAL".
 - THE MINIMUM REQUIREMENT FOR COMPACTION SHALL BE 95% OF MAXIMUM DENSITY PER ASTM D698 AT +2% TO -4% OF OPTIMUM MOISTURE CONTENT.
 - THE NATIVE MATERIAL BELOW THE ABC PAD SHALL BE COMPACTED AS INDICATED IN NOTE 2.
 - APPLY EPOXY ADHESIVE TO EACH PANEL JOINT IMMEDIATELY BEFORE ASSEMBLY. THE MINIMUM BEAD OF ADHESIVE SHALL BE 1" WIDE X 1/2" DEEP AT THE CENTER OF THE JOINT FLANGE.
 - INSTALL CONCRETE PIPE COLLARS FOR EACH PRECAST CONCRETE PIPE JOINT.
 - BACKFILL AND COMPACT THE AREA AROUND THE STRUCTURE USING ABC MATERIAL TO A MINIMUM ELEVATION OF 6" ABOVE THE HIGHEST STUBOUT PIPE. THE REMAINING AREA SHALL BE BACK-FILLED AND COMPACTED USING 3" MAXIMUM DIMENSION NATIVE MATERIAL TO THE PLAN FINISH GRADE ELEVATION. ABC AND NATIVE MATERIAL SHALL BE COMPACTED AS INDICATED IN NOTE 2. AGGREGATE SLURRY BACKFILL CAN BE USED IN LIEU OF ABC OR NATIVE MATERIAL BACKFILL.
 - SEAL ALL INSIDE CORNERS WATERTIGHT WITH NON-SHRINK GROUT USING A 1" MINIMUM FILLET.
 - SHAPE CHANNEL SECTION SURROUNDING STRUCTURE IN ACCORDANCE WITH REQUIRED PLAN ELEVATIONS AND STANDARD DRAWINGS CES-30100-006 AND CES-30100-008.
 - INSTALL 12" MINIMUM TURNDOWN AT EDGES OF CHANNEL BANK AND BOTTOM LINING IN UNLINED CHANNEL SECTIONS, IN LINED CHANNEL SECTIONS TIE TO LINING AS SHOWN ON STANDARD DWG CES-30100-006.
 - TIE CHANNEL BANK LINING TO STRUCTURE SIDE WALLS AS SHOWN ON STANDARD DRAWING CES-30100-008.
 - INSTALL THE 1/2" DIA. X 3 3/4" EXPANSION ANCHORS USING THE TRASHRACKS AS TEMPLATES. EMBEDMENT OF THE ANCHORS SHALL BE TO THE FULL LENGTH OF THE ANCHOR.

REFERENCE DRAWINGS

PLAN/PROFILE	B-112-0686	STA 65+12.0	SH# 2
LATERAL HEAD TRASH RACKS & LIFTING STEM HARDWARE	TEMPORARY		SH# 10
CASTING DETAILS	TEMPORARY		SH# 11
	TEMPORARY		SH# 12

FOR CONSTRUCTION

RD-12359	BMP	DLN	GMB	PVH	/ /
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH

SALT RIVER PROJECT
 WATER ENGINEERING PHOENIX, ARIZONA

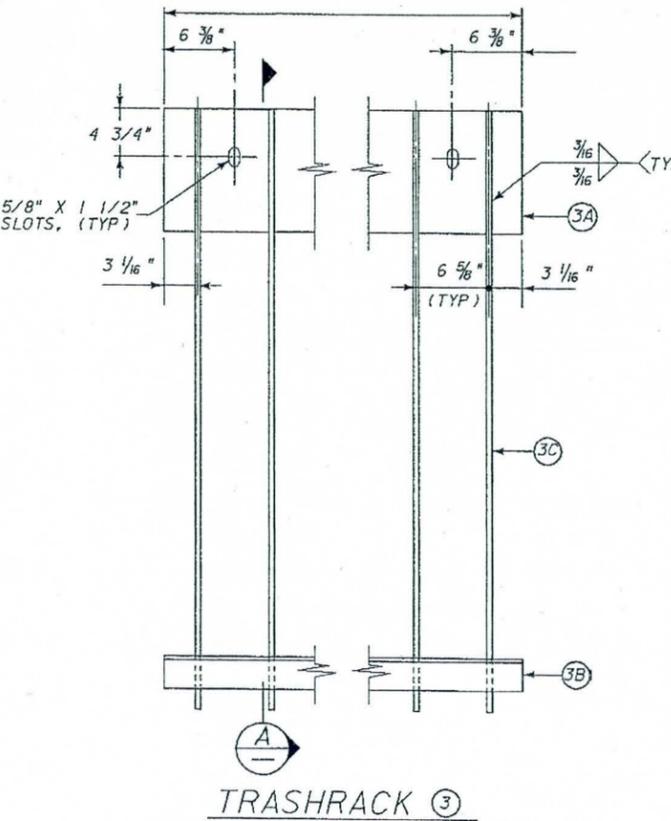
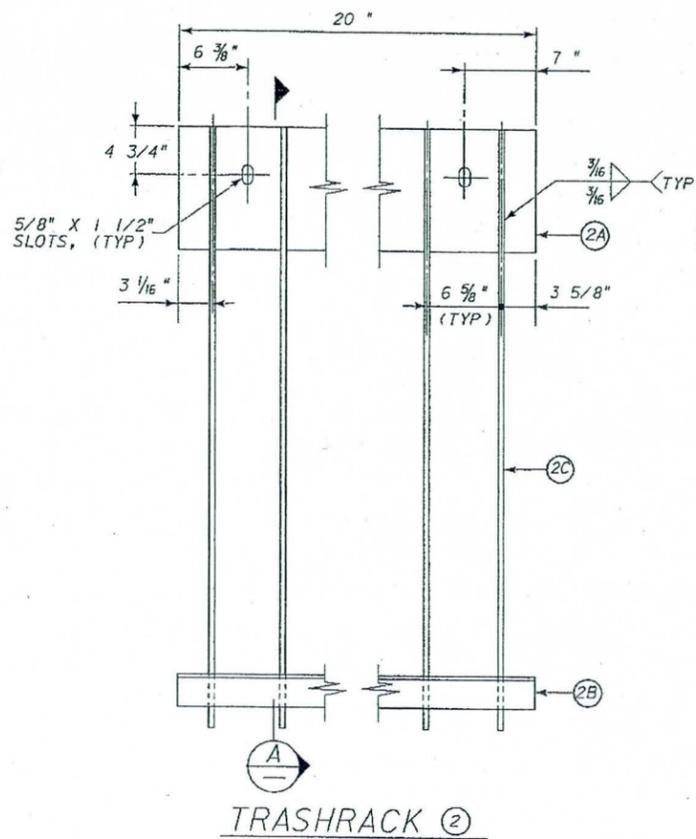
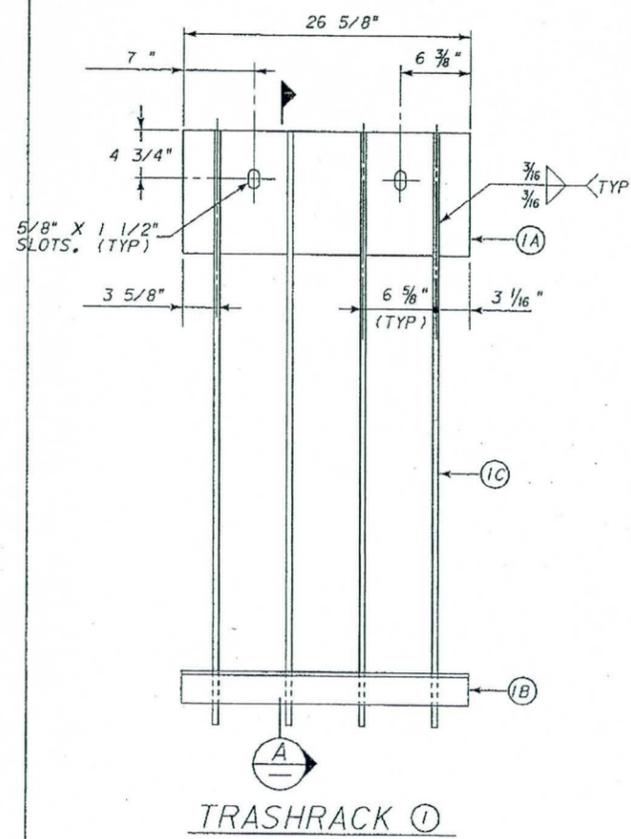
LACC CHANNEL DIVERSION STRUCTURE
 SEC. 2 T IS R IE
 SW/O NE COR, COORD, 4.9E-0.1S
 INSTALLATION DETAILS

SCALE: NONE	120,1173151W005.DGN	SHEET NO.
SUBJ CODE	DIST CODE	DWG SIZE
LH	Y3	22X34
B-151-W005		9

REV	DATE	BY	CHK	APP	ISSUE
0	02-92	JAC			INITIAL ISSUE
1	01/97	MD	SWT	MBB	REL

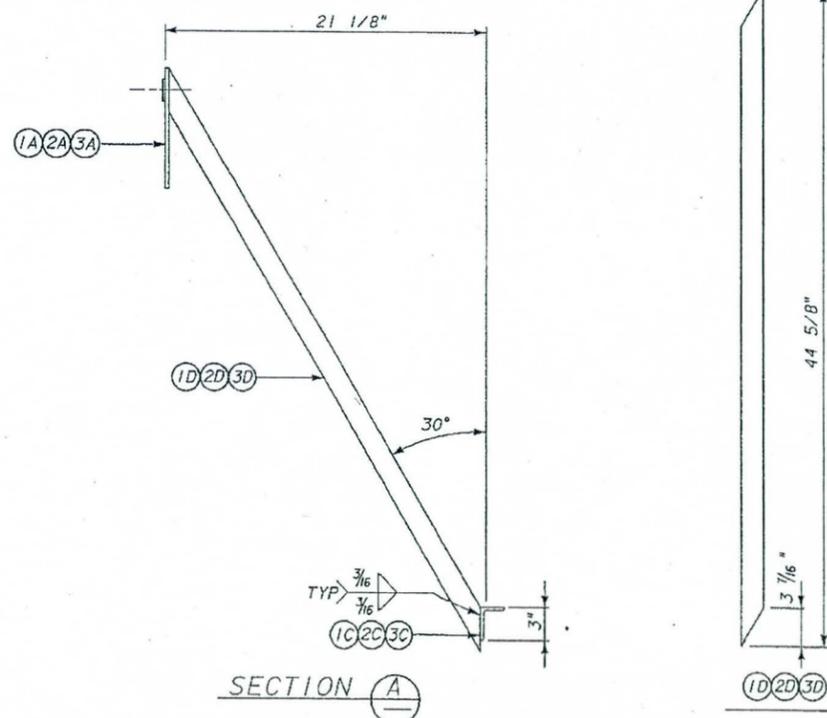
FORM NO. DGN-LHTRRK

For Information Only



BILL OF MATERIAL

ITEM	NO. REQ'D.	DESCRIPTION	LENGTH INCHES	STOCK CODE NO.
1	1	TRASH RACK		
1A	1	PL 1/4 X 11 ASTM A36	26 5/8	
1B	1	L 3 X 2 X 1/4 ASTM A36	26 5/8"	
1C	4	BAR 2 X 1/2 ASTM A36	44 5/8	
2	1	TRASH RACK		
2A	1	PL 1/4 X 11 ASTM A36	20	
2B	1	L 3 X 2 X 1/4 ASTM A36	20	
2C	3	BAR 2 X 1/2 ASTM A36	44 5/8	
3	0	TRASH RACK		
3A	0	PL 1/4 X 11 ASTM A36		
3B	0	L 3 X 2 X 1/4 ASTM A36		
3C	0	BAR 2 X 1/2 ASTM A36	44 5/8	



