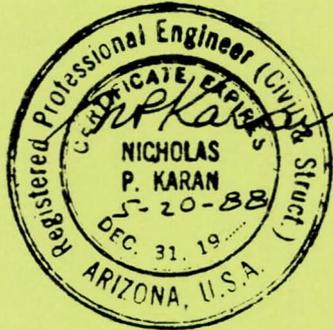


SPECIAL PROVISIONS
FOR
UTILITY RELOCATIONS AND UNDERPASSES
FOR
CAVE CREEK WASH

CONTRACT NO. FCD 88-17

May 1988

Property of
Flood Control District of MC Library
Return to
2001 W. Durango
Phoenix, AZ 85009



SUPPLEMENTARY TO MARICOPA ASSOCIATION OF GOVERNMENTS UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION EDITION OF 1979 AND REVISIONS AND SUPPLEMENTS THERETO.

A118.524

FLOOD CONTROL DISTRICT of Maricopa County

Tabulation of Bids

Utility Relocations and Underpasses

Project: for the Cave Creek Wash FCD 88-17

Date Opened: 6/14/88

Pg. 1 of 2

Pay Item No.	Description	Unit	Engineers Estimate		JWJ Contracting Co		CS Construction		MAC Contracting		Unit Price	Bid Total
			Bid Unit	Price	Bid Unit	Price	Bid Unit	Price	Bid Unit	Price		
301-1	Sub-Grade Preparation	SY	1433	4.	5,732.00	3.	4,299.00	8.	11,464.00	4.	5,732.00	
310-1	Aggregate Base Course	Ton	305	13.	3,965.00	10.	3,050.00	40.	12,200.00	23.	7,015.00	
315-1	Bituminous Prime Coat	Ton	3	200.	600.00	140.	420.00	300.	900.00	900.	2,700.00	
321-1	Bituminous Tack Coat	Ton	1	400.	400.00	300.	300.00	275.	275.00	360.	360.00	
321-2	Asphaltic Concrete (1/2")	Ton	12	20.	240.00	100.	1,200.00	120.	1,440.00	125.	1,500.00	
321-3	Asphaltic Concrete (3/4")	Ton	146	17.	2,482.00	170.	24,820.00	100.	14,600.00	125.	18,250.00	
321-4	Sand Blotter Material	Ton	3	30.	90.00	10.	30.00	50.	150.00	80.	240.00	
321-5	Asphaltic Cement (AC40)	Ton	9	200.	1,800.00	125.	1,125.00	135.	1,215.00	300.	2,700.00	
324-1	Const. PCC Bridge Approach Slabs, Complete	SY	220	30.	6,600.00	15.	3,300.00	100.	22,000.00	72.	15,840.00	
336-1	Rem. Exist. Conc. Approach Slabs, Complete	SY	175	20.	3,500.00	10.	1,750.00	100.	17,500.00	45.	7,875.00	
336-2	Sawcut & Remove Existing Asphalt Paving	SY	265	5.	1,325.00	10.	2,650.00	5.	1,325.00	6.	1,590.00	
340-1	Sawcut, Remove & Replace Curb & Gutter, Standard Detail 220, Type "A" H=6"	LF	133	14.	1,862.00	10.	1,330.00	50.	6,650.00	8.	1,064.00	
340-2	Sawcut, Rem. & Replace 4" & 6" Concrete Sidewalk, Driveway & Alley Entrances	SF	845	5.	4,225.00	3.	2,535.00	10.	8,450.00	3.	2,535.00	
345-1	Adj. MH & Valve Frames, Covers, Valve Bxs	EA	4	200.	800.00	200.	800.00	270.	1,080.00	365.	1,460.00	
350-1	Sawcut & Remove Gunite Slope Protection	LS	1	3250.	3,250.00	3500.	3,500.00	2200.	2,200.00	2500.	2,500.00	
350-2	Miscellaneous Removal & Other Work	LS	1	18900.	18,900.00	141981.	141,981.00	95000.	95,000.00	40000.	40,000.00	
401-1	Uniformed, Off-Duty Law Enforc. Officer	HR	96	30.	2,880.00	30.	2,880.00	18.	1,728.00	27.	2,592.00	
401-2	Traffic Control	LS	1	67000.	67,000.00	30000.	30,000.00	15000.	15,000.00	30500.	30,500.00	
415-1	Furn & Inst Flex. Metal Guard Rail Compl.	LF	138	15.	2,070.00	40.	5,520.00	35.	4,830.00	25.	3,450.00	
415-2	Furn & Inst Breakaway Cable Term., Compl.	EA	4	1000.	4,000.00	600.	2,400.00	560.	2,240.00	1200.	4,800.00	
505-1	Type I Concrete Encasement (Sht 7 of 13)	LF	100	200.	20,000.00	30.	3,000.00	120.	12,000.00	144.	14,400.00	
505-2	Type I Concrete Encasement (Sht 11 of 13)	LF	120	200.	24,000.00	30.	3,600.00	120.	14,400.00	144.	17,280.00	
505-3	Type II Concr. Encasement (Sht 11 of 13)	LF	200	175.	35,000.00	30.	6,000.00	125.	25,000.00	147.	29,400.00	
505-4	Furn & Inst Struc. Concr. for Underpasses	LS	1	197450.	197,450.00	200000.	200,000.00	175000.	175,000.00	212000.	212,000.00	
505-5	Furn & Inst Struc. Concr. for Retain Walls	CY	1529	400.	611,600.00	145.	221,705.00	190.	290,510.00	320.	489,280.00	
505-6	Furn & Inst Reinforcing Steel	LB	209862	0.40	83,944.80	0.40	83,944.80	0.35	73,451.70	0.50	104,931.00	
520-1	Furn & Inst Steel Handrail, Complete	LF	1655	5.	8,275.00	10.	16,550.00	6.	9,930.00	9.	14,895.00	
525-1	Const. 4" Gunite Slope Protection	LS	1	9750.	9,750.00	15000.	15,000.00	13000.	13,000.00	14000.	14,000.00	
530-1	Furn & Inst Pavemnt Markrs & Street Paint	LS	1	800.	800.00	2000.	2,000.00	1000.	1,000.00	3000.	3,000.00	
605-1	Furn & Inst Retaining Wall Drge Material	CY	485	10.	4,850.00	12.	5,820.00	20.	9,700.00	25.	12,125.00	
610-1	Furn & Inst 8" Cl 51 DIP Waterline Replacement (incl Fittings & Polyethylene Corrosion Protection)	LF	768	90.	69,120.00	15.	11,520.00	120.	92,160.00	140.	107,520.00	

E.E. 1,367,310.⁰⁰

BID SUMMARY & CHECK LIST

PROJECT: Cone Creek Wash

CONTRACT FCD: 88-17

DATE: June 14, 1988

FCD Personnel in Attendance

*Ellery Biathrow
Stash Smith
Andy Anderson
Bob Payette
Don Rbrick
Joy Ketchum
John Rodriguez*

Item	Name <i>MAC Contracting</i>	<i>CS Construction</i>	<i>JWJ Contracting</i>			
Bid Form	✓	✓	✓			
Schedule Complete	✓	✓	✓			
No Exceptions	✓	✓	✓			
Changes Initialed	✓	✓	✓			
Addenda Noted	✓	✓	✓			
Proposal Signed	✓	✓	✓			
License Number	✓	✓	✓			
Surety Bond	✓	✓	✓			
No Collusion Affidavit	✓	✓	✓			
Contract	-	-	-			
Performance Bond	-	-	-			
Payment Bond	-	-	-			
Insurance Certificate	-	-	-			
Total Contract	1,424,827. -	1,146,444. ⁷⁰	940,700. ⁰⁰			

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To Contracts Documents

ENTITLED: UTILITY RELOCATIONS AND UNDERPASSES FOR CAVE CREEK WASH

OWNER: Flood Control District of Maricopa County

The above documents are herein modified. The provisions of said documents applicable to these modifications remain unchanged unless specifically indicated otherwise herein. This addendum forms a part of the contract documents and modifies them as follows:

1. Construction Special Provisions, Bidding Schedule, page 3E of 5, the cubic yard quantity shown for Bid Item No. 505-5, Furnish and Install Structural Concrete for Retaining Walls, is incorrect. The corrected quantity for this item should be => 1529 C.Y. The appropriate change should be made on the Bidding Schedule prior to submission of the bid package.

To Contract Documents

ENTITLED: UTILITY RELOCATIONS AND UNDERPASSES FOR CAVE CREEK WASH

OWNER: Flood Control District of Maricopa County

The above documents are herein modified. The provisions of said documents applicable to these modifications remain unchanged unless specifically indicated otherwise herein. This addendum forms a part of the contract documents and modifies them as follows:

1. Construction Special Provisions page 1 of 25, add the following sentence to the end of paragraph SP-A2 - Proposed Work: "...the COE Contractor, and the City of Phoenix Contractor constructing a new city park along the west side of Cave Creek Wash from about 700 feet south of Peoria Avenue to the Arizona Canal."

2. Construction Special Provisions page 6 of 25, add the following section:
Section 106.5 - Contractor's Work Area
The Contractor may use vacant property along the Cave Creek Wash for a contractor's work area, per the following guidelines:
 1. the work area cannot be within 50 feet of the "limits of channel construction" as shown on drawings C.2 thru C.4.
 2. the area bounded by 23rd Avenue, west to Cave Creek Wash and south of Cheryl Drive, cannot be used as a contractor's work area.
 3. the Contractor must obtain all necessary approvals and/or permits from the Flood Control District and the City of Phoenix.

3. Construction Special Provisions page 8 of 25, insert the following after the third sentence in item number 5 in Subsection 108.4 - Contractor's Construction Schedule: "The bracing of the power pole will include the installation to the south, of a spanguy and stub pole with downguy. The stub pole with downguy will be located approximately 100 feet south of the power pole and on the east side of the ramp. Therefore, excavation limits must be modified around the stub pole. APS guidelines will have to be followed when excavating for the ramp construction in the area of the stub pole and downguy."

4. Construction Special Provisions page 8 of 25, add the following to the second paragraph of item number 6 in Subsection 108.4 - Contractor's Construction Schedule: "Existing underground Mountain Bell conduits and direct bury cables, which are within the sidewalk on the south side of the bridge and exit the sidewalk at the west end of the bridge to become underground services, may interfere with the shoring scheme in that area. Therefore, the Contractor, as soon as possible after issuance of the Notice To Proceed, will investigate the existing utility conditions at this location to determine what interferences exist and how they will affect the installation of the shoring and traffic detours. The Engineer will work with the Contractor to resolve any problems that may exist caused by any interferences found. The cost for this investigatory work will be included in bid item 505-4, the lump sum bid for the concrete underpasses, including shoring."

5. Construction Special Provisions page 8 of 25, in the second paragraph of item number 6 in Subsection 108.4 - Contractor's Construction Schedule, revise the sentence that begins, "Disapproval of the alternate shoring.....", to the following: "Disapproval of the design for the alternate shoring scheme will not relieve the Contractor of his responsibility to fulfill the contract as written, and no additional compensation will be provided to the Contractor should the design for the alternate shoring scheme be disapproved. If the design for the alternate shoring scheme is disapproved, the Contractor may resubmit a revised design to the Engineer for review and approval."

6. Construction Special Provisions page 9 of 25, revise the first sentence of the third paragraph of item number 6 in Subsection 108.4 - Contractor's Construction Schedule to the following: "The existing APS power pole located at the southwest edge of the box culvert will be relocated by APS prior to the start of construction of the box culvert underpass, to approximately 27 feet west of the centerline of the box culvert."

7. Construction Plans sheets C.2 thru C.4 of C.27, right-of-way boundaries are incorrectly identified. The following changes should be noted:
 1. Along the west side from about Station 51+00 (+/-) on sheet C.2 to the south side of Cactus Road on sheet C.3, the R/W designated as F.C.D. R.O.W. should be called out as City of Phoenix right-of-way.

 2. Along the east side from about Station 54+00 (+/-) on sheet C.2 to about Station 93+00 (+/-) on sheet C.3, the R/W designated as F.C.D. R.O.W. should be called out as City Of Phoenix right-of-way.

7. Continued;

3. Within the above areas, the "limits of channel construction" as shown on sheets C.2 and C.3 approximately represents Flood Control District right-of-way.
 4. See sheets C.5 thru C.11, C.15 and C.18 for Flood Control District right-of-way at the various construction work locations for this project. Right-of-way is indicated by _____ .
8. Construction Plans sheets C.15 and C.18, in the Plan View, the new storm drain manholes #1 and #2 should have the rim elevations set to existing, prevailing grade.
 9. Construction Plans sheet C.27, in the Plan View, the existing Mountain Bell services indicated at the south end of the shoring plan run east and west in the area of the sidewalk. They may interfere with the piles, pile cap beams and the precast slab in line with the south sidewalk. The Contractor must consider this potential problem, as it relates to the shoring installation and the detour construction.
 10. Construction Plans sheet C.27, to General Note Number 6 add the following:
"PCI certification may be waived with the approval of the Engineer, based on the Contractor's documented history of performance in the pre-tensioning field. Documentation of previous and accepted pre-tensioning work for such agencies as ADOT, the Corps of Engineers, the Bureau of Reclamation or the Soil Conservation Service must be made available to the Engineer. In addition, the Engineer may request an inspection of the casting yard and the pre-tensioning facilities."
 11. Construction Plans sheet C.27, in Section 3, the use of drilled shafts with piles set in concrete is shown. The Contractor may submit for approval the use of driven piles instead of using the drilled shaft placement method. To do this work, the Contractor would also have to obtain the necessary approvals and permits from the City of Phoenix.
 12. Construction Plans sheet C.18, in the Plan View, the excavation limits shown on the east side of the south ramp must be modified at the stub pole with downguy that will be installed by APS as part of the power pole bracing for the underpass box culvert construction. The stub pole will be located approximately 100 feet south of the power pole and on the east side of the ramp. The excavation limit will be located between the stub pole and the east ramp retaining wall. See item number 3 of this Addendum.

SPECIAL PROVISIONS
FOR
UTILITY RELOCATIONS AND UNDERPASSES
FOR
CAVE CREEK WASH

CONTRACT NO. FCD 88-17

May 1988



SUPPLEMENTARY TO MARICOPA ASSOCIATION OF GOVERNMENTS UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION EDITION OF 1979 AND REVISIONS AND SUPPLEMENTS THERETO.

ATTENTION
ALL PROSPECTIVE BIDDERS

Some of the Bid Bonds previously received with bids for Flood Control District construction projects have not been in complete compliance with Arizona Revised Statutes (ARS).

ARS 34-201-A3 requires that every bid be accompanied by a certified check, cashier's check or surety bond for five percent (5%) of the amount of the bid.

In some cases the bonds limit the five percent (5%) to the difference between the low bid and that of the next lowest responsible bidder, to whom a contract could be awarded, in the event that the low bidder failed to enter into contract within the specified time.

Bids received with limitation on the five percent (5%) will be considered as non-responsive bids and will not be accepted or considered for award of contract.

The SURETY BOND form contained in the M.A.G. specifications or a similar form must be used for bids to be acceptable to the Flood Control District.

Please take note and submit your bids accordingly.

Any Bid Bond submitted with the wording, or similar wording, as underlined in the following paragraph will be considered unacceptable.

SAMPLE OF LIMITATION IN UNACCEPTABLE BID BOND

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or contract documents with good and sufficient surety for the faithful performance of such contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
CONTRACT FCD 88-17

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1. Invitation for Bids
2. Bid Form
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4. No Collusion Affidavit
5. Construction Special Provisions
6. Contract
7. Statutory Payment Bond
8. Statutory Performance Bond
9. Certificate of Insurance
10. Soils Report Supplement at Cactus Road and Peoria Avenue
by "Speedie and Associates"
11. Drawings: Utility Relocations & Pedestrian Underpasses for
the Cave Creek Channel Project
Sheets C.0 through C.27

INVITATION FOR BIDS
(Construction Contract)

Project: Utility Relocations and Pedestrian Underpasses for Cave Creek Wash
Ref. Invitation FCD 88-17
Date: May 23, 1988
Issued by: Flood Control District of Maricopa County

Vicinity: Cave Creek Wash between Sweetwater Avenue and the Arizona Canal, Phoenix, Arizona

SEALED BIDS, IN SINGLE COPY FOR THE WORK DESCRIBED HEREIN WILL BE RECEIVED UNTIL 2:00 P.M., LOCAL TIME AT THE PLACE OF THE BID OPENING JUNE 14, 1988, IN THE OFFICE OF THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, 3335 WEST DURANGO STREET, PHOENIX, ARIZONA, 85009, AND AT THAT TIME PUBLICLY OPENED.

A PRE-BID CONFERENCE WILL BE HELD ON JUNE 1, 1988, AT 2:00 P.M. IN THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY CONFERENCE ROOM, 3335 WEST DURANGO STREET. IT IS IN THE BEST INTEREST OF PROSPECTIVE BIDDERS TO ATTEND THE PRE-BID CONFERENCE.

BID SECURITY IN AN AMOUNT OF NOT LESS THAN FIVE PERCENT (5%) OF THE TOTAL BID PRICE MUST BE SUBMITTED WITH EACH BID. THE BID SECURITY MAY BE IN THE FORM OF A BID BOND, CASHIER'S CHECK, POSTAL MONEY ORDER, OR CASH. THE BID SECURITY WILL BE MADE PAYABLE TO THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY AS A GUARANTEE THAT IF THE WORK IS AWARDED TO THE BIDDER, HE WILL WITHIN TEN (10) DAYS FROM THE DATE OF SUCH AWARD, ENTER INTO PROPER CONTRACT AND BOND CONDITIONS FOR THE FAITHFUL PERFORMANCE OF THE WORK. OTHERWISE, SAID AMOUNT WILL BE FORFEITED TO THE FLOOD CONTROL DISTRICT. BID SECURITY WILL BE RETURNED AS PRESCRIBED BY MAG 103.

THE SUCCESSFUL BIDDER SHALL BE REQUIRED TO FURNISH PERFORMANCE AND PAYMENT BONDS IN PENAL SUMS NOT LESS THAN ONE HUNDRED PERCENT (100%) RESPECTIVELY, OF THE ORIGINAL AMOUNT OF THE CONTRACT.

DESCRIPTION OF WORK:

A. UTILITY RELOCATIONS

Construct 420 L.F. of concrete sanitary sewer encasement (two locations); furnish and install 770 L.F. of 8-inch water line (two locations); furnish and install 590 L.F. of 12-inch water line (three locations); and other miscellaneous related work.

B. PEDESTRIAN UNDERPASSES (CACTUS AND PEORIA)

Construct 205 L.F. of concrete box culvert; construct 1656 L.F. of concrete retaining walls; remove and replace 220 S.Y. of PCC approach slabs; furnish traffic control devices; furnish and install 436 L.F. of concrete storm drain pipe; furnish and install two underpass drains and sump pumps; construct 1,100 S.Y. of ramp and street asphalt pavement; 1703 L.F. of 3'-6" fence and other miscellaneous related work.

