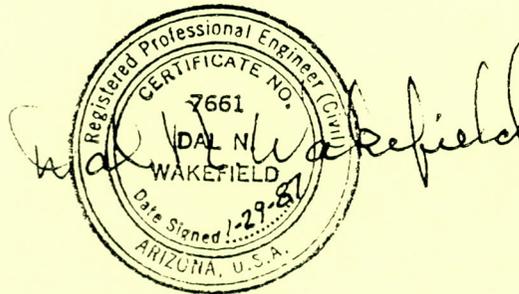


CONSTRUCTION SPECIAL PROVISIONS  
FOR  
AGUA FRIA RIVER IMPROVEMENTS  
BUCKEYE ROAD TO INTERSTATE 10  
CHANNELIZATION AND BANK PROTECTION  
CONTRACT NO. FCD 85-37



WESTERN TECHNOLOGIES INC.

JANUARY 29, 1987

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

ADDENDUM NO. 1

DATE: February 27, 1987

FCD Contract No. 85 - 37

Page 1 of 3

TO CONTRACT DOCUMENTS

ENTITLED: Agua Fria River Improvements  
Buckeye Road to Interstate 10  
Channelization and Bank Protection

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

Section 203 - CHANNEL EXCAVATION:

Page 31 of 80 - Change the first paragraph to read as follows:

"levee and the east construction easement, and between the Section Line on Thomas Road and 350 feet north of the Section Line. This fill shall be graded to lines and grades required on the plans for drainage into the two 36" RCP's at CP-12. All soils trimmed from existing levee embankments at Thomas Road and from excavation of the drainage ditch west of the west levee and excess soils from toe trench excavations for soil-cement bank protection on the east and west levees shall also be used for constructing this fill. Sufficient soil to complete the grading-to-drain in this area, after utilization of the removed ramp soils, of the excavated soils from the drainage ditch and toe trench excavations, and of the trimmed soils, shall be obtained by channel excavation in the river to maximum depth of one foot between the RID flume and Thomas Road. Excavation of material from the river channel between Thomas Road and the RID flume shall be done such that a low-flow channel is formed. The low flow channel shall be in the approximate center of the river between levees or between bank protection of utility towers and the east levee. The river bottom shall slope toward the low flow channel from existing elevations along existing bank protection unless otherwise approved by the Engineer."

Section 221 - SOIL-CEMENT BANK PROTECTION, GRADE-CONTROL STRUCTURE  
& UTILITY TOWER PROTECTION:

Page 44 of 80 - Change the first paragraph of subsection  
221.1-Description as follows:

"The work shall consist of the construction of soil-cement bank protection, grade-control structures, and utility tower protection as required by the plans, including toe trench excavation, backfill, and dewatering for the construction of all soil-cement falling below the proposed channel as indicated on the plans and trimming of existing soil cement at Thomas Road and south of Interstate 10 to match the lines and grades indicated on the plans."

Page 47 of 80 - Add the following paragraph to subsection  
221.5.2-Preparation:

"Existing soil cement surfaces at Thomas Road and south of Interstate 10, against which new soil-cement is to be placed, shall be scored and roughened to a depth of at least one (1) inch prior to placement of new soil cement. The existing bank protection end ramps on the east and west levees south of Interstate 10 and north and south of Thomas Road extend into the river beyond the lines and grades shown on the plans. The Contractor shall trim and shape the existing soil-cement to 1:1 slopes to conform to the lines and grades shown on the plans prior to placement of new soil-cement. The trimming and preparation of existing soil cement surfaces shall be considered incidental to the construction of soil cement and shall be included in the cost of Item 221.1 Soil Cement."

Page 51 of 80 - Change the second sentence in the third paragraph of subsection 221.6 - Inspection and Testing to read as follows:

"If the lift being tested does not pass the minimum 98% density requirements, it must be reworked as directed by the Engineer until it passes or be removed by the Contractor at the Contractor's expense."

Page 52 of 80 - Add the following to subsection 221.7.2-Payment after the word "watering," and before the word "mixing":

"trimming and preparation of existing soil cement surfaces,"

Section 350 - REMOVAL OF EXISTING IMPROVEMENTS:

Page 60 of 80 - Change the first paragraph of subsection 350.1 - Description to read as follows:

"This work shall consist of the removal of asphalt concrete pavements, existing fence, buildings, concrete pads, irrigation structures, canal and ditch lining, culverts, manholes, headwalls, sand piles, gravel piles, rock piles, and other miscellaneous items shown on the plans to be removed from within the limits of the work. The asphalt concrete pavement on Van Buren Street shall be removed between the easternmost and westernmost levee embankment toes. The fences along the Right-of-Way which are in the construction area west of the west levee and east of the east levee at Thomas Road and on the west levee at the RID flume shall be removed, salvaged, stored and protected in the Contractor's construction yard, and replaced after completion of construction in the area. The Contractor shall construct temporary barriers preventing access into the river or onto the levees at Thomas Road and the RID flume area during the time the fences are in storage."

Section 350 - REMOVAL OF EXISTING IMPROVEMENTS: (con't)

Page 60 of 80 - Change the first paragraph of subsection 350.4 - Payment to read as follows:

"Payment for removal of all existing improvements, removal, storage, and replacement of the fences at Thomas Road and the RID flume, and construction of temporary access barriers at Thomas Road and the RID flume will be made at the Contract lump sum price for Removal of Existing Improvements. This lump sum price shall be full compensation for the item complete, as described herein or on the plans."

2. Plans

Sheet 49 of 53:

At CP-11, the "2- 36" x 60" R.C.P.", should be changed to read "2- 36" x 60' R.C.P."

Sheet 52 of 53:

Section A:

At pipe inlet, the note beginning, "Existing fill within 10' radius of pipe outlet", should be changed to read "Existing fill within 10' radius of pipe inlet."

Section 350 - REMOVAL OF EXISTING IMPROVEMENTS:

Page 60 of 80 - Change the first paragraph of subsection 350.1 - Description to read as follows:

"This work shall consist of the removal of asphalt concrete pavements, existing fence, buildings, concrete pads, irrigation structures, canal and ditch lining, culverts, manholes, headwalls, sand piles, gravel piles, rock piles, and other miscellaneous items shown on the plans to be removed from within the limits of the work. The asphalt concrete pavement on Van Buren Street shall be removed between the easternmost and westernmost levee embankment toes. The fences along the Right-of-Way which are in the construction area west of the west levee and east of the east levee at Thomas Road and on the west levee at the RID flume shall be removed, salvaged, stored and protected in the Contractor's construction yard, and replaced after completion of construction in the area. The Contractor shall construct temporary barriers preventing access into the river or onto the levees at Thomas Road and the RID flume area during the time the fences are in storage."

Section 350 - REMOVAL OF EXISTING IMPROVEMENTS: (con't)

Page 60 of 80 - Change the first paragraph of subsection 350.4 - Payment to read as follows:

"Payment for removal of all existing improvements, removal, storage, and replacement of the fences at Thomas Road and the RID flume, and construction of temporary access barriers at Thomas Road and the RID flume will be made at the Contract lump sum price for Removal of Existing Improvements. This lump sum price shall be full compensation for the item complete, as described herein or on the plans."

2. Plans

Sheet 49 of 53:

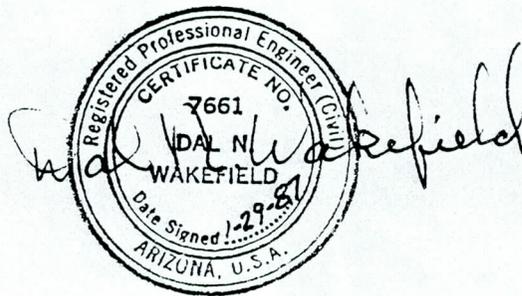
At CP-11, the "2- 36" x 60" R.C.P.", should be changed to read "2- 36" x 60' R.C.P."

Sheet 52 of 53:

Section A:

At pipe inlet, the note beginning, "Existing fill within 10' radius of pipe outlet", should be changed to read "Existing fill within 10' radius of pipe inlet."

CONSTRUCTION SPECIAL PROVISIONS  
FOR  
AGUA FRIA RIVER IMPROVEMENTS  
BUCKEYE ROAD TO INTERSTATE 10  
CHANNELIZATION AND BANK PROTECTION  
CONTRACT NO. FCD 85-37



WESTERN TECHNOLOGIES INC.

JANUARY 29, 1987

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

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

CONTRACT NO. FCD 85-37

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INVITATION FOR BIDS  
(Construction Contract)

Project: Agua Fria River Improvements  
Buckeye Road to  
Interstate 10

Ref. Invitation FCD 85-37  
Date: February 9, 1987  
Issued by: Flood Control  
District Maricopa  
County

Location: Along the Agua Fria River from Lower Buckeye Road to Interstate 10 in Sections 2, 11, and 14, Township 1 North, Range 1 West; and from 550 feet south to 400 feet north of Thomas Road in Sections 25 and 36, Township 2 North, Range 1 West; and from 2,040 feet south to 2,140 feet south of Indian School Road in Section 25, Township 2 North, Range 1 West; Gila and Salt River Base and Meridian, Maricopa County, Arizona.

SEALED BIDS, IN SINGLE COPY FOR THE WORK DESCRIBED HEREIN WILL BE RECEIVED UNTIL 2:00 PM LOCAL TIME AT THE PLACE OF THE BID OPENING March 19, 1987 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 AT THE OFFICE OF THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, 3335 WEST DURANGO STREET, PHOENIX, ARIZONA ON February 26, 1987 AT 10:00 A.M. ALL PROSPECTIVE BIDDERS ARE URGED TO ATTEND.

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, CASHIERS 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:

THE PROPOSED PROJECT INVOLVES CHANNELIZATION OF THE AGUA FRIA RIVER BETWEEN LOWER BUCKEYE ROAD AND INTERSTATE 10; AND FROM 550 FEET SOUTH OF THOMAS ROAD TO 400 FEET NORTH OF THOMAS ROAD. THE WORK CONSISTS OF FURNISHING ALL MATERIAL, LABOR AND EQUIPMENT NECESSARY TO CONSTRUCT LEVEES, SOIL-CEMENT BANK PROTECTION, AND A SOIL-CEMENT GRADE-CONTROL STRUCTURE, UTILITY TOWER PROTECTION MEASURES, BRIDGE PIER PROTECTION, CHANNEL EXCAVATION, DITCH LINING, GRAVEL PIT BACKFILL, CULVERTS, FLAPGATES, AND OTHER INCIDENTAL ITEMS AS SHOWN ON THE PLANS OR AS SPECIFIED HEREIN.

THE WORK SHALL COMMENCE WITHIN SEVEN (7) CALENDAR DAYS AND BE COMPLETED WITHIN THREE HUNDRED (300) CALENDAR DAYS AFTER RECEIPT OF THE NOTICE TO PROCEED.

NOTICE: THE BID SCHEDULE, SPECIAL PROVISIONS, INSTRUCTIONS TO BIDDERS, UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1979 EDITION (MAG) AND REVISIONS AND SUPPLEMENTS THERETO, 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

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY  
INVITATION FOR BIDS, FCD NO. 85-37  
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. Bidders should visit the site and take such other steps as may be reasonably necessary to ascertain the nature 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. Bidders 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 organizations, financial resources, and plant available to be used in performing the work (see Section 102-Bidding Requirements and Conditions as modified by the Special Provisions).
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.