TRASH RACK NOTE

1. SANDBLAST TO NEAR WHITE FINISH AND ZINC METAL SPRAY OR HOT DIP GALVANIZE 5-7 MILS AFTER FABRICATION.

REFERENCE DRAWINGS

PLAN/PROFILE — B-112-0686 STA 65+12.0

DIVERSION STRUCTURE INSTALLATION DETAILS — B-151-W005

ISSUE FOR CONSTRUCTION

0	RD-12359	BMP	DLN	GMB	PVH	/	/
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE	

SALT RIVER PROJECT
WATER ENGINEERING ♦ PHOENIX, ARIZONA

LACC CHANNEL
DIVERSION STRUCTURE
SEC. 2 T-1S R-1E
SW/O NE COR, COORD, 4.9E-0.1S
FABRICATION DETAILS

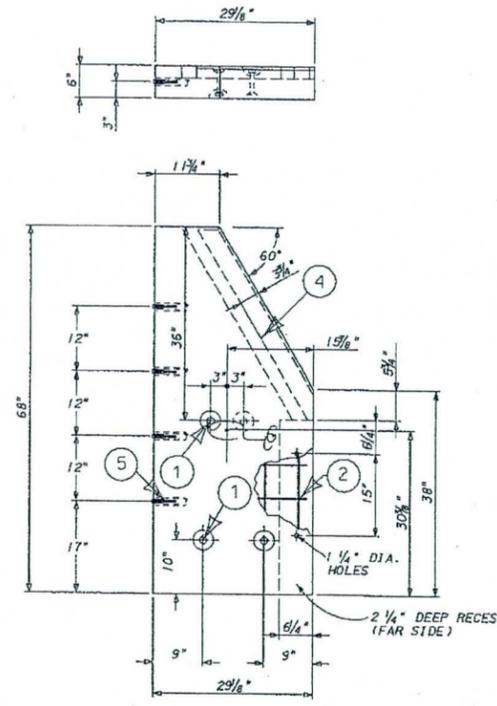
SCALE: NONE	(120, 1173B151W005.DGN)	SHEET NO.
SUBJ CODE	DIST CODE	DWG SIZE
LH	Y3	22X34
TEMPORARY		10

For Information Only

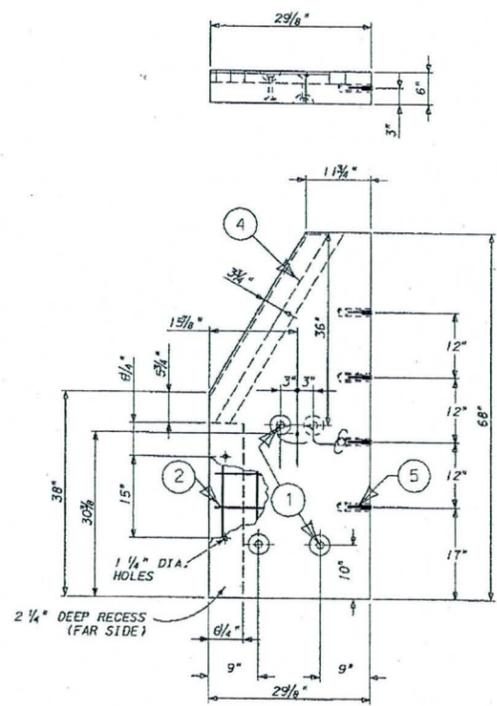
REV	NO.	DATE	BY	CHK	APP	AUTH

P02: (120, 121) BORDER.DGN

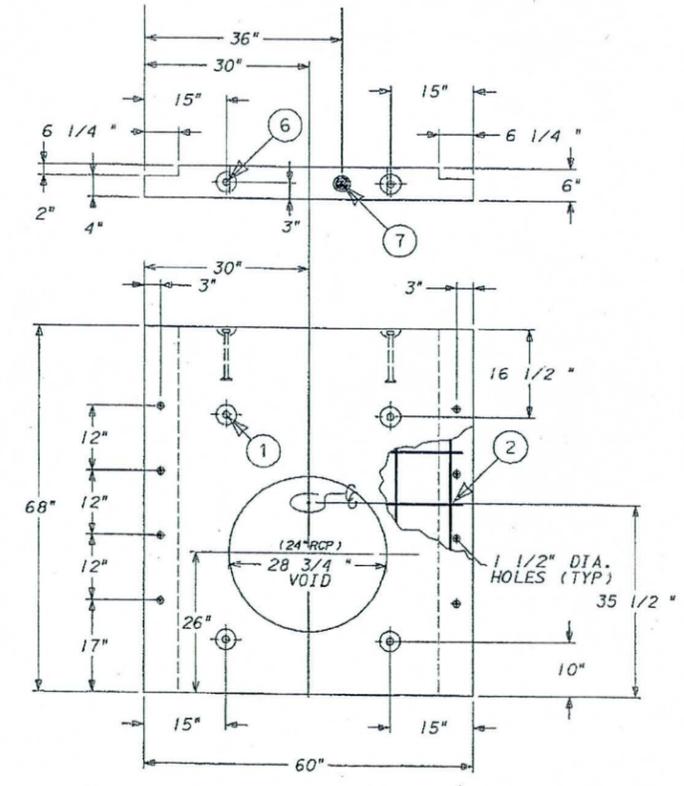
REV	DATE	BY	CHKD	DESCRIPTION
1	01/21/15	...	...	...
2	02/02/15	...	...	...
3	02/02/15	...	...	...
4	02/02/15	...	...	...
5	02/02/15	...	...	...
6	02/02/15	...	...	...
7	02/02/15	...	...	...
8	02/02/15	...	...	...
9	02/02/15	...	...	...
10	02/02/15	...	...	...



Left Wall (3)
APPROX. PANEL WT. 895.00 LBS



Right Wall (3)
APPROX. PANEL WT. 895.00 LBS



DownStream (3)
APPROX. PANEL WT. 1787.00 LBS.

Item	REQD	Description	FT	IN	Cat No.
1	12	(ea) 4 TON DAYTON-SUPERIOR P-52 S.L. ANCHOR	0	4 3/4	
2	172	(1#) REBAR (SEE NOTE #3)			
3	1.0	(cy) CONCRETE MIX *(SEE NOTE 4)			
4	8	(1#) TYPE 1 DISP. STEEL CHECK GUIDE FORM			04-0480
5	8	(ea) 1/2" DIA. COIL LOOP ANCHOR	0	6	04-0045
6	2	(ea) 4 TON DAYTON-SUPERIOR P-52 S.L. ANCHOR WITH P-59 SHEAR BAR	0	9 1/2	
7	1	(ea) STD WUA BRONZE BENCH MARK	X	X	15-1650

- NOTES:
- REINFORCING BARS SHALL BE ASTM A615, GRADE 60.
 - REINFORCEMENT ORIENTATION HEREINAFTER REFERRED TO SHALL BE RELATIVE TO THE ERECTED PANELS POSITION.
 - HORIZONTAL REINFORCEMENT IN WALLS SHALL BE #4 AT 12" ON CENTER. VERTICAL REINFORCEMENT IN WALLS SHALL BE #4 AT 12" ON CENTER. REINFORCEMENT IN FLOOR SHALL BE #4 AT 12" ON CENTER BOTH WAYS. ALL REINFORCEMENT SHALL BE CENTERED IN PANEL. ADDITIONAL REINFORCEMENT SHALL BE PROVIDED AT BLOCKOUTS.
 - STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH (f'c') OF 4000 PSI.
 - TOLERANCE FOR P-52 ANCHOR PLACEMENT SHALL BE WITHIN 1 INCH OF DIMENSIONS SHOWN (SYMMETRY ABOUT VERTICAL CENTER GRAVITY SHALL BE MAINTAINED).
 - PANELS SHALL BE PRECAST WITH INSIDE FACE DOWN FOR WALLS AND TOP FACE DOWN FOR FLOOR. EXPOSED FACE SHALL RECEIVE BROOM FINISH. DATE OF POUR AND PANEL WEIGHT SHALL BE IMPRINTED ON PANEL USING LETTERS 6 INCH MINIMUM HEIGHT.
 - A DECORATIVE STAMPED CONCRETE FINISH SHALL BE APPLIED TO THE OUTSIDE FACE OF THE PANELS FROM THE TOP OF THE WALL DOWN TO THE DIMENSION SHOWN.
 - PROVIDE A 4 INCH X 12 INCH SMOOTH FINISH GATE IDENTIFICATION SPACE FOR EACH DELIVERY GATE AT THE LOCATIONS SHOWN.
 - PIPE VOID DIMENSIONS SHOWN ARE ACTUAL SIZE. FIBERGLASS RINGS ARE AVAILABLE FOR THE PIPE UP TO 66" ID. (VOID SIZE 73 1/4"). SEE WES-CASTSTDS FOR AVAILABLE VOID AND RING SIZES.
 - GATE VOID BLOCKOUT SHALL BE AS SPECIFIED IN THE DETAILS SHOWN ON DRAWING WES-CASTSTDS.

STANDARD SPECIFICATIONS:
 REINFORCING STEEL _____ SRP 03210
 CONCRETE AND NON-STRUCTURAL GROUT _____ SRP 03300
 DETAILS AND ASSEMBLY FORMS:
 B-54-157.1, B-54-157.2, B-54-157.3, B-54-157.4

REFERENCE DRAWINGS:
 PLAN/PROFILE: B-112-0686 STA: 65+12.0
 PRECAST TURNOUT STRUCTURE: B-151-W005
 STD SUPPLEMENTAL CASTING DETAIL: WES-CASTSTDS

--	--	--	--	--	--

ISSUE FOR CONSTRUCTION						
0	RD-12359	BMP	DLN	GMB	PVH	/ /
REV NO.	JOB NO.	DFTN	DSGN	ENGR CHK	TSSUE AUTH	DATE



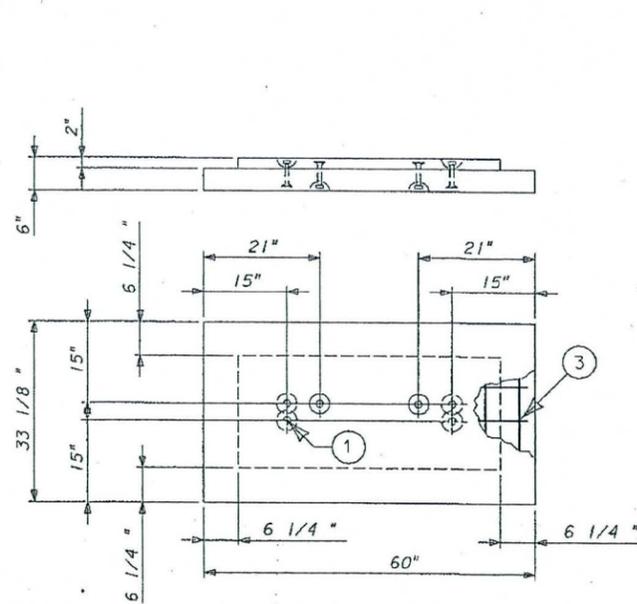
LACC CHANNEL
 DIVERSION STRUCTURE
 SEC. 2 T IS R IE
 SW/O NE COR, COORD, 4.9E-0.1S
 STR CASTING DETAIL

SCALE: 3/4" = 1'-0"	(120, 117, 115) W005.DGN	SHEET NO.
SUBJ CODE	DIST CODE	DWG SIZE
CD	Y-3	22X34
TEMPORARY		11

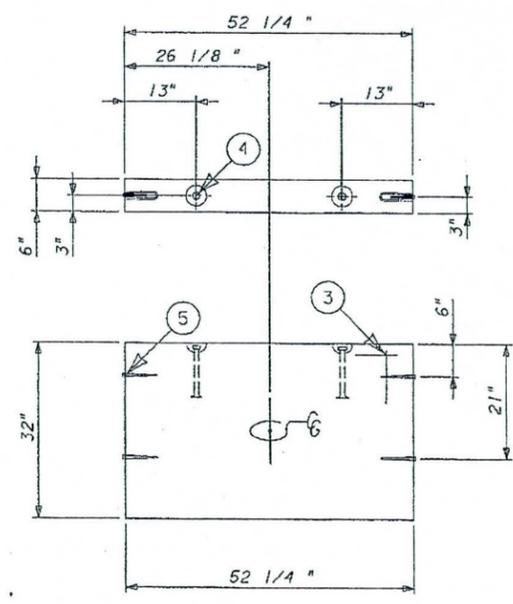
For Information Only

PO2: [120, 121] BORDER.DGN

NO.	REV.	DATE	BY	CHKD.	APP'D.