INVITATION FOR BIDS
NO. FCD 88-17

THE WORK SHALL COMMENCE WITHIN SEVEN (7) CALENDAR DAYS AND BE COMPLETED WITHIN ONE HUNDRED FIFTY (150) CALENDAR DAYS AFTER RECEIPT OF THE NOTICE TO PROCEED. IN ADDITION, CERTAIN WORK WILL BE COMPLETED IN A SEQUENCE AND BY DATES INDICATED IN SECTION 108.4.

NOTICE: THE BID SCHEDULE, SPECIAL PROVISIONS, INSTRUCTIONS TO BIDDERS, UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, EDITION OF 1979 (MAG) AND DRAWINGS LISTED UNDER THE CONTENTS WILL BE INCORPORATED IN AND BECOME A PART OF THE RESULTANT CONTRACT.

CHERIE PENNINGTON, CLERK
BOARD OF DIRECTORS
FLOOD CONTROL DISTRICT OF
MARICOPA COUNTY

INVITATION FOR BIDS
NO. FCD 88-17

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
INVITATION FOR BIDS, FCD 88-17
INSTRUCTIONS TO BIDDERS

1. Explanation to Bidders. Any explanations desired by the bidder, questions, or items for clarification regarding the meaning or interpretation of the invitation for bids, drawings, specifications, etc., may be addressed to the Chief Engineer and General Manager, preferably in writing, prior to the pre-bid conference. Any answers, interpretations, or clarifications affecting the cost will be addressed to all bidders in an addendum to the invitation. The receipt of an addendum by the bidder must be acknowledged in the space provided on the bid form or by letter or telegram received before the time set for the bid opening. Oral explanations or instructions given before the award of the contract will not be binding.
2. Conditions Affecting the Work. It is in the best interest of the bidders to attend the pre-bid conference. Bidders should visit the site and take such other steps as may be reasonably necessary to ascertain the nature and the location of the work, the general and local conditions which can affect the work and the cost thereof. Failure to do so will not relieve bidders from responsibility for estimating properly the difficulty or cost of successfully performing the work. (See MAG 102.4)
3. Bidder's Qualifications. Before a bid is considered for award, a bidder may be requested by the Chief Engineer and General Manager of the Flood Control District to submit a statement regarding his previous experience in performing comparable work, his business and technical organization, financial resources, and plant available to be used in performing the work.
4. Bid Guarantee. Where a bid guarantee is required by the invitation for bids, failure to furnish a bid guarantee in the proper form and amount by the time set for opening of bids, may be cause for rejection of the bid.

If the successful bidder, upon acceptance of his bid by the Flood Control District within the period specified herein for acceptance (sixty days if no period is specified) fails to execute such further contractual documents, if any, and give such bond(s) as may be required by the terms of the bid as accepted within the time specified (ten days if no period is specified) after receipt of the forms by him, his contract may be terminated for default. In such event the bid guarantee shall be retained as liquidated damages.

INVITATION FOR BIDS
NO. FCD 88-17

5. Preparation of Bids. Bids shall be submitted on the forms furnished, or copies thereof, and must be manually signed. If erasures or other changes appear on the forms, each erasure or change must be initialed by the person signing the bid. Unless specifically authorized in the invitation for bids, telegraphic bids will not be considered.

No bid will be considered unless all items in the bid schedule are priced. In case of an error in the extension of price, the unit price shall govern. The quantities listed on the bid schedule on which unit prices are requested are estimates only.

Unless called for, alternate bids will not be considered.

Modifications of bids already submitted will be considered if received at the office designated in the invitation for bids by the time set for opening bids.

6. Submission of Bids. Bids must be sealed, addressed to the Chief Engineer and General Manager, Flood Control District of Maricopa County, 3335 West Durango, Phoenix, Arizona 85009, and marked to identify the bid to the referenced Contract FCD Number. Failure to appropriately identify the bid may result in a premature opening of, or a failure to open, such bid. The name of the bidder shall be on the outside of the envelope. (See MAG 102.9)
7. Withdrawal of Bids or Modifications. Bids may be withdrawn by written request received from the bidder prior to the time set for opening of bids.
8. Public Opening of Bids. Bids will be publicly opened at the time and place set for the opening in the invitation for bids. Their content will be made public for the information of bidders and others interested, who may be present either in person or by representative.
9. Award of Contract. Award and execution of a contract shall be in accordance with MAG Section 103.
10. Specifications. Specifications referred to herein shall include all revisions and amendments in effect on the date of issuance of the invitation for bids. These instructions, Special Instructions to Bidders, and the herein contained Construction Special Provisions supplement the Uniform Standard Specifications herein referred to by "MAG" section number or paragraph number; however, in case of conflict, these instructions and Special Provisions supersede the Uniform Standard Specifications (MAG).

INVITATION FOR BIDS
NO. FCD 88-17

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 INVITATION FOR BIDS, FCD 88-17
 SPECIAL INSTRUCTIONS TO BIDDER

Contract Plans, Special Provisions and Contract Documents: Plans, Special Provisions, and forms for proposal, Bidding Schedule, Contract Agreement and Performance Bond may be obtained from the Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, Arizona, upon payment of \$18.00 by check payable to the FLOOD CONTROL DISTRICT OF MARICOPA COUNTY. This payment will not be refunded.

APPROXIMATE QUANTITIES FOR PRINCIPAL ITEMS

<u>QUANTITY</u>	<u>UNIT</u>	<u>DESCRIPTION</u>
420	LF	Concrete Pipe Encasement
770	LF	8" D.I.P. Waterline
590	LF	12" D.I.P. Waterline
205	LF	10' x 10' Reinforced Concrete Underpasses
1,656	LF	Reinforced Concrete Retaining Wall
220	SY	PCC Bridge Approach Slabs
436	LF	15", 18", and 24" R.C.P. Storm Drain
2	EA	Drains and Sump Pumps
1,100	SY	Asphalt Pavement (2" and 4")
1,703	LF	3'-6" Fence

and such other pertinent items as are necessary for the completion of the project as shown on the plans or as called for in the Special Provisions or in the Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction.

Location of Work: The proposed utility work is located at five (5) locations along Cave Creek Wash between Sweetwater Avenue and the Arizona Canal, described as follows:

1. Sweetwater Avenue (extended)
2. Cactus Road
3. Cholla Street (extended)
4. Peoria Avenue
5. Cheryl Drive (extended)

The proposed underpass work is located at two (2) locations as follows:

1. Peoria Avenue
2. Cactus Road

CHERIE PENNINGTON, CLERK
 BOARD OF DIRECTORS
 FLOOD CONTROL DISTRICT OF
 MARICOPA COUNTY

INVITATION FOR BIDS
 CONTRACT NO. FCD 88-17

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
(Construction Contract)

BID FORM

Project: Utility Relocations and Underpasses
for Cave Creek Wash

Invitation FCD 88-17
Date: May 23, 1988

Location: Cave Creek Wash between Sweetwater
Avenue and the Arizona Canal,
Phoenix, Arizona

To: Chief Engineer and General Manager
Flood Control District of Maricopa County
3335 West Durango Street
Phoenix, Arizona 85009

The following Proposal is made on behalf of _____
_____ and no others. The Total Contract amount of
this proposal is (in words) _____
_____ and _____/100 dollars, (in figures)
_____, this amount being the sum total of the extended
amount for each pay item on the Bidding Schedule.

Evidence of authority to submit the Proposal is herewith furnished. The Proposal 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 Board of Directors is personally or financially interested, directly or indirectly in the Proposal, 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, Uniform Standard Specifications for Public Works Construction, 1979 Edition (MAG) and revisions and supplements thereto, together with the Special Provisions, forms of Contract and Bond authorized by the Board of Directors and constituting essential parts of this Proposal, have been carefully examined, and also that the site of the work 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, Specifications, Special Provisions, or conditions to be overcome, be pled. On the basis of the Plans, Specifications, Special Provisions, the forms of Contract, and the Bond proposed for use, the Undersigned proposes to furnish

PROPOSAL
CONTRACT FCD 88-17

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 therefor, the sum of various products obtained by multiplying each unit price, herein bid for work or materials, by the quantity thereof actually incorporated in the completed project, as determined by the Chief Engineer and General Manager, Flood Control District of Maricopa County.

The Undersigned understands that the quantities mentioned herein are approximate 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.

BIDDING SCHEDULE

PROJECT: Utility Relocations and Underpasses
for the Cave Creek Wash

CONTRACT: FCD 88-17

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 Dollars	Unit Cost	Extended Amount
301-1	1,433	SY	Sub-Grade Preparation			
310-1	305	Ton	Aggregate Base Course			
315-1	3	Ton	Bituminous Prime Coat			
321-1	1	Ton	Bituminous Tack Coat			
321-2	12	Ton	Asphaltic Concrete (1/2")			
321-3	146	Ton	Asphaltic Concrete (3/4")			

BIDDING SCHEDULE

PROJECT: Utility Relocations and Underpasses
for the Cave Creek Wash

CONTRACT: FCD 88-17

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 Dollars	Unit Cost	Extended Amount
321-4	3	Ton	Sand Blotter Material			
321-5	9	Ton	Asphaltic Cement (AC40)			
324-1	220	SY	Construct PCC Bridge Approach Slabs, Complete			
336-1	175	SY	Remove Existing Concrete Approach Slabs, Complete			
336-2	265	SY	Saw Cut and Remove Existing Asphalt Pavings			
340-1	133	L.F.	Saw Cut, Remove and Replace Curb and Gutter, Standard Detail 220, Type "A", H=6"			

BIDDING SCHEDULE

PROJECT: Utility Relocations and Underpasses
for the Cave Creek Wash

CONTRACT: FCD 88-17

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 Dollars	Unit Cost	Extended Amount
340-2	845	S.F.	Saw Cut, Remove and Replace 4" & 6" Concrete Sidewalk, Driveway and Alley Entrances			
345-1	4	EA	Adjust MH and Valve Frames, Covers, and Valve Boxes			
350-1	1	L.S.	Saw Cut and Removal of Gunite Slope Protection			
350-2	1	L.S.	Miscellaneous Removal and Other Work			
401-1	96	HR	Uniformed, Off-duty Law Enforcement Officer			
401-2	1	L.S.	Traffic Control			

BIDDING SCHEDULE

PROJECT: Utility Relocations and Underpasses
for the Cave Creek Wash

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Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 Dollars	Unit Cost	Extended Amount
415-1	138	L.F.	Furnish and Install Flexible Metal Guard Rail, Complete			
415-2	4	EA	Furnish and Install Breakway Cable Terminal, Complete			
505-1	100	L.F.	Type I Concrete Encasement (SHT 7 of 13)			
505-2	120	L.F.	Type I Concrete Encasement (SHT 11 of 13)			
505-3	200	L.F.	Type II Concrete Encasement (SHT 11 of 13)			
505-4	1	L.S.	Furnish and Install Structural Concrete for Underpasses			

BIDDING SCHEDULE

PROJECT: Utility Relocations and Underpasses
for the Cave Creek Wash

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Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 Dollars	Unit Cost	Extended Amount
505-5	1849	CY	Furnish and Install Structural Concrete for Retaining Walls			
505-6	209,862	LB	Furnish and Install Reinforcing Steel			
520-1	1,655	L.F.	Furnish and Install Steel Handrail, Complete			
525-1	1	L.S.	Construct 4" Gunite Slope Protection (See 350-1)			
530-1	1	L.S.	Furnish and Install Pavement Markers and Street Painting			
605-1	485	C.Y.	Furnish and Install Retaining Wall Drainage Material			

BIDDING SCHEDULE

PROJECT: Utility Relocations and Underpasses
for the Cave Creek Wash

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Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 Dollars	Unit Cost	Extended Amount
610-1	768	L.F.	Furnish and Install 8" Class 51 DIP Waterline Replacement (including fittings and Polyethylene Corrosion Protection)			
610-2	589	L.F.	Furnish and Install 12" Class 51 DIP Waterline Replacement (including fittings and Polyethylene Corrosion Protection)			
610-3	4	EA	Furnish and Install 8" Waterline Plugs, Standard P-1343			
610-4	200	LB	Furnish and Install DIP Fittings Not Shown on Plans			
610-5	75	L.F.	Furnish and Install 2" Galvanized Pipe and Fittings			
618-1	30	L.F.	Furnish and Install 15" Storm Drain Reinforced Concrete Pipe (RCP) Class 3, Complete			

BIDDING SCHEDULE

PROJECT: Utility Relocations and Underpasses
for the Cave Creek Wash

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Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 Dollars	Unit Cost	Extended Amount
618-2	230	L.F.	Furnish and Install 18" Storm Drain, RCP, Cl.3, Complete			
618-3	194	L.F.	Furnish and Install 24" Storm Drain, RCP, Cl.3, Complete			
618-4	1	EA	Construct Concrete Straight Headwall for 24" RCP, Complete			
625-1	1	L.S.	Furnish and Install Manhole Section, Watertight Frame and Cover, Complete per Sheet C.21			
625-2	4	EA	Construct Storm Drain MH with Cover and Frame, Complete			
625-3	1	EA	Construct 48" Irrigation Standpipe with Temporary Security Frame			

BIDDING SCHEDULE

PROJECT: Utility Relocations and Underpasses
for the Cave Creek Wash

CONTRACT: FCD 88-17

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 Dollars	Unit Cost	Extended Amount
625-4	2	EA	Construct Special Storm Trench Drain with C.I. Inlet, Complete			
625-5	2	EA	Furnish and Install Drain Sump Pump with MH, Frame and Cover; Controller and Level Sensors; Starter and Enclosure, Complete			
630-1	4	EA	Furnish and Install 8" Gate Valve and Tapping Sleeve (including box and cover)			
630-2	2	EA	Furnish and Install 12" Gate Valve (including box and cover)			

BIDDING SCHEDULE

PROJECT: Utility Relocations and Underpasses
for the Cave Creek Wash

CONTRACT: FCD 88-17

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 dollars	Unit Cost	Extended Amount
801-1	1	L.S.	Furnish and Install Miscellaneous Electrical Conduit, Pull Boxes, etc., for Future Lighting and Sump Pump Wiring			
810-1	1703	L.F.	3'-6" Steel Picket Fence per Drawings C.17 & C.20			

The Bidder hereby acknowledges receipt of and agrees his proposal is based on the following Addenda

Total _____

The Undersigned further proposes to execute the Contract Agreement and furnish satisfactory Bonds within ten (10) days from the date of award, time being of the essence. The undersigned further proposes to begin the work as specified in the Contract attached hereto, and to complete the work within the time limits as specified in the Special Provisions and maintain at all times a Contract Bond, approved by the Board of Directors, in an amount equal to one hundred percent (100%) of the total bid. 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 Bond to be in full force and effect until the work is finally accepted and the provisions of the Plans, Specifications and Special Provisions are fulfilled.

A Proposal guaranty in the amount and character named in the Invitation for Bids is enclosed amounting to not less than five percent (5%) of the total bid, which Proposal guaranty is submitted as a guaranty of the good faith of the Bidder and that the Bidder will enter into written contract, as provided, to do the work, if successful in securing the award thereof; and it is hereby agreed that if at any time other than as provided in the Proposal requirements and conditions the Undersigned should withdraw this Proposal, or if the Proposal is accepted and there should be failure on the part of the Undersigned to execute the Contract and furnish satisfactory Bond as herein provided, the Flood Control District of Maricopa County in either of such events, shall be entitled and is hereby given the right to retain the said Proposal guaranty as liquidated damages.

Date: _____, 19__.

IF BY AN INDIVIDUAL: License No. _____ Classification _____

(Name) (Address)

IF BY A FIRM OR PARTNERSHIP: License No. _____ Classification _____

(Firm Name) (Firm Address)

By: _____

*Name and Address of Each Member:

PROPOSAL
CONTRACT NO. FCD 88-17

Date _____, 19__.

IF BY A CORPORATION: License No. _____ Classification _____

(Corporate Name) (Corporation Address)

By: _____

**Incorporated under the Laws of _____

Names and Addresses of Officers:

(President) (Address)

(Secretary) (Address)

(Treasurer) (Address)

*The name and post office address of each member of the firm or partnership must be shown.

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

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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 as Obligee, in the sum of ___ percent (___%) of the total amount of the bid of Principal, submitted by him to the Flood Control District of Maricopa County, 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 ourselves, our heirs, executors, and administrators, successors and assigns, jointly and severally, firmly by these presents, and in conformance with A.R.S.

WHEREAS, the said Principal is herewith submitting its proposal for _____

NOW, THEREFORE, if the Flood Control District of Maricopa County shall accept the proposal of the Principal and the Principal shall enter into a contract with the Flood Control District of Maricopa County in accordance with the terms of such proposal and give such Bonds and Certificates of Insurance as specified in the Standard Specifications with good and sufficient Surety for the faithful performance of such contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter into such contract and give such Bond and Certificates of Insurance, if the Principal shall pay to the Flood Control District of Maricopa County the sum of money set forth above as liquidated damages for failure of the Principal to enter into the contract, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this _____ day of _____, A.D., 19__.

Principal

Title

Witness:

Surety

Title

Witness:

CONSTRUCTION SPECIAL PROVISIONS

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

CONTRACT NO. FCD 88-17

FOR

UTILITY RELOCATIONS AND UNDERPASSES

FOR

CAVE CREEK WASH

SP-A GENERAL SPECIFICATIONS

SP-A1 LOCATION OF THE WORK: This project is located in Phoenix, Arizona, along Cave Creek Wash from the Arizona Canal Diversion Channel, approximately 1/4 mile north of Dunlap Avenue, to Sweetwater Avenue, 1/2 mile south of Thunderbird Avenue.

SP-A2 PROPOSED WORK: The work includes the construction of approximately 1,360 LF of 8-inch and 12-inch water line, approximately 420 LF of concrete encasement, construction of approximately 205 LF of concrete box culvert, and 1,656 LF of retaining walls (Cactus Road and Peoria Avenue), replacement of two concrete bridge approach slabs, construction of 436 LF of storm drain pipe, 2 sump pumps, and 1,100 SY of asphalt pavement, 1,703 LF of fence, and related sump pumps appurtenances. Miscellaneous utility relocations by others will also be taking place. In addition, the Corps of Engineers Contractor may begin construction of the Cave Creek Channel Project during this contract, and the Contractor will coordinate his work effort with the COE Contractor as well. During the construction of this work, Contractor will be required to coordinate his work effort with utility companies and the COE Contractor.

SP-A3 SPECIFICATIONS: The work embraced herein and as shown on the plans for the construction of this project shall be done in accordance with the Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction dated 1979 and the current revisions thereto, the City of Phoenix Supplement to MAG Uniform Standard Specifications, and the Construction Special Provisions contained herein.

SP-A4 PRECEDENCE OF CONTRACT DOCUMENT: The City of Phoenix Supplements to MAG Specifications and Details will govern over the MAG Standard Specifications and Details. In case of a discrepancy or conflict, Project Plans will govern over both the City of Phoenix Supplements and MAG Standard Specifications and Details. These Construction Special Provisions will govern over the City of Phoenix Supplements and MAG Standard Specifications and Details and the Project Plan.