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 too 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 envelop (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 the 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 of paragraph number; however, in case of conflict, these instructions and Special Provisions supersede the Uniform Standard Specifications (MAG).

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY  
INVITATION FOR BIDS, NO. FCD 85-37  
SPECIAL INSTRUCTIONS TO BIDDERS

Location of the Work:

The location of the proposed work is along the Agua Fria River from Lower Buckeye Road to Interstate 10 in Sections 2, 11, and 14, Township 1 North, Range 1 West; and from 550 feet south to 400 feet north of Thomas Road in Sections 25 and 36, Township 2 North, Range 1 West; and from 2,040 feet south to 2,140 feet south of Indian School Road in Section 25, Township 2 North, Range 1 West; Gila and Salt River Base and Meridian, Maricopa County, Arizona.

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 \$32.00 by check payable to the FLOOD CONTROL DISTRICT OF MARICOPA COUNTY. This payment will not be refunded.

The project consists of furnishing all materials, labor, and equipment necessary to construct levees, soil-cement bank protection, a soil-cement grade-control structure, utility tower protection measures, bridge pier protection, channel excavation, ditch lining, gravel pit backfill, culverts, flapgates, 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.

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

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY  
(Construction Contract)

BID FORM

Project: Agua Fria River Improvements  
Buckeye Road to  
Interstate 10

Ref. Invitation FCD 85-37  
Date: February 9, 1987  
Issued By: Flood Control  
District Maricopa  
County

Location: Along the Agua Fria River from Lower Buckeye Road to  
Interstate 10 Sections 2, 11 and 14 Township 1 North,  
Range 1 West; and from 550 feet south to 400 feet north  
of Thomas Road in Sections 25 and 36, Township 2 North,  
Range 1 West; and from 2,040 feet south to 2,140 feet  
south of Indian School Road in Section 25, Township 2  
North, Range 1 West; Gila and Salt River Base and Mer-  
idian, Maricopa County, Arizona.

To: Chief Engineer and General Manager  
Flood Control District of Maricopa County  
3335 West Durango  
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 Bid-  
ding Schedule.

Evidence of authority to submit the Proposal is herewith fur-  
nished. The Proposal is in all respects fair and is made without  
collusion on the part of any person, firm, or corporation men-  
tioned above, and no member or employee of the Flood Control Dis-  
trict 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 plead. On the basis of the Plans, Specifications, Special Provisions, the forms of Contract, and the Bond proposed for use, the Undersigned proposes to furnish all the necessary machinery, equipment, tools, apparatus, and other means of construction, to do all the work and to furnish all the materials in the manner specified and to finish the entire project within the time hereinafter proposed and to accept, as full compensation therefore, the sum of various products obtained by multiplying each unit price, herein bid for 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: Agua Fria River Improvements  
 Buckeye Road to Interstate 10

Contract: FDC 85-37

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and / 100 dollars	Unit Cost	Extended Amount
201	1	L.S.	Clearing and Grubbing			
203	1,830,000	C.Y.	Channel Excavation (Includes Fill, See Section 211)			
212	190,500	C.Y.	Levee Embankment			
220.1	33,500	C.Y.	Dumped Riprap (Includes Tower and Pier Protection)			
220.2	2,100	C.Y.	Gravel Filter Blanket			
220.2.3	12,200	S.Y.	Filter Fabric			
221.1	179,600	C.Y.	Soil Cement (Levees, Tower, and Grade Control)			
221.2	35,000	TON	Cement for Soil Cement			
221.3	6,200	TON	Fly Ash for Soil Cement			
350.1	1	L.S.	Removal of Existing Improvements			
505.1	30	C.Y.	Structural Concrete (Class AA)			
505.2	7,900	LBS	Steel Reinforcement			
515.1	10	EA	Debris Racks Type I Headwall			
515.2	5	EA	Debris Racks Type II Headwall			
515.3	2	EA	Safety Rack (48" & 42" RCP)			
515.3.1	1	EA	Safety Rack (18" RCP)			
515.3.2	2	EA	Access Barrier (60" RCP)			
515.3.7	2	EA	Safety Rack (36" RCP)			

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

\_\_\_\_\_ (List Addenda)

\_\_\_\_\_ (Signature of Bidder)

BIDDING SCHEDULE

Project: Agua Fria River Improvements  
 Buckeye Road to Interstate 10

Contract: FDC 85-37

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and / 100 dollars	Unit Cost	Extended Amount
515.4	2	EA	24" Flap Gate			
515.5	12	EA	36" Flap Gate			
515.6	1	EA	42" Flap Gate			
526	321	C.Y.	Shotcrete (Lining(s) and Bank Protection)			
618.1	52	L.F.	18" R.C.P. (D-1350)			
618.2	112.5	L.F.	24" R.C.P. (D-1350)			
618.3	668.5	L.F.	36" R.C.P. (D-1350)			
618.4	94	L.F.	42" R.C.P. (D-1350)			
618.5	73	L.F.	Relocated 48" R.C.P.			
618.6	120	L.F.	60" R.C.P. (D-1350)			
901	1	L.S.	Mobilization			
902	1	L.S.	Field Office			
903.1	1	L.S.	Construction Surveying and Layout			
903.2	80	HR.	Two-Person Survey Party			
903.3	80	HR.	Three-Person Survey Party			

TOTAL \_\_\_\_\_

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

(List Addenda)

\_\_\_\_\_  
 (Signature of Bidder)

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 and Specifications, and Special Provisions are fulfilled.

A Proposal guarantee 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 guarantee 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:

\_\_\_\_\_  
(Name) (Address)

IF BY A FIRM OR PARTNERSHIP:

\_\_\_\_\_  
(Firm Name) (Firm Address)

By: \_\_\_\_\_

\*Name and Address of Each Member:

\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_ . 19\_\_ .

IF BY A CORPORATION:

\_\_\_\_\_  
(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 laws of the Corporation was chartered and names, title, and business address of the President, Secretary and Treasurer must be shown.

CONSTRUCTION SPECIAL PROVISIONS

AGUA FRIA RIVER IMPROVEMENTS

BUCKEYE ROAD TO INTERSTATE 10

CONTRACT FCD NO. 85-37

GENERAL

Location of Work:

The location of the proposed work is along the Agua Fria River, from Lower Buckeye Road to Interstate 10, in Sections 2, 11, and 14, Township 1 North, Range 1 West; and from 550 feet south to 400 feet north of Thomas Road in Sections 25 and 36, Township 2 North, Range 1 West; and from 2,040 feet south to 2,140 feet south of Indian School Road in Section 25, Township 2 North, Range 1 West; Gila and Salt River Base and Meridian, Maricopa County, Arizona.

Scope of Work:

The project consists of furnishing all material, labor and equipment necessary to construct levees, soil-cement bank protection, a soil-cement grade-control structure, bridge pier protection, utility tower protection measures, channel excavation, ditch lining, gravel pit backfill, culverts, flapgates and other incidental items as shown on the plans or as specified herein.

Specifications:

The work embraced herein shall be performed in accordance with the requirements of the following separate document:

Maricopa Association of Governments (MAG) Uniform Standard Specifications for Public Works Construction, Edition of 1979, inclusive of all revisions and amendments in effect on the date of issuance of the invitation for bids, which is herein referred to as the "Standard Specifications."

Intent and Purpose:

The intent and purpose of these Special Provisions is to interpret, correct, and supplement the Standard Specifications to the extent and in the manner necessary and to provide additional specifications for items of work not found in the Standard Specifications.

Permits and Approvals:

Prior to the start of construction, the Contractor shall procure all permits and licenses, pay all charges, fees and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the work. Copies of the fully executed permits shall be furnished to the Engineer.

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).

Contract Time:

The Contractor shall start work within seven (7) calendar days and complete all work on the project within three hundred (300) calendar days after the date of Notice to Proceed.

Order of Work:

Unless otherwise approved in writing by the Engineer, the Contractor shall schedule and perform the work to accomplish the following:

1. Completion of soil cement embankment protection on both the East Bank and West Bank Levees in the area from 550 feet south to 400 feet north of Thomas Road, and on the West Bank Levee in the area from 2,040 feet south to 2,140 feet south of Indian School Road, before beginning construction of soil cement bank protection south of Interstate 10.
2. Completion of installation of reinforced concrete pipe and flapgates, and construction of spillways and breakout sections in both levees in the area from 550 feet south to 400 feet north of Thomas Road before beginning installation and construction of these facilities south of Interstate 10.
3. Completion of all channel excavation north of Buckeye Road before beginning channel excavation in the temporary excavation easement south of Buckeye Road.
4. Progression of channel excavation from north to south in the temporary excavation easement, except for selection of soils for soil cement aggregate stockpiling.

Water, Light, Power, Heat, Telephone:

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

General Comment:

The cost of all work required under this contract as shown on plans for which there are no specific items shown on the Bidding Schedule, shall be included in the prices bid for related items.

Ground and Surface Water:

The water-table elevations at the site during certain periods of the year may create a need for dewatering during the construction of the Agua Fria River channelization, bank protection including backfilling of pits, tower protection, and grade-control structure. It is the Contractor's responsibility to make provisions for the removal and/or control of ground and surface water during the course of construction. No direct payment will be made for dewatering ground water or channelizing and diverting surface water. Costs for this work shall be considered incidental to and included in the bid items for Channel Excavation and the various bid items for bank protection.

Prior to the commencement of construction, the Contractor shall submit to the Engineer an acceptable plan for handling ground and surface waters within the channelization limits during construction.

Earthwork Quantities:

The ground surface contours shown on plan sheets 3A of 53 and 3B of 53 were produced from aerial mapping flown in May, 1985. The ground surface contours shown on plan sheets 4 of 53, 5 of 53 and 6 of 53 were produced from aerial mapping flown in August, 1983. The existing channel grades shown on the Channel Cross Sections, plan sheets 17 of 53 through 48 of 53, were produced from cross-sections surveyed August, 1986 through December, 1986.

Material volumes required, and Bidding Schedule quantities were estimated based upon the existing channel grades shown on the Channel Cross Sections. A 30% shrinkage factor was used to compute volume of excavation necessary to provide the estimated required compacted fills. Due to flow(s) in the river during the intervening time period, and continued extraction of material from the gravel pits after aerial mapping in August, 1983, actual site elevations differ from those indicated on plan sheets 3A of 53 althrough 6 of 53.

SECTION 101 - ABBREVIATIONS AND DEFINITIONS

101.2 - Definitions and Terms:

Superseding the Standard Specifications definition of "Engineer":

Engineer: The individual, firm, partnership, corporation, or combination thereof designated by the Flood Control District of Maricopa County to act as the Engineer, on the District's behalf, either directly or through a duly authorized representative.

Superseding the Standard Specifications definition of "Budget Project":

Budget Project: 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.

Superseding the Standard Specifications definition of "Owner":

Owner: The Flood Control District of Maricopa County, acting through its legally constituted officials, officers, or employees.