Floor ②
APPROX. PANEL WT. 1034.00 LBS.



Crest Wall ②
APPROX. PANEL WT. 871.00 LBS.

Bill of Material					
Item	REQD	Description	FT	IN	Cat No.
①	6	(ea) 4 TON DAYTON-SUPERIOR P-52 S.L. ANCHOR	0	4 3/4	
②	0.5	(cy) CONCRETE MIX *(SEE NOTE 4)			
③	69	(lf) REBAR (SEE NOTE #3)			
④	2	(ea) 4 TON DAYTON-SUPERIOR P-52 S.L. ANCHOR WITH P-59 SHEAR BAR	0	9 1/2	
⑤	4	(ea) 1/2" DIA. COIL LOOP ANCHOR	0	6	04-0045

- NOTES:
- REINFORCING BARS SHALL BE ASTM A615, GRADE 60.
 - REINFORCEMENT ORIENTATION HEREINAFTER REFERRED TO SHALL BE RELATIVE TO THE ERECTED PANELS POSITION.
 - HORIZONTAL REINFORCEMENT IN WALLS SHALL BE #4 AT 12" ON CENTER. VERTICAL REINFORCEMENT IN WALLS SHALL BE #4 AT 12" ON CENTER. REINFORCEMENT IN FLOOR SHALL BE #4 AT 12" ON CENTER BOTH WAYS. ALL REINFORCEMENT SHALL BE CENTERED IN PANEL. ADDITIONAL REINFORCEMENT SHALL BE PROVIDED AT BLOCKOUTS.
 - STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH (f_c') OF 4000 PSI.
 - TOLERANCE FOR P-52 ANCHOR PLACEMENT SHALL BE WITHIN 1 INCH OF DIMENSIONS SHOWN (SYMMETRY ABOUT VERTICAL CENTER GRAVITY SHALL BE MAINTAINED).
 - PANELS SHALL BE PRECAST WITH INSIDE FACE DOWN FOR WALLS AND TOP FACE DOWN FOR FLOOR. EXPOSED FACE SHALL RECEIVE BROOM FINISH. DATE OF POUR AND PANEL WEIGHT SHALL BE IMPRINTED ON PANEL USING LETTERS 6 INCH MINIMUM HEIGHT.
 - A DECORATIVE STAMPED CONCRETE FINISH SHALL BE APPLIED TO THE OUTSIDE FACE OF THE PANELS FROM THE TOP OF THE WALL DOWN TO THE DIMENSION SHOWN.
 - PROVIDE A 4 INCH X 12 INCH SMOOTH FINISH GATE IDENTIFICATION SPACE FOR EACH DELIVERY GATE AT THE LOCATIONS SHOWN.
 - PIPE VOID DIMENSIONS SHOWN ARE ACTUAL SIZE. FIBERGLASS RINGS ARE AVAILABLE FOR THE PIPE UP TO 66" ID. (VOID SIZE 73 1/4"). SEE WES-CASTSTDS FOR AVAILABLE VOID AND RING SIZES.
 - GATE VOID BLOCKOUT SHALL BE AS SPECIFIED IN THE DETAILS SHOWN ON DRAWING WES-CASTSTDS.

STANDARD SPECIFICATIONS:
 REINFORCING STEEL _____ SRP 03210
 CONCRETE AND NON-STRUCTURAL GROUT _____ SRP 03300
 DETAILS AND ASSEMBLY FORMS:
 B-54-157.1, B-54-157.2, B-54-157.3, B-54-157.4

REFERENCE DRAWINGS:
 PLAN/PROFILE: B-112-0686 STA: 65+12.0
 PRECAST TURNOUT STRUCTURE: B-151-W005
 STD SUPPLEMENTAL CASTING DETAIL: WES-CASTSTDS

--	--	--	--	--	--

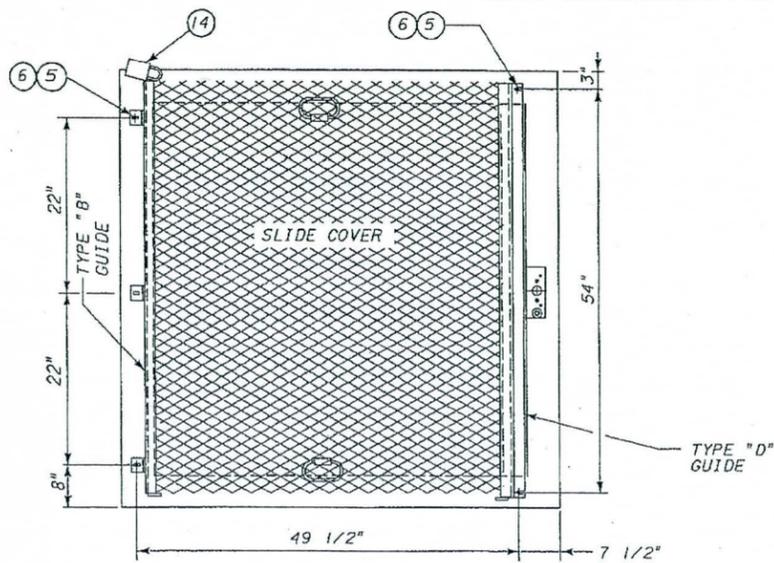
ISSUE FOR CONSTRUCTION						
0	RD-12359	BMP	DLN	OMB	PVH	/ /
REV. NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE

SALT RIVER PROJECT
 WATER ENGINEERING PHOENIX, ARIZONA

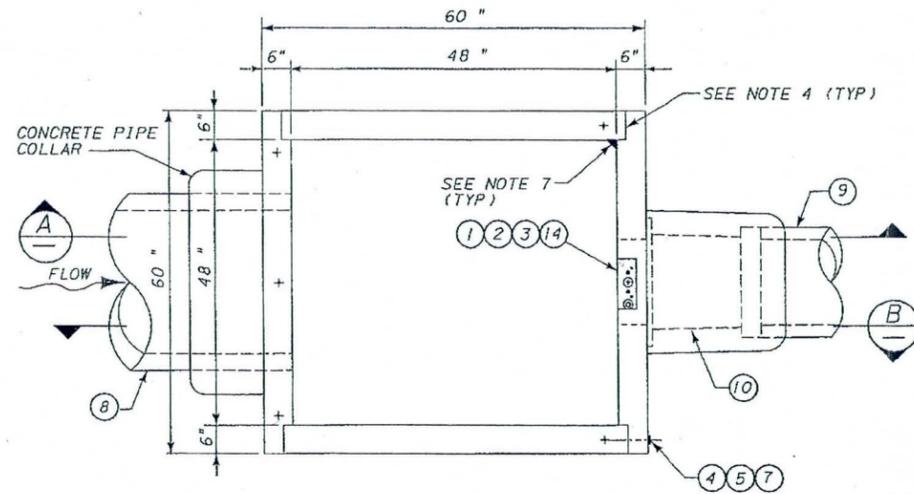
LACC CHANNEL
 DIVERSION STRUCTURE
 SEC. 2 T 15 R 1E
 SW/O NE COR, COORD, 4.9E-0.1S
 STR CASTING DETAIL

SCALE: 3/4" = 1'-0"	L120, 1113181519005.DGN	SHEET NO
SUBJ CODE/DIST CODE/DWG SIZE	CD Y-3 22X34	TEMPORARY 12

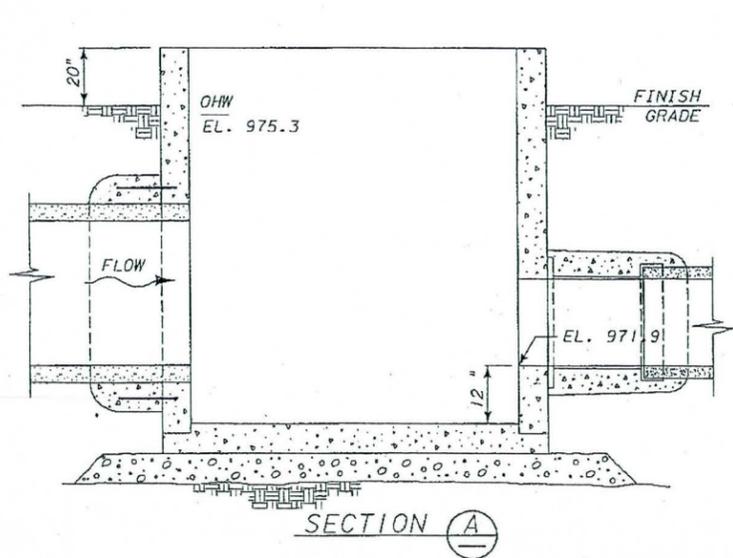
For Information Only



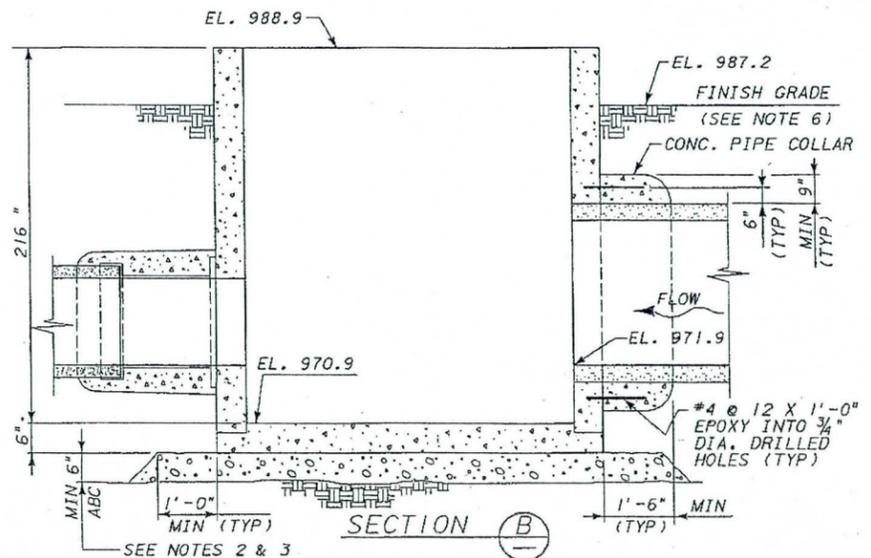
COVER PLAN



FOUNDATION PLAN



SECTION A



SECTION B

BILL OF MATERIAL

ITEM	NO. REQ'D.	DESCRIPTION	LENGTH		STOCK CODE NO.
			FT	IN	
1	1	24" TURNOUT GATE, TYPE III			004-1100
2	1	STEM CONNECTOR FOR TYPE III GATE			004-2159
3	1	TEE HANDLE ASSEMBLY			004-1181
4	16	1/2" DIA. COIL BOLT	0	6	
5	37	1/2" DIA. FLAT WASHER			058-9660
6	5	1/2" DIA. HEX HEAD, CONC. EXP. BOLT	0	3 3/4	
7	24	1/2" DIA. SQUARE WASHER			058-9870
8	1	24" RGRCP, CLASS V	8	0	
9	1	24" RGRCP, CLASS V	8	0	
10	1	24" STRAIGHT FIBERGLASS TRANSITION			
11	6	1/2" DIA. HEX HEAD MACHINE BOLT & NUT	0	8"	
12	5	1/2" DIA. UNC HEX HEAD BOLTS	0	2	
13	2	WUA LOCK, TYPE "A"			015-8365
14	1	MUFFLER CLAMP LOCKING COLLAR			