Construction Special Provisions
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SP-A5 NEGOTIATION CLAUSE: Recovery of damages related to expenses incurred by the Contractor for a delay for which the Flood Control District of Maricopa County 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 Flood Control District of Maricopa County. This provision shall not be construed to void any provision in the contract which requires notice of delays, provides for arbitration or other procedure for settlement or provides for liquidated damages.

SP-A6 WORK STANDARDS: The Contractor shall comply with Sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330) as supplemented by Department of Labor Regulations (29 CFR Part 5).

SP-A7 CONTRACT TIME: The Contractor shall start work within seven (7) calendar days and complete all work on the project within one hundred fifty (150) calendar days after receipt of the Notice to Proceed.

The Contractor must complete the utility relocations (water line relocations and the sewer line encasements) by September 1, 1988. In addition, at Cactus Road and Peoria Avenue, the Contractor must complete construction of the box culvert underpasses and restore Cactus Road and Peoria Avenue to accommodate full traffic conditions within a construction period of 30 days for the Cactus Road underpass and within the allotted 150 day total contract time for the Peoria Avenue underpass. Failure to complete work within the time frames given for the utility relocations and underpass construction will result in damages assessed in accordance with Sections 108.5 and 108.9 of these Special Provisions.

SP-A8 WATER, LIGHT, POWER, SANITARY FACILITIES, HEAT, TELEPHONE: All water for construction purposes and drinking water; lighting, temporary electric power, and heat; and telephone service shall be arranged for and provided for the requirements of the work by the Contractor at his expense. Contractor shall also provide sufficient self-contained sanitary facilities as necessary for his work force. If work is progressing at multiple locations, multiple toilet facilities shall be provided.

SP-A9 PROGRESS SCHEDULE: The Contractor shall submit his proposed work progress schedule to the Chief Engineer and General Manager for approval before starting the work. Special consideration shall be made to limit downtime of the City of Phoenix Water System and limit time of traffic interruption on Cactus Road and Peoria Avenue.

SP-A10 ITEM COMMENTS: The herein contained construction special provisions supplement the Uniform Standard Specifications; however, in case of conflict, these Special Provisions supersede the Uniform Standard Specifications.

Construction Special Provisions
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SP-A11 GENERAL COMMENT: The cost of all work required under this contract as shown on the plans for which there are no specific items shown on the Bidding Schedule, shall be included in the prices bid for related items (also see Section 104.2).

The following segments of this Special Provision, SP-B, SP-C, SP-D, SP-E, SP-F, SP-G, and SP-H are supplements to the MAG Uniform Standard Specifications.

The term "or equal," when used in the description of any construction materials, shall be understood to mean "or approved equal", as determined by the Engineer.

The Contractor shall exercise care to prevent damage to any existing facilities.

Upon completion of the construction, the Contractor shall clear the work area of all debris to the satisfaction of the Engineer.

SP-B SUPPLEMENT TO PART 100 - GENERAL CONDITIONS

SP-B1 SUBSECTION 101.2 - DEFINITIONS AND TERMS: Change the definition of Budget Project to read as follows: 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.

Change the definition of Engineer to read as follows: The Chief Engineer and General Manager of the Flood Control District of Maricopa County acting directly or through his authorized representative.

Change the definition of Owner to read as follows: The Flood Control District of Maricopa County, acting through its legally constituted officials, officers or employees.

SP-B2 SECTION 102 - ADDENDA AND SUBMISSION OF BIDDING SCHEDULE: Section 102 of the MAG Standard Specifications are amended to include the following: It shall be the responsibility of prospective bidders to determine, prior to submission of a bid, if any addenda have been issued. This may be accomplished by calling (602) 262-1501. Any addendum issued, if not already bound into the Special Provisions, must be included as a part of the Special Provisions, and any quantities on the Bidding Schedule requiring change shall be adjusted by pen and ink to the new figure.

Bids that do not include appropriate addenda and show appropriate changes to the Bidding Schedule shall be invalid.

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SUBSECTION 102.5 - PREPARATION OF PROPOSAL: The Contractor shall be appropriately licensed as a contractor in the State of Arizona for performing the work in this project.

SP-B3 SUBSECTION 103.6 - CONTRACTOR'S INSURANCE: Concurrently with the execution of the contract, the Contractor shall furnish a Certificate of Insurance. The types of insurance and the limits of liability shall be as indicated thereon, i.e.

\$1,000,000.00	Bodily injury per person
\$5,000,000.00	Bodily injury each occurrence
\$1,000,000.00	Property damage

SP-B4 SUBSECTION 104.2 - ALTERATION OF WORK: Subsection 104.2 of the MAG Standard Specifications are amended to include the following:

The Flood Control District of Maricopa County reserves the right to adjust design grades or the location of the sewer and water lines and structures prior to construction, if it should become necessary in the opinion of the Engineer, without additional cost to the Flood Control District of Maricopa County.

SP-B5 SUBSECTION 105.2 - PLANS AND SHOP DRAWINGS: The number of copies of plans/shop drawings required for review and/or approval shall be as follows:

Initial submittal: Three (3) copies. One (1) copy will be returned to the Contractor.

Final submittal: Five (5) copies. Two (2) copies will be returned to the Contractor.

Subsection 105.2 of the MAG Standard Specifications are amended to include the following:

The Contractor, at his own expense, shall make such changes on the shop drawings as may be necessary to conform to the plans and specifications. Prior to return of such drawings, marked "Furnish as Submitted" or "Furnish as Noted", any work which the Contractor may do on the fabrications covered by the same shall be at his own risk, as the FCD will not be responsible for any expense or delays incurred by the Contractor for changes required to make the same conform to the drawings as finally reviewed.

One copy of submitted drawings will be returned to the Contractor marked "Furnish as Submitted" or "Furnish as Noted". If the submittal is marked "Revise and Resubmit" or "Rejected", a new submittal shall be made in the same manner as the original submittal.

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When submitted for the Engineer's review, shop drawings, line layouts, etc. shall bear the Contractor's certification that he has reviewed, checked, and approved the shop drawings, etc. and that they are in conformance with the requirements of the Contract Documents. The Engineer will not review any submittals which do not bear the Contractor's certification.

After the review has been completed, the above drawings, lists, samples, design calculations, and other data shall become a part of the Contract Documents, and the fabrications furnished shall conform to the submittals.

Review of material and layout drawings consists of review for general conformity to plans and specifications, and in no way relieves the Contractor or the supplier from responsibility for the correctness of the drawings.

Deviations or changes from plans or specifications must be called out as such and will require review by the Engineer for approval or rejection.

Construction of this project shall not begin until the shop drawings and line layouts have been reviewed. Corrections required on the shop drawings will not constitute a valid reason for delay in the project schedule.

SP-B6 SECTION 105.6 - COOPERATION WITH UTILITIES: An attempt has been made to determine the locations of all underground utilities and drainage pipes, culverts, and structures. The Contractor shall comply with the requirements of the ARS 40-360.21 through 40-360.29 in notification to the interested utility owners prior to the start of construction and shall ascertain the approximate locations of the various underground utilities shown on the plans and as may be brought to his attention. The exact locations of these underground utilities shall be determined by excavations made by the Contractor prior to any trenching operations. It shall be the Contractor's responsibility to cooperate with the pertinent utility companies, so that any obstructing utility installation may be adjusted. Should the Contractor's operations result in damage to any utility, the location of which has been brought to his attention, he shall assume full responsibility for such damage.

Any facility or work which may be performed for the accommodation of any utility shall be paid for by the utility owner. The Contractor shall make all arrangements that may be necessary for the construction, and any financial agreement shall be solely between the Contractor and the utility owner.

The following telephone numbers, as indicated, should place the Contractor in contact with proper personnel:

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Southwest Gas Company	Ron Morency	484-5254
Mountain Bell Telephone Company	Fred Locke	842-7720
Arizona Public Service	Lois Winkler	371-6837
Location Staking (APS, Mountain Bell, SRP)		263-1100
City of Phoenix (Water and Sewer)	Gerry Arakaki	261-8229
City of Phoenix (Streets and Storm Drainage)	Roger Olson	256-3441
City of Phoenix (Engineering - Parks Project)	Chris Cornell	262-4953
City of Phoenix (Traffic)	Marsh Hollan	262-6565
Flood Control District of Maricopa County	Don Rerick	262-1501
Corps of Engineers	Neil Erwin	261-3023

SP-B7 SECTION 105.8 - CONSTRUCTION STAKES, LINES AND GRADES: The project control line and bench mark elevation are shown on the drawings and will be established by the Engineer. The Contractor shall establish offset stakes and additional temporary bench marks, as needed, for referencing the designated construction lines and grades. The Contractor shall provide all rough grade, fine grade, and structural reference lines and shall be responsible for their conformance to the plans and specifications.

The Flood Control District of Maricopa County reserves the right to adjust design grades or the locations of the utilities or structures prior to construction if, in the opinion of the Engineer, it should become necessary, without additional cost to the Flood Control District of Maricopa County.

Survey work shall be performed by a qualified and experienced surveyor under the supervision of a licensed land surveyor in Arizona.

No separate payment will be made for construction surveying, and the cost, thereof, shall be included in the price bid for related items of work.

SP-B8 SUBSECTION 107.2 - PERMITS: The Contractor shall be responsible for obtaining all permits and licenses, pay all charges, fees, taxes and give all notices necessary and incidental to the due and lawful prosecution of the work. Permits for earth moving may be obtained from the Bureau of Air Pollution Control, Maricopa County Department of Health Services, 1845 East Roosevelt, telephone number 258-6381.

The Contractor shall pay for all shutdown fees for water line construction as required by Subsection 610.9 of the MAG Standard Specifications. In addition, all shut-down fees for power outages shall be paid by the contractor. No shut-down fees will be paid by Flood Control District.

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SUBSECTION 107.10 - CONTRACTOR'S RESPONSIBILITY FOR WORK: The Contractor shall properly guard, protect, and take every precaution necessary against injury or damage to all finished or partially finished work, by the action of the elements or from any other cause until the entire project is completed and accepted by the Engineer. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work before final acceptance at no cost to the Contracting Agency. Partial payment for completed portions of the work shall not release the Contractor from such responsibility.

SP-B9 SUBSECTION 108.4 - CONTRACTOR'S CONSTRUCTION SCHEDULE: Subsection 108.4 of the MAG Standard Specifications shall be amended to include the following:

SEQUENCE OF CONSTRUCTION

General: The right to direct the sequence of the work under this contract is a function vested solely in the Engineer. Prior to commencement of the work, the Contractor shall prepare and submit to the Engineer for approval, a written schedule covering the general sequence of the whole work to be performed. The schedule shall be submitted to the Engineer at the Pre-Construction Conference.

The work schedule, when approved, shall not be subject to change without the written consent of the Engineer. Orderly procedure of all work to be performed under this contract shall be the full responsibility of the Contractor. The work schedule must conform to the contract time requirements.

Special Construction Requirements: Due to the short construction schedule, traffic restrictions, and need for utility services, the Contractor will prepare his Progress Schedule to incorporate the following restrictions:

1. The Contractor shall not have more than one 12-inch water line out of service at any one time. The 8-inch water line at Sweetwater Avenue will not be replaced when the water line at Cholla is out of service.
2. Not more than any two (2) water lines shall be out of service at one time during the construction period. All utility work shall be concurrently scheduled with City of Phoenix prior to commencement of work.
3. Water line relocations at Cactus Road and Peoria Avenue must be completed prior to start of Underpass Construction at those locations.
4. The box culvert underpass at Cactus Road and associated other construction required to reopen Cactus Road to full traffic shall be completed before similar construction is undertaken at Peoria Avenue.

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At Cactus Road, the construction sequence for the ramps shall allow adequate time for Southwest Gas Company to remove temporary relocated gas lines and install the permanent relocated gas lines. The permanent gas line relocation will be placed over the north end of the box culvert in the area of the sidewalk.

It will be the responsibility of the Contractor to give adequate notification to Southwest Gas Company as to when the permanent gas line relocation can proceed and said relocation must be done before the north ramp can be constructed.

5. Cactus Road - the box culvert underpass shall be constructed together with curb and gutter, bridge approach slab, and asphalt pavement necessary to reopen Cactus Road to full traffic as soon as possible. The existing Arizona Public Service (APS) power pole located at the southwest edge of the box culvert cannot be relocated for construction activities. The pole will be braced in place by APS prior to start of construction, at the direction and expense of the Flood Control District. The new storm drain M.H. #1 and storm drain line in the vicinity of the power pole bracing cannot be constructed until after the bracing has been removed by APS, at the direction of the Contractor. All other utilities will be protected in place by the Contractor and, if damaged, replaced at Contractor's expense. The Contractor shall employ extra work shifts as required to complete the box culvert underpass and related work necessary to reopen Cactus Road to full traffic within thirty (30) working days.
6. Peoria Avenue - the box culvert underpass shall be constructed together with curb and gutter, bridge approach slab, and A.C. pavement necessary to reopen Peoria Avenue to full traffic as soon as possible. Construction of the underpass will be accomplished using a temporary shoring scheme that will allow traffic to be maintained on Peoria Avenue, during underpass construction, per the requirements of the City of Phoenix as stated in Section 401 of these Special Provisions.

A temporary shoring and bridging scheme is provided on drawing C.27, sheet 14 of 14. Alternate shoring schemes may be proposed by the Contractor and must be submitted at the pre-construction meeting and be approved by the Engineer. The shoring scheme will be submitted complete with all necessary design calculations and drawings. All calculations and drawings will be sealed by a Civil or Structural Engineer registered in the State of Arizona. Disapproval of the alternate shoring scheme will not relieve the Contractor of his responsibility to fulfill the contract

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as written, and no additional compensation will be provided to the Contractor should the alternate scheme be disapproved.

The existing APS power pole located at the southwest edge of the box culvert will be relocated to the west of the new storm drain M.H. #1 by APS prior to the start of construction of the box culvert underpass. The power pole cannot be relocated until after construction of the new storm drain M.H. #1 and approximately 50 feet of storm drain line to the south has been completed. The Contractor will be responsible to provide adequate notice (minimum of two weeks), to APS as to when the power pole relocation must take place. The relocation of the power pole will be at the expense of the Flood Control District. All other utilities will be protected in place by the Contractor and, if damaged, replaced at Contractor's expense.

The Contractor shall employ extra work shifts as required to complete the box culvert underpass and related work necessary to reopen Peoria Avenue to full traffic, so that the completion of the associated retaining walls for the underpass and all other related work at this location can be completed within the total contract time of 150 days.

7. All utility work (water line relocations and sewer line encasements) shall be completed and accepted by the Engineer and the COP not later than September 1, 1988.

SP-B10 SUBSECTION 108.5 - LIMITATION OF OPERATIONS: Subsection 108.5 of the MAG Standard Specifications is amended to include the following:

Should the Contractor elect to perform any work after regular working hours, on weekends, or legal holidays, any charges incurred by the District for inspection of the work, surveys, or tests of materials will be deducted from monies due or to become due to the Contractor. This work limitation will not apply to the box culvert underpass construction at Cactus Road and Peoria Avenue, as described in Subsection 108.4. However, should construction extend beyond the construction time frames dictated in Subsection 108.4, the entire daily costs beyond the construction time frames dictated in Subsection 108.4, for inspection, survey, and testing of materials related to the construction of the box culvert underpasses and the associated work necessary to reopen Cactus and Peoria to full traffic, will be assessed to the Contractor and will be deducted from monies due or to become due to the Contractor.

SP-B11 SUBSECTION 108.9 - FAILURE TO COMPLETE ON TIME: The actual cost per calendar day incurred by the District for Consultant Administrative and Inspection Services on this project will be

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added to the daily charges as indicated by TABLE 108, LIQUIDATED DAMAGES and as stated in Subsection 108.5 above, and will be deducted from monies due or to become due to the Contractor for each and every calendar day that work shall remain uncompleted after the time specified for the completion of the work in the proposal, and specifically as stated in Subsection 108.4 above, or as adjusted by the Engineer. Nothing contained in this provision shall prohibit the District from deducting from monies due or to become due to the Contractor any other costs incurred by the District directly attributable to the delay in completing this contract.

SP-C SUPPLEMENT TO PART 200 - EARTHWORK

SP-C1 SECTION 201 - CLEARING AND GRUBBING: This work consists of removal and disposal of all trees, stumps, asphaltic pavement, and structures within the limits of the roadways and easements, as designated on the plans. Materials shall be disposed of off-site at the Contractors expense.

No separate payment will be made for clearing and grubbing, and the costs, thereof, shall be included in the price bid for related items of work.

SP-C2 SECTION 206 - STRUCTURE EXCAVATION AND BACKFILL: Structure excavation and backfill shall conform to Section 206 and 211.4 of the MAG Standard Specifications, except that structure backfill will be Type III as specified in Table 601-2 and backfill placement shall be per ADOT Standard Detail C-13.45. The provisions of Subsection 601.2.1 of these Special Provisions regarding soil conditions and possible dewatering as altered herein shall also apply.

SP-D SUPPLEMENT TO PART 300 - STREETS AND RELATED WORK

SP-D1 SECTION 301 - SUBGRADE PREPARATION: Bid Item 301-1 of this project shall conform in its entirety to Section 301 of the MAG Standard Specifications and City of Phoenix Supplement.

SP-D2 SECTION 310 - UNTREATED BASE: Bid Item 310-1 of this project shall conform in its entirety to Section 310 of the MAG Standard Specifications. Add the following: "Contractor shall notify the Engineer in writing 10 days prior to use of the source for base materials so tests may be performed". Untreated base will be compacted to an in-place density of not less than 95 percent of optimum as specified in Section 301.3.

SP-D3 SECTION 315 - BITUMINOUS PRIME COAT: Bid Item 315-1 of this project shall conform in its entirety to Section 315 of the MAG Standard Specifications. Bituminous material shall be MC 250 and shall be applied at a rate of 0.40 gal/SY. Actual rate of application shall be adjusted in the field.

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SP-D4 SECTION 321 - ASPHALT CONCRETE PAVEMENT: Bid Item 321-1 of this project shall conform in its entirety to Section 321 and Section 710 of the MAG Standard Specifications and COP Supplement. Tack coat shall be SS1h emulsified asphalt diluted 50 percent with water and applied at a rate of 0.06 gal/SY.

Bid Item 321-2 of this project shall conform in its entirety to Section 321 and Section 710 of the MAG Standard Specifications and COP Supplement except as amended herein.

Asphalt concrete shall be mix type D-1/2 for a 1-inch depth of in-place surface course. Liquid asphalt shall be AC-40 viscosity grade. Measurements and payment for asphalt concrete shall be made according to Weighmaster's Certificates, less the weight for asphalt cement which will be paid separately. Mix design previously approved by the City of Phoenix may be used if agreeable to the engineer. The amount of liquid asphalt, by weight, shall be 6.0 percent of the total mixed material. Asphalt concrete (1/2-inch) shall be applied in one lift for compacted in-place depth of 1-inch.