## SECTION 102 - BIDDING REQUIREMENTS AND CONDITIONS

In addition to the requirement of Subsection 102.1 - Eligibility and Preference of the Standard Specifications:

Each bidder shall furnish the owner satisfactory evidence of his competency to perform the proposed work. Such evidence of competency, unless otherwise specified, shall consist of: (1) statements covering the bidder's past experience on similar work; (2) a list of equipment that would be available for the work; and, (3) a list of key personnel that would be available and their past experience on similar work. In addition, each bidder shall furnish the owner satisfactory evidence of his financial responsibility. Such evidence of financial responsibility, unless otherwise specified, shall consist of a confidential statement or report of the bidder's financial resources and liability as of the last calendar year or the Contractor's last fiscal year. Such statement or report shall be certified by a public accountant. At the time of submitting such financial statement or report, the bidder shall further certify whether his financial responsibility is approximately the same as stated or reported by the public accountant. If the bidder's financial responsibility has changed, the bidder shall qualify the public accountant's statement or report to reflect his (bidder's) true financial condition at the time such qualified statement or report is submitted to the owner.

Unless otherwise specified, a bidder may submit evidence that he is prequalified with the State Highway Division and is on the current "bidder's list" of the State in which the proposed work is located. Such evidence of State Highway Division prequalification may be submitted as evidence of financial responsibility and competency to perform the proposed work in lieu of the statement or report hereinbefore specified.

Each bidder shall submit "evidence of competency" and "evidence of financial responsibility" to the owner at the time of bid opening.

If awarded the Contract, the bidder will furnish certificates from the owners of leased equipment to the effect that in case of default, the bidder has the right to take over the leased equipment for use in completing the work.

Additional to the requirements of subsection 102.4 - Examination of Plans, Special Provisions, and Site of Work:

By the act of submitting a bid for the proposed work, the Bidder warrants the following:

- A. The Bidder and all subcontractors he intends to use have carefully and thoroughly reviewed the Plans, Specifications, and Special Provisions, and other Contract Documents and have found them complete and free from ambiguities and sufficient for the purpose intended.
- B. The Bidder and all workmen, employees, and subcontractors he intends to use are skilled and experienced in the type of construction represented by the Plans and Contract Documents.
- C. Neither the Bidder nor any of the employees, agents, intended suppliers, or subcontractors have relied upon any verbal representations, allegedly authorized or unauthorized from the Owner, his employees or agents including engineers or consultants, in assembling the bid.
- D. The bid provided is based solely on the Plans, Specifications, Special Provisions, Contract Documents and properly issued written Addenda and not upon any other written representation.
- E. The Bidder has carefully examined the site of the work and that from his own investigation(s) has satisfied himself as to the nature and location of the work and the character, quality, quantities of materials, and difficulties to be encountered, the kind and extent of equipment and other facilities needed for the performance of the work, the general and local conditions, and other items which may, in any way, affect the work or its performance.

In addition to the requirements of Subsection 102.5 - Preparation of Proposal:

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.

SECTION 103 - AWARD AND EXECUTION OF CONTRACT

Additional to the Standard Specification requirements of Sub-section 103.6.1 - Contractor's Insurance:

Concurrently with the execution of the Contract, the Contractor shall furnish Certificates of Insurance to the Flood Control District of Maricopa County. The types of insurance and the limits of liability shall be as indicated in the INDEMNIFICATION AND INSURANCE clauses as contained in the final page of these Contract Documents and Special Provisions.

On all policies, the Flood Control District of Maricopa County shall be named as an additional insured.

SECTION 104 - SCOPE OF WORK

The last sentence of Section 104.2.1. is modified as follows:

If the alterations or changes made by the Contracting Agency increases or decreases the total cost of the contract or the total cost of any major item by more than 40 percent, either party may request an adjustment in payment in accordance with Section 109.

SECTION 105 - CONTROL OF WORK

Additional to the requirements of Subsection 105.1 - Authority of the Engineer:

In an emergency affecting the safety of life or of the adjoining property, the Contractor, without special instruction or authorization from the Engineer, is hereby permitted to act at his discretion to prevent such threatened loss or injury, and he shall so act, without appeal, if so instructed or authorized. Any compensation claimed by the Contractor on account of emergency work shall be determined by the Engineer.

Additional to the requirements of 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.

Additional to the requirements of Subsection 105.6 - Cooperation With Utilities:

Utility locations, as shown on the plans, were compiled based on the best information available. Utility locations are not intended to be exact or complete. Prior to commencing construction, the Contractor shall verify the location of all utilities with the appropriate organization. If potholing is required to determine or verify the location or depth of any utilities, all associated excavation shall be performed by the contractor.

The Contractor's attention is directed to Subsection 105.6 (Cooperation With Utilities) and to Subsection 107.11 (Contractor's Responsibility For Utility Property And Services) of the Standard Specifications. In addition, the Contractor's attention is directed to the requirements of Arizona Revised Statutes 40-370.21 through 40-370.29 requiring all parties excavating in public streets, alleys or utility easements to first secure the location of all underground facilities in the vicinity of the excavation.

Whenever any work is scheduled which may affect a utility, the Contractor will be required to give the respective owner sufficient advance notice so that the owner may provide an Inspector to prevent damage to the utility. The following utilities are known to have facilities in the area of the construction:

Arizona Department of Transportation	255-7541
	255-7381
Maricopa County Highway Department	262-3611
Southwest Gas Corporation	866-425
AT&T Communications	981-2800
Arizona Public Service	932-2300
City of Avondale, City Manager	932-2400
City of Avondale, Public Works	932-1909
Mountain Bell	235-3278
Southern Pacific Pipelines	623-6464
Tucson Electric Power Company	1-622-6661
Southern Pacific Transportation Company	1-629-2247
El Paso Natural Gas Company	438-1675

At least forty-eight (48) hours prior to commencing excavation, the Contractor shall call Blue Stake Center between the hours of 7:30 a.m. and 4:30 p.m., Monday through Friday, for information concerning the location of buried utilities in the area of construction. The telephone number to call is: 263-1100. It shall be the responsibility of the Contractor to contact the utility companies in order to determine if there is a need for any bracing or shoring of facilities on the project. If bracing or shoring is necessary, the Contractor shall do so to the satisfaction of the utility company. No measurement or direct payment will be made for such bracing or shoring.

Tucson Electric Power Company maintains energized aerial electric power lines in the vicinity of this project. Do not consider these lines to be insulated. Construction personnel working in proximity to these lines are exposed to an extreme hazard from electrical shock. Contractors, their employees, and all other construction personnel working on this project shall be aware of the danger and instructed to take adequate protective measures as required by the NES code for 345 kv transmission lines and OSHA Standard 1926.550(a)15. Fill material is not allowed on or near steel components of towers. Vehicular ingress and egress shall be maintained to the towers both during and after construction.

Southern Pacific Pipelines operates and maintains one 12-inch high pressure refined petroleum products (HPRPP) pipeline that crosses the Agua Fria River Approximately 35' downstream of

the beginning of the levee channelization (approximate station 2+70), and a 6-inch gas pipeline which crosses the Agua Fria River at Thomas Road (approximate station 0+15). The Contractor shall notify SPPL's superintendent in Tucson, Mr. J. D. Owen, at (602) 623-6464, at least one (1) week prior to commencement of work in these areas, and shall not reduce cover over SPPL's pipelines without written permission from Mr. Owen.

El Paso Natural Gas Company maintains a 10.75" gas line crossing the Agua Fria River at approximately station 6+90. Based on information provided by El Paso Natural Gas Company, this line will pass through the toe of the west bank soil cement levee. The Contractor shall encase the line in accordance with the details shown on the plans (see Sheet 11 of 53). The Contractor shall notify Mr. J. V. Williams at (602) 438-1675 at least one (1) week prior to any excavation in the vicinity of the pipeline. After exposure of the pipeline by the Contractor, El Paso Natural Gas Company will inspect and, if necessary, recondition and rewrap the pipeline prior to encasement and backfill.

The Contractor shall be responsible to coordinate this work with the Southern Pacific Railroad Company. The attached Forms 7345 and C.S. 7345-B, "Contractor's Right of Entry" agreement and insurance requirements are provided for the Bidders information. The Southern Pacific Transportation Co., 400 E. Toole Ave., Tucson, Arizona 85701, will prepare the documents for execution by the Contractor.

The Southern Pacific Transportation Company will have other contractors modifying the railroad trestle and the Southern Pacific Pipelines Company will be installing a 20-inch high pressure fuel line crossing under the river during the Contractor's work on the river channelization and bank protection. The trestle modifications and the location of the 20-inch high pressure line are shown on the plans. The Contractor shall coordinate with the Railroad Company and the Pipeline Company and their contractors to avoid conflicts in work schedules and access.

Additional to the requirements of Subsection 105.7 - Cooperation Between Contractors:

The Maricopa County Highway Department will be letting a contract for construction of the Van Buren Street Bridge over the Agua Fria River. This bridge will be under construction during the Contractor's work on the river channelization and bank protection. The Contractor shall coordinate with the Highway

Department's Bridge contractor to avoid conflicts in work schedule and access. The bridge contractor will not be permitted to start work on the bridge within 90 days of the Notice to Proceed on this contract.

Additional to the requirements of Subsection 105.10 - Inspection of Work:

It shall be the responsibility of the Contractor and/or Materials Supplier to maintain in-house quality control. The Contractor shall submit requests for density testing forty-eight (48) hours in advance. Should a density test prove unsatisfactory, additional re-testing will be done at the Contractor's expense. The cost of additional density testing beyond that stipulated as being covered in the Contract will be deducted from the Contractor's payment estimate. The charges for these re-tests are stated in Section 106 of these Special Provisions.

## SECTION 106 - CONTROL OF MATERIAL

Additional to the Standard Specification requirements of Sub-section 106.1 - Source of Materials and Quality:

### Construction of Stockpiles:

The Engineer or his representative will inspect the construction of all stockpiles to verify that the following requirements are complied with at all times.

Stockpiles shall be constructed on level, firm ground free of brush, trees, stumps, roots, rubbish, debris and other objectionable or deleterious material. Sufficient access shall be provided around the entire stockpile to sample and remove material in accordance with these provisions.

Stockpiles shall be constructed in layers, each layer not exceeding two (2) feet in thickness.

The total height of any stockpile shall not exceed fifteen (15) feet or the reach of the equipment employed to remove material for sampling and utilization, whichever is less.

### Sampling:

During construction of stockpiles to be utilized in the production of soil cement, the Contractor will be solely responsible for monitoring the uniformity of the material being placed therein to assure conformance with the gradation requirements specified for said soil material. The Contractor's attention is directed to the soils reports prepared for this project and which are on file at the office of the Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, Arizona. The aforementioned reports indicate that the upper three(3) to five (5) feet of material in overbank areas adjacent to the present Agua Fria channel are very fine, falling outside the specified gradation band for soil cement. The Contractor is advised that these fine-grained soils cannot be incorporated into the soil cement without prior blending with coarser material.

Stockpiles for use in soil cement production shall be constructed to the following minimum size:

1. 40,000 cubic yards, or
2. The total quantity of material required to complete all soil cement when the quantity of material required for blending into the soil aggregate is less than 40,000 cubic yards.

It shall be the responsibility of the Contractor and/or materials supplier to maintain in-house quality control of processed materials.