NOTES

- EXCAVATION FOR THE STRUCTURE SHALL BE IN ACCORDANCE WITH THE SRP "EXCAVATION SAFETY RESOURCE MANUAL".
- THE MINIMUM REQUIREMENT FOR COMPACTION SHALL BE 95% OF MAXIMUM DENSITY PER ASTM D698 AT +2% TO -4% OF OPTIMUM MOISTURE CONTENT.
- THE NATIVE MATERIAL BELOW THE ABC PAD SHALL BE COMPACTED AS INDICATED IN NOTE 2.
- APPLY EPOXY ADHESIVE TO EACH PANEL JOINT AND FIBERGLASS TRANSITION IMMEDIATELY BEFORE ASSEMBLY. THE MINIMUM BEAD OF ADHESIVE SHALL BE 1" WIDE X 1/2" DEEP AT THE CENTER OF THE JOINT FLANGE.
- INSTALL CONCRETE PIPE COLLARS FOR EACH FIBERGLASS TRANSITION LOCATION, COVERING THE TRANSITION AND JOINT AT THE PRECAST CONCRETE PIPE.
- BACKFILL AND COMPACT THE AREA AROUND THE STRUCTURE USING ABC MATERIAL TO A MINIMUM ELEVATION OF 6" ABOVE THE HIGHEST STUBOUT PIPE. THE REMAINING AREA SHALL BE BACK-FILLED AND COMPACTED USING 3" MAXIMUM DIMENSION NATIVE MATERIAL TO THE PLAN FINISH GRADE ELEVATION. ABC AND NATIVE MATERIAL SHALL BE COMPACTED AS INDICATED IN NOTE 2. AGGREGATE SLURRY BACKFILL CAN BE USED IN LIEU OF ABC OR NATIVE MATERIAL BACKFILL.
- SEAL ALL INSIDE CORNERS WATERTIGHT WITH NON-SHRINK GROUT USING A 1" MINIMUM FILLET.
- STEP RUNGS, WHEN SPECIFIED IN THE BILL OF MATERIAL SHALL BE PROVIDED AS SHOWN ON DWG. C-23-30 AND INSTALLED AS SPECIFIED ON DWG. C-23-31.
- INSTALL THE 1/2" DIA. X 3 3/4" EXPANSION ANCHORS USING THE COVER GUIDES AS A TEMPLATE. EMBEDMENT OF THE ANCHORS SHALL BE TO THE FULL LENGTH OF THE ANCHOR.

REFERENCE DRAWINGS

- PLAN/PROFILE B-112-0686 STA 64+97.0 SH# 2
- T.O. STR SLIDE COVERS GUIDES & HARDWARE TEMPORARY SH# 14
- CASTING DETAILS TEMPORARY SH# 15
- TEMPORARY SH# 16
- TEMPORARY SH# 17

ISSUE FOR CONSTRUCTION

RD-12359	BMP	BMP	GMB	PVH	/	/
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE

SALT RIVER PROJECT
WATER ENGINEERING PHOENIX, ARIZONA

LACC DIVERSION
SEC. 2 T IS R IE
SW/O NE COR, COORD, 4.9E-0.1S
MHTO INSTALLATION DETAILS

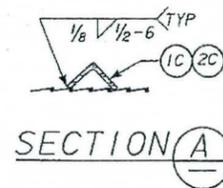
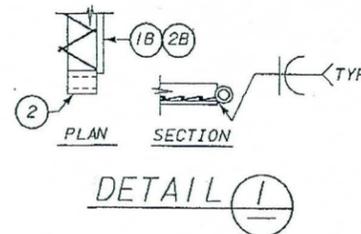
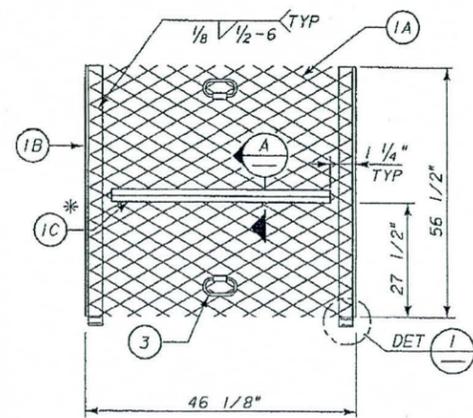
SCALE: NONE	C120.1172B151W006.DGN	SHEET NO.
SUBJ CODE	DIST CODE	DWG SIZE
MH	Y3	22X34
B-151-W006		13

For Information Only

DGN-MH10PDE

BILL OF MATERIAL

ITEM	NO. REQD	DESCRIPTION	WIDTH	LENGTH	STOCK CODE NO.
			INCHES	INCHES	
①	1	UPSTREAM COVER TYPE I	—	—	
①A	1	1 1/2 X 6 EXPANDED METAL GRATING	45 7/8"	56 1/2"	
①B	2	L 3/4 X 3/4 X 1/8 (1 ASS'Y. AS SHOWN, 1 OPP.)		56 1/2"	
①C	*	L 1 1/2 X 1 1/2 X 1/4		43 5/8"	
②	2	1/4" DIA. PIPE, STD. WT.		0 5/8"	
③	2	HANDLE			004-1280
④	1	TYPE "B" GUIDE		56 "	004-1242
⑤	1	TYPE "D" GUIDE			
⑤A	1	L 1 1/4 X 1 1/4 X 1/8		56 "	
⑤B	1	L 3 X 2 X 1/4		56	
⑥	1	STEM FOR TYPE III GATE		210"	NON-STOCK



UPSTREAM COVER TYPE I ①

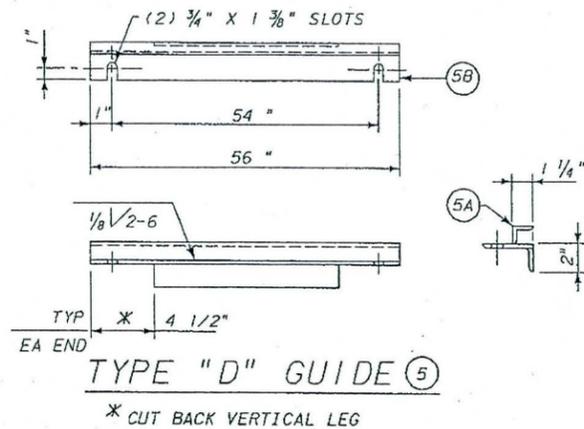
* NOTE: USE SUPPORT ANGLE ON COVER ≥ 4'-0" IN WIDTH. COVER < 4'-0" DOES NOT REQUIRE A SUPPORT.

NOTES:

- UNLESS OTHERWISE SPECIFIED, TOLERANCE DIMENSIONS SHALL BE ± 1/32".
- ALL STEEL SHALL BE ASTM A36 UNLESS OTHERWISE NOTED.
- COVER DIMENSIONS SHOWN PROVIDE FOR 1/2" TOTAL CLEARANCE IN GUIDES.
- SANDBLAST TO NEAR WHITE AND ZINC METAL SPRAY OR HOT DIP GALVANIZE 5-7 MILS AFTER FABRICATION.

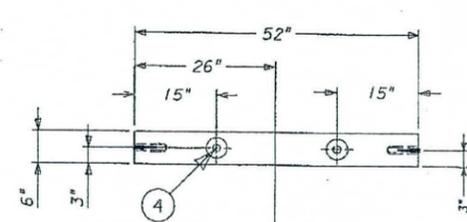
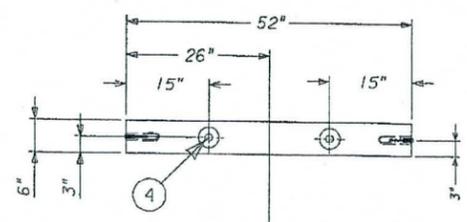
REFERENCE DRAWINGS:

PLAN PROFILE — B-112-0686 STA 64+97.0
STRUCTURE DRAWING — B-151-W006



For Information Only

ISSUE FOR CONSTRUCTION						
0	RD-12359	BMP	BMP	GMB	PVH	/ /
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE
SALT RIVER PROJECT WATER ENGINEERING ♦ PHOENIX, ARIZONA						
LACC DIVERSION SEC. 2 T-IS R-1E SW/O NE COR, COORD, 4.9E-0.1S MHTO SLIDE COVER DETAILS						
SCALE: NONE		[120, 117]B151W006			SH. NO.	
SUBJ CODE	DISTR CODE	DWG SIZE	TEMPORARY		14	
CO	Y3	22X34				



Bill of Material				
Item	REQD	Description	FT	IN Cat No.
①	396	(1F) REBAR (SEE NOTE #3)		
②	16	(eq) 1/2" DIA. COIL LOOP ANCHOR	0	6 04-0045
③	6	(eq) 4 TON DAYTON-SUPERIOR P-52 S.L. ANCHOR	0	4 3/4
④	4	(eq) 4 TON DAYTON-SUPERIOR P-52 S.L. ANCHOR WITH P-59 SHEAR BAR	0	9 1/2
⑤	3.2	(cy) CONCRETE MIX # (SEE NOTE 4)		

- NOTES:
- REINFORCING BARS SHALL BE ASTM A615, GRADE 60.
 - REINFORCEMENT ORIENTATION HEREINAFTER REFERRED TO SHALL BE RELATIVE TO THE ERECTED PANELS POSITION.
 - HORIZONTAL REINFORCEMENT IN WALLS SHALL BE #4 AT 12" ON CENTER. VERTICAL REINFORCEMENT IN WALLS SHALL BE #4 AT 12" ON CENTER. REINFORCEMENT IN FLOOR SHALL BE #4 AT 12" ON CENTER BOTH WAYS. ALL REINFORCEMENT SHALL BE CENTERED IN PANEL. ADDITIONAL REINFORCEMENT SHALL BE PROVIDED AT BLOCKOUTS.
 - STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH (f_c') OF 4000 PSI.
 - TOLERANCE FOR P-52 ANCHOR PLACEMENT SHALL BE WITHIN 1 INCH OF DIMENSIONS SHOWN (SYMMETRY ABOUT VERTICAL CENTER GRAVITY SHALL BE MAINTAINED).
 - PANELS SHALL BE PRECAST WITH INSIDE FACE DOWN FOR WALLS AND TOP FACE DOWN FOR FLOOR. EXPOSED FACE SHALL RECEIVE BROOM FINISH. DATE OF POUR AND PANEL WEIGHT SHALL BE IMPRINTED ON PANEL USING LETTERS 6 INCH MINIMUM HEIGHT.
 - A DECORATIVE STAMPED CONCRETE FINISH SHALL BE APPLIED TO THE OUTSIDE FACE OF THE PANELS FROM THE TOP OF THE WALL DOWN TO THE DIMENSION SHOWN.
 - PROVIDE A 4 INCH X 12 INCH SMOOTH FINISH GATE IDENTIFICATION SPACE FOR EACH DELIVERY GATE AT THE LOCATIONS SHOWN.
 - PIPE VOID DIMENSIONS SHOWN ARE ACTUAL SIZE. FIBERGLASS RINGS ARE AVAILABLE FOR THE PIPE UP TO 66" ID. (VOID SIZE 73 1/4"). SEE WES-CASTSTDS FOR AVAILABLE VOID AND RING SIZES.
 - GATE VOID BLOCKOUT SHALL BE AS SPECIFIED IN THE DETAILS SHOWN ON DRAWING WES-CASTSTDS.