Bid Item 321-3 of this project shall conform in its entirety to Section 321 and Section 710 of the MAG Standard Specifications and COP Supplement except as amended herein. Asphalt concrete shall be mix type C-3/4 for a 3-inch base course. Liquid asphalt shall be AC-40 viscosity grade. Measurements and payments for asphalt concrete shall be made according to Weighmaster's Certificates, less the weight of asphalt cement, which will be paid separately.

Mix design previously approved by the City of Phoenix may be used if acceptable to the engineer. The amount of liquid asphalt, by weight, shall be 5.5 percent of the total mixed material. Asphalt concrete (3/4-inch) shall be applied in one lift for a compacted in-place depth of 3-inches.

Bid Item 321-4 of this project, shall conform in its entirety to Section 321 and Table 321-1 of the MAG Standard Specifications except as amended herein. This item is a contingency item. At the direction of the engineer, Sand Blotter may be applied at a rate of 2 to 3 pounds per square yard for prime coat or after final rolling of surface course. Payment will be per dry ton from Weighmasters Certificates and no other compensation shall be made.

Bid Item 321-5 of this project shall conform in its entirety to Section 321 and Section 710 of MAG Standard Specifications and COP Supplement. Payment will be by the ton as calculated for asphalt concrete under items 321-2 and 321-3.

Payment for Bid Items 321-1 through 321-5 shall be payment in full for all labor, material, equipment, and services necessary to complete asphaltic pavement for streets and underpasses and no additional compensation will be allowed.

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SP-D5 SECTION 324 - PORTLAND CEMENT CONCRETE STREET PAVEMENT: Bid Item 324-1 of this project shall conform in its entirety to Section 324 and 725 of the MAG Standard Specifications and COP Supplement except as amended herein.

Concrete PCC approach slabs shall attain a compressive strength of at least 2,000 psi in 24 hours and 3,000 psi at 28 days. Portland Cement for approach slab concrete shall be Type IP or II. Course aggregate shall be size 57 as determined by AASHTO M43.

Contractor shall submit his mix design for approval and review at least two weeks prior to start of concrete operations. Mix designs for previous or concurrent projects may be submitted for approval. Concrete shall be textured transversely as described in Section 601-3.05 of ADOT Specifications.

Bridge approach will be 15 feet in length and constructed in accordance with ADOT Standard Drawing B-19.10. Tests will be conducted in accordance with COP Subsection 725.10.

Measurements and payments will be in square yards per bridge approach slab and shall be complete compensation for all concrete, reinforcement, subgrade preparation, joints, finishing, and curing as shown on plans or as specified.

SP-D6 SECTION 336 - PAVEMENT MATCHING AND SURFACE REPLACEMENT: Bid Items 336-1 and 336-2 of this project shall conform in their entirety to Section 336.2.2 and Section 350 of the MAG Standard Specifications and COP Supplement. Street surface replacement and underpass ramp pavement will be paid for under Bid Items 301-1, 315-1, and 321-1 through 321-5. Measurement and payment for this item shall be measured and paid for by the square yard of removed concrete approach slab or asphalt concrete paving. Payment will be full compensation regardless of actual depth of material removed.

SP-D7 SECTION 340 - CONCRETE CURB, GUTTER, SIDEWALK, DRIVEWAY, AND ALLEY ENTRANCE: Bid Items 340-1 and 340-2 of this project shall conform in their entirety to Section 340 of the MAG Standard Specifications and the COP Supplement. Sawcutting, removing, and constructing the 6" high curb at the locations shown on the project plans or otherwise designated, matching in cross-section, color, and texture to the curb removed, shall be included in Bid Item 340-1. Sawcutting, removing, and constructing of the sidewalks at the locations designated, matching in cross-section, color, and texture (per City of Phoenix Detail P-1230 and P-1255) to the sidewalk removed, shall be included in Bid Item 340-2.

Materials: Portland cement, water, and admixtures shall conform to the requirements of Section 725.

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Fine aggregate and coarse aggregate shall conform to the requirements of Section 725. Coarse aggregate shall conform to the requirements of Aggregate Base in Table 702 of the MAG Standard Specifications.

The Contractor may add additional fine aggregate to the aggregate for the curb, in order to facilitate finishing. Fine aggregate for this purpose shall be non-plastic and shall conform to the following grading requirements:

Passing No. 4 Sieve	100 percent
Passing No. 200 Sieve	0 - 100 percent

Fine aggregate added for this purpose shall not exceed 25 percent of the total aggregate for the concrete curb.

Liquid membrane-forming shall conform to the requirements of AASHTO M148, Type I, Class A.

The minimum cement content per cubic yard of concrete shall be 470 pounds.

The Contractor shall be responsible for furnishing, proportioning, and mixing the various ingredients; however, approval of the proposed materials and proportioning and mixing shall be obtained prior to any concrete operations.

Concrete curb shall be constructed by the use of conventional fixed forms. The surface on which the curbs are to be placed shall be cleaned of all loose dirt and debris prior to placing.

The work shall be performed so as not to mar the paved surface. Concrete placed in fixed forms shall be thoroughly consolidated.

Concrete curbs shall be cured by the application of liquid membrane-forming compound. The time at which it is to be applied and the rate of application shall be approved by the Engineer.

Basis of Payment: The accepted quantities of concrete curb will be paid for at the contract unit price per linear foot, complete in place, sidewalks and driveways at unit price per square foot, complete in place.

SP-D8 SECTION 345 - ADJUSTING FRAMES, COVERS, AND VALVE BOXES: Bid Item 345-1 of this project shall conform in its entirety to Section 345 of the MAG Standard Specifications and COP Supplement.

SP-D9 SECTION 350 - REMOVAL OF EXISTING IMPROVEMENTS: In addition to the items listed in Subsection 350.3 of the MAG Standard

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Specifications, the following shall be included for Bid Items 350-1 and 350-2 as indicated:

Bid Item 350-1 - Sawcut and Removal of Gunite Slope Paving:

- K. Sawcutting, removal, and disposal of existing concrete slope paving as shown on the plans and directed by the Engineer. Care shall be exercised to retain at least 10 inches of existing welded wire fabric on each side of slope paving opening for replacement work under Bid Item No. 525-1.

Payment for this work will be made as a lump sum for removal.

Bid Item 350-2 - Miscellaneous Removal and Other Work:

- L. Restoration of Temporary Construction Easements: The Contractor shall leave the easements in as good condition, or better, after work is completed. Special care must be taken to replace any asphalt, trees, sprinklers, lights, walls, fences, etc., which were disturbed as a result of construction. Where grass is located within the easement, such as a lawn, the Contractor shall remove the sod which would be in the path of any construction, store it, keep it moist, and replace it immediately after construction is complete.
- M. Any and all items not specifically set forth as a separate pay item to include concrete storm drain, utility pipes, conduit, etc.
- N. Sawcutting and matching existing pavements and curbs, gutters, etc.
- O. Relocating positions of existing signs to be staked by the Inspector.
- P. Relocating positions of existing plants within the right-of-way to be staked by the Inspector.
- Q. Curb and gutter, where designated on plans.
- R. Replacement of strip curbing and decomposed granite at Peoria Avenue.

Payment for this work will be made at the contract lump sum price for Bid Item 350-2 Miscellaneous Removal and Other Work.

SP-E SUPPLEMENT TO PART 400 - RIGHT-OF-WAY AND TRAFFIC CONTROL

- SP-E1 SECTION 401 - TRAFFIC CONTROL: Bid Items 401-1 and 401-2 of this project shall conform in their entirety to Section 401 of the COP Supplement except as amended herein.

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Section 401.5 - General Traffic Regulations: Add the following items:

- I. Cactus Road and Peoria Avenue shall be considered major streets. The Contractor shall maintain them open to traffic (one 12-foot lane in each direction as a minimum) at all times. In addition, construction of the underpass box culvert at Peoria Avenue cannot disrupt traffic except as allowed by the City of Phoenix and stated below:
1. FULL TRAFFIC required (4 lanes plus turn lane) - 6 a.m. to 7 p.m., Monday through Friday.
 2. 3 LANES OPEN (2 lanes plus turn lane) - 7 p.m. Friday through 6 p.m. Saturday.
 3. 2 LANES OPEN (1 each way) - 7 p.m. to 6 a.m., Sunday through Thursday, and 6 p.m. Saturday through 7 p.m. Sunday.

The Contractor must obtain all necessary approvals for any traffic plans used, prior to implementation. The Contractor may also request approval, from the City of Phoenix, to deviate from the already approved traffic plans as shown on the drawings, sheets C.23 through C.26.

- J. 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. For construction of underpasses, Contractor shall use "Detour Plan" as contained in Construction Documents for Traffic Control. Use of this plan does not relieve the Contractor from compliance with COP Traffic Barricade Manual or added special traffic control measures resulting from his method of operation and/or changes due to special equipment utilized on this project.
- K. Permission to restrict City streets, sidewalks, and alleys (street closure permits for utility relocations) shall be requested as specified in Section III of the Traffic Barricade Manual. No additional contract time will be permitted, nor will additional compensation be paid to the contractor if such restrictions are not allowed by the COP.
- L. Unless otherwise provided for, all traffic on this project shall be regulated as specified in Section IV of the Traffic Barricade Manual.

Section 401.10 - Payment: Add the following items:

Payment for Bid Item 401-2, Traffic Control will be paid as a lump sum. This lump sum shall be compensation in full for all traffic control measures to include electrical, rentals, repairs,

additional signage, and all other incidental costs not specifically covered relating to traffic control during the duration of this project.

SP-E2 SECTION 415 - FLEXIBLE METAL GUARDRAIL: Bid Items 415-1 and 415-2 of this project shall conform in its entirety to Sections 415, 771, and 779 of the MAG Standard Specifications except as amended herein.

The breakaway cable terminal shall be constructed to the dimensions, thicknesses, and locations shown on plans. All wood posts shall be placed in drilled or mechanically dug holes. Wood posts will not be driven into place.

Section 414.4 (Flexible Guardrail) and Section 415.5 (Breakaway Cable Terminal) are amended to add the following:

Bid Item 415-2, Breakaway Cable Terminal, shall be measured per each unit and will be paid per unit as constructed in-place.

SP-F SUPPLEMENT TO PART 500 - STRUCTURES

SP-F1 SECTION 505 - CONCRETE STRUCTURES: Bid Items 505-1 and 505-2 Type I Concrete Encasement and 505-3 Type II Concrete Encasement of this project shall conform in their entirety to Section 505 and Section 725 of the MAG Standard Specifications and COP Supplement except as amended herein.

Concrete used for sewer line encasement shall be Class B (2,500 psi at 28 days) in accordance with Section 725 and Table 725.

Add the following to MAG Standard Specifications Subsection 505.10, Payment: Payment for Bid Items 505-1, 505-2, and 505-3 shall be based on the lineal feet of concrete encasement actually installed. Measurement for payment will be made to the nearest one foot along the pipe, with all fractional footages to be rounded up to the nearest foot.

Payment shall be compensation in full for locating and encasing existing pipe, as required on the plans, to include excavation, form work, steel reinforcing, placing of concrete, handling and controlling flows in the existing pipe, removing and replacing existing pipe where necessary, supporting of other utilities, backfilling and compaction and dewatering, and related activities.

Reinforcing steel shall be installed in the sizes and locations shown on plans and shall conform to ASTM Specification A-615. Reinforcement shall be installed in accordance with Section 505.5 of the MAG Standard Specifications. No payment will be made for furnishing or placing reinforcement and cost shall be included in the unit cost for concrete encasement.

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Bid Item 505-4 and 505-5 (Structural Concrete) of this project shall conform in its entirety to Section 505 and Section 725 of MAG Standard Specifications, Class A, except as amended herein.

Portland cement concrete for box culverts shall attain a compressive strength of at least 2,000 psi in 24 hours and 3,000 psi at 28 days. Portland Cement for structural concrete shall be Type IP or II. Course aggregate shall be size 57 as determined by AASHTO M43.

All exposed surfaces shall receive a Class II finish and all surfaces to be backfilled shall receive a Class I finish as outlined in MAG Standard Specifications, Section 505.9, "Finishing Concrete." Concrete shall be measured and paid for per MAG Section 505 as follows: by the cubic yard, complete in place, for the retaining walls (item 505-5), and as a lump sum item for the box culvert underpasses (item 505-4), including costs associated with any shoring scheme that may be used for the Peoria Avenue underpass construction.

Backfill shall not be placed against concrete box walls unless roof is placed and cured for at least 24 hours or Contractor has installed internal bracing in the box culvert to the satisfaction of the Engineer.

Bid Item 505-6 (Reinforcing Steel) of this project shall conform in its entirety to MAG Standard Specifications except as amended herein.

Reinforcing bars shall be furnished and installed as shown on plans and ADOT Details B-01.10, B-02.10 (Table I), B-18.10, and B-18.20 (Case II).

Payment for Bid Item 505-6, Reinforcing Steel shall be paid by the pound of calculated steel rebar regardless of grade excluding wire ties, benches, laps, etc.

SP-F2 SECTION 520 - STEEL AND ALUMINUM HANDRAILS: Bid Item 520-1 (Steel Handrail) of this project shall conform in its entirety to Section 520, 530, and 790 of the MAG Standard Specifications and shall be painted with #9 paint as shown on plans. Plan/shop drawings will be provided per Subsection 105.2.

Payment for Bid Item 520-1 shall be for fabrication, installation complete with paint.

SP-F3 SECTION 525 - PNEUMATICALLY PLACED MORTAR: Bid Item 525-1 shall conform in its entirety to Sections 525, 725, and 727 of MAG Standard Specifications and as shown on plans. Mortar shall be prepared by the wet mix process as described in Subsection 525.3. Reinforcing shall be galvanized welded wire fabric, 4x4-W3xW3 and placed in the center of the 4-inch pneumatically placed mortar.

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Payment will be made as a lump sum and shall include reinforcement and compaction complete in place.

SP-F4 SECTION 530 - PAINTING: Bid Item 530-1 (Pavement Markers and Street Paint) of this project shall conform in its entirety to Section 703 and 706-2 of the ADOT Standard Specification except as amended herein.

"Contractor shall replace reflective and non-reflective markers at bridge approach slabs in accordance with Subsections 706-2.02, "Reflective Pavement Markers," and 706-2.03, "Non-Reflective Pavement Markers" (Types D and H). Types A and AY. Yellow and white street paint will be furnished and installed with glass beads in accordance with City of Phoenix street painting criteria."

Payment for Bid Item 530-1 (Pavement Markers and Street Paint) shall be at a lump sum basis and will be full compensation for removal, furnishing, and installing all pavement markings and painting of lane dividers.

SP-G SUPPLEMENT TO PART 600 - WATER AND SEWER

SP-G1 Bid Item 605-1 (Retaining Wall Drainage Material) of this project shall be placed in accordance with ADOT Detail B18.10 "Typical Section" and consist of fine aggregate with average sand equivalent of not less than 75 when tested in accordance with AASHTO T-176. Coarse aggregate shall conform to AASHTO M43, Size #7 and shall be placed in a 1 cubic foot burlap bag at 10 foot centers next to 3-inch drain pipes. Drainage pipe shall be standard strength 3-inch galvanized pipe and placed at 10 foot centers with a 1/2-inch per foot slope to drain onto the ramp pavement.

Payment will be at the lump sum bid amount and will be payment in full for placement of fine aggregate, coarse aggregate, and drain pipe complete.

SP-G2 Bid Item 610-1 (8" Ductile Iron Pipe) and 610-2 (12" Ductile Iron Pipe) of this project shall conform in its entirety to Sections 601, 610, and 611 of the MAG Standard Specifications and COP Supplement except as amended herein.

SUBSECTION 601.2.1 - GENERAL: Is amended to add the following paragraphs:

"No extra compensation or additional time will be authorized for claims that soil conditions differ from those anticipated or those indicated by soil logs and/or reports. It is the Contractor's responsibility to make his own determination as to actual existing conditions.

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Further, no extra compensation or additional time will be authorized for dewatering of trench or structural excavations to perform the work as described in the MAG Standard Specifications and Drawings. This cost, if any, shall be included in the unit price bid for the construction or installation of the Items to which such excavation and backfill are incidental or appurtenant."

SUBSECTION 601.2.2 - TRENCH WIDTH: Is amended to add the following paragraph:

"If the Contractor elects to slope the trench walls in lieu of shoring, sheeting or other wall support measures, he shall be responsible for any and all problems encountered and costs incurred as a result of the increased trench width. Furthermore, no increases in contract time will be allowed as a result of sloping trench walls."

SUBSECTION 601.2.3 - TRENCH GRADE: Subsection 601.2.3 Trench Grade, the second paragraph is modified to read:

"For all pipe, the Contractor shall over-excavate the bottom of the trench by a minimum of 4 inches or 1/12 the O.D., whichever is greater."

SUBSECTION 601.2.5 - OVER EXCAVATION: Is amended to add the following paragraph:

"When the Engineer determines that over-excavation and backfilling, below the normal foundation and bedding depth, are required as a result of unsuitable material, it will be considered extra work. Payment and construction time extension will be negotiated with the Contractor or as otherwise provided for in these contract documents. As a condition of the contractor receiving payment, agreement on method of payment and construction time extension shall be reached prior to start of work unless otherwise authorized in writing by the Engineer."

SUBSECTION 601.2.8 - GRADING AND STOCKPILING: Add the following paragraph:

"Excavated material shall not be considered as unsuitable due to an excessive moisture content or an inadequate moisture content for proper compaction. The Contractor shall take whatever measures are required, at his own expense, to add or remove moisture from material to be used as backfill in order that proper compaction can be obtained within the limits set in Subsection 601.4.

The Contractor may elect, at no cost to the Flood Control District to haul off and dispose of excessively wet or dry material and replace it with material conforming to the specifications for backfill.

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In either event, the proper compaction shall be obtained.

There will be no additional payment or time extension allowed for this work."

SUBSECTION 601.4.2 - BEDDING: The first paragraph is modified to read:

"For all pipe, the bedding material from the bottom of the trench to 1 foot over the top of the pipe shall be ABC or Select Material, Type "B", per Section 702 compacted to a minimum density of 95 percent when tested by AASHTO T-99 (Method "A") with rock correction and T-191."

All bedding shall be included in the unit price bid for the pipes.

SUBSECTION 601.4.3 - BACKFILL: Delete the fourth paragraph in its entirety, and substitute the following:

"When mechanical compaction is to be used, the Contractor shall provide a test section demonstrating his proposed method and equipment to be used. Upon agreement with the Engineer as to the acceptability of the Contractor's proposed method and equipment, they shall not be changed without the prior approval of the Engineer. Mechanical compacted lifts in excess of one foot will not be allowed without the express written consent of the Engineer."

SUBSECTION 601.4.3 - BACKFILL: Amend to add the following paragraphs:

"Backfill material shall be within the range of +2% to -4% of the optimum moisture content, prior to placing the material in the trench. The moisture content shall be uniform throughout the backfill material. Material not meeting these requirements may be required to be removed from the trench and moisture added or removed to correct the deficiencies prior to replacement, all at the Contractor's expense.