The Contractor shall submit requests for materials testing forty-eight(48) hours in advance. All re-testing of materials or material sources shall be done at the Contractor's expense. The charges for the retests will be based upon the following unit rates:

Inspector/Technician Time . . . . . \$30.00 per hour

Laboratory Technician Time for  
on-site laboratory tests. . . . . \$25.00 per hour

Vehicle mileage . . . . . \$0.40 per mile

Laboratory tests other than gradations  
plasticity indices, proctors, concrete  
cylinder strengths and shot-crete core  
strengths will be charged at the rates  
currently charged by the off-site  
laboratory for the pertinent tests.

SECTION 107 -LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Additional to the requirements of Subsection 107.2 - Permits:

The Contractor shall be responsible to obtain all permits and licenses, pay all charges, fees, taxes and give all notices necessary and incidental to the due and lawfull 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.

Additional to the requirements of Subsection 107.5 - Safety, Health, and Sanitation Provisions:

The Contractor shall protect, indemnify and defend Flood Control District of Maricopa County, the Engineer and his employees, officers, and agents against any claims of liability arising from or based on the violation of U. S. Occupational Safety and Health Act or any other safety provisions in law or equity.

The Contractor shall provide, at the site, such equipment and medical facilities as are necessary to supply first-aid service to anyone who may be injured in connection with the work.

The Contractor must promptly report, in writing, to the Engineer all accidents whatsoever, arising out of or in connection with the performance of the work, whether on or adjacent to the site, which caused death, personal injury, or property damages, giving full details and statements of witnesses. In addition, if death or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the Engineer.

If any claim is made by anyone against the Contractor or any Subcontractor on account of any accident, the Contractor shall promptly report the facts, in writing, to the Engineer, giving full details of the claim.

Additional to the requirements of Subsection 107.9 - Protection and Restoration of Property and Landscape:

All existing drainage channels of any size disturbed by construction, whether shown on the plans, or not, shall be reconstructed, at their original location, to drain properly without unnecessary erosion.

Before removing any fences, enclosed yards, or structures confining any livestock such as horse, cows, etc., the Contractor shall notify the property owner with adequate time for their safe removal or confinement elsewhere.

When requested by the property owner or the Engineer, the Contractor shall be required to erect temporary fencing, at no cost to the County or property owner, to prevent the escape or injury of said livestock during construction.

The Contractor shall be responsible for all damaged and/or destroyed Land Monuments and Property Marks. Said Monuments and Marks shall be replaced or restored by the Contractor. Final acceptance by the Engineer will not relieve the responsibility of the Contractor to protect said Monuments and Marks. Compensation for restoring damaged or obliterated Land Monuments shall be considered as included in the contract lump sum price paid for Construction Surveying and Layout.

Additional to the requirements of Subsection 107.10 - Contractor's Responsibility for Work:

The Contractor shall guarantee the work against defective workmanship or materials for a period of one (1) year from the date of its final acceptance under the contract, ordinary wear and tear and unusual abuse or neglect excepted.

Any omission on the part of the Engineer to condemn defective work or materials at the time of construction shall not be deemed an acceptance, and the Contractor will be required to correct defective work or materials at anytime before full acceptance and within one (1) year thereafter.

Should any defects develop within one (1) year from the date of final acceptance due to faults in workmanship or materials, the Contractor shall, within fourteen (14) calendar days of receipt of written notice from the Flood Control District of Maricopa County, begin making the necessary repairs to the satisfaction of the Engineer. Such work shall include the repair or replacement of other work or materials damaged or affected by making the above repairs or corrective work, all at no additional cost to the Flood Control District of Maricopa County.

In case of work, materials, or equipment for which written warranties are required by the Standard Specifications or Special Provisions, the Contractor shall provide or secure from the appropriate Subcontractor or supplier such warranties addressed to and in favor of the Flood Control District of

Maricopa County and deliver same to the Engineer prior to final acceptance of the work. Delivery of such warranties shall not relieve the Contractor from any obligation assumed under any other provisions of the contract.

The warranties and guaranties provided in this subsection of the contract documents shall be in addition to and not in limitation of any other warranties, guaranties or remedies required by law.

In the event that the Contractor should fail to make such repairs, adjustments, or other work that may be made necessary by such defects, the Flood Control District may do so and charge the Contractor the cost thereby incurred. The performance bond shall remain in full force and effect through the guarantee period.

Additional to the requirements of Subsection 107.11 - Contractor's Responsibility for Utility Property and Services:

The Contractor shall take full responsibility for costs incurred due to damage to utilities as result of grading or excavation operations.

Utility locations shown on the plans are approximate and all utilities are not necessarily shown. The possibility of conflicts with utilities exists. If these conflicting utilities interfere with the Contractor's normal progress towards completion of this project, the Engineer may authorize the Contractor to relocate said conflicting utilities by Actual Cost Work as detailed in Subsection 109.5 of the Standard Specification.

The Contractor shall be responsible for coordination and cost of all utility relocations indicated on the plans as to be done by the Contractor.

An exception to the provisions of Subsection 107.12 - Furnishing Right-of-Way, shall be as follows:

Before entering onto the Southern Pacific Transportation Company (hereinafter called "Railroad") right-of-way for any purpose, the Contractor shall obtain a Right of Entry Agreement from the Railroad and shall furnish a copy of the completely executed Agreement to the Engineer.

The Contractor shall contact the Railroad and initiate all actions required by the Railroad in order to execute the Agreement, including obtaining the comprehensive and automobile liability insurance required by the Railroad. Refer to Section 105 - Control of Work, of these special provisions.

## SECTION 108 - COMMENCEMENT, PROSECUTION, AND PROGRESS

In addition to the requirements of the Standard Specifications:

### 108.4 - Contractor's Construction Schedule:

The Contractor shall furnish, at the preconstruction conference, for approval by the Engineer, a proposed progress schedule for the work including miscellaneous items of construction which make up this project. The detail included in the progress schedule shall be acceptable by the Engineer. The progress schedule shall be updated and submitted to the Engineer prior to approval of monthly payment requests.

After the work is in progress, on Thursday of each week the Contractor shall submit weekly work schedules, with detail acceptable by the Engineer, indicating the number of personnel, type of equipment, and location and nature of the work to be performed the following week. Changes in the Contractor's progress schedule requiring an increase in the Flood Control District's engineering and/or technical personnel on the project shall not be put into effect for fifteen (15) days after submission of the schedule change to the Engineer or until the Engineer has made arrangements for the additional personnel, whichever is the shorter time.

### 108.5 - Limitation of Operations:

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.

### 108.7 -Determination and Extension of Contract time:

The Contractor shall complete all work on the project within 300 calendar days after receipt of the Notice to Proceed.

The contract time may be changed only by an executed Change Order. The Contractor must request, in writing, any extension of th contract time in accordance with Subsection 108.7 of the Standard Specifications within ten (10) days of the occurrence of the event for which the extension is requested. Delays beyond the reasonable control of the Contractor, as stated in Standard Specifications 108.7, are further defined as: war, government regulations, labor disputes, strikes, fires, floods, adverse weather necessitating cessation of work, other similar action of the elements, inability to obtain materials, equipment or labor because

of Federal Government restrictions arising out of the national defense or war program, required "extra work," or other specific reasons as may be further described in the specifications, which may constitute such a delay.

If delays beyond the Contractor's control are caused by reasons other than those mentioned above, but substantially equal in gravity to those enumerated, and an extension of time is deemed by the Engineer to be in the best interests of the Flood Control District, an extension of time may be granted, but the Contractor shall not be entitled to damages or additional payment due to such delays. If delays beyond the Contractor's control are caused solely by action or inaction by the Flood Control District of Maricopa County or its agents, such delays will entitle the Contractor to an extension of time only.

Extension of time, when granted, will be based upon the effect of delays to the project as a whole and will not be granted for non-controlling delays to minor included portions of work unless it can be shown that such delays did, in fact, delay the progress of the project as a whole.

No work on Saturdays, Sundays, or holidays will be permitted unless written permission is obtained from the Engineer at least 48 hours in advance. If the Contractor receives permission to work on a Saturday, Sunday, or holiday, said time shall be charged against the contract time for "working day" contracts.

#### 108.8 - Guarantee and Warrantee Provisions:

In case of work, materials, or equipment for which written warranties are required by the Standard Specifications or Special Provisions, the Contractor shall provide or secure from the appropriate Subcontractor or supplier such warranties addressed to and in favor of the Flood Control District of Maricopa County and deliver same to the Engineer prior to final acceptance of the work.

In the event that the Contractor should fail to make such repairs, adjustments, or other work that may be made necessary by defects in workmanship or materials, the Flood Control District of Maricopa County may cause the work to be properly done in accordance with the provisions of the Contract Documents and to pursue whatever recourse it deems necessary to recover from the Contractor any additional expense or cost it may have incurred. The Performance Bond shall remain in full force and effect throughout the guarantee period.

108.9 - Failure to Complete on Time:

In addition to the requirements of Subsection 108.9 of the Standard Specifications:

The Schedule of Liquidated Damages, Table 108, of the Standard Specifications shall be the basis for computing the amount of liquidated damages should such be assessed on this project.

When the work specified in the contract is not completed within the number of calendar days or working days specified therein, engineering and inspection expenses incurred by the Flood Control District of Maricopa County upon the work from the contract time originally fixed in the contract to the final date of completion of the work will be charged to the Contractor and will be deducted by the Flood Control District from the final monies due to the Contractor. Consideration of any extra work or change order added to the original contract, as well as extenuating circumstances beyond the control of the Contractor, will be given due consideration by the Flood Control District before assessing engineering and inspection charges against the Contractor. Such charges will be assessed, however, in cases where the work has been unduly delayed by the Contractor because of unwarranted reasons, inefficient operation or for any other reason for which the Flood Control District determines the Contractor liable.

The assessing of engineering charges shall be in addition to Liquidated Damages as provided for above.

Nothing contained in this section shall prohibit the Flood Control District from deducting from monies due or to become due to the Contractor any other costs incurred by the Flood Control District directly attributable to the delay in completing the Contract.

108.10 - Forfeiture and Default of Contract:

If, in the judgment of the Engineer, the Contractor, in connection with any job or jobs assigned hereunder, refuses or fails to supply a sufficient number of workmen, or the proper quality of material, or the required equipment, or refuses or fails in any respect to carry on the work in a workmanlike manner with promptness and diligence, or violates any of the terms or conditions of the Contract Document, such refusal, failure or violation shall constitute a default by the Contractor under this Contract, and in such event the Owner may give the Contractor twenty-four (24) hours written notice to remedy such default. Upon the failure of the Contractor to remedy such default within such time, the Owner shall be relieved of any further duties or obligations hereunder and the Owner reserves the right to remove the Contractor from the

job, to take over any or all labor, materials and appliances on the ground, and to complete or have completed any part or all of the individual work assignments then in progress.

108.12 - Temporary Suspension of Work:

The Engineer shall have the authority to suspend the work wholly or in part, for such period as he may deem necessary, due to unsuitable weather, or to such other conditions as are considered unfavorable for the suitable prosecution of the work, or for such time as he may deem necessary due to the failure on the part of the Contractor to carry out orders given, or to perform any provision of the Contract. The Contractor shall immediately comply with the written order of the Engineer to suspend the work wholly or in part. The suspended work shall be resumed when conditions are favorable and methods are corrected, as ordered or approved in writing by the Engineer.