STANDARD SPECIFICATIONS:
 REINFORCING STEEL _____ SRP 03210
 CONCRETE AND NON-STRUCTURAL GROUT _____ SRP 03300
 DETAILS AND ASSEMBLY FORMS:
 B-54-157.1, B-54-157.2, B-54-157.3, B-54-157.4

REFERENCE DRAWINGS:
 PLAN/PROFILE: B-112-0686 STA: 64+97.0
 PRECAST TURNOUT STRUCTURE: B-151-W006
 STD SUPPLEMENTAL CASTING DETAIL: WES-CASTSTDS

--	--	--	--	--	--

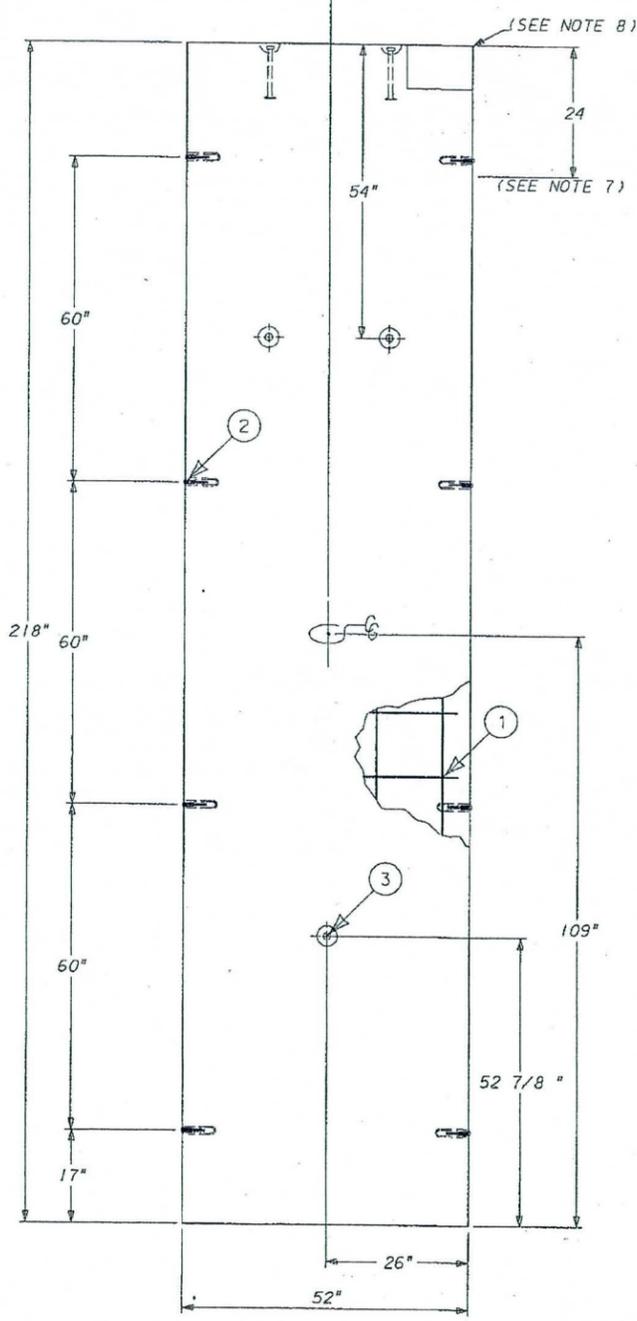
ISSUE FOR CONSTRUCTION					
REV NO.	JOB NO.	DFTR	ENGR CHK	ISSUE AUTH	DATE
0	RD-12359				

SALT RIVER PROJECT
 WATER ENGINEERING PHOENIX, ARIZONA

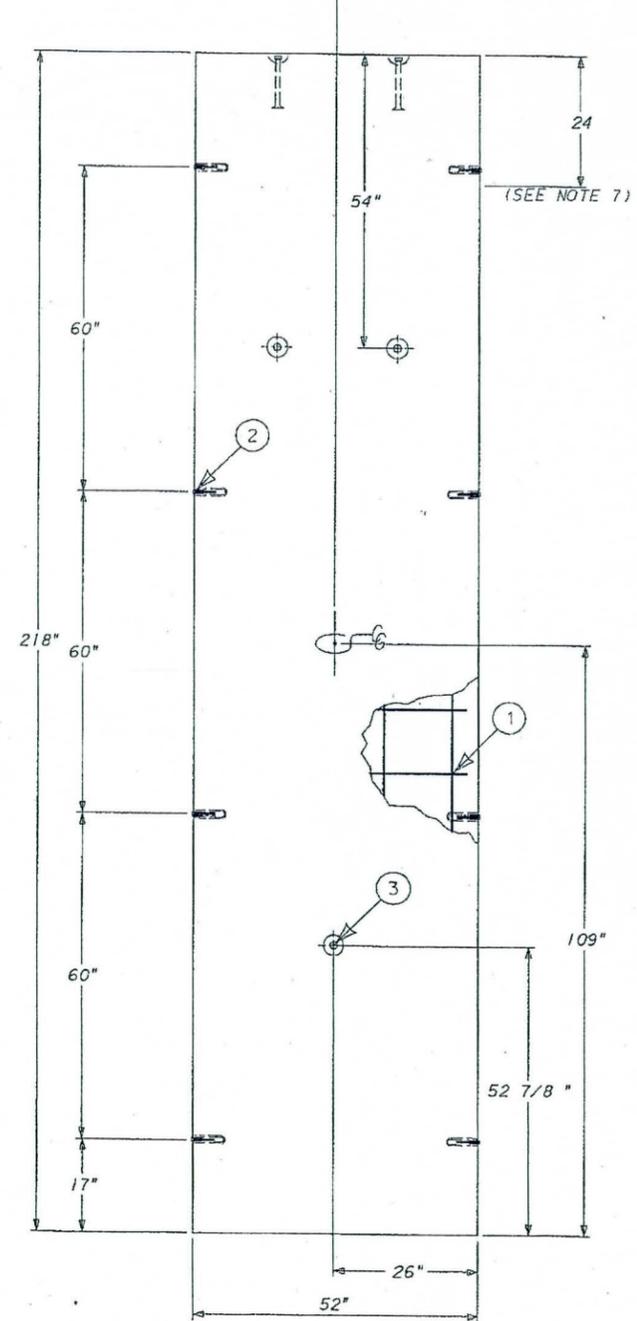
LACC DIVERSION
 SEC. 2 T I S R I E
 SW/O NE COR, COORD, 4.9E-0.1S
 MHTO CASTING DETAIL

SCALE: 3/4" = 1'-0"	[120, 117]B151W006.DGN	SHEET NO.
SUBJ CODE: DIST CODE: DWG SIZE	CD Y-3 22X34	TEMPORARY 15

For Information Only

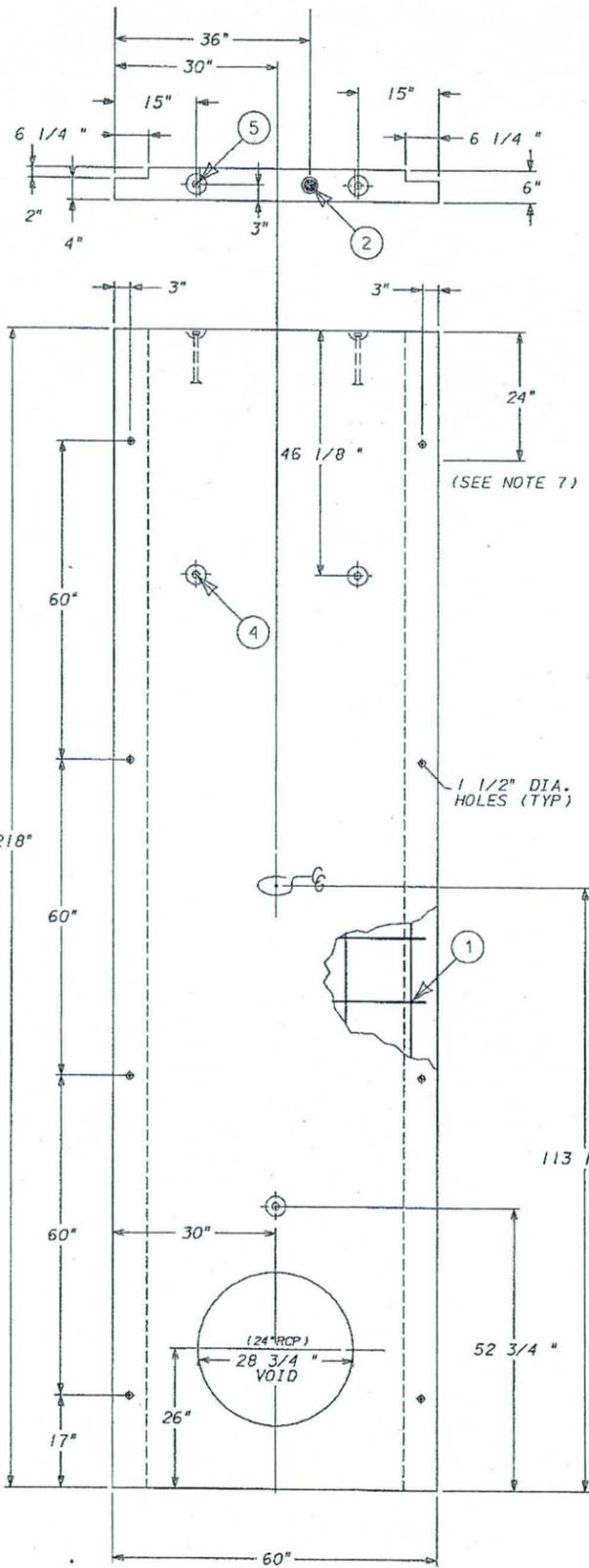


Left Wall ⑤
 APPROX. PANEL WT. 5905.00 LBS.

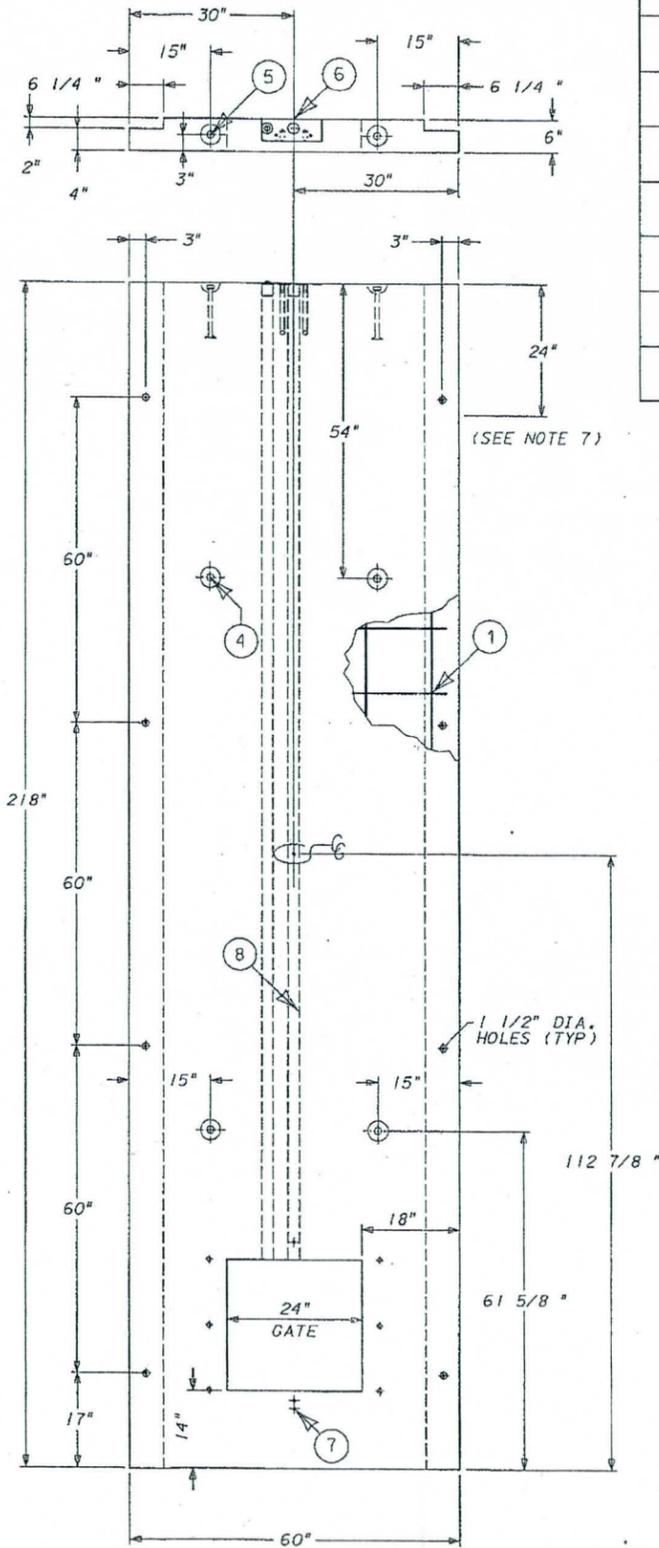


Right Wall ⑤
 APPROX. PANEL WT. 5905.00 LBS.