It shall be the Contractor's responsibility to blend excavated material, removing or adding moisture as may be necessary to meet the requirements of the specification, all at the Contractor's expense.

Excavated material when used for backfill shall meet the requirements of the preceding paragraph.

The Engineer may require all or any part of the trench to be load tested for stability with Contractor's equipment prior to placement of asphalt. Unstable areas as determined by the Engineer shall be corrected by the Contractor at his expense."

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SUBMITTAL: The Contractor shall submit his plan, methods, and procedures for protecting existing utilities prior to beginning construction. Approval of the plan does not limit the Contractor's responsibility for utility protection, and the Contractor shall implement all additional utility protection measures as determined to be necessary in the field.

SP-G3 **SECTION 610 - WATER LINE CONSTRUCTION:** The construction of the water line relocation and appurtenances shall conform to the applicable MAG Standard Specifications and Details, and City of Phoenix Supplements thereto.

SECTION 610.3 - MATERIALS: All water line pipe shall comply with Subsection 750.2, "Ductile Iron Water Pipe," and shall be minimum Class 51, in accordance with AWWA C-150. All pipe, except where shown on plans, shall comply with AWWA C-111 for mechanical joint pipe, C1.150. Fittings shall be mechanical joint ductile iron with cement mortar lining and coal-tar coated.

SUBSECTION 610.5 - POLYETHYLENE CORROSION PROTECTION: All D.I. pipe valves and fittings installed shall be protected from corrosion by encasement in a polyethylene protective wrapping per Subsection 610.5 of the MAG Standard Specifications and Details.

No separate payment will be made for polyethylene protective wrapping. Materials and installation shall be included in the unit price bid for pipe or individual appurtenance.

SUBSECTION 610.18 MEASUREMENT AND PAYMENT: Payment for the various sizes of ductile iron pipe will be made at the unit price bid per linear foot, measured along the centerline of the pipe, through all valves and fittings, from centerline to centerline of fittings or valves, to the nearest 0.1 foot. Payment shall be full compensation for furnishing and installing new pipe and fittings complete in-place, as specified, including excavating, concrete thrust blocks, steel tie-backs, backfilling, bedding, compacting, sheeting and bracing, testing, disinfecting, and all incidental work not specifically covered in other pay items.

SP-G4 **Bid Item 610-3, 8" Waterline Plugs:** Waterline plugs shall be installed as shown on plans and on detail sheets. Payment shall be per each and shall be full compensation for removal of pipe, concrete blocking, pit cock, backfill and compaction, and incidental work related to installing waterline plugs complete, in-place.

SP-G5 **Bid Item 610-4, Ductile Iron Pipe Fittings, Miscellaneous:** This contingency item is provided for incidental fittings not detailed on plans that may be necessary due to unforeseen conditions at time of construction. Payment for this item will be per pound as given by manufacturer for item, less shipping and packing materials and shall be made at the sole discretion of the engineer.

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SP-G6 Bid Item 610-5, Galvanized Pipe and Fittings: All pipe and fittings shall comply with Section 753, MAG Standard Specifications.

Payment for Item 610-5, Galvanized Pipe and Fittings, shall be per lineal foot measured along the pipe centerline from center to center of fittings. Payment shall be full compensation for installation, backfilling, corrosion protection, supports and check valve complete and in-place as shown on plans.

SP-G7 SECTION 618 - STORM DRAIN CONSTRUCTION WITH CONCRETE PIPE: Bid Items 618-1, 618-2, and 618-3 (Reinforced Concrete Pipe) of this project shall conform in its entirety to Sections 618 and 735 of the MAG Standard Specifications and COP Supplement except as amended herein.

All 15-inch reinforced concrete pipe shall be installed as connecting pipe where shown on plans. All 15-inch RCP shall be Class 3 and shall comply with ASTM C-76 and provisions of Section 735.

All 18-inch and 24-inch Reinforced Concrete Pipe shall be installed as shown on plans as main line pipe. Reinforced Concrete Pipe shall be Class 3, shall comply with ASTM C-76 and be manufactured, cured, and tested in accordance with Section 735.

Measurement and payment will be as provided in Section 618.5, Measurement, and 618.6, payment at the unit price bid per lineal foot for size of pipe.

SP-G8 Bid Item 618-4 (Concrete Straight Headwall) of this project shall conform in its entirety to Section 505, 725, and 727 of the MAG Standard Specification and COP Supplement except as amended herein.

Concrete used shall be Class A as shown in COP Supplement Table 725 with a minimum compressive strength of 2,500 psi at 28 days. Cement shall be Portland Cement and comply with requirements of ASTM C-150, Type II, Low Alkali Steel Reinforcement shall comply with Section 727 (grade 40 deformed billet steel) for the sizes shown on plans. Exposed concrete shall receive a Class II finish and backfilled surfaces shall receive a Class I finish.

Payment for Item 618-4, Concrete Headwall shall be made at the unit cost per each and shall be full compensation for excavation, backfill, vee ditch, compaction, curing, reinforcement, finishing, and other related items necessary to complete this item in-place, as shown on plans.

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SP-G9 Bid Item 625-1 - Salvage Sanitary Manhole of this project shall conform in its entirety to Sections 350 and 625 of the MAG Standard Specification and COP Supplement except as amended herein.

Removal of and salvage of manhole frame and cover and removal of cone section and risers shall proceed only after installation of falsework within the sanitary manholes to prevent construction debris from entering the sewer. After construction is complete and manhole frames and covers installed per plans and Section 625, all falsework shall be removed.

Payment shall be at the unit bid cost per each for Item 625-1, Set Manhole Section W/Watertight Frame and Cover.

Removed frame and covers shall become the property of the City of Phoenix, and the Contractor shall load, haul, and stockpile the frames and covers, as directed, at the City of Phoenix Maintenance Yard, 2301 West Durango Avenue.

SP-G10 SECTION 625 - MANHOLE CONSTRUCTION AND DROP SEWER CONNECTIONS: Bid Item 625-2 (Storm Drain Manhole) shall conform in its entirety to Section 625 of the MAG Standard Specifications and MAG Details 420 and 424 except as modified by COP Supplements.

SP-G11 Bid Item 625-3 (48" Irrigation Standpipe) of this project shall conform in its entirety to Sections 725 and 735 of the MAG Standard Specification and COP Supplement except as amended herein.

The 48-inch precast standpipe shall be constructed of materials and at location as shown on plans. Payment will be made at the unit bid cost and will be full compensation for constructing concrete base, grouting pipe into standpipe, concrete grouting, excavation, backfill and compaction, and setting of precast riser and install temporary security cover, complete and in-place.

SP-G12 Bid Item 625-4 (Special Storm Trench Drain) of this project shall conform in its entirety to Sections 505, 725, and 787 of the MAG Standard Specification and COP Supplement except as amended herein.

Trench drains shall be constructed of materials and located as shown on plans. Payment shall be made per each complete, in-place at the unit bid cost. Payment shall be full compensation for excavating, forming, finishing, curing and backfilling with related incidental items.

SP-G13 Bid Item 625-5 (Drain Sump Pump) of this project shall conform in its entirety to Sections 625, 725, and 787 of the MAG Standard Specification and COP Supplement except as amended herein.

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Contract No. FCD 88-17

Sump pump manholes shall comply with Section 625, Manhole Construction; base and collar shall comply with Section 725, Portland Cement Concrete, Class B (2500 psi compressive strength at 28 days) and manhole cover and frame shall comply with Section 787, Cast Iron Castings.

Non-clog submersible pump shall be Flygt Model C-3085, with single phase, 120 volt, 1.6 HP fully submersible motor, with pump capacity of 100 gpm at TDH=30 ft. Electric control panel shall be Flygt F3000-402 with switches, starter, and transformer in a NEMA-4 enclosure. Contractor shall furnish two wide angle mercury switches set for on-off operation as shown on plans Underpass Pump Station plans and details. All items will be permanently installed as shown on plans, to include control wiring from electric panel to motor and mercury switches. Also, Contractor must "proof run" the sump pumps for 6 complete cycles, and provide proof of warranty. This proof run shall be included in the lump sum payment for each sump pump.

Payment will be at the unit bid price per each and shall include all excavation, precast manhole frame and cover, concrete, grout, pump, wiring, control panel with enclosure, starter, mercury switches, and miscellaneous related items complete and in-place as shown on plans.

SP-G14 Bid Items 630-1 and 630-2 (Tapping Sleeve, Gate Valve, and Box and Cover) of this project shall conform in their entirety to Section 630 of the MAG Standard Specification except as amended herein.

Tapping sleeve and valve shall be installed in accordance with MAG Detail 340 at the locations shown on plans.

Payment shall be made for the size and kind in accordance with Section 630.9, Payment.

SP-H SECTION 801 - MISCELLANEOUS ELECTRICAL

Bid Item 801-1 of this project shall conform with the 1987 National Electrical Code (NEC), the current Phoenix Electrical Code and project plan.

A. Conduit: The conduit placed underground or in concrete shall be Schedule 40 PVC with Schedule 40 PVC elbows. The minimum allowable conduit size shall be 1 1/2-inch. Pullwires shall be installed in the conduits for future electrical service. Conduit expansion joints to be provided as necessary.

Conduit above grade shall be galvanized rigid steel with a minimum size of 3/4". All couplings and connectors shall be raintight.

Construction Special Provisions
Contract No. FCD 88-17

- B. Outlet Boxes: The outlet boxes shall be concrete tight and have weatherproof blank covers with gaskets. The boxes and covers shall be constructed of galvanized steel or cast iron and placed as shown on plans.
- C. Meter Base: The meter base shall be 100 ampere, 120/240 v, single phase, 3 wire weatherproof meter socket. The meter base shall meet Arizona Public Service requirements.
- D. Disconnect Switch: The disconnect switch shall be a 30 ampere, 2 pole, 3 wire fusible switch with NEMA 3R enclosure and two 15 ampere dual element fuses.
- E. Ground Rod: The ground rod shall be 3/4" diameter by 10 foot copper clad steel. Connection to the ground rod shall be made with a fused connection.
- F. Sump pumps, controllers, mercury switches, motor panel, and disconnect switches must be wired complete to allow for testing.
- G. All electrical components associated with the sump pumps shall be warranted for one (1) year after date of "proof run". Contractor shall furnish warranty to the Flood Control District.
- H. Payment: Payment shall be made at the lump sum bid price and shall be compensation in full for all materials and installation within concrete box culvert and retaining walls. The above lump sum bid price shall also include the materials and installation of the sump pump controls, pump control panel, disconnect switch, meter base, ground rods, wiring, conduit and all associated hardware.

SOILS REPORT SUPPLEMENT

AT

CACTUS ROAD AND PEORIA AVENUE

by

"SPEEDIE AND ASSOCIATES"

SPEEDIE AND ASSOCIATES

GEOTECHNICAL AND SITE ENGINEERS

11029 N. 24th AVE., SUITE 805 • PHOENIX, ARIZONA 85029 • (602) 997-6391
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JAMES A. SPEEDIE, P.E.
GREGG A. CREASER, P.E.
GARY E. STOCKER, P.E.
STEVEN A. GRIESS, P.E.

REPORT ON SOIL INVESTIGATION

DESIGNATION: Proposed Pedestrian Structures
Cave Creek Wash

LOCATION: ACDC Canal to Cactus Road
Phoenix, Arizona

CLIENT: Sverdrup Corporation

PROJECT NO: 870317SA

DATE: February 29, 1988

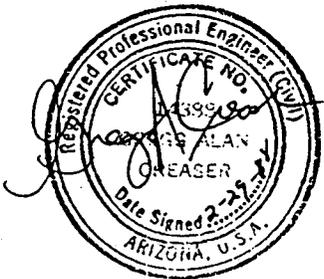
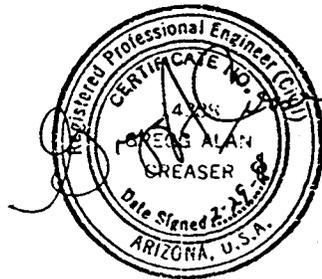


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INTRODUCTION

This report presents the results of a subsoil investigation carried out at the site of several pedestrian access structures along the proposed realignment of Cave Creek Wash. The sites are scattered along Cave Creek Wash between the Arizona Canal and Cactus Road in Phoenix, Arizona.

Preliminary information calls for the construction of two 10' x 10' culvert-type underpasses located at Peoria Avenue and Cactus Road, and six pedestrian bridges to be located generally as shown on the Soil Boring Location Plans, Plates 1, 2 and 3. Construction of the underpasses will be a box culvert type structure with a slab-on-grade and cast-in-place concrete walls. The underpasses will not be within the channel. The pedestrian bridges will be 10 foot wide single-span structures of concrete, steel or wood, and will be capable of supporting maintenance vehicle traffic. On the vertical wall sections, the bridges will be supported on the channel walls. On the trapezoidal sections, the bridge abutments will be located on the top of the bank slope. Abutment structural loads will be on the order of 13 KLF in the rectangular channel sections and 27.5 KLF in trapezoidal sections. No special considerations regarding settlement tolerance are known. Adjacent areas will be landscaped.

It is our understanding that the entire channel will be concrete lined throughout the length of this project. Therefore, scour should not be a factor in design of the proposed structures.

Two of the structure locations were changed after the preliminary drilling was complete. This report includes the boring logs for the redrilled locations.

GENERAL SITE AND SOIL CONDITIONS

Site Conditions - The entire length of the Cave Creek Channel through the reach under investigation is undeveloped with the exception of bridge crossings at Peoria Avenue and Cactus Road. The steep sided channel is slightly meandering and in many places vegetation was growing within the channel and along the channel banks. The out-of-bank areas are generally clear of vegetation with the exception of grass and a few scattered trees.

Soil Conditions - Subsoil conditions at the various bridge and underpass locations are somewhat variable throughout the length of the channel. The subsoils consist primarily of sand, gravelly sand, silty sand, clayey sand, or sand, gravel and cobble mixtures. Subordinate amounts of clay, sandy clay and sandy silt were encountered. Strata of the above materials were inter-bedded from site to site in a generally random sequence typical of intermittent fluvial deposition. In general, the subsoils exhibit a Standard Penetration Resistance (SPT) of 10 to 25 blows per foot in the upper 10 to 20 feet and 25 to 50-plus blows per foot below 25 feet. An SPT of less than 10 blows per foot was recorded in the upper 5 feet in four test borings. Moisture contents range from 4 to 23 percent and plastic soils exhibit plasticity indices of 15 to 32 percent. In-place dry densities range from 86 to 128 PCF. Swell tests indicate that the more clayey soils have a moderate potential for volume increase due to wetting. For more detailed descriptions of the soils at each structure location, please refer to the individual Logs of Test Borings and Tabulation of Test Data contained in the Appendix. Groundwater was not encountered at any of these locations.

ANALYSIS AND RECOMMENDATIONS

Analysis - Analysis of the field and laboratory data indicates that subsoils encountered at the various bridge locations are favorable for support of the proposed structures.

Underpasses - It is recommended that the proposed pedestrian underpass culverts be founded on undisturbed native soil, or on properly compacted fill. Ramp retaining wall footings should be founded at a minimum depth of 24 inches below slab elevation. Scour will not be a factor in support of the underpasses. If site preparation is carried out as set forth herein, a recommended safe allowable bearing capacity of 2,500 psf may be utilized for design of both underpasses.

Pedestrian Bridges - It is recommended that the proposed pedestrian bridges be founded on shallow spread footings bearing on undisturbed native soils as follows:

<u>Bridge</u>	<u>Station</u>	<u>Channel Bottom Elevation</u>	<u>Top of Bank Elevation</u>	<u>Channel Type</u>	<u>Footing Bottom Elevation</u>	<u>Bearing Capacity (PSF)</u>
1	581+50	1207.5 ₊	1228.0	Vertical	1204.5	4,500
2	14+00	1207.5 ₊	1230.0	Vertical	1204.5	5,000
3	29+10	1229.0	1241.0	Trapezoidal	1236.0	5,000
4	55+00	1240.0	1254.0	Trapezoidal	1249.0	3,000
4 Alt.	59+00	1241.7 ₊	1254.0	Trapezoidal	1249.0	2,500 ⁽¹⁾
5	73+00	1248.0	1262.0	Trapezoidal	1257.0	2,500 ⁽¹⁾
6	87+50	1254.0	1265.0	Trapezoidal	1260.0	2,500 ⁽¹⁾
6 (Alt.)	87+50	1254.0	1265.0	Trapezoidal	1255.0	6,000 ⁽²⁾

NOTES:

- (1) Bearing capacity for footings founded on at least 24 inches of recompacted native soil, or on properly compacted fill.
- (2) Bearing capacity for spread footings founded on dense sandy gravel.

Alternately, bridges along the trapezoidal channel sections may be founded on drilled piers bearing on the deeper, more dense soils as follows:

<u>Bridge</u>	<u>Station</u>	<u>Top of Bank Elevation</u>	<u>Caisson Bottom Elevation</u>	<u>Capacity (PSF)</u>
3	29+10	1241.0	1220.0	8,000
4	59+00	1254.0	1230.0	6,000
5	73+00	1262.0	1235.0	8,000
6	87+50	1265.0	1250.0	8,000

Caisson bottoms should be examined by a Soils Engineer to confirm proper cleaning and that the proper bearing stratum has been reached. Accordingly, minimum 30-inch diameter shafts should be utilized, and safety casing made available for those entering the bore hole. concrete must be placed in the caissons the same day as drilled, or they must be re-examined prior to concrete placement.

These bearing capacities refer to the total of all loads, dead and live, and are net pressures. They may be increased one-third for wind, seismic or other loads of short duration. All footing excavations should be level and cleaned of all loose or disturbed materials.

Isolated rectangular footings should be designed with minimum width of 24 inches regardless of the resultant bearing pressure. Estimated settlements under design loads are on the order of 1/2-inch, virtually all of which will occur during construction. Post-construction differential settlements will be negligible, under existing and compacted moisture contents. Additional localized settlements of the same magnitude could occur if native supporting soils were to experience a significant increase in moisture content. Positive drainage away from structures, and the concrete lining of the drainage channel should prevent saturation of the subsoils.

Site Preparation - The entire area to be occupied by the proposed construction should be stripped of all vegetation, debris, rubble and obviously loose surface soils.

Prior to placing structural fill below footing bottom elevation, the existing grade should be scarified to a depth of 8 inches, moisture conditioned to optimum (+2 percent) and compacted to at least 95 percent of maximum dry density as determined by ASTM D-698.

All cut areas and areas above footing bottom elevation that are to receive slab fill should be scarified 8 inches, moisture conditioned to optimum (+2 percent) and uniformly compacted to 95 percent of maximum dry density.

Lateral Pressures - The following lateral pressure values may be utilized for the proposed construction:

Active Pressure⁽¹⁾

Unrestrained Walls 35 PCF

Restrained Walls 60 PCF

Passive Pressure

Continuous Footings 350 PCF

Spread Footings or
Drilled Piers 400 PCF

Coefficient of Friction

(With Passive Pressure) 0.35

Coefficient of Friction

(Without Passive Pressure) 0.45

(1) NOTE: If there is a possibility that the wall backfill can be saturated, the design should account for full hydrostatic pressure.