In the event that a suspension of work is ordered as provided above, and should such suspension be ordered by reason of the failure of the Contractor to carry out orders or to perform any provision of the Contract, or by reason of weather conditions being unsuitable for performing any item or items of work, which work, in the sole opinion of the Engineer, could have been performed prior to the occurrence of such unsuitable weather conditions had the Contractor diligently prosecuted the work when weather conditions were suitable, the Contractor, at his expense, shall do all the work necessary to provide a safe, smooth, and unobstructed passageway through construction for use by public traffic during the period of such suspension as provided in Subsection 107.6, "Public Convenience and Safety," and as specified in the Special Provisions for the work. In the event that the Contractor fails to perform the work above specified, the County will perform such work and the cost thereof will be deducted from monies due or to become due the Contractor.

In the event that a suspension of work is ordered by the Engineer due to unsuitable weather conditions, and in the sole opinion of the Engineer, the Contractor has prosecuted the work with energy and diligence prior to the time that operations were suspended, the cost of providing a smooth and unobstructed passageway through the work will be paid for as extra work as provided in Subsection 104.2 - Alteration of Work, or at the option of the Engineer, such work will be performed by the Department at no cost to the Contractor.

If the Engineer orders a suspension of all of the work or a portion of the work which is the current controlling operation or operations, due to unsuitable weather or to such other conditions

as are considered unfavorable to the suitable prosecution of the work, the days on which the suspension is in effect shall not be counted against the Contract time set forth under Subsection 108.7.

If suspension of work is ordered by the Engineer, due to the failure on the part of the Contractor to carry out orders given or to perform any provision of the Contract, the days on which the suspension order is in effect shall be counted against the Contract time set forth under Subsection 108.7.

In the event of a suspension of work under any of the conditions set forth in this Subsection, such suspension of work shall not relieve the Contractor of his responsibilities as set forth in Section 107, "Legal Relations and Responsibility to the Public."

## SECTION 109 - MEASUREMENTS AND PAYMENTS

In lieu of the requirements of Subsection 109.5 - Actual Cost Work, the following shall apply:

The value of extra work performed in accordance with the requirements and provisions of Section 109 shall be determined by the Engineer in one or more of the following ways:

(A) By unit bid prices or lump sum, either as set forth in the original proposal or as agreed upon by both the Contractor and the Engineer and stipulated in the change orders authorizing the work. Should both parties fail to agree on a basis of payment, the Engineer may order the work done on an actual cost basis.

(B) By actual cost, for which reimbursement will be based in the following manner:

- (1) LABOR: The actual wages and fringe benefits paid as shown by the payrolls of the Contractor plus 15 percent, for labor and foreman in direct charge of the work, or a proportionate amount of wages paid to foreman directly in charge of the work, but not exclusively engaged in direct supervision of such work.
- (2) MATERIALS: The invoice costs, plus 15 percent, for materials actually used in the work and accepted by the Engineer including any transport charges paid by the Contractor.
- (3) EQUIPMENT: For other than small tools and manual equipment, the use of which has been authorized by the Engineer, the Contractor will be paid in accordance with the latest schedule of Equipment Rental Rates in use by the Arizona Department of Transportation on the date of bid opening for the project. ADOT methodology in determination of equipment rental rates shall be strictly adhered to unless another rate schedule and/or methodology is agreed to, in writing, prior to issuance of a "notice to proceed" on the work. No percentage will be added to any of these equipment rental rates.
- (4) BONDS, INSURANCE, AND TAXES: The actual cost, plus six percent (6%), when such can be shown to have been paid for property damage, liability, and Workman's Compensation Insurance premiums, unemployment insurance contributions and social security taxes.

- (5) STATEMENTS: No payment will be made for work performed until the Contractor has furnished the Engineer with duplicate, itemized statements of the cost of such work, detailed as follows:
- a. Name, classification, date, daily hours, total hours, rate and extension for each laborer and foreman.
  - b. Quantities of materials, prices, extensions, and transportation costs. These charges shall be submitted with the reports or, if not available, they shall be submitted with subsequent reports. In the event vendor's invoices are not submitted within fifteen (15) days after acceptance of the work, the Maricopa County Flood Control District reserves the right to establish the cost of such materials at the lowest current price at which said materials are available in the quantities concerned, delivered to the location of the work.
  - c. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of equipment.
  - d. Cost of property damage, liability, and Workman's Compensation Insurance premiums, unemployment insurance contribution and social security taxes.
- (6) Labor and equipment hours, and materials incorporated into the work shall be documented on a daily basis on a form approved by the Engineer. The Engineer will compare his records with the statements furnished by the Contractor, resolve any differences and make the necessary adjustments. When the actual equipment hours, labor hours, and materials are agreed upon and signed by both parties, it shall become the basis of payment for the work performed.
- (7) In the case where the actual cost work is performed by a Subcontractor, the above percentages will be added only once to the actual statement costs of the work; however, the Contractor may add five percent (5%) to the Subcontractor's costs, for labor and materials only, to cover his own overhead.
- (8) The Engineer is in charge of actual cost work and has the authority to direct which labor and equipment will be used, suspend operations, and refuse to pay for any labor and/or equipment which he feels is not doing productive work.

(C) By Force Account. Should both parties fail to agree on the above basis of payments, the Engineer may have the work done or cause the work to be done, by in-house forces or by parties or means other than the Contractor, by force account. This work shall not invalidate the Contract nor release the surety.

## SECTION 120 - CORRECTIVE REQUIREMENTS FOR DEFICIENCIES

### 120.1 - General:

It is recognized that variations from specifications may be classified as defects and vary in degree in their effect on the quality of the work.

In cases of failure to meet specifications, the Engineer may give the Contractor the option of removing and replacing the material at his own expense or accepting a payment adjustment.

Penalties described below are for acceptance procedure only, not for approval procedure. On approval stage any material which is not within specifications will be rejected. For additional testing of corrected materials, the Contractor will be charged, said charges being deducted from his payment estimate. The quantity of defective material that the Contractor will be penalized for will be based on the ratio of tests showing deficiencies to the total number of tests taken.

In addition to the assessment of penalties, if defective material is found during production, production shall cease immediately and shall not begin again until calibration tests indicate that material is within specification limits.

### 120.2 - Portland Cement Concret Lining:

Corrective requirements for deficiencies under this Subsection shall apply to Portland Cement concrete bank protection, spillways, aprons and breakout sections including shotcrete, gunite, and other similar items as required by the Engineer.

Concrete lining which is cracked and/or otherwise damaged during the course of construction shall be removed from joint to joint, or if the cracking or damage is confined to the middle portion of a panel, sawcut, so long as the remainder of the panel is not less than seven (7) feet wide, and replaced, all at no cost to the Flood Control District of Maricopa County.

When, in the opinion of the Engineer, there is reason to believe that the concrete lining is deficient in thickness, one core will be taken by the Engineer for every 500 linear feet, or fraction thereof, of the lining in question. When a deficiency of more than 1/4 inch is found, additional cores will be taken in order to isolate the deficient area.

Where lining thickness is deficient by 1/4 inch or less, payment will be made at the Contract unit price.

Where the deficiency exceeds 1/4 inch, but is less than or equal to 25 percent of the design thickness shown on the plans, payment for the deficient area will be adjusted based on the following formula.

$$\frac{\text{Core Thickness}}{\text{Design Thickness}} \times \text{Contract Unit Price} = \text{Adjusted Unit Price}$$

Where the deficiency exceeds 25 percent of the design thickness, the lining shall be removed and replaced, from joint to joint, at no additional cost to the Flood Control District of Maricopaja County.

In addition to the above, the Contractor shall be responsible for all testing costs associated with deficient cores for which an adjustment is made in the unit price of the as-constructed work. The cost of said testing shall be withheld from monies due the Contractor by the Flood Control District.

Adjustments in the Contract Unit Price for deficiencies in compressive strength on concrete items shall be made in accordance with the following table:

<u>Percent of Specified 28-Day Compressive Strength Attained, to the Nearest One Percent</u>	<u>Percent of Contract Unit Price Allowed</u>
100 or more	100
98 - 99	95
96 - 97	90
95	85
Less than 95	55*

\* If allowed to remain in place, final decision will be made by Project Engineer and depends on failure degree.

## SECTION 201 - CLEARING AND GRUBBING

This work shall consist of clearing, grubbing, removing, and disposing of all trees, brush, stumps, roots, rubbish, debris, and miscellaneous structures (e.g., abandoned wells and concrete ditches) not covered under other contract items within the construction area and the temporary excavation easement channel excavation area. Work under this item shall be progressed on the basis that NO BURNING will be permitted on or off the contract site. All wood and brush shall be disposed of within seven (7) calendar days after cutting or felling unless otherwise approved. Additionally, the Contractor shall clear all trash, brush, stumps, building materials, tires sludge, and miscellaneous debris from areas which "classified fill" or levee embankment are to be placed upon. ("Classified Fill" zones and "Unclassified Fill" zones are shown on the Detail for Backfilling of Pits on the contract plans.) Some of these materials, cleared from classified fill and levee embankment areas, can be mixed with soil and placed in "Unclassified Fill" zones, by methods approved by the Engineer, which ensure against entrapment of voids in the "Unclassified Fill" and which allow for compaction of the fill soils. The quantity of these cleared materials mixed into the "Unclassified Fill" zones shall not exceed the quantity which is consistent with eliminating voids and obtaining compaction of the fill. All remaining cleared materials, not incorporated into "Unclassified Fill," shall become the property of the Contractor and shall be disposed of off of the project right-of-way.

The Contractor shall take care to confine his operations to the areas so specified. Cacti shall be removed by the Contractor. Removal of cacti by the Contractor shall be in accordance with the "Arizona Native Plant Law," A.R.S. Chapter 7.

Superseding the requirements of Subsection 201.5 - Payment, of the Standard Specifications:

Payment for clearing and grubbing will be made on a lump sum basis for work satisfactorily completed. Monthly payments will be made in proportion to the amount of work done as determined by the Engineer. Damages to existing facilities incurred during this work shall be repaired by the Contractor at no additional cost to the Flood Control District.

The amount bid for clearing and grubbing shall not exceed one percent (1%) of the total contract bid price excluding the bid price for clearing and grubbing. Should the bidder exceed the foregoing one percent (1%), the Flood Control District will make the necessary adjustment to determine the total amount bid based on the arithmetically correct proposal.

All other details for this item of work shall conform to Section 201 of the Standard Specifications.

## SECTION 203 - CHANNEL EXCAVATION

This item of work shall include channel excavation and ditch excavation, removal of existing levees and bank protection, removal of existing earth levee access ramps, trimming of existing levee embankments, removal of earth and shotcrete from the levee plug south of Indian School Road, channel and gravel pit backfill, drainage ditching and grading behind levees, watering, grading, shaping, and compaction. Excavated material, exclusive of old tires, rubbish, and other objectional materials, shall be used in fill areas and other areas within the project limits as shown on the plans, as required by the specifications and these Special Provisions and as directed by the Engineer. Tires, rubbish and other debris encountered by excavation can be incorporated into "Unclassified Fill" (in zones detailed on the plans) by methods approved by the Engineer which ensure against entrapment of voids in the unclassified fill, and which allow for compaction of fill soils.

Channel excavation shall conform to the requirements of Sections 215.3 and 215.5 of the Standard Specifications.