PO2: [120, 121] BORDER.DGN
 1. DATE PLOTTED: 12/15/10 10:00 AM
 2. PLOTTER: HP DesignJet 500
 3. PLOT SCALE: 1:1
 4. PLOT SHEET: 15 OF 15
 5. PLOT SIZE: 22 X 34
 6. PLOT ORIENTATION: Landscape
 7. PLOT RANGE: All
 8. PLOT RANGE: From: 0.00 To: 22.00
 9. PLOT RANGE: From: 0.00 To: 34.00
 10. PLOT RANGE: From: 0.00 To: 0.00
 11. PLOT RANGE: From: 0.00 To: 0.00
 12. PLOT RANGE: From: 0.00 To: 0.00
 13. PLOT RANGE: From: 0.00 To: 0.00
 14. PLOT RANGE: From: 0.00 To: 0.00
 15. PLOT RANGE: From: 0.00 To: 0.00
 16. PLOT RANGE: From: 0.00 To: 0.00
 17. PLOT RANGE: From: 0.00 To: 0.00
 18. PLOT RANGE: From: 0.00 To: 0.00
 19. PLOT RANGE: From: 0.00 To: 0.00
 20. PLOT RANGE: From: 0.00 To: 0.00
 21. PLOT RANGE: From: 0.00 To: 0.00
 22. PLOT RANGE: From: 0.00 To: 0.00
 23. PLOT RANGE: From: 0.00 To: 0.00
 24. PLOT RANGE: From: 0.00 To: 0.00
 25. PLOT RANGE: From: 0.00 To: 0.00
 26. PLOT RANGE: From: 0.00 To: 0.00
 27. PLOT RANGE: From: 0.00 To: 0.00
 28. PLOT RANGE: From: 0.00 To: 0.00
 29. PLOT RANGE: From: 0.00 To: 0.00
 30. PLOT RANGE: From: 0.00 To: 0.00
 31. PLOT RANGE: From: 0.00 To: 0.00
 32. PLOT RANGE: From: 0.00 To: 0.00
 33. PLOT RANGE: From: 0.00 To: 0.00
 34. PLOT RANGE: From: 0.00 To: 0.00
 35. PLOT RANGE: From: 0.00 To: 0.00
 36. PLOT RANGE: From: 0.00 To: 0.00
 37. PLOT RANGE: From: 0.00 To: 0.00
 38. PLOT RANGE: From: 0.00 To: 0.00
 39. PLOT RANGE: From: 0.00 To: 0.00
 40. PLOT RANGE: From: 0.00 To: 0.00
 41. PLOT RANGE: From: 0.00 To: 0.00
 42. PLOT RANGE: From: 0.00 To: 0.00
 43. PLOT RANGE: From: 0.00 To: 0.00
 44. PLOT RANGE: From: 0.00 To: 0.00
 45. PLOT RANGE: From: 0.00 To: 0.00
 46. PLOT RANGE: From: 0.00 To: 0.00
 47. PLOT RANGE: From: 0.00 To: 0.00
 48. PLOT RANGE: From: 0.00 To: 0.00
 49. PLOT RANGE: From: 0.00 To: 0.00
 50. PLOT RANGE: From: 0.00 To: 0.00
 51. PLOT RANGE: From: 0.00 To: 0.00
 52. PLOT RANGE: From: 0.00 To: 0.00
 53. PLOT RANGE: From: 0.00 To: 0.00
 54. PLOT RANGE: From: 0.00 To: 0.00
 55. PLOT RANGE: From: 0.00 To: 0.00
 56. PLOT RANGE: From: 0.00 To: 0.00
 57. PLOT RANGE: From: 0.00 To: 0.00
 58. PLOT RANGE: From: 0.00 To: 0.00
 59. PLOT RANGE: From: 0.00 To: 0.00
 60. PLOT RANGE: From: 0.00 To: 0.00
 61. PLOT RANGE: From: 0.00 To: 0.00
 62. PLOT RANGE: From: 0.00 To: 0.00
 63. PLOT RANGE: From: 0.00 To: 0.00
 64. PLOT RANGE: From: 0.00 To: 0.00
 65. PLOT RANGE: From: 0.00 To: 0.00
 66. PLOT RANGE: From: 0.00 To: 0.00
 67. PLOT RANGE: From: 0.00 To: 0.00
 68. PLOT RANGE: From: 0.00 To: 0.00
 69. PLOT RANGE: From: 0.00 To: 0.00
 70. PLOT RANGE: From: 0.00 To: 0.00
 71. PLOT RANGE: From: 0.00 To: 0.00
 72. PLOT RANGE: From: 0.00 To: 0.00
 73. PLOT RANGE: From: 0.00 To: 0.00
 74. PLOT RANGE: From: 0.00 To: 0.00
 75. PLOT RANGE: From: 0.00 To: 0.00
 76. PLOT RANGE: From: 0.00 To: 0.00
 77. PLOT RANGE: From: 0.00 To: 0.00
 78. PLOT RANGE: From: 0.00 To: 0.00
 79. PLOT RANGE: From: 0.00 To: 0.00
 80. PLOT RANGE: From: 0.00 To: 0.00
 81. PLOT RANGE: From: 0.00 To: 0.00
 82. PLOT RANGE: From: 0.00 To: 0.00
 83. PLOT RANGE: From: 0.00 To: 0.00
 84. PLOT RANGE: From: 0.00 To: 0.00
 85. PLOT RANGE: From: 0.00 To: 0.00
 86. PLOT RANGE: From: 0.00 To: 0.00
 87. PLOT RANGE: From: 0.00 To: 0.00
 88. PLOT RANGE: From: 0.00 To: 0.00
 89. PLOT RANGE: From: 0.00 To: 0.00
 90. PLOT RANGE: From: 0.00 To: 0.00
 91. PLOT RANGE: From: 0.00 To: 0.00
 92. PLOT RANGE: From: 0.00 To: 0.00
 93. PLOT RANGE: From: 0.00 To: 0.00
 94. PLOT RANGE: From: 0.00 To: 0.00
 95. PLOT RANGE: From: 0.00 To: 0.00
 96. PLOT RANGE: From: 0.00 To: 0.00
 97. PLOT RANGE: From: 0.00 To: 0.00
 98. PLOT RANGE: From: 0.00 To: 0.00
 99. PLOT RANGE: From: 0.00 To: 0.00
 100. PLOT RANGE: From: 0.00 To: 0.00
 101. PLOT RANGE: From: 0.00 To: 0.00
 102. PLOT RANGE: From: 0.00 To: 0.00
 103. PLOT RANGE: From: 0.00 To: 0.00
 104. PLOT RANGE: From: 0.00 To: 0.00
 105. PLOT RANGE: From: 0.00 To: 0.00
 106. PLOT RANGE: From: 0.00 To: 0.00
 107. PLOT RANGE: From: 0.00 To: 0.00
 108. PLOT RANGE: From: 0.00 To: 0.00
 109. PLOT RANGE: From: 0.00 To: 0.00
 110. PLOT RANGE: From: 0.00 To: 0.00
 111. PLOT RANGE: From: 0.00 To: 0.00
 112. PLOT RANGE: From: 0.00 To: 0.00
 113. PLOT RANGE: From: 0.00 To: 0.00
 114. PLOT RANGE: From: 0.00 To: 0.00
 115. PLOT RANGE: From: 0.00 To: 0.00
 116. PLOT RANGE: From: 0.00 To: 0.00
 117. PLOT RANGE: From: 0.00 To: 0.00
 118. PLOT RANGE: From: 0.00 To: 0.00
 119. PLOT RANGE: From: 0.00 To: 0.00
 120. PLOT RANGE: From: 0.00 To: 0.00
 121. PLOT RANGE: From: 0.00 To: 0.00
 122. PLOT RANGE: From: 0.00 To: 0.00
 123. PLOT RANGE: From: 0.00 To: 0.00
 124. PLOT RANGE: From: 0.00 To: 0.00
 125. PLOT RANGE: From: 0.00 To: 0.00
 126. PLOT RANGE: From: 0.00 To: 0.00
 127. PLOT RANGE: From: 0.00 To: 0.00
 128. PLOT RANGE: From: 0.00 To: 0.00
 129. PLOT RANGE: From: 0.00 To: 0.00
 130. PLOT RANGE: From: 0.00 To: 0.00
 131. PLOT RANGE: From: 0.00 To: 0.00
 132. PLOT RANGE: From: 0.00 To: 0.00
 133. PLOT RANGE: From: 0.00 To: 0.00
 134. PLOT RANGE: From: 0.00 To: 0.00
 135. PLOT RANGE: From: 0.00 To: 0.00
 136. PLOT RANGE: From: 0.00 To: 0.00
 137. PLOT RANGE: From: 0.00 To: 0.00
 138. PLOT RANGE: From: 0.00 To: 0.00
 139. PLOT RANGE: From: 0.00 To: 0.00
 140. PLOT RANGE: From: 0.00 To: 0.00
 141. PLOT RANGE: From: 0.00 To: 0.00
 142. PLOT RANGE: From: 0.00 To: 0.00
 143. PLOT RANGE: From: 0.00 To: 0.00
 144. PLOT RANGE: From: 0.00 To: 0.00
 145. PLOT RANGE: From: 0.00 To: 0.00
 146. PLOT RANGE: From: 0.00 To: 0.00
 147. PLOT RANGE: From: 0.00 To: 0.00
 148. PLOT RANGE: From: 0.00 To: 0.00
 149. PLOT RANGE: From: 0.00 To: 0.00
 150. PLOT RANGE: From: 0.00 To: 0.00
 151. PLOT RANGE: From: 0.00 To: 0.00
 152. PLOT RANGE: From: 0.00 To: 0.00
 153. PLOT RANGE: From: 0.00 To: 0.00
 154. PLOT RANGE: From: 0.00 To: 0.00
 155. PLOT RANGE: From: 0.00 To: 0.00
 156. PLOT RANGE: From: 0.00 To: 0.00
 157. PLOT RANGE: From: 0.00 To: 0.00
 158. PLOT RANGE: From: 0.00 To: 0.00
 159. PLOT RANGE: From: 0.00 To: 0.00
 160. PLOT RANGE: From: 0.00 To: 0.00
 161. PLOT RANGE: From: 0.00 To: 0.00
 162. PLOT RANGE: From: 0.00 To: 0.00
 163. PLOT RANGE: From: 0.00 To: 0.00
 164. PLOT RANGE: From: 0.00 To: 0.00
 165. PLOT RANGE: From: 0.00 To: 0.00
 166. PLOT RANGE: From: 0.00 To: 0.00
 167. PLOT RANGE: From: 0.00 To: 0.00
 168. PLOT RANGE: From: 0.00 To: 0.00
 169. PLOT RANGE: From: 0.00 To: 0.00
 170. PLOT RANGE: From: 0.00 To: 0.00
 171. PLOT RANGE: From: 0.00 To: 0.00
 172. PLOT RANGE: From: 0.00 To: 0.00
 173. PLOT RANGE: From: 0.00 To: 0.00
 174. PLOT RANGE: From: 0.00 To: 0.00
 175. PLOT RANGE: From: 0.00 To: 0.00
 176. PLOT RANGE: From: 0.00 To: 0.00
 177. PLOT RANGE: From: 0.00 To: 0.00
 178. PLOT RANGE: From: 0.00 To: 0.00
 179. PLOT RANGE: From: 0.00 To: 0.00
 180. PLOT RANGE: From: 0.00 To: 0.00
 181. PLOT RANGE: From: 0.00 To: 0.00
 182. PLOT RANGE: From: 0.00 To: 0.00
 183. PLOT RANGE: From: 0.00 To: 0.00
 184. PLOT RANGE: From: 0.00 To: 0.00
 185. PLOT RANGE: From: 0.00 To: 0.00
 186. PLOT RANGE: From: 0.00 To: 0.00
 187. PLOT RANGE: From: 0.00 To: 0.00
 188. PLOT RANGE: From: 0.00 To: 0.00