All backfill must be compacted to not less than 95 percent (ASTM D-698) to mobilize these passive values at low strain. Clay soils should not be used as backfill against abutments, wing walls or walls as expansive potentials could greatly increase wall pressures. Thin lifts and hand held equipment should be utilized within 10 feet of walls to prevent overloading due to equipment surcharges.

Fill and Backfill - Native soils are suitable for use in grading fills. Imported common fill for use in site grading should be examined by a Soils Engineer to ensure that it is of low swell potential and free of organic or otherwise deleterious material. In general, the fill should have 100 percent passing the 3-inch sieve and no more than 60 percent passing the 200 sieve. For the fine fraction (passing the 40 sieve), the liquid limit and plasticity index should not exceed 30 percent and 10 percent, respectively. It should exhibit less than 1.5 percent swell potential when compacted to 95 percent of maximum dry density (ASTM D-698) at a moisture content of 2 percent below optimum, confined under a 100 psf surcharge, and inundated.

Fill should be placed on subgrade which has been properly prepared and approved by a Soils Engineer. Fill must be wetted and thoroughly mixed to achieve optimum moisture content, +2 percent (optimum to +3 percent for underslab fill). Fill should be placed in horizontal lifts of 8-inch thickness (or as dictated by compaction equipment) and compacted to the percent of maximum dry density per ASTM D-698 set forth as follows:

A. Pavement Subgrade or Fill	95
B. Utility Trench Backfill	
1. More than 1.5' below finish S/G	90
2. Within 1.5' of finish S/G	95
C. Landscape Areas	
1. Miscellaneous fill	90
2. Utility trench - more than 1.0' below F/G	85
3. Utility trench - within 1.0' of F/G	90

Utilities Installation - Trench excavations for utilities can be accomplished by conventional trenching equipment. Trench walls will stand near-vertically for the short periods of time required to install utilities. If trenches are greater than shoulder-height, precautions must be taken to protect workmen.

Backfill of trenches may be carried out with native excavated material. This material should be moisture-conditioned, placed in 8

inch lifts and mechanically compacted. Water settling is not recommended. Compaction requirements are summarized in the "Fill And Backfill" section of this report.

Backfilling in compacted lifts is preferred to minimize settlements. A less desirable, but more expedient process would involve backfill of trenches to 18 inches below finish subgrade, jetting as set forth in Section 601 of the M.A.G. Specification, and allowing time for moisture stabilization. The surface should then be thoroughly wheel-rolled to provide stable conditions. The upper 18 inches should then be placed in two moisture-conditioned lifts and compacted to not less than 95 percent of maximum dry density. This process should only be used in granular soils and in areas where jetting water will not enter wall backfill.

Slabs-On-Grade - To facilitate fine grading operations and aid in concrete curing, a 4-inch thick layer of granular material conforming to the gradation for Aggregate Base Course (A.B.C.) as per M.A.G. Specification Section 702 should be utilized beneath the slab. Dried subgrade soils should be moistened prior to placing the A.B.C.

GENERAL

The scope of this investigation and report does not include regional considerations such as seismic activity and ground fissures resulting from subsidence due to groundwater withdrawal, nor any considerations of hazardous releases or toxic contamination of any type.

Our analysis of data and the recommendations presented herein are based on the assumption that soil conditions do not vary significantly from those found at specific sample locations. Our work has been performed in accordance with generally accepted engineering principles and practice; this warranty is in lieu of all other warranties expressed or implied.

We recommend that a Soils Engineer monitor the earthwork and foundation portions of this project to ensure compliance to project specifications and the field applicability of subsurface conditions

which are the basis of the recommendations presented in this report. If any significant changes are made in the scope of work or type of construction that was assumed in this report, we must review such revised conditions to confirm our findings if the conclusions and recommendations presented herein are to apply.

Respectfully submitted,

Richard A. Schooler



Richard A. Schooler, R.G.

Gregg A. Creaser



Gregg A. Creaser, P.E.

February 29, 1988

APPENDIX

FIELD AND LABORATORY INVESTIGATION Page 1 of 1

SOIL BORING LOCATION PLAN Plates 1, 2 & 3

SOIL LOG LEGEND Plate 4

LOG OF TEST BORING:

[REDACTED]

Boring No. B-7 Figure No. 7

Boring No. B-8 Figure No. 8

[REDACTED]

Boring No. B-15 Figure No. 15

Boring No. B-16 Figure No. 16

[REDACTED]

TABULATION OF TEST DATA Figure No. 19

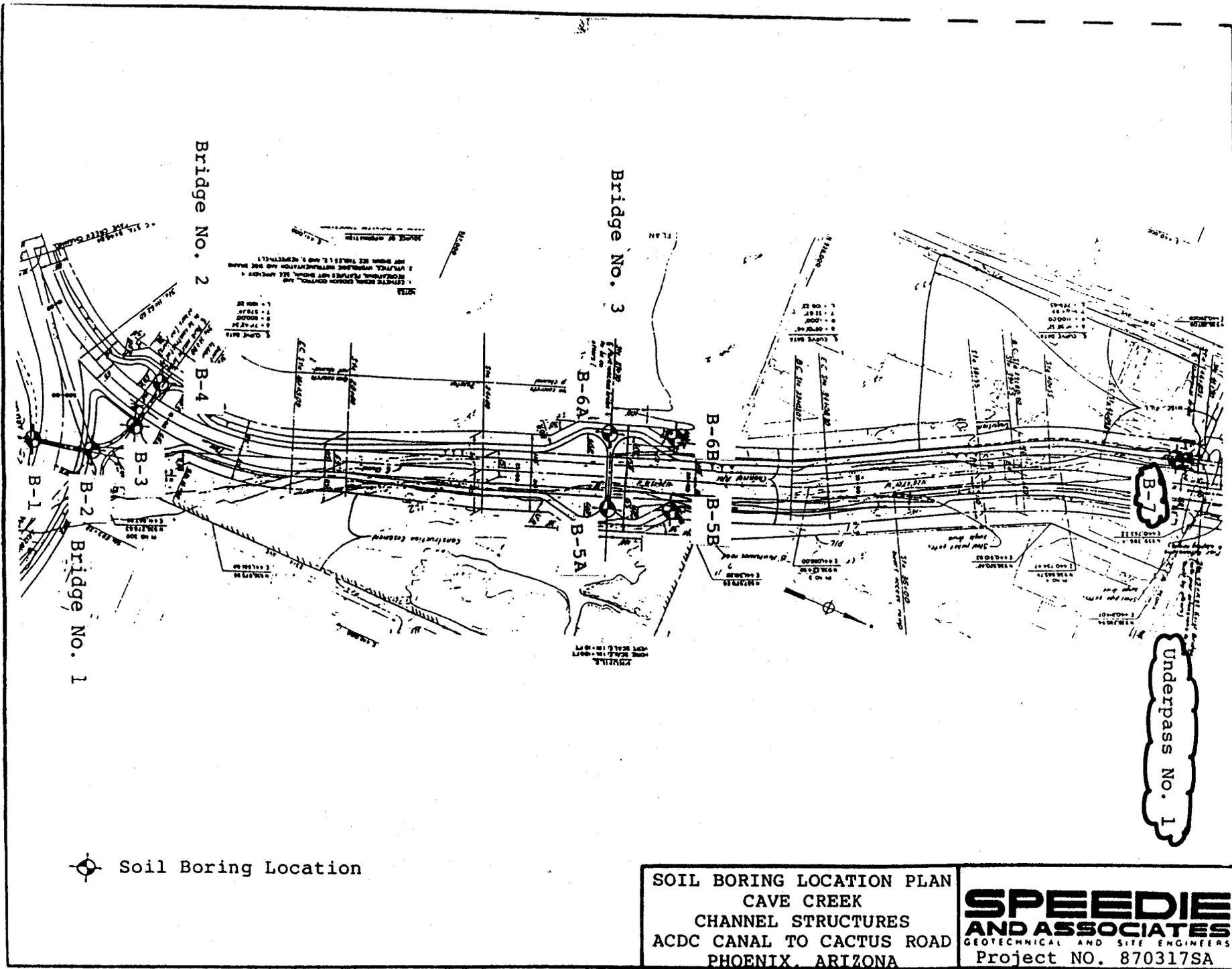
CONSOLIDATION DATA Figure No. 22

SWELL TEST DATA Figure No. 24

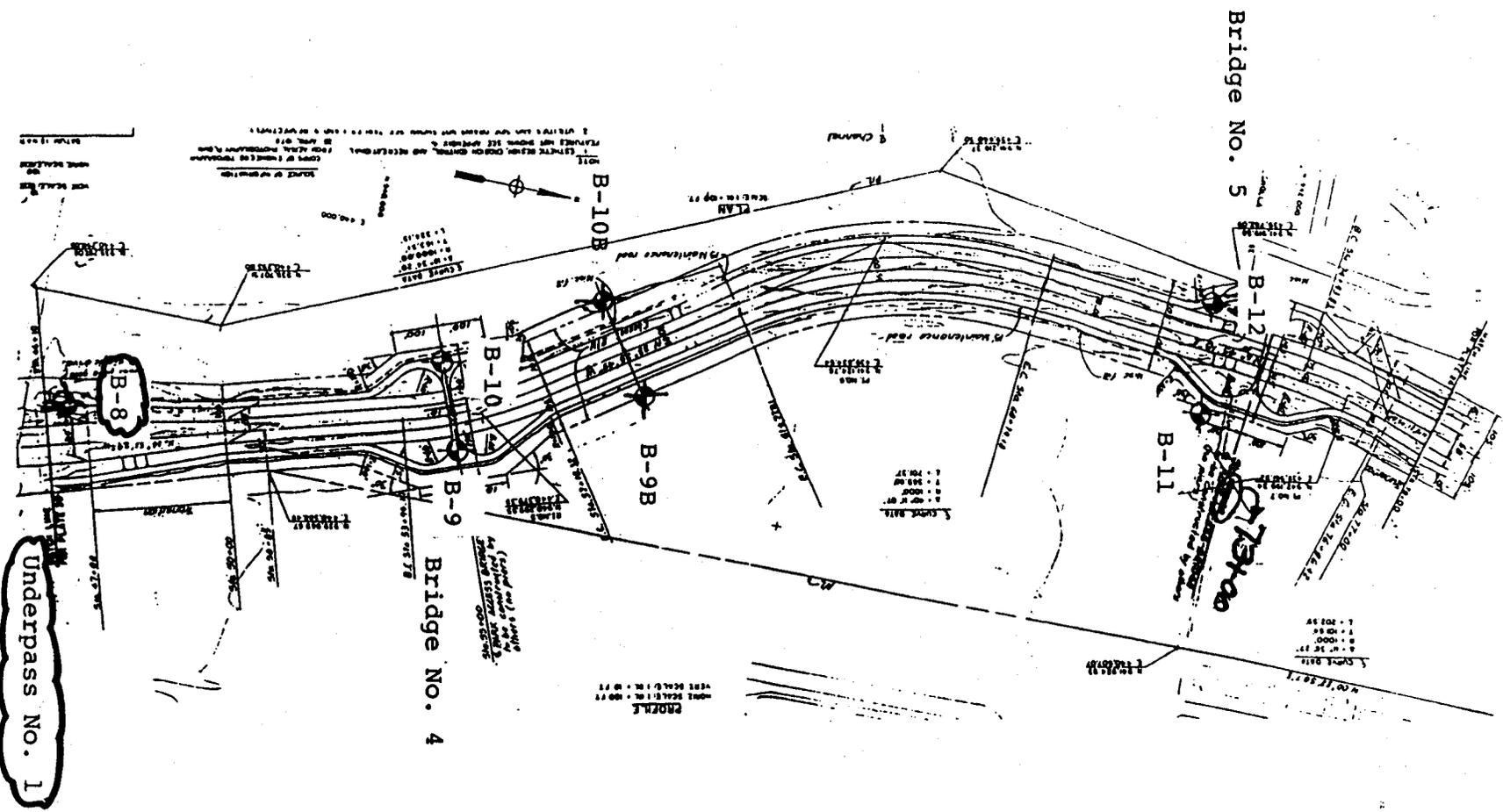
FIELD AND LABORATORY INVESTIGATION

Between September 30 and October 9, 1987, 16 soil test borings were drilled at the approximate locations shown on the attached Soil Boring Location Plan, Plates 1 through 3. All exploration work was carried out under the full-time supervision of our engineer, who recorded subsurface conditions and obtained samples for laboratory testing. The soil borings were advanced with a truck-mounted CME 75 drill rig utilizing 7.0-inch diameter hollow stem flight augers. Detailed information regarding the borings and samples obtained can be found on an individual Log of Test Boring prepared for each drilling location.

Laboratory testing consisted of moisture content, dry density, grain-size distribution and plasticity (Atterberg Limits) tests for classification. Compression tests were performed on selected ring sample in order to estimate settlements and determine effects of inundation. Remolded swell tests were performed on samples compacted to densities and moisture contents expected during construction. All field and laboratory data is presented in this Appendix as Figures No. 1 through 24.



DT AMP 1



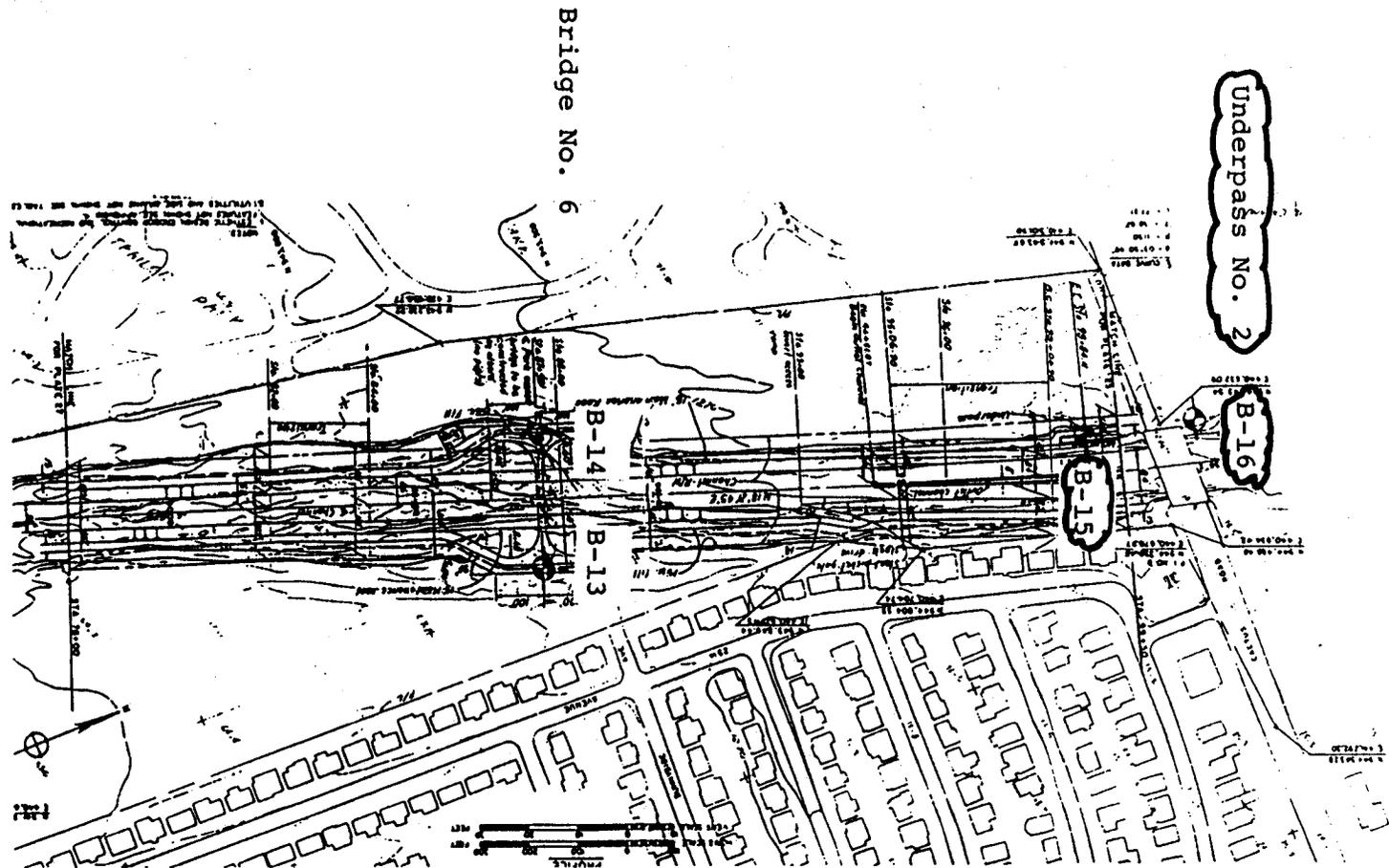
SOIL BORING LOCATION PLAN
 CAVE CREEK
 CHANNEL STRUCTURES
 ACDC CANAL TO CACTUS ROAD
 PHOENIX, ARIZONA

**SPEEDIE
 AND ASSOCIATES**
 GEOTECHNICAL AND SITE ENGINEERS
 Project No. 870317SA

Soil Boring Location

PLATE 2

10.3-A



 Soil Boring Location

SOIL BORING LOCATION PLAN
 CAVE CREEK
 CHANNEL STRUCTURES
 ACDC CANAL TO CACTUS ROAD
 PHOENIX, ARIZONA

SPEEDIE
AND ASSOCIATES
 GEOTECHNICAL AND SITE ENGINEERS
 Project No. 870317SA

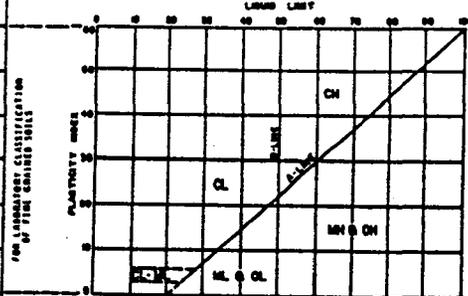
SOILS CLASSIFICATION CHART

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-SORTED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVEL WITH FINES (APPROXIMATE AMOUNT OF FINES)		GP	POORLY-SORTED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVEL WITH FINES (APPROXIMATE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND SILT MIXTURES
		CLAYEY GRAVELS, GRAVEL-SAND CLAY MIXTURES		GC	CLAYEY GRAVELS, GRAVEL-SAND CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-SORTED SANDS, CORNELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPROXIMATE AMOUNT OF FINES)		SP	POORLY-SORTED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOES, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
		LIQUID LIMIT GREATER THAN 50		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, COMBUSTIBLE CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
		LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MEDIUM OR PLASTICITY FINE SAND OR SILTY SOILS
HIGHLY ORGANIC SOILS	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		LIQUID LIMIT GREATER THAN 50		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, MUCK, SUMP SOILS WITH HIGH ORGANIC CONTENTS

GRADATION CHART

MATERIAL SIZE	PARTICLE SIZE				
	LOWER LIMIT		UPPER LIMIT		
	MILLIMETERS	SIEM SIZE	MILLIMETERS	SIEM SIZE	
SAND	FINE	0.075	200*	0.425	100*
	MEDIUM	0.425	100*	2.00	60*
	COARSE	2.00	60*	7.50	20*
GRAVEL	FINE	0.75	60*	1.18	150*
	COARSE	1.18	150*	2.00	100*
COBBLES		75	3"	300.0	12"
SOUL BEARS		300.0	12"	510.0	20"

PLASTICITY CHART



CONSISTENCY			RELATIVE DENSITY	
CLAYS & SILTS	BLOWS/FOOT*	STRENGTH †	SANDS & GRAVELS	BLOWS/FOOT*
VERY SOFT	0-7	0-2	VERY LOOSE	0-4
SOFT	7-15	2-5	LOOSE	4-10
FIRM	15-30	5-15	MEDIUM DENSE	10-30
STIFF	30-50	15-30	DENSE	30-50
VERY STIFF	50-100	30-60	VERY DENSE	OVER 50
HARD	OVER 100	OVER 60		

* Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch D.O. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

† Unconfined compressive strength in tons/sq ft. Read from a pocket penetrometer.