Excavation of material from the areas of the temporary excavation easements south of Channel Control Line Station 3+05 shall be included as channel excavation. Additional to the requirements of this Section 203 of these Special Provisions, the channel excavation south of Channel Control Line Station 3+05 shall conform to the requirements of Sections 210.1 and 210.3 of the Standard Specifications. Excavation of material from the temporary excavation easements shall be to the limits, lines and grades shown on the plans or otherwise directed by the Engineer.

At the time of compaction, the moisture content of material to be used in fill areas shall be such that the specified compaction will be obtained and the fill will be firm and unyielding. Material containing excessive moisture shall not be compacted until the material is dry enough to obtain the required compaction. Compensation for additional work involved in drying fill material to the required moisture content shall be considered as included in the contract price for Channel Excavation and no additional compensation will be allowed.

In areas of embankment/fill, material shall be placed such that slide slopes do not exceed a 2 to 1 slope, except as noted on the plans or approved or directed, in writing, by the Engineer.

Soils removed from the two earthen levee access ramps north and south of the existing Roosevelt Irrigation District Flume, between Thomas Road and Indian School Road, shall be placed as fill in the area shown on the plans to be graded to drain between the east

levee and the east construction easement, and between the Section Line on Thomas Road and 350 feet north of the Section Line. This fill shall be graded to lines and grades required on the plans for drainage into the two 36" RCP's at CP-12. All soils trimmed from existing levee embankments at Thomas Road shall also be used for constructing this fill. Sufficient soil to complete the grading-to-drain in this area, after utilization of the removed ramp soils and trimmed soils, shall be obtained by channel excavation in the river to maximum depth of one foot between the RID Flume and Thomas Road.

Prior to commencing any excavation work, the Contractor shall notify the appropriate utility companies and arrange to have company line spotters present. The Contractor shall take full responsibility for costs incurred due to damage to utilities as a result of excavation or embankment operations. Utility locations shown are approximate and all utilities are not necessarily shown. No direct payment will be made for this work, the cost being included in the price for Channel Excavation.

The Contractor shall provide for continued access to private property during and after grading of the right-of-way has been accomplished, as indicated in the Plans. Any deviation from the Plans necessary for this purpose shall first be approved, in writing, by the Engineer. The Contractor shall secure written permission from the appropriate property owner prior to undertaking any work outside the designated right-of-way necessary for this purpose. No direct payment will be made for this work, the cost being included in the price for Channel Excavation.

#### Measurement and Payment:

The quantities of Channel Excavation will be measured by the cubic yard, in the original position within the payment limits indicated on the Plans. The Engineer will compute the quantities of Channel Excavation by a method which in his opinion is best suited to obtaining an accurate determination of the material moved. Over-excavation shall not be paid for unless authorized, in writing, by the Engineer.

The Contract unit price for Channel Excavation includes payment for all work encompassed by this Section, and shall be full compensation for performing all work and for furnishing all equipment, labor, and materials as necessary to complete the work of the item, except where specific costs are designated or included in another pay item of work. All incidental costs, such as acquisition of borrow pits or material outside of the right-of-way, rock drilling and blasting, compaction and special test requirements, stockpiling and rehandling of materials, precautionary measures to protect private property and utilities, to

form and trim graded surfaces, and any delays caused by corrective work, shall all be included in the unit price of the pay item where such costs are incurred. When there is no pay item for Construction Water in the itemized proposal, the work shall be performed in accordance with the specifications for the appropriate items but, the costs thereof shall be included in those pay items that require the application of water. Payment shall be made at the Contract unit price for Item 203 - Channel Excavation, and shall cover all costs of excavation and fill as indicated on the Project Plans. No additional compensation will be made for over-haul required to complete the work.

SECTION 211 - FILL CONSTRUCTION

Subsection 211.5 - Measurements and Subsection 211.6 - Payment, are hereby deleted. No measurement or direct payment will be made for fill construction, the cost being considered as incidental to and included in the cost of channel excavation.

Wheel rolling with construction hauling equipment will not be an acceptable method of compaction. Equipment specifically designed for earthwork compaction will be acceptable. If a steel wheel roller is used, the resulting smooth surface shall be sufficiently roughened after compaction to insure bond to the succeeding layer.

## SECTION 212 - LEVEES

This item of work shall consist of the construction of earthen levees including watering, grading, shaping and compaction. Levees shall be constructed to a smooth and uniform surface and in close conformity to the lines, grades, dimensions, and cross sections shown on the Plans or established by the Engineer.

Levee construction shall not be started until clearing and grubbing for the levee area is completed in accordance with the requirements of Section 201.

Levee construction shall conform to the requirements of Subsections 215.4 and 215.5 of the Standard Specifications.

Levee embankments shall be constructed to a total width at least two (2) feet wider than that indicated on the plans, of which one (1) foot of additional width shall occur on each side of the levee. Once constructed, each levee face shall be trimmed back to the finished lines, grades and dimensions shown on the plans in order to insure proper compaction and stability of the levee embankment. Material trimmed from the levee embankment slopes shall be used as fill and/or backfill at other locations on the project. No additional payment shall be made for material placed beyond the finished lines and grades of the levees or for trimming, removing, and hauling said material, rather, these costs are considered incidental to the construction of the levee.

Earth material for levees shall be placed in uniform horizontal layers not exceeding eight (8) inches in depth before compaction. Compaction shall be accomplished by rolling, tamping, or other suitable means utilizing equipment specifically designed for earthwork compaction. Wheel rolling with construction hauling equipment will not be considered an acceptable method of compaction. Each layer of earth material shall be compacted to the specified density before the next layer is placed. Effective spreading equipment shall be used on each layer to obtain uniform thickness prior to compacting. As the compaction of each layer progresses, continuous leveling and manipulation of the material will be required to assure uniform density. Water shall be added or removed, if necessary, in order to obtain the required density. It shall be the Contractor's responsibility to properly place and compact all materials in the levee section, and to correct any deficiencies resulting from improper or insufficient compaction of such materials throughout the contract period.

The top six inches of ground on which levees are to be constructed shall be compacted to a density of not less than 95.0 percent of



the maximum density. All material placed in fill areas upon which levees are to be constructed shall be compacted to a density of not less than 95% of the maximum density.

Each layer of earth material for levee construction shall be compacted to a density of not less than 95.0 percent of the maximum density.

All determinations of density will be made in accordance with the requirements of Arizona Test Methods 225 and 230.

During the progression of the work, the Engineer will review the Contractor's operations with regard to the following items:

1. Lift thickness not exceeding the maximum allowed as herein stated. Thinner lifts than the maximum allowed may be necessary to obtain satisfactory results on some materials.
2. The compactive effort is uniformly applied.
3. Significant rutting, under the action of the compactor, on the final passes on a layer does not occur.
4. Proper compaction on a layer is obtained in accordance with the specifications.

Whenever a deficiency is noted in the Contractor's operations, the Engineer will prohibit placement or an overlaying lift until the Contractor takes effective corrective action. When the Engineer determines that density tests are necessary, the Contractor shall provide any assistance requested to facilitate such tests. Such assistance shall include, but will not be limited to, excavation and backfill of test pits and holes. This work shall be considered to be incidental construction.

Damage to any compacted lift at any time during the course of construction, such as rutting under the loads imposed by earth moving equipment, shall be fully repaired by the Contractor, at his own expense, prior to placement of any overlaying material.

#### Measurement and Payment:

The quantities of earth material for levees will be measured by the cubic yard, computed in the final compacted position. Any additional quantity of material required to compensate for foundation settlement, compaction, erosion, or other cause shall not be included in the measurement of this item. The quantities of earth material for levees shall exclude the total volume of bank protection. No deductions will be made for the volumes occupied by pipes

or culverts. Quantities shall be computed from the payment lines shown on the Plans. Cross-sectioning, for the exclusive purpose of determining quantities for payment, shall be employed only where payment lines are not shown on the plans, and cannot be reasonably established by the Engineer.

The Contract unit price for Item 212 - Levees, shall include the costs of furnishing all equipment, labor, and materials as necessary to complete the work of the item, except where specific costs are designated or included in another pay item of work. All incidental costs, such as acquisition of borrow pits or material outside of the right-of-way, rock drilling and blasting, compaction and special test requirements, stockpiling and rehandling of materials, precautionary measures to protect private property and utilities, to form and trim graded surfaces, and any delays caused by corrective work, required during the course of construction shall all be included in the unit price of the pay item where such costs are incurred. When there is no pay item for Construction Water in the itemized proposal, the work shall be performed in accordance with the specifications for the appropriate items but the costs thereof shall be included in those pay items that require the application of water. Payment shall be made at the Contract unit price for Item 212 - Levees and shall cover all costs of earthwork placement necessary for levee construction.

SECTION 220 - RIPRAP CONSTRUCTION

The requirements of Section 220 of the Standard Specifications are hereby superseded. A new section, Section 220 - Riprap Construction, is hereby established.

220.1 - Description:

This work shall consist of furnishing all plant, labor, equipment, and materials and performing all work necessary, including toe excavation, backfill, and dewatering, to place a protective covering of erosion-resistant material on the slopes of embankments, riverbanks, or levees, at culvert inlets and outlets, on bottoms and side slopes of channels, at abutment wings, at structure foundations, at other locations shown on the plans, or as directed by the Engineer. The work shall be done in accordance with these specifications and in conformity with the lines and grades shown on the plans or established by the Engineer. The types of riprap included in this specification are:

- (a) Dumped Riprap: Dumped riprap consists of rock that is dumped in place on a filter blanket or prepared slope to form a well graded mass with a minimum of voids.

220.2 - Materials:

220.2.1 - Riprap:

Rock used for riprap shall be sound and durable, free from clay or shale seams, cracks or other structural defects and shall have a specific gravity of at least 2.50. Rock used to construct riprap shall be angular in shape. Rock shall have a least dimension not less than one third of its greatest dimension. Gradation of riprap shall be as follows:

<u>Rock Size</u>	<u>Percent of Total Smaller than the Given Size</u>
36"	100
18"	50 - 70
9"	15 - 30
4"	0 - 5

Control of gradation will be by visual inspection. The Contractor shall provide two samples of rock of at least five (5) cubic yards each, meeting the gradation specified herein. One sample shall be provided at the quarry and one sample at the construction site. The sample at the construction site may be a part of the furnished riprap covering. These samples shall

be used as a frequent reference for judging the gradation of the riprap supplied. Any difference of opinion between the Engineer and the Contractor shall be resolved by dumping and checking the gradation of two random truck loads of rock. Mechanical equipment, a sorting site, and labor needed to assist in checking gradation shall be provided by the Contractor at no additional cost to the Flood Control District. No source of rock is designated. It shall be the Contractor's responsibility to negotiate for the material, obtain the right-of-way and pay all applicable royalties and damages.

The source from which the rock will be obtained shall be selected well in advance of the time when the rock will be required in the work. The acceptability of the rock will be determined by the Engineer on the basis of test results furnished by the Contractor. Suitable samples of rock shall be taken in the presence of the Engineer at least 45 days in advance of the time when the use of the rock is expected to begin. The Contractor shall provide the Engineer with test reports from an independent testing laboratory to establish that the sampled rock meets the following requirements:

<u>Test</u>	<u>Test Method</u>	<u>Requirement</u>
Specific Gravity (Bulk SSD)	ASTM C127	2.50 (Minimum)
Absorption	ASTM C127	2.0% (Maximum)
Wetting & Drying	Corps of Engineers Std. Test Procedures	No Fracturing after 15 Cycles
Sulfate Soundness	ASTM C88	10% Loss (Maximum)
Abrasion	ASTM C535	50% Loss (Maximum)

Rock shall contain no swelling type clay.