 189. PLOT RANGE: From: 0.00 To: 0.00
 190. PLOT RANGE: From: 0.00 To: 0.00
 191. PLOT RANGE: From: 0.00 To: 0.00
 192. PLOT RANGE: From: 0.00 To: 0.00
 193. PLOT RANGE: From: 0.00 To: 0.00
 194. PLOT RANGE: From: 0.00 To: 0.00
 195. PLOT RANGE: From: 0.00 To: 0.00
 196. PLOT RANGE: From: 0.00 To: 0.00
 197. PLOT RANGE: From: 0.00 To: 0.00
 198. PLOT RANGE: From: 0.00 To: 0.00
 199. PLOT RANGE: From: 0.00 To: 0.00
 200. PLOT RANGE: From: 0.00 To: 0.00
 201. PLOT RANGE: From: 0.00 To: 0.00
 202. PLOT RANGE: From: 0.00 To: 0.00
 203. PLOT RANGE: From: 0.00 To: 0.00
 204. PLOT RANGE: From: 0.00 To: 0.00
 205. PLOT RANGE: From: 0.00 To: 0.00
 206. PLOT RANGE: From: 0.00 To: 0.00
 207. PLOT RANGE: From: 0.00 To: 0.00
 208. PLOT RANGE: From: 0.00 To: 0.00
 209. PLOT RANGE: From: 0.00 To: 0.00
 210. PLOT RANGE: From: 0.00 To: 0.00
 211. PLOT RANGE: From: 0.00 To: 0.00
 212. PLOT RANGE: From: 0.00 To: 0.00
 213. PLOT RANGE: From: 0.00 To: 0.00
 214. PLOT RANGE: From: 0.00 To: 0.00
 215. PLOT RANGE: From: 0.00 To: 0.00
 216. PLOT RANGE: From: 0.00 To: 0.00
 217. PLOT RANGE: From: 0.00 To: 0.00
 218. PLOT RANGE: From: 0.00 To: 0.00
 219. PLOT RANGE: From: 0.00 To: 0.00
 220. PLOT RANGE: From: 0.00 To: 0.00
 221. PLOT RANGE: From: 0.00 To: 0.00
 222. PLOT RANGE: From: 0.00 To: 0.00
 223. PLOT RANGE: From: 0.00 To: 0.00
 224. PLOT RANGE: From: 0.00 To: 0.00
 225. PLOT RANGE: From: 0.00 To: 0.00
 226. PLOT RANGE: From: 0.00 To: 0.00
 227. PLOT RANGE: From: 0.00 To: 0.00
 228. PLOT RANGE: From: 0.00 To: 0.00
 229. PLOT RANGE: From: 0.00 To: 0.00
 230. PLOT RANGE: From: 0.00 To: 0.00
 231. PLOT RANGE: From: 0.00 To: 0.00
 232. PLOT RANGE: From: 0.00 To: 0.00
 233. PLOT RANGE: From: 0.00 To: 0.00
 234. PLOT RANGE: From: 0.00 To: 0.00
 235. PLOT RANGE: From: 0.00 To: 0.00
 236. PLOT RANGE: From: 0.00 To: 0.00
 237. PLOT RANGE: From: 0.00 To: 0.00
 238. PLOT RANGE: From: 0.00 To: 0.00
 239. PLOT RANGE: From: 0.00 To: 0.00
 240. PLOT RANGE: From: 0.00 To: 0.00
 241. PLOT RANGE: From: 0.00 To: 0.00
 242. PLOT RANGE: From: 0.00 To: 0.00
 243. PLOT RANGE: From: 0.00 To: 0.00
 244. PLOT RANGE: From: 0.00 To: 0.00
 245. PLOT RANGE: From: 0.00 To: 0.00
 246. PLOT RANGE: From: 0.00 To: 0.00
 247. PLOT RANGE: From: 0.00 To: 0.00
 248. PLOT RANGE: From: 0.00 To: 0.00
 249. PLOT RANGE: From: 0.00 To: 0.00
 250. PLOT RANGE: From: 0.00 To: 0.00
 251. PLOT RANGE: From: 0.00 To: 0.00
 252. PLOT RANGE: From: 0.00 To: 0.00
 253. PLOT RANGE: From: 0.00 To: 0.00
 254. PLOT RANGE: From: 0.00 To: 0.00
 255. PLOT RANGE: From: 0.00 To: 0.00
 256. PLOT RANGE: From: 0.00 To: 0.00
 257. PLOT RANGE: From: 0.00 To: 0.00
 258. PLOT RANGE: From: 0.00 To: 0.00
 259. PLOT RANGE: From: 0.00 To: 0.00
 260. PLOT RANGE: From: 0.00 To: 0.00
 261. PLOT RANGE: From: 0.00 To: 0.00
 262. PLOT RANGE: From: 0.00 To: 0.00
 263. PLOT RANGE: From: 0.00 To: 0.00
 264. PLOT RANGE: From: 0.00 To: 0.00
 265. PLOT RANGE: From: 0.00 To: 0.00
 266. PLOT RANGE: From: 0.00 To: 0.00
 267. PLOT RANGE: From: 0.00 To: 0.00
 268. PLOT RANGE: From: 0.00 To: 0.00
 269. PLOT RANGE: From: 0.00 To: 0.00
 270. PLOT RANGE: From: 0.00 To: 0.00
 271. PLOT RANGE: From: 0.00 To: 0.00
 272. PLOT RANGE: From: 0.00 To: 0.00
 273. PLOT RANGE: From: 0.00 To: 0.00
 274. PLOT RANGE: From: 0.00 To: 0.00
 275. PLOT RANGE: From: 0.00 To: 0.00
 276. PLOT RANGE: From: 0.00 To: 0.00
 277. PLOT RANGE: From: 0.00 To: 0.00
 278. PLOT RANGE: From: 0.00 To: 0.00
 279. PLOT RANGE: From: 0.00 To: 0.00
 280. PLOT RANGE: From: 0.00 To: 0.00
 281. PLOT RANGE: From: 0.00 To: 0.00
 282. PLOT RANGE: From: 0.00 To: 0.00
 283. PLOT RANGE: From: 0.00 To: 0.00
 284. PLOT RANGE: From: 0.00 To: 0.00
 285. PLOT RANGE: From: 0.00 To: 0.00
 286. PLOT RANGE: From: 0.00 To: 0.00
 287. PLOT RANGE: From: 0.00 To: 0.00
 288. PLOT RANGE: From: 0.00 To: 0.00
 289. PLOT RANGE: From: 0.00 To: 0.00
 290. PLOT RANGE: From: 0.00 To: 0.00
 291. PLOT RANGE: From: 0.00 To: 0.00
 292. PLOT RANGE: From: 0.00 To: 0.00
 293. PLOT RANGE: From: 0.00 To: 0.00
 294. PLOT RANGE: From: 0.00 To: 0.00
 295. PLOT RANGE: From: 0.00 To: 0.00
 296. PLOT RANGE: From: 0.00 To: 0.00
 297. PLOT RANGE: From: 0.00 To: 0.00
 298. PLOT RANGE: From: 0.00 To: 0.00
 299. PLOT RANGE: From: 0.00 To: 0.00
 300. PLOT RANGE: From: 0.00 To: 0.00
 301. PLOT RANGE: From: 0.00 To: 0.00
 302. PLOT RANGE: From: 0.00 To: 0.00
 303. PLOT RANGE: From: 0.00 To: 0.00
 304. PLOT RANGE: From: 0.00 To: 0.00
 305. PLOT RANGE: From: 0.00 To: 0.00
 306. PLOT RANGE: From: 0.00 To: 0.00
 307. PLOT RANGE: From: 0.00 To: 0.00
 308. PLOT RANGE: From: 0.00 To: 0.00
 309. PLOT RANGE: From: 0.00 To: 0.00
 310. PLOT RANGE: From: 0.00 To: 0.00
 311. PLOT RANGE: From: 0.00 To: 0.00
 312. PLOT RANGE: From: 0.00 To: 0.00
 313. PLOT RANGE: From: 0.00 To: 0.00
 314. PLOT RANGE: From: 0.00 To: 0.00
 315. PLOT RANGE: From: 0.00 To: 0.00
 316. PLOT RANGE: From: 0.00 To: 0.00
 317. PLOT RANGE: From: 0.00 To: 0.00
 318. PLOT RANGE: From: 0.00 To: 0.00
 319. PLOT RANGE: From: 0.00 To: 0.00
 320. PLOT RANGE: From: 0.00 To: 0.00
 321. PLOT RANGE: From: 0.00 To: 0.00
 322. PLOT RANGE: From: 0.00 To: 0.00
 323. PLOT RANGE: From: 0.00 To: 0.00
 324. PLOT RANGE: From: 0.00 To: 0.00
 325. PLOT RANGE: From: 0.00 To: 0.00
 326. PLOT RANGE: From: 0.00 To: 0.00
 327. PLOT RANGE: From: 0.00 To: 0.00
 328. PLOT RANGE: From: 0.00 To: 0.00
 329. PLOT RANGE: From: 0.00 To: 0.00
 330. PLOT RANGE: From: 0.00 To: 0.00
 331. PLOT RANGE: From: 0.00 To: 0.00
 332. PLOT RANGE: From: 0.00 To: 0.00
 333. PLOT RANGE: From: 0.00 To: 0.00
 334. PLOT RANGE: From: 0.00 To: 0.00
 335. PLOT RANGE: From: 0.00 To: 0.00
 336. PLOT RANGE: From: 0.00 To: 0.00
 337. PLOT RANGE: From: 0.00 To: 0.00
 338. PLOT RANGE: From: 0.00 To: 0.00
 339. PLOT RANGE: From: 0.00 To: 0.00
 340. PLOT RANGE: From: 0.00 To: 0.00
 341. PLOT RANGE: From: 0.00 To: 0.00
 342. PLOT RANGE: From: 0.00 To: 0.00
 343. PLOT RANGE: From: 0.00 To: 0.00
 344. PLOT RANGE: From: 0.00 To: 0.00
 345. PLOT RANGE: From: 0.00 To: 0.00
 346. PLOT RANGE: From: 0.00 To: 0.00
 347. PLOT RANGE: From: 0.00 To: 0.00
 348. PLOT RANGE: From: 0.00 To: 0.00
 349. PLOT RANGE: From: 0.00 To: 0.00
 350. PLOT RANGE: From: 0.00 To: 0.00
 351. PLOT RANGE: From: 0.00 To: 0.00
 352. PLOT RANGE: From: 0.00 To: 0.00
 353. PLOT RANGE: From: 0.00 To: 0.00
 354. PLOT RANGE: From: 0.00 To: 0.00
 355. PLOT RANGE: From: 0.00 To: 0.00
 356. PLOT RANGE: From: 0.00 To: 0.00
 357. PLOT RANGE: From: 0.00 To: 0.00
 358. PLOT RANGE: From: 0.00 To: 0.00
 359. PLOT RANGE: From: 0.00 To: 0.00
 360. PLOT RANGE: From: 0.00 To: 0.00
 361. PLOT RANGE: From: 0.00 To: 0.00
 362. PLOT RANGE: From: 0.00 To: 0.00
 363. PLOT RANGE: From: 0.00 To: 0.00
 364. PLOT RANGE: From: 0.00 To: 0.00
 365. PLOT RANGE: From: 0.00 To: 0.00
 366. PLOT RANGE: From: 0.00 To: 0.00
 367. PLOT RANGE: From: 0.00 To: 0.00
 368. PLOT RANGE: From: 0.00 To: 0.00
 369. PLOT RANGE: From: 0.00 To: 0.00
 370. PLOT RANGE: From: 0.00 To: 0.00
 371. PLOT RANGE: From: 0.00 To: 0.00
 372. PLOT RANGE: From: 0.