SAMPLE DESIGNATION	PENETRATION RESISTANCE SYMBOL	DESCRIPTION
Bag	-	Large Bulk Sample
BS	-	Misc. Grab Sample - Bottle or Bag
AS	-	Auger Sample - A grab sample taken directly from auger flights
S	●	Spoon Sample - Standard Penetration Test (ASTM D-1586)-Driving a 2.0-inch outside diameter, 1 3/8-inch inside diameter, split spoon sampler into undisturbed soil for three successive 6-inch increments of penetration by means of a 140-pound weight falling freely through a distance of 30 inches. The cumulative number of blows required for the final 12 inches of penetration is the Standard Penetration Resistance (N).
LS	●	Liner Sample - Standard Penetration Test-Driving a 2.0-inch outside diameter split spoon, equipped with two, 3-inch long by 1 3/8-inch inside diameter brass liners, separated by a 1-inch long spacer, into undisturbed soil as above.
RS	○	Ring Sample - Driving a 3.0-inch outside diameter spoon, equipped with a series of 2.42-inch inside diameter, 1-inch long brass rings, into undisturbed soil for one 12-inch increment by means of a 140-pound weight falling freely through a distance of 30 inches. The blows required for the 12 inches of penetration are recorded.
ST	-	Shelby Tube - A 3.0-inch outside diameter thin-walled tube continuously pushed into undisturbed soil by a rapid motion, without impact or twisting. (ASTM D-1587)
-	■	Continuous Penetration Resistance (Bullnose) - Driving a 2.0-inch outside diameter "Bullnose penetrometer" continuously into undisturbed soil by means of a 140-pound weight falling freely through a distance of 30 inches. The blows for each successive 12-inch increment are recorded.

NOTE: The stratification lines shown on the Logs of Test Borings and/or Test Pit represent the approximate boundary between soil types, and the transition may be gradual.

SOIL LOG
LEGEND

SPEEDIE & ASSOCIATES
LICENSED MECHANICAL AND ELECTRICAL ENGINEERS
1100 NORTH 20TH AVENUE, SUITE 200
DENVER, COLORADO 80202

Station 44+15, 70' LT Underpass No. 1
 GROUND SURFACE ELEVATION: 1248.4
 SOIL DESCRIPTION

FILL: Dense Brown GRAVELLY SAND (SW/SM - Dry) With A Trace Of Silt And Concrete And Metal Debris. 3.0'
Very Stiff Brown SANDY CLAY (CL - Dry) With A Trace Of Gravel. 7.5'
Dense Brown GRAVELLY SAND (SW/SM - Dry) With A Trace Of Silt. 13.5'
Very Stiff Brown SANDY CLAY (CL - Dry) With A Trace Of Gravel. 18.0'
Hard Brown SANDY SILT (ML - Wet) With A Trace Of Clay. 25.0'
CONTINUED ON NEXT SHEET

ELEVATION (FEET)

SAMPLE NUMBER	ELEVATION OF SAMPLE TIP	NATURAL WATER CONTENT (%)	IN-PLACE DRY DENSITY (P.C.F.)	STANDARD PENETRATION NUMBER (N)	
				0	25 50
RS-1	1243.4	12.1	117.5		
S-2	1237.9	-	-		
S-3	1232.9	-	-		
S-4	1227.9	-	-		
RS-5	1223.6	19.8	101.7	50/10"	

BORING STARTED: 10-01-87
 BORING COMPLETED: 10-01-87
 FIELD ENGINEER/TECHNICIAN: S. Smelser
 DRILLER: K. Heinrich
 CONTRACTOR: Heber Mining

≡ WATER LEVEL IN HOLE AT Dry
 NUMBERS OF HOURS AFTER COMPLETION:

SPEEDIE AND ASSOCIATES	
LOG OF TEST BORING NUMBER B-7	
CAVE CREEK CHANNEL STRUCTURES ARIZONA CANAL TO CACTUS ROAD PHOENIX, ARIZONA	
APPROVED: <i>gk</i>	DATE: 10-21-87
PROJECT NO870317SA	FIGURE NO: 7A

Station 44+15, 70' LT Underpass No. 1		SAMPLE NUMBER	ELEVATION OF SAMPLE TIP	NATURAL WATER CONTENT (%)	IN-PLACE DRY DENSITY (P.C.F.)	STANDARD PENETRATION NUMBER (N) BLOWS PER FOOT		
GROUND SURFACE ELEVATION: <u>1248.4</u>						0	25	50
SOIL DESCRIPTION								
See Previous Sheet. 26.5'								
Very Dense Brown SAND AND GRAVEL (SW/SM - Dry) With A Trace Of Silt. 30.5'		S-6	1217.9	-	-			
END OF BORING								

ELEVATION (FEET)

BORING STARTED: 10-01-87
 BORING COMPLETED: 10-01-87
 FIELD ENGINEER/TECHNICIAN: S. Smelser
 DRILLER: K. Heinrich
 CONTRACTOR: Heber Mining

≡ WATER LEVEL IN HOLE AT Dry
 NUMBERS OF HOURS AFTER COMPLETION:

SPEEDIE AND ASSOCIATES	
LOG OF TEST BORING NUMBER <u>B-7</u>	
CAVE CREEK CHANNEL STRUCTURES ARIZONA CANAL TO CACTUS ROAD PHOENIX, ARIZONA	
APPROVED: <i>JK</i>	DATE: 10-21-87
PROJECT NO: 870317SA	FIGURE NO: 7B

Station 46+60, 80' LT
Underpass No. 1
GROUND SURFACE ELEVATION: 1251.8
SOIL DESCRIPTION

SAMPLE NUMBER	ELEVATION OF SAMPLE TIP	NATURAL WATER CONTENT (%)	IN-PLACE DRY DENSITY (P.C.F.)	STANDARD PENETRATION NUMBER (N) BLOWS PER FOOT		
				0	25	50

ELEVATION (FEET)

FILL: Medium Dense Brown SILTY SAND (SM - Dry) With Some Gravel And Cobbles.	1.5'
Medium Dense Brown SILTY SAND (SM - Dry) With A Trace Of Gravel.	9.0'
Medium Dense Brown SAND (SP/ SM - Dry) With A Trace Of Gravel And A Trace Of Silt.	17.0'
Very Stiff Brown SANDY CLAY (CL - Dry).	25.5'
CONTINUED ON NEXT SHEET	

S-1	1246.3	-	-	-	-	-	-	-	-
S-2	1241.3	-	-	-	-	-	-	-	-
RS-3	1236.8	4.4	109.3	-	-	-	-	-	-
S-4	1231.3	-	-	-	-	-	-	-	-
S-5	1226.3	-	-	-	-	-	-	-	72/12" →

BORING STARTED: 10-01-87
 BORING COMPLETED: 10-01-87
 FIELD ENGINEER/TECHNICIAN: S. Smelser
 DRILLER: K. Heinrich
 CONTRACTOR: Heber Mining

≡ WATER LEVEL IN HOLE AT Dry
 NUMBERS OF HOURS AFTER COMPLETION:

SPEEDIE AND ASSOCIATES	
LOG OF TEST BORING NUMBER <u>B-8</u>	
CAVE CREEK CHANNEL STRUCTURES ARIZONA CANAL TO CACTUS ROAD PHOENIX, ARIZONA	
APPROVED: <i>JK</i>	DATE: 10-21-87
PROJECT NO: 870317SA	FIGURE NO: 8A

Station 46+60, 80' LT
Underpass No. 1
GROUND SURFACE ELEVATION: 1251.8
SOIL DESCRIPTION

SAMPLE NUMBER	ELEVATION OF SAMPLE TIP	NATURAL WATER CONTENT (%)	IN-PLACE DRY DENSITY (P.C.F.)	STANDARD PENETRATION NUMBER (N)		
				BLOWS PER FOOT		
				0	25	50
S-6	1221.3	-	-	74/12" →		

ELEVATION (FEET)

Very Stiff Brown SANDY CLAY (CL - Dry).
30.0'

Very Dense Brown SAND AND GRAVEL (SW/SM - Dry) With A Trace Of Gravel. 30.5'

END OF BORING

BORING STARTED: 10-01-87
BORING COMPLETED: 10-01-87
FIELD ENGINEER/TECHNICIAN: S. Smelser
DRILLER: K. Heinrich
CONTRACTOR: Heber Mining

≡ WATER LEVEL IN HOLE AT Dry
NUMBERS OF HOURS AFTER COMPLETION:

SPEEDIE AND ASSOCIATES	
LOG OF TEST BORING NUMBER <u>B-8</u>	
CAVE CREEK CHANNEL STRUCTURES ARIZONA CANAL TO CACTUS ROAD PHOENIX, ARIZONA	
APPROVED: <i>AK</i>	DATE: 10-21-87
PROJECT NO: 870317SA	FIGURE NO: 8B

Station 98+90, 80' LT
Underpass No. 2
GROUND SURFACE ELEVATION: 1273.5
SOIL DESCRIPTION

SAMPLE NUMBER	ELEVATION OF SAMPLE TIP	NATURAL WATER CONTENT (%)	IN-PLACE DRY DENSITY (P.C.F.)	STANDARD PENETRATION NUMBER (N) BLOWS PER FOOT		
				0	25	50
S-1	1268.0	-	-			
S-2	1263.0	-	-			
BS-3	1258.5	-	-			
S-4	1253.0	-	-			
S-5	1248.0	5.1	-			

ELEVATION (FEET)

FILL: Dense Light Brown CLAYEY SAND (SC - Dry) With Some Gravel. 3.5'
Stiff Brown SANDY CLAY (CL - Dry) With A Trace Of Gravel. 8.0'
Medium Dense Light Brown GRAVELLY SAND (SW/SM - Dry) With A Trace Of Silt. 10.5'
Dense Brown SILTY SAND (SM - Dry). 17.5'
Medium Dense Brown SAND (SM - Dry) With Some Silt And A Trace Of Gravel. 25.5'
CONTINUED ON NEXT SHEET

BORING STARTED: 10-09-87
BORING COMPLETED: 10-09-87
FIELD ENGINEER/TECHNICIAN: S. Smelser
DRILLER: K. Heinrich
CONTRACTOR: Heber Mining

≡ WATER LEVEL IN HOLE AT Dry
NUMBERS OF HOURS AFTER COMPLETION:

SPEEDIE AND ASSOCIATES	
LOG OF TEST BORING NUMBER <u>B-15</u>	
CAVE CREEK CHANNEL STRUCTURES ARIZONA CANAL TO CACTUS ROAD PHOENIX, ARIZONA	
APPROVED: <i>ax</i>	DATE: 10-21-87
PROJECT NO: 870317SA	FIGURE NO: 15A

ELEVATION (FEET)

Station 98+90, 80' LT Underpass No. 2 GROUND SURFACE ELEVATION: <u>1273.5</u> SOIL DESCRIPTION		SAMPLE NUMBER	ELEVATION OF SAMPLE TIP	NATURAL WATER CONTENT (%)	IN-PLACE DRY DENSITY (P.C.F.)	STANDARD PENETRATION NUMBER (N) BLOWS PER FOOT
See Previous Sheet.						
28.0'						
Very Dense Brown SAND, GRAVEL AND COBBLES (GW/GC - Dry) With A Trace Of Clay.		S-6	1243.0	-	-	82/12"
30.5'						
END OF BORING						

BORING STARTED: 10-09-87
 BORING COMPLETED: 10-09-87
 FIELD ENGINEER/TECHNICIAN: S. Smelser
 DRILLER: K. Heinrich
 CONTRACTOR: Heber Mining

= WATER LEVEL IN HOLE AT Dry
 NUMBERS OF HOURS AFTER COMPLETION:

SPEEDIE AND ASSOCIATES	
LOG OF TEST BORING NUMBER <u>B-15</u>	
CAVE CREEK CHANNEL STRUCTURES ARIZONA CANAL TO CACTUS ROAD PHOENIX, ARIZONA	
APPROVED: <i>gdx</i>	DATE: 10-21-87
PROJECT NO: 870317SA	FIGURE NO: 15B

Station 101+50, 80' LT
Underpass No. 2
GROUND SURFACE ELEVATION: 1273.6
SOIL DESCRIPTION

SAMPLE NUMBER	ELEVATION OF SAMPLE TIP	NATURAL WATER CONTENT (%)	IN-PLACE DRY DENSITY (P.C.F.)	STANDARD PENETRATION NUMBER (N)	
				BLOWS PER FOOT	
RS-1	1268.7	9.3	128.2	50/10*	
S-2	1263.1	-	-		
S-3	1258.1	-	-		
RS-4	1253.7	-	-	50/10*	
S-5	1248.1	6.8	-		

ELEVATION (FEET)

7.5'	FILL: Very Dense Brown SANDY GRAVEL (GC - Dry) With Some Clay.
14.0'	Loose Brown GRAVELLY SAND (SW/SM - Dry) With A Trace Of Silt.
22.0'	Dense Brown SAND AND GRAVEL (SW/GW - Dry).
23.5'	Dense Brown COBBLES AND GRAVEL (GP - Dry).
25.5'	Medium Dense Brown SAND (SP/SM - Dry) With A Trace Of Gravel And A Trace Of Silt.

CONTINUED ON NEXT SHEET

BORING STARTED: 10-05-87
BORING COMPLETED: 10-05-87
FIELD ENGINEER/TECHNICIAN: S. Smelser
DRILLER: K. Heinrich
CONTRACTOR: Heber Mining

≡ WATER LEVEL IN HOLE AT Dry
NUMBERS OF HOURS AFTER COMPLETION:

SPEEDIE AND ASSOCIATES	
LOG OF TEST BORING NUMBER <u>B-16</u>	
CAVE CREEK CHANNEL STRUCTURES ARIZONA CANAL TO CACTUS ROAD PHOENIX, ARIZONA	
APPROVED: <i>gsl</i>	DATE: 10-21-87
PROJECT NO: 870317SA	FIGURE NO: 16A

Station 101+50, 80' LT
Underpass No. 2
GROUND SURFACE ELEVATION: 1273.6
SOIL DESCRIPTION

SAMPLE NUMBER	ELEVATION OF SAMPLE TIP	NATURAL WATER CONTENT (%)	IN-PLACE DRY DENSITY (P.C.F.)	STANDARD PENETRATION NUMBER (N)		
				BLOWS PER FOOT		
				0	25	50
	27.0'					
	29.9'					
S-6	1243.7	-	-	50/4" →		

See Previous Sheet.

Very Dense Brown SAND, GRAVEL AND COBBLES (GW - Dry).

END OF BORING

ELEVATION (FEET)

BORING STARTED: 10-05-87
 BORING COMPLETED: 10-05-87
 FIELD ENGINEER/TECHNICIAN: S. Smelser
 DRILLER: K. Heinrich
 CONTRACTOR: Heber Mining

≡ WATER LEVEL IN HOLE AT Dry
 NUMBERS OF HOURS AFTER COMPLETION:

SPEEDIE AND ASSOCIATES	
LOG OF TEST BORING NUMBER <u>B-16</u>	
CAVE CREEK CHANNEL STRUCTURES ARIZONA CANAL TO CACTUS ROAD PHOENIX, ARIZONA	
APPROVED: <i>gk</i>	DATE: 10-21-87
PROJECT NO: 870317SA	FIGURE NO: 16B

TABULATION OF TEST DATA

TEST BORING OR TEST PIT NUMBER	SAMPLE NUMBER	DEPTH OF SAMPLE TIP	ELEVATION OF SAMPLE TIP	NATURAL WATER CONTENT (PERCENT OF DRY WEIGHT)	IN-PLACE DRY DENSITY (POUNDS PER CUBIC FOOT)	PARTICLE SIZE DISTRIBUTION						ATTERBERG LIMITS			UNIFIED SOIL CLASSIFICATION	COHESION - ONE-HALF OF UNCONFINED COMPRESSIVE STRENGTH (PSF)	
						COLLOIDS (PERCENT)	CLAY (PERCENT)	SILT (PERCENT)	FINE SAND (PERCENT)	MEDIUM SAND (PERCENT)	COARSE SAND (PERCENT)	GRAVEL (PERCENT)	LIQUID LIMIT (PERCENT)	PLASTIC LIMIT (PERCENT)			PLASTICITY INDEX (PERCENT)
B-1	RS-1	5.0	1226.2	4.7	101.6	-	-	-	-	-	-	-	-	-	-	SP/SC	-
B-1	S-3	15.5	1215.7	18.5	-	←	70	→	19	9	2	0	39	25	14	CL	-
B-2	RS-3	15.0	1214.7	11.8	111.1	←	56	→	18	12	12	2	32	23	9	CL/ML	-
B-2	S-6	30.5	1199.2	8.5	-	←	26	→	38	28	7	1	-	-	NP	SM	-
B-2	S-9	45.5	1184.2	29.9	-	←	63	→	28	8	1	0	44	27	17	ML	-
B-3	BS-1	5.0	1224.1	-	-	←	57	→	29	9	3	2	-	-	NP	ML	-
B-3	RS-3	10.0	1217.1	2.8	112.2	←	8	→	9	34	9	40	28	19	9	SW/SC	-
B-3	RS-9	45.0	1182.1	23.5	97.1	←	59	→	31	8	2	0	53	32	21	MH	-
B-4	RS-5	25.0	1204.5	19.8	99.1	←	48	→	24	14	6	8	42	29	13	SM	-
B-5	RS-1	5.0	1233.2	6.6	124.9	←	9	→	13	34	24	20	-	-	-	SW/SM	-
B-5	S-3	15.5	1222.7	14.9	-	←	47	→	14	28	15	6	50	27	23	SC	-
B-5	S-5	25.5	1212.7	4.6	-	←	15	→	23	35	16	11	-	-	NP	SM	-
B-6	BS-2	10.5	1231.0	-	-	←	40	→	16	22	12	10	32	21	11	SC	-
B-6	RS-3	15.0	1226.0	12.3	108.2	-	-	-	-	-	-	-	-	-	-	CL	-
B-6	S-5	25.5	1215.5	18.7	-	←	44	→	30	13	5	8	36	24	12	SC	-
B-7	RS-1	5.0	1243.4	12.1	117.5	←	61	→	22	12	3	2	32	20	12	CL	-
B-7	S-5	24.8	1223.6	19.8	101.7	←	60	→	33	4	2	1	33	29	4	ML	-