The approval of some rock fragments from a particular quarry site shall not be construed as constituting the approval of all rock fragments taken from the quarry.

220.2.2 - Gravel Filter Blanket:

The gravel filter blanket shall consist of one or more layers of gravel, crushed rock, or sand of the thickness shown on the plans. All material shall be composed of durable particles,

free of thin, flat, and elongated pieces, and shall contain no organic matter or soft, friable particles in quantities in excess of those approved by the Engineer. Gravel filter material shall meet the following gradations requirements:

<u>Size</u>	<u>Percent Passing Sieve</u>
4"	100
3"	85 - 100
2"	35 - 70
1"	0 - 15
1/2"	0 - 5

The material will be tested by the Engineer for durability and soundness in accordance with ASTM C131, and the percentage of wear shall not exceed 50% after 500 revolutions.

#### 220.2.3 - Filter Fabric:

Filter fabric for riprap construction shall be a woven fabric composed of polypropylene filaments. The fabric shall be inert to biological degradation and naturally encountered chemicals, alkalies, and acids, such as Mirafi 600X or approved equal.

The filter fabric shall meet or exceed the following requirements when tested in accordance with the test methods indicated:

<u>Property/Unit</u>	<u>Requirement*</u>	<u>Test Method</u>
Grab Tensile Strength, Lbs	300 x 280	ASTM D-1682-64
Grab Tensile Elongation, %	35 (max) x 30 (max)	ASTM D-1682-64
Burst Strength, psi	600 (min)	ASTM D-3786-80
Trapezoid Tear Strength, lbs	145 x 110	ASTM D-1117-80
Puncture Strength, lbs	115	ASTM D-3787-80
Modulus, lbs (load at 10% Elongation)	125 x 130	ASTM D-1682-64
Permeability Coefficient, "k," cm/sec	0.01	CFMC GET-2
Ultraviolet Stability, %	90	ASTM D-1682-64 & G-26

\*Minimum requirement based on 95% confidence level with sample size of six.

Securing pins used to secure the filter fabric in place shall be steel or fiberglass. Each pin shall be 12 inches minimum length and shall be formed as a "U", "L", or "T" shape or contain "ears" to prevent total penetration. Grommets or steel

washers with an outside diameter of 1 1/2 inches shall be provided for all but "U" shaped securing pins.

All brands of filter fabric shall be accepted on the following basis:

The Contractor shall furnish the Engineer, in duplicate, a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the fabric. The mill certificate or affidavit shall attest that the fabric delivered to the site meets the chemical, physical, and manufacturing requirements stated herein and shall contain the following information:

- A. Name of manufacturer.
- B. Name of fabricator.
- C. Chemical composition of fabric and coating, if any.
- D. Product description and life expectancy.
- E. Statement of specification compliance including the name of this project.
- F. Signature of authorized official attesting to the information presented.
- G. Manufacturer's recommendations for field sewing and repairs.

At least 30 days prior to delivery of filter fabric to the site, the Contractor shall inform the Engineer of the manufacturer and/or supplier from which he intends to obtain the filter fabric. The Engineer shall have free access to the site of manufacture and subsequent area of storage for the purpose of obtaining samples for testing. All materials shall be subject to the approval of the Engineer.

During all periods of shipment and storage, the filter fabric shall be protected from direct sunlight, ultra-violet rays, temperatures greater than 140°F, and all objectionable substances. To the extent possible, the cloth shall be maintained wrapped in a heavy duty protective covering.

## 220.3 - Construction Requirements:

### 220.3.1 - General:

Areas on which riprap is to be constructed shall be cleared, grubbed, excavated, or backfilled in accordance with the Standard Specifications and these Special Provision. The areas shall be graded and dressed to produce a ground surface in reasonable conformance with the lines and grades shown on the plans or established by the Engineer. All soft or spongy material shall be removed to the depth directed by the Engineer and replaced with approved material. Filled area shall be compacted as specified in Section 212-Levees.

Placement of riprap, filter fabric, or gravel filter blanket through water will not be permitted unless otherwise approved, in writing, by the Engineer.

### 220.3.2 - Dumped Riprap:

Rock for riprap shall be placed on the prepared slope or area in a manner which will produce a reasonably well-graded mass of rock with the minimum practicable percentage of voids. The entire mass of rock shall be placed so as to be in conformance with the lines, grades, and thicknesses shown on the plans. Riprap shall be placed to its full course thickness at one operation and in such a manner as to avoid displacing the underlying material. Placing the riprap in layers, or by dumping into chutes, or by similar methods likely to cause segregation, will not be permitted.

The larger rocks shall be well distributed and the entire mass of rock shall conform to the gradation specified in Subsection 220.2.1. All material going into riprap bank protection shall be so placed and distributed that there will be no large accumulations of either the larger or smaller sizes of rock.

It is the intent of these specifications to produce a fairly compact riprap protection in which all sizes of material are placed in their proper proportions. Hand placing or rearranging of individual rocks by mechanical equipment may be required to the extent necessary to secure the results specified.

The Contractor shall maintain the riprap protection until accepted, and any material displaced by any cause shall be replaced to the lines and grades shown on the plan at no additional cost to the Flood Control District.

### 220.3.3 - Gravel Filter Blanket:

When indicated on the plans, a gravel filter blanket shall be placed on the prepared slope or area to the full specified thickness of each layer in one operation, using methods which will not cause segregation of the material. The surface of the finished layer shall be reasonably even and free from mounds, depressions, or windrows. Gradation of the gravel filter material shall conform to the requirements of Subsection 220.2.2 of these Special Provisions.

### 220.3.4 - Filter Fabric:

When filter fabric is required, it shall be placed in the manner and at the locations shown on the project plans. Filter fabric shall be rejected if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation or storage. Filter fabric stored at the site shall be covered with an ultraviolet stabilized tarp to protect it. Filter fabric shall not be exposed to direct sunlight for more than two days. The surface to receive the fabric shall be graded to a relatively smooth condition free of obstructions, projections, depressions, debris, and soft or yielding areas. The fabric shall be placed to provide a minimum 24 inches of overlap for each joint. Where overlaps do not lie flat against each other and the possibility exists that rock could move between the laps, a greater overlap shall be used to insure at least two (2) feet of matted overlap. Fabric shall be laid smooth and free of tension, stress, folds, wrinkles, and creases. On horizontal joints, the uphill strip shall overlap the downhill strip. On vertical joints, the upstream strip shall overlap the downstream strip.

At vertical laps, securing pins shall be inserted through both layers along a line through the approximate midpoint of the overlap. At horizontal laps, securing pins shall be inserted through the bottom layer only. The pins shall be placed at not greater than four (4) foot intervals. Securing pins shall be placed along a line approximately four (4) inches in from the edge of the outer limits of the completed filter fabric area at intervals not greater than four (4) feet. Additional pins, regardless of location or spacing, shall be installed as necessary to prevent slippage of the filter fabric.

Rock shall be carefully placed on the gravel filter blanket and filter fabric in such a manner as not to damage the fabric. If, in the opinion of the Engineer, the fabric is damaged or displaced to the extent that it cannot function as intended, he will order the Contractor to remove the rock, regrade the area if necessary, and replace the filter fabric.

220.4 - Measurement:

Dumped riprap will be measured by the cubic yard of material placed by computing the volume within the lines shown on the plans or otherwise directed by the Engineer.

Gravel filter blanket will be measured by the cubic yard of material placed by computing the volume within the lines shown on the plans or otherwise directed by the engineer. Filter fabric (i.e., geotextile fabric) will be measured by the square yard, placed as shown on the plans or as directed by the Engineer.

Riprap, gravel filter blanket and filter fabric placed outside the specified limits will not be measured or paid for, and the Contractor may be required to remove and dispose of the excess material without cost to the County.

220.5 - Basis of Payment:

The accepted quantities of dumped riprap and gravel filter blanket will be paid for at the Contract unit price per cubic yard, as designated in the bidding schedule. Filter fabric will be paid for at the Contract unit price per square yard as provided in the bidding schedule for Filter Fabric. These unit prices shall be full compensation for the work, complete in place, including preparation of the work area, toe excavation, backfill, dewatering, and furnishing, testing and installing rock, filter fabric, gravel filter blanket, and other incidental items and operations.

SECTION 221 - SOIL-CEMENT BANK PROTECTION, GRADE-CONTROL STRUCTURE  
& Utility Tower Protection

221.1 - Description:

The work shall consist of the construction of soil-cement bank protection, grade-control structures, and utility tower protection as required by the Plans, including toe trench excavation, back-fill, and dewatering for the construction of all soil cement falling below the proposed channel bed profile as indicated on the plans.

221.2 - Materials:

221.2.1 - Portland Cement:

Portland Cement shall comply with the latest Specifications as approved by the Engineer, for Portland Cement (ASTM C150, Type II [low alkali]), and shall conform to the requirements of Subsection 725.2 of the Standard Specifications.

221.2.2 - Water:

Water shall be clear and free from injurious amount of oil, acid, alkali, organic matter, or other deleterious substances. Water shall contain not more than 1,000 parts per million of chlorides as CL or of sulfates as SO<sub>4</sub>. Water shall be sampled and tested in accordance with the requirements of AASHTO T26.

221.2.3 - Aggregate:

The soil used in the soil-cement mix shall not contain any material retained on a one and one-half (1 1/2) inch sieve, nor any deleterious material. Soil for soil-cement shall be obtained from the required excavations, or from Contractor-furnished borrow approved by the Engineer and stockpiled on the job site as specified herein. The available quantities of channel excavation soils containing material which will pass the one and one-half (1 1/2) inch sieve and be retained on the No. 4 sieve, and of soils containing more than traces of material which will pass the No. 200 sieve, are sufficient for blending into the other soils to produce the quantity of soil aggregate needed for the soil cement if the Contractor selectively excavates these soils, which occur in thin lenses. If the Contractor chooses not to selectively excavate and stockpile such materials, then the Contractor shall stockpile imported borrow materials for blending the soil aggregate to conform to the required soil aggregate gradation in Subsection 221.3.

The actual soil to be used shall be analyzed by laboratory tests in order to determine the job mix as set forth herein. The distribution and gradation of materials in the soil-cement lining shall not result in lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from surrounding material.

221.2.4 - Fly Ash:

Fly ash shall conform to the requirements of ASTM C-618 for Class F except that the pozzolanic activity index with lime shall be reduced to a minimum of 650 psi at 7 days. The Blaine fineness shall have an average value of at least 2,800 with a minimum value of 2,600 for any one sample. The average value shall be determined on the last 5 consecutive samples. The loss on ignition shall not exceed 3.0 percent.