Upstream ③
APPROX. PANEL WT. 6475.00 LBS.



DownStream ③
APPROX. PANEL WT. 6513.00 LBS.

Bill of Material

Item	REQD	Description	FT	IN	Cat No.
①	537	(lf) REBAR (SEE NOTE #3)			
②	1	(ea) STD WUA BRONZE BENCH MARK	X	X	15-1650
③	3.5	(cy) CONCRETE MIX *(SEE NOTE 4)			
④	7	(ea) 4 TON DAYTON-SUPERIOR P-52 S.L. ANCHOR	0	4 3/4	
⑤	4	(ea) 4 TON DAYTON-SUPERIOR P-52 S.L. ANCHOR WITH P-59 SHEAR BAR	0	9 1/2	
⑥	1	(ea) HANDWHEEL ADAPTER FOR TYPE III TURNOUT GATES	X	X	04-2880
⑦	3	(ea) 1/2" DIA. UNC CONCRETE ANCHOR	0	3	04-0040
⑧	30	(lf) 2" SCHEDULE 40 PVC (RIGID)	-	-	04-1840

NOTES:

- REINFORCING BARS SHALL BE ASTM A615, GRADE 60.
- REINFORCEMENT ORIENTATION HEREINAFTER REFERRED TO SHALL BE RELATIVE TO THE ERECTED PANELS POSITION.
- HORIZONTAL REINFORCEMENT IN WALLS SHALL BE #4 AT 12" ON CENTER. VERTICAL REINFORCEMENT IN WALLS SHALL BE #4 AT 12" ON CENTER. REINFORCEMENT IN FLOOR SHALL BE #4 AT 12" ON CENTER BOTH WAYS. ALL REINFORCEMENT SHALL BE CENTERED IN PANEL. ADDITIONAL REINFORCEMENT SHALL BE PROVIDED AT BLOCKOUTS.
- STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH (f'_c) OF 4000 PSI.
- TOLERANCE FOR P-52 ANCHOR PLACEMENT SHALL BE WITHIN 1 INCH OF DIMENSIONS SHOWN (SYMMETRY ABOUT VERTICAL CENTER GRAVITY SHALL BE MAINTAINED).
- PANELS SHALL BE PRECAST WITH INSIDE FACE DOWN FOR WALLS AND TOP FACE DOWN FOR FLOOR. EXPOSED FACE SHALL RECEIVE BROOM FINISH. DATE OF POUR AND PANEL WEIGHT SHALL BE IMPRINTED ON PANEL USING LETTERS 6 INCH MINIMUM HEIGHT.
- A DECORATIVE STAMPED CONCRETE FINISH SHALL BE APPLIED TO THE OUTSIDE FACE OF THE PANELS FROM THE TOP OF THE WALL DOWN TO THE DIMENSION SHOWN.
- PROVIDE A 4 INCH X 12 INCH SMOOTH FINISH GATE IDENTIFICATION SPACE FOR EACH DELIVERY GATE AT THE LOCATIONS SHOWN.
- PIPE VOID DIMENSIONS SHOWN ARE ACTUAL SIZE. FIBERGLASS RINGS ARE AVAILABLE FOR THE PIPE UP TO 66" ID. (VOID SIZE 73 1/4"). SEE WES-CASTSTDS FOR AVAILABLE VOID AND RING SIZES.
- GATE VOID BLOCKOUT SHALL BE AS SPECIFIED IN THE DETAILS SHOWN ON DRAWING WES-CASTSTDS.

STANDARD SPECIFICATIONS:
 REINFORCING STEEL _____ SRP 03210
 CONCRETE AND NON-STRUCTURAL GROUT _____ SRP 03300
 DETAILS AND ASSEMBLY FORMS:
 B-54-157.1, B-54-157.2, B-54-157.3, B-54-157.4

REFERENCE DRAWINGS:
 PLAN/PROFILE: B-112-0686 STA. 64+97.0
 PRECAST TURNOUT STRUCTURE: B-151-W006
 STD SUPPLEMENTAL CASTING DETAIL: WES-CASTSTDS

ISSUE FOR CONSTRUCTION

0	RD-12359	BMP	BMP	GMB	PVH	/	/
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE	

SALT RIVER PROJECT
 WATER ENGINEERING PHOENIX, ARIZONA

LACC DIVERSION
 SEC. 2 T I S R I E
 SW/O NE COR, COORD, 4.9E-0.1S
 MHTO CASTING DETAIL

SCALE: 3/4" = 1'-0"	C120, 1173B151W006.DGN	SHEET NO
SUBJ CODE/DIST CODE	DWG SIZE	
CD	Y-3 22X34	TEMPORARY 16

For Information Only

P02: (120, 121) BORDER.DGN

DATE	BY	CHK	APP	REV

For Information Only

Bill of Material					
Item	REQD	Description	FT	IN	Cat No.
①	6	(ea) 4 TON DAYTON-SUPERIOR P-52 S.L. ANCHOR	0	4 3/4	
②	0.5	(cy) CONCRETE MIX *(SEE NOTE 4)			
③	60	(lf) REBAR (SEE NOTE #3)			

- NOTES:
- REINFORCING BARS SHALL BE ASTM A615, GRADE 60.
 - REINFORCEMENT ORIENTATION HEREINAFTER REFERRED TO SHALL BE RELATIVE TO THE ERECTED PANELS POSITION.
 - HORIZONTAL REINFORCEMENT IN WALLS SHALL BE #4 AT 12" ON CENTER. VERTICAL REINFORCEMENT IN WALLS SHALL BE #4 AT 12" ON CENTER. REINFORCEMENT IN FLOOR SHALL BE #4 AT 12" ON CENTER BOTH WAYS. ALL REINFORCEMENT SHALL BE CENTERED IN PANEL. ADDITIONAL REINFORCEMENT SHALL BE PROVIDED AT BLOCKOUTS.
 - STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH (f_c') OF 4000 PSI.
 - TOLERANCE FOR P-52 ANCHOR PLACEMENT SHALL BE WITHIN 1 INCH OF DIMENSIONS SHOWN (SYMMETRY ABOUT VERTICAL CENTER GRAVITY SHALL BE MAINTAINED).
 - PANELS SHALL BE PRECAST WITH INSIDE FACE DOWN FOR WALLS AND TOP FACE DOWN FOR FLOOR. EXPOSED FACE SHALL RECEIVE BROOM FINISH. DATE OF POUR AND PANEL WEIGHT SHALL BE IMPRINTED ON PANEL USING LETTERS 6 INCH MINIMUM HEIGHT.
 - A DECORATIVE STAMPED CONCRETE FINISH SHALL BE APPLIED TO THE OUTSIDE FACE OF THE PANELS FROM THE TOP OF THE WALL DOWN TO THE DIMENSION SHOWN.
 - PROVIDE A 4 INCH X 12 INCH SMOOTH FINISH GATE IDENTIFICATION SPACE FOR EACH DELIVERY GATE AT THE LOCATIONS SHOWN.
 - PIPE VOID DIMENSIONS SHOWN ARE ACTUAL SIZE. FIBERGLASS RINGS ARE AVAILABLE FOR THE PIPE UP TO 66" ID. (VOID SIZE 73 1/4"). SEE WES-CASTSTDS FOR AVAILABLE VOID AND RING SIZES.
 - GATE VOID BLOCKOUT SHALL BE AS SPECIFIED IN THE DETAILS SHOWN ON DRAWING WES-CASTSTDS.

STANDARD SPECIFICATIONS:
 REINFORCING STEEL _____ SRP 03210
 CONCRETE AND NON-STRUCTURAL GROUT _____ SRP 03300
 DETAILS AND ASSEMBLY FORMS:
 B-54-157.1, B-54-157.2, B-54-157.3, B-54-157.4

REFERENCE DRAWINGS:
 PLAN/PROFILE: B-112-0686 STA: 64+97.0
 PRECAST TURNOUT STRUCTURE: B-151-W006
 STD SUPPLEMENTAL CASTING DETAIL: WES-CASTSTDS

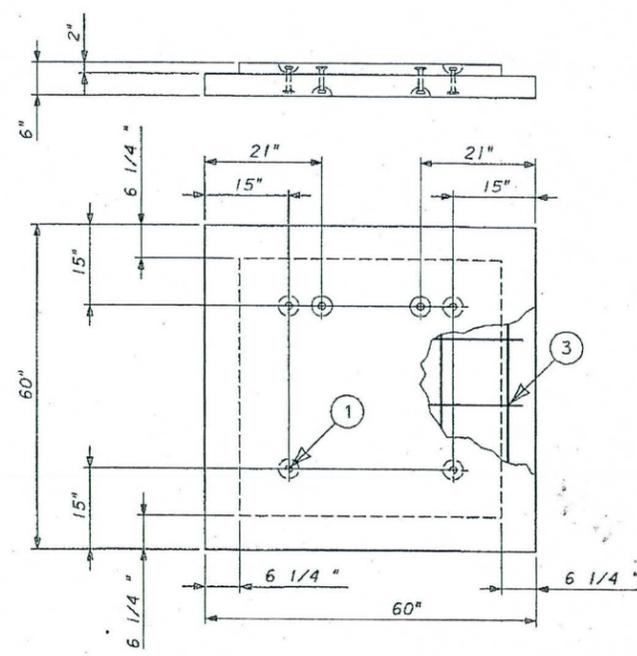
--	--	--	--	--	--	--	--	--	--

ISSUE FOR CONSTRUCTION						
REV NO.	JOB NO.	DFTR	DSGN	ENGR CHK	ISSUE AUTH	DATE
0	RD-12359					

SALT RIVER PROJECT
 WATER ENGINEERING & PROENIX, ARIZONA

LACC DIVERSION
 SEC. 2 T IS R IE
 SW/O NE COR, COORD, 4.9E-0.1S
 MHTO CASTING DETAIL

SCALE: 3/4" = 1'-0"	(120, 117) B151W006.DGN	SHEET NO
SUBJ CODE: Y-3	DIST CODE: 22X34	TEMPORARY
CD		17



Floor ②
 APPROX. PANEL WT. 1875.00 LBS.

P02: (120, 121) BORDER.DGN

NO.	DATE	BY	CHKD	APP'D	DESCRIPTION

For Information Only