FIGURE NO. 19A

TABULATION OF TEST DATA

TEST BORING OR TEST PIT NUMBER	SAMPLE NUMBER	DEPTH OF SAMPLE TIP	ELEVATION OF SAMPLE TIP	NATURAL WATER CONTENT (PERCENT OF DRY WEIGHT)	IN-PLACE DRY DENSITY (POUNDS PER CUBIC FOOT)	PARTICLE SIZE DISTRIBUTION							ATTERBERG LIMITS			UNIFIED SOIL CLASSIFICATION	COHESION - ONE-HALF OF UNCONFINED COMPRESSIVE STRENGTH (PSF)
						COLLOIDS (PERCENT)	CLAY (PERCENT)	SILT (PERCENT)	FINE SAND (PERCENT)	MEDIUM SAND (PERCENT)	COARSE SAND (PERCENT)	GRAVEL (PERCENT)	LIQUID LIMIT (PERCENT)	PLASTIC LIMIT (PERCENT)	PLASTICITY INDEX (PERCENT)		
B-8	RS-3	15.0	1236.8	4.4	109.3	←	8	→	23	56	11	2	-	-	NP	SP/SM	-
B-9	RS-1	5.0	1247.7	7.5	110.9	-	-	-	-	-	-	-	-	-	-	SC	-
B-9	BS-4	20.5	1232.7	-	-	←	64	→	19	11	4	2	43	24	19	CL	-
B-10	RS-5	25.0	1228.7	17.3	108.4	-	-	-	-	-	-	-	-	-	-	CL	-
B-10	S-8	39.8	1213.9	10.3	-	←	13	→	12	26	23	26	37	22	15	SC	-
B-11	RS-1	5.0	1257.5	8.4	86.4	-	-	-	-	-	-	-	-	-	-	CL	-
B-11	S-4	20.5	1242.0	5.0	-	←	37	→	24	22	9	8	21	18	3	SM	-
B-12	RS-2	10.0	1253.2	13.3	86.4	-	-	-	-	-	-	-	-	-	-	CL	-
B-12	S-6	30.5	1232.7	4.9	-	←	11	→	11	28	16	34	-	-	NP	SW/SM	-
B-13	BS-3	15.0	1252.3	-	-	←	27	→	18	13	10	32	23	16	7	SM/SC	-
B-13	RS-6	29.5	1237.8	8.8	118.3	←	20	→	14	15	16	35	25	17	8	SM/SC	-
B-14	RS-2	9.9	1254.0	4.0	109.0	←	6	→	11	21	14	48	28	15	13	GW/GC	-
B-14	S-10	49.8	1214.1	11.0	-	←	23	→	18	17	15	27	31	20	11	SC	-
B-15	BS-3	15.0	1258.5	-	-	←	23	→	27	31	19	0	19	18	1	SM	-
B-15	S-5	25.5	1248.0	5.1	-	←	14	→	19	49	13	5	-	-	NP	SM	-
B-16	RS-1	4.9	1268.7	9.3	128.2	-	-	-	-	-	-	-	-	-	-	GC	-
B-16	S-5	25.5	1248.1	6.8	-	←	9	→	17	44	20	10	-	-	NP	SP/SM	-

FIGURE NO. 19B

TABULATION OF TEST DATA

TEST BORING OR TEST PIT NUMBER	SAMPLE NUMBER	DEPTH OF SAMPLE TIP	ELEVATION OF SAMPLE TIP	NATURAL WATER CONTENT (PERCENT OF DRY WEIGHT)	IN-PLACE DRY DENSITY (POUNDS PER CUBIC FOOT)	PARTICLE SIZE DISTRIBUTION						ATTERBERG LIMITS			UNIFIED SOIL CLASSIFICATION	COHESION - ONE-HALF OF UNCONFINED COMPRESSIVE STRENGTH (PSF)	
						COLLOIDS (PERCENT)	CLAY (PERCENT)	SILT (PERCENT)	FINE SAND (PERCENT)	MEDIUM SAND (PERCENT)	COARSE SAND (PERCENT)	GRAVEL (PERCENT)	LIQUID LIMIT (PERCENT)	PLASTIC LIMIT (PERCENT)			PLASTICITY INDEX (PERCENT)
B-9B	RS-1	5.0	1249.1	7.3	100.8		33		19	32	7	9	-	-	NP	SM	-
B-9B	S-5	25.5	1228.6	9.4	-		77		13	7	2	1	42	23	19	CL	-
B-10B	RS-1	5.0	1248.2	9.2	103.6		86		10	2	1	1	22	19	3	ML	-
B-10B	S-9	45.0	1208.5	18.5	-		59		33	7	1	0	31	26	5	CL/ML	-

SPEEDIE AND ASSOCIATES

GEOTECHNICAL AND SITE ENGINEERS
11029 N. 24TH AVE. • SUITE 805 • PHOENIX, ARIZONA • 85029 • (602) 997-6391

CONSOLIDATION TEST

PROJECT: Cave Creek Channel Structures PROJECT NO.: 870317SA DATE: 10-21-87
 LOCATION: ACDC Canal to Cactus Road - Phoenix, Arizona
 CLIENT: Sverdrup Corporation LAB. SAMPLE NO.: 7508
 BORING NO.: B-7 FIELD SAMPLE NO.: RS-5 SAMPLE DEPTH: 24.8' SAMPLE ELEV. (TIP): -
 TESTED BY: JB DATE: 10-04-87 CHECKED BY: RAS DATE: 10-09-87
 REMARKS: Sample inundated at end of test at 2,000 PSF.

——— In-situ
 - - - Inundated

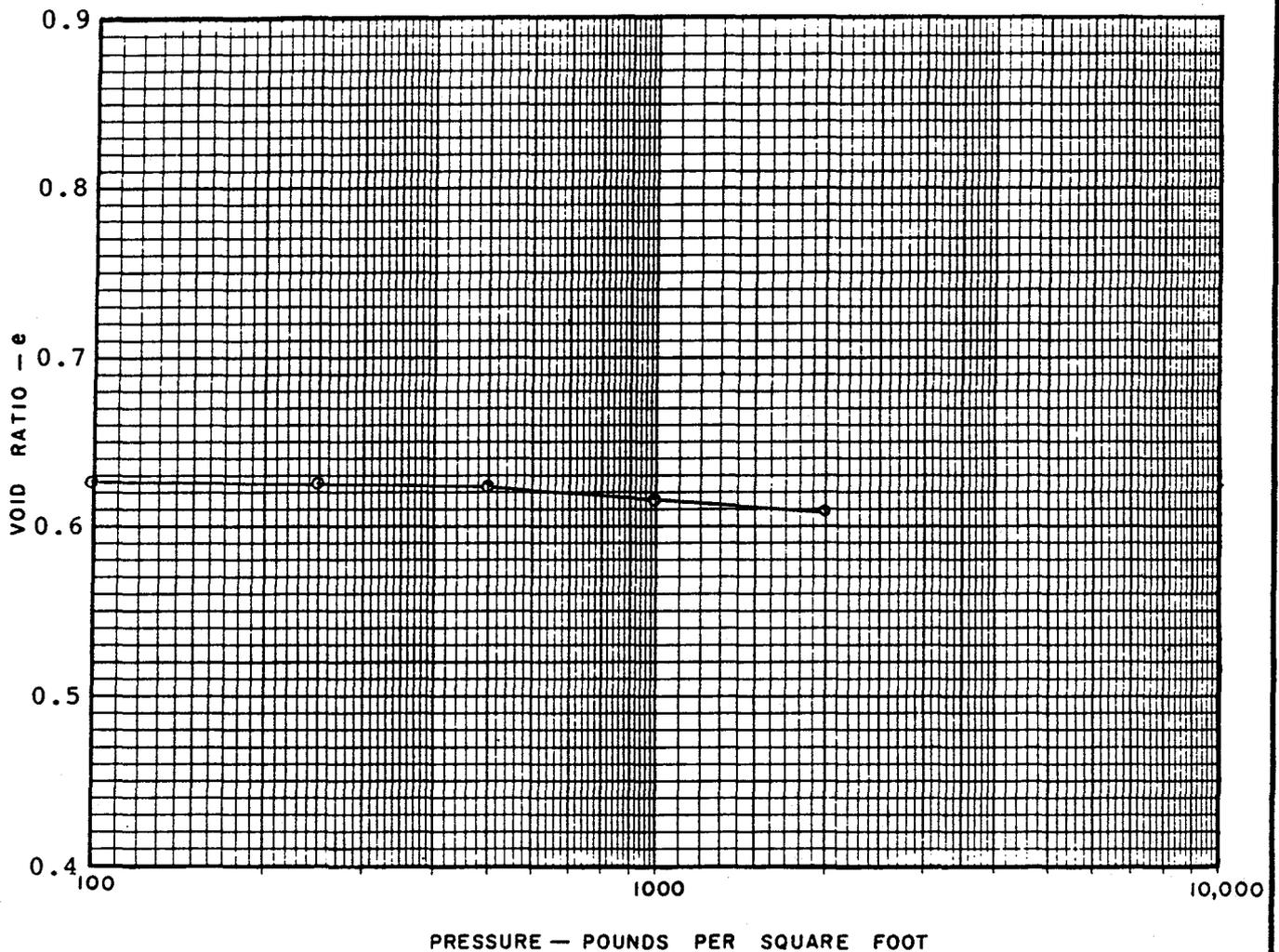


FIGURE NO. 22

SWELL TEST DATA

BORING/ PIT NO.	SAMPLE DEPTH (FT.)	REMOLDED DRY DENSITY (PCF)	INITIAL MOISTURE CONTENT PERCENT	PERCENT COMPACTION	INITIAL DEGREE OF SATURATION PERCENT	FINAL DEGREE OF SATURATION PERCENT	TOTAL SWELL PERCENT
B-3/BS-1	3.0	113.7	10.9	92.9 ⁽¹⁾	63.2	96.7	2.9
B-9/BS-4	20.0	105.2	15.7	94.6 ⁽²⁾	72.6	93.6	4.3
B-15/BS-3	15.0	126.0	7.6	96.3 ⁽³⁾	64.1	95.2	0.3

1. Based on a maximum dry density of 122.3 PCF at 11.6 percent moisture.
2. Based on a maximum dry density of 111.2 PCF at 16.1 percent moisture.
3. Based on a maximum dry density of 130.8 PCF at 8.6 percent moisture.

FIGURE NO. 24

CAVE CREEK
CHANNEL STRUCTURES
ACDC CANAL TO CACTUS ROAD
PHOENIX, ARIZONA

**SPEEDIE
AND ASSOCIATES**
GEOTECHNICAL AND SITE ENGINEERS
PROJECT NO. 870317SA

CONTRACT FCD 88-17

THIS AGREEMENT, made and entered into this _____ day of _____, 19____,
by and between _____

of the City of _____, County of _____, State of _____,
party of the first part, hereinafter designated the CONTRACTOR, and the FLOOD
CONTROL DISTRICT OF MARICOPA COUNTY, acting by and through its BOARD OF
DIRECTORS, a political subdivision of the State of Arizona, a body politic with
corporate power, party of the second part, hereinafter designated OWNER.

WITNESSETH: That the said CONTRACTOR, for and in consideration of the sum
to be paid him by the said OWNER, in the manner and at the time hereinafter
provided, and of the other covenants and agreements hereincontained, and under
the penalties expressed in the bonds provided, hereby agrees, for himself, his
heirs, executors, administrators, successors, and assigns to as follows:

ARTICLE I-SCOPE OF WORK: The CONTRACTOR shall furnish any and all labor,
materials, equipment, transportation, utilities, services and facilities
required to perform all work for the construction of Project No. FCD 88-17
Utility Relocations and Underpasses for the Cave Creek Wash,
and to complete and totally construct the same and install the material therein
for the OWNER, in a good and workmanlike and substantial manner and to the
satisfaction of the OWNER through its Engineers and under the direction and
supervision of the Engineer, or his properly authorized agents and strictly
pursuant to and in conformity with the Plans and Specifications prepared by the
Engineers for the OWNER, and with such modifications of the same and other
documents that may be made by the OWNER through the Engineer or his properly
authorized agents, as provided herein.

ARTICLE II-CONTRACT DOCUMENTS: The Invitation for Bids, Plans, Standard
Specifications and Details, Special Provisions, Addenda, if any, and Proposal,
as accepted by the BOARD OF DIRECTORS, Performance Bond, Payment Bond,
Certificates of Insurance, and Change Orders, if any, are by this reference
made a part of this Contract to the same extent as if set forth herein in full.

ARTICLE III-TIME OF COMPLETION: The CONTRACTOR further covenants and agrees
at his own proper cost and expense, to do all work as aforesaid for the con-
struction 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 the time, or times, stated in the proposal pamphlet.

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 his 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 within forty (40) days after final
inspection and acceptance of the work.

IN WITNESS WHEREOF: Four (4) 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.

The CONTRACTOR agrees that this Contract, as awarded, is for the stated work, and understands that payment for the total work will be made on the basis of the indicated amount(s), as bid in the Proposal.

PARTY OF THE FIRST PART

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PARTY OF THE SECOND PART

By: _____
Chairman, Board of Directors

Date: _____

RECOMMENDED BY:

ATTEST:

Chief Engineer and General Manager
Flood Control District
of Maricopa County

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.

By: _____

Date: _____

CONTRACT NO. FCD 88-17

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, in the amount of _____ dollars (\$ _____), for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Flood Control District of Maricopa County, dated the _____ day of _____, 19____, for FCD No. 88-17, Utility Relocations and Underpasses for

Cave Creek Wash

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 said Principal shall faithfully perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said contract during the original term of said contract and any extension thereof, with or without notice to the Surety, and during the life of any guaranty required under the contract, and shall also perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the Surety being hereby waived; then the above obligation shall be void, otherwise to remain in full force and effect;

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of 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 of said Title, Chapter, and Article, to the extent as if it were copied at length herein.

The prevailing party in a suit on this bond shall be entitled to such reasonable attorney's fees as may be fixed by a judge of the court.

Witness our hands this _____ day of _____, 19____.

AGENCY OF RECORD

AGENCY ADDRESS

CONTRACT NO. FCD 88-17
PERFORMANCE BOND

PRINCIPAL SEAL

BY: _____

SURETY SEAL

BY: _____

POWER OF ATTORNEY SEAL

BY: _____

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, State of Arizona (hereinafter called the Oblige) in the amount of _____ dollars (\$ _____), for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Oblige, dated the _____ day of _____, 19____, for FCD No. 88-17

Utility Relocations and Underpasses for Cave Creek Wash

_____ 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 said Principal shall promptly pay all moneys due to all persons supplying labor or materials to him or his subcontractors in the prosecution of the work provided for in said contract, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of 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, of said Title, Chapter, and Article, to the extent as if it were copied at length herein.

The prevailing party or any party which recovers judgment on this bond shall be entitled to such reasonable attorney's fees as may be fixed by the court or a judge thereof.

Witness our hands this _____ day of _____, 19____.

PRINCIPAL SEAL

BY: _____

AGENCY OF RECORD

SURETY SEAL

BY: _____

AGENCY ADDRESS

POWER OF ATTORNEY SEAL

BY: _____

CONTRACT NO. FCD 88-17
PAYMENT BOND

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

CERTIFICATE OF INSURANCE

Utility Relocations and Underpasses

CONTRACT FCD 88-17

PROJECT TITLE for Cave Creek Wash

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

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE AND ARE IN FORCE AT THIS TIME.

COMPANY LETTER	TYPE OF INSURANCE	POLICY NUMBER	EXPIRATION DATE	LIMITS OF LIABILITY IN \$1,000 MINIMUM each occurrence	
	<input checked="" type="checkbox"/> COMPREHENSIVE GENERAL LIABILITY FORM <input checked="" type="checkbox"/> PREMISES OPERATIONS <input checked="" type="checkbox"/> CONTRACTUAL <input checked="" type="checkbox"/> BROAD FORM PROPERTY DAMAGE <input checked="" type="checkbox"/> EXPLOSION & COLLAPSE <input checked="" type="checkbox"/> PRODUCTS/COMPLETED OPERATIONS HAZARD <input checked="" type="checkbox"/> UNDERGROUND HAZARD <input checked="" type="checkbox"/> INDEPENDENT CONTRACTORS <input checked="" type="checkbox"/> PERSONAL INJURY			BODILY INJURY per person \$1,000 each occurrence \$5,000 PROPERTY DAMAGE \$1,000 OR BODILY INJURY AND PROPERTY DAMAGE Combined \$5,000	
	<input checked="" type="checkbox"/> COMPREHENSIVE AUTO LIABILITY & NON-OWNED			SAME AS ABOVE	
	<input type="checkbox"/> EXCESS LIABILITY			NECESSARY IF UNDERLYING NOT ABOVE MINIMUM	
	<input checked="" type="checkbox"/> WORKERS' COMPENSATION and EMPLOYERS' LIABILITY			STATUTORY each accident	\$100
	<input type="checkbox"/> OTHER				

The Flood Control District of Maricopa County is added as an additional insured as respects work done for the District by the named insured as required by statute, contract, purchase order or otherwise requested. 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 effect the coverage available to the District without fifteen days written notice to the District. THIS CERTIFICATE IS NOT VALID UNLESS COUNTERSIGNED BY AN AUTHORIZED REPRESENTATIVE OF THE INSURANCE COMPANY.

NAME AND ADDRESS OF CERTIFICATE HOLDER
 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 3335 West Durango Street
 Phoenix, Arizona 85009

DATE ISSUED _____

 AUTHORIZED REPRESENTATIVE

It is further agreed that:

The Contractor hereby agrees to indemnify and save harmless the FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, or any of its departments, agencies, officers or employees, from and against all loss, expense, damage or claim of any nature whatsoever which is caused by any activity, condition or event arising out of the performance or nonperformance of any of the provisions of this Agreement. The Flood Control District of Maricopa County shall in all instances be indemnified against all liability, losses and damages of any nature for or on account of any injuries to or death of persons or damages to or destruction of property arising out of or in any way connected with the performance or nonperformance of this Agreement, except such injury or damage as shall have been occasioned by the negligence of the Flood Control District of Maricopa County. The above cost of damages incurred by the Flood Control District of Maricopa County or any of its departments, agencies, officers or employees shall include in the event of an action, court costs, expenses for litigation and reasonable attorney's fees.

Date _____ Contractor _____

CERTIFICATE OF INSURANCE
CONTRACT FCD 88-17