221.3 - Proportioning:

The Contractor shall use the soil aggregate, fly ash content, cement content, and moisture content determined by the Engineer in accordance with laboratory tests. The Contractor shall allow a minimum of fourteen (14) days for the cement and fly ash content results. During the course of the work, the Engineer shall adjust the job mix proportions whenever necessary in order to achieve the minimum design strength shown in Subsection 221.8. The Contractor shall select, screen and blend the soils excavated from the channel and from the temporary excavation easement to provide soil aggregate conforming to the gradation required below. Blending shall include constructing separate stockpiles for materials to be blended and it shall be performed by the utilization of the separate storage feed bins at the plant to the satisfaction of the Engineer.

REQUIRED SOIL AGGREGATE GRADATION

<u>Sieve Size</u>	<u>Percent Passing (Dry Weight)</u>
1-1/2"	98% - 100%
#4	60% - 90%
#200	5% - 15%

The plasticity Index of soil aggregate shall be a maximum of 5. Clay and silt lumps larger than one-half (1/2) inch shall be unacceptable. The amount of cementitious material (cement and fly ash) required shall be determined by tests performed by the Engineer in accordance with the procedure specified in Subsection 221.11 herein. Testing during the life of the project may require

changes in the cement and fly ash contents which shall be made promptly by the Contractor at the direction of the Engineer.

221.4 - Equipment:

The soil-cement bank protection, grade-control structure, and utility tower protection may be constructed with any combination of machines and/or equipment, except as noted herein, that will produce a completed soil-cement meeting the requirements for soil pulverization, cement and fly ash and water application, mixing, transporting, placing, compacting, finishing, and curing as provided in these Specifications.

221.5 - Construction Requirements:

221.5.1 - Required Contractor Submittals:

Prior to the start of construction, the Contractor shall submit, in writing, for approval, the following items:

1. The approximate length of soil cement to be placed prior to starting compaction operations.
2. The type of compaction equipment to be used.
3. The number and type of watering equipment to be used.
4. The method used to keep surfaces continually moist until subsequent layers of soil cement are placed.
5. The method used to cure permanently exposed surfaces.
6. The length of bank protection to be completed between top of bank protection and channel bottom before performing trimming of the slope face of the soil cement.
7. The proposed source of soil, if other than required excavations.
8. The proposed sources of cement and fly ash. Changes of sources of cement or fly ash will not be permitted without prior approval from the Engineer.

221.5.2 - Preparation:

Before soil-cement processing begins, the area on which soil-cement will be placed shall be graded and shaped to lines and grades as shown on the Plans or as directed by the Engineer.

The subgrade shall be compacted to a minimum of ninety-five (95%) percent.

Excavation, backfilling, and dewatering necessary to construct soil cement bank protection, grade-control structures, and utility tower protection below the channel bed profile elevations as shown on the plans shall be considered incidental to the construction of the soil cement and included in the cost of item 221.1 Soil Cement (levees, dikes, towers, grade-control structures).

Immediately prior to placement of the soil-cement mixture, the subgrade shall be moistened. Soft or yielding subgrade shall be corrected and made stable before construction proceeds.

#### 221.5.3 - Mixing:

Soil cement shall be central-plant mixed in a approved twin shaft continuous-flow or batch-type pugmill. The plant shall be equipped with separate storage silos for cement and for fly ash. The plant shall be equipped with screening, feeding and metering devices that will add the soil, cement, fly ash, and water into the mixer in the specified quantities. During the production of the soil cement, the percent of cement and the percent of fly ash incorporated into the mix shall not vary by more than +0.5 percent from the requirements of the mix design specified in Subsection 221.9 or as may be ordered by the Engineer. The plant is to also be equipped with a hydraulically or mechanically operated discharge hopper having a minimum capacity of six (6) cubic yards. Scales are required at the cement feed, at the fly ash feed, and either the soil or total mix feed locations. Each scale shall record weight of the material and have a digital readout, such that the total discharged weight per hour is displayed. Scales shall be calibrated and certified by the Contractor at least forty-eight (48) hours prior to the start of production. The Engineer shall observe the calibration of the plant and scales and approve of same prior to the production of soil cement for the project. The Contractor shall notify the Engineer at least 48 hours in advance of plant calibration. Each scale shall be calibrated to an accuracy of plus/minus 2.0%. Soil, fly ash, and cement shall be mixed sufficiently to prevent cement balls from forming when water is added.

The mixing time shall be that time which is required to secure a homogeneous, intimate, uniform mixture of the soil, fly ash, cement, and water.

A Plant Operating Manual shall be provided to the Engineer prior to plant calibration. Free and safe access to the plant must be provided to the Engineer at all times for inspection of the plant's operation and for sampling soil-cement mixture and its components.

#### 221.5.4 - Required Moisture:

At the time of compaction, the moisture content shall not be more than one (1) percent below optimum and shall not be more than one (1) percentage point above optimum when the mean air temperature during construction hours does not exceed 90 degrees F. When the mean air temperature does exceed 90 degrees F, or there is a breeze or wind which promotes the rapid drying out of the soil-cement mixture, the moisture content of said mix shall be increased as needed at the direction of the Engineer, but shall be less than that quantity that will cause the soil cement to become unstable during compaction and finishing operations.

#### 221.5.5 - Handling:

The soil-cement mixture shall be transported from the mixing area to the embankment in clean equipment provided with suitable protective devices in unfavorable weather. The total elapsed time between the addition of water to the mixture and the start of compaction shall be the minimum possible. In no case shall the total elapsed time exceed thirty (30) minutes. (This time may be reduced by the Engineer when the air temperature exceeds 90 degrees F or when there is a breeze or wind which promotes rapid drying of the soil-cement mixture.)

The Contractor shall take all necessary precautions to avoid damage to completed soil cement by the equipment and to avoid the deposition of raw earth or foreign materials between layers of soil cement. Earth ramps crossing completed soil cement must have at least two (2) foot compacted thickness. Where ramps are constructed over soil cement that is not to grade, all foreign materials and the upper-most one (1) inch of the previously placed soil-cement mixture must be removed prior to continuation of the soil-cement construction.

#### 221.5.6 - Placing:

The mixture shall be placed on the moistened subgrade, embankment, or previously completed soil cement with spreading equipment that will produce layers of such widths and thicknesses as are necessary for compaction to the required dimensions of the completed soil-cement layers. The compacted

layers of soil-cement shall not exceed eight (8) inches in thickness, nor be less than four (4) inches in thickness.

Each successive layer shall be placed as soon as practicable after the compaction of the preceding layer has been verified by the Engineer.

The Contractor shall schedule placement of all soil cement above channel bottom such that the placement of soil cement protection at each location will be completed from channel bottom to plan top of soil cement within five (5) calendar days, unless otherwise approved by the Engineer, or unless prevented by inclement weather.

All soil-cement surfaces that will be in contact with succeeding layers of soil cement shall be kept continuously moist by fog spraying until placement of the subsequent layer, except that the Contractor will not be required to keep such surfaces continuously moist for a period longer than seven (7) days.

Mixing shall not proceed when the soil aggregate or the area on which the soil-cement is to be placed is frozen. Soil cement shall not be mixed or placed when the air temperature is below forty-five (45) degrees F (7 degrees C), unless the air temperature is at least forty (40) degrees F (5 degrees C) and rising.

#### 221.5.7 - Compaction:

Soil cement shall be uniformly compacted to a minimum of 98% of maximum density as determined by field density tests. Optimum moisture and maximum density shall be determined in accordance with Arizona 221, 222B, and 223 procedures. However, Arizona 231 shall not be used. Wheel rolling with hauling, grading, spreading or watering equipment shall not be an acceptable method of compaction.

At the start of compaction, the mixture shall be in a uniform, loose condition throughout its full depth. Its moisture content shall be as specified in Subsection 221.5.4 herein. No section shall be left undisturbed for longer than thirty (30) minutes during compaction operations. Compaction of each layer shall be done in such a manner as to produce a dense surface, free of compaction planes, in not longer than one (1) hour from the time water is added to the mixture. Whenever the Contractor's operation is interrupted for more than two (2) hours, the top surface of the completed layer, if smooth, shall be scored to a depth of at least one (1) inch with a spike-tooth instrument, or by other means approved by the

Engineer, prior to placement of the next lift. The spacing of scores shall not exceed 18 inches, measured across the direction of soil cement placement. The surface, after said scoring, shall be swept using a power broom or other method approved by the Engineer to completely free the surface of all loose material prior to actual placement of the soil-cement mixture for the next lift.

#### 221.5.8 - Finishing:

After compaction, the soil cement shall be shaped to the required lines, grades, and cross sections and rolled to a reasonably smooth surface. The face of soil cement above the riverbed at each location shall be trimmed within two (2) working days after completing placement of the soil cement to plan top of soil cement, unless otherwise approved by the Engineer, or unless prevented by inclement weather.

#### 221.5.9 - Curing:

Temporarily exposed surfaces shall be kept moist as set forth in Subsection 221.5.6.

Care shall be exercised to ensure that no curing material other than water is applied to surfaces that will be in contact with succeeding layers of soil-cement.

Permanently exposed surfaces shall be kept in a moist condition for seven (7) days, or they may be covered with a suitable curing material, subject to the Engineer's approval. Any damage to the protective membrane provided by an approved curing material occurring within the initial seven (7) days of placement shall be repaired to the satisfaction of the Engineer.

Regardless of whether water or an approved curing material is used, the permanently exposed surfaces of the soil cement shall be kept moist during the seven-day cure period or until the protective membrane is applied. Curing material is to be applied as soon as practicable, within a maximum time limit of twenty-four (24) hours, between the finishing of the surface and the application of the protective membrane. Whenever atmospheric temperatures are expected to drop below 30°F, soil-cement shall be protected from freezing for (7) days after its construction by a covering of loose earth, straw, or other suitable material approved by the Engineer.

#### 221.5.10 - Construction Joints:

At the end of each day's work, or whenever construction operations are interrupted for more than two (2) hours, a transverse construction joint shall be formed in the last-placed lift by cutting back into the completed lift to form a full-depth vertical face.

#### 221.5.11 - Maintenance;

the Contractor shall be required, within the limits of the Contract, to maintain the soil cement in good condition until all work is completed and accepted. Maintenance shall include immediate repairs of any defects that may occur. This work shall be done by the Contractor at his own expense and repeated as often as necessary. Faulty work shall be replaced for a full depth of the layer.

#### 221.6 - Inspection and Testing:

The Engineer, with the assistance and cooperation of the Contractor, will make such inspections and tests as he deems necessary to verify the conformance of the work to the Contract Documents. These inspections and tests will include, but will not be limited to: (1) the taking of test samples of the soil cement and its individual components at all stages of processing and after completion, and (2) the close observation of the operation of all equipment used on the work. Only those materials, machines, and methods meeting the requirements of the Contract Documents will be approved by the Engineer.

All testing of soil cement or its individual components, unless otherwise provided specifically in the Contract Documents, shall be in accordance with the latest applicable ADOT, ASTM, or AASHTO Specifications in effect as of the date of advertisement for bids on the project.

Testing for proper compaction shall be done on at least every other lift of compacted soil cement at locations chosen by the testing personnel. If the lift being tested does not pass the minimum 95% density requirements, it must be reworked as directed by the Engineer until it passes or be removed by the Contractor at the Contractor's expense. The Contractor shall not be permitted to continue placing lifts of soil cement on any lift which has failed the compaction tests until such time as that lift has been reworked, retested, and passed as to meeting density requirements.

The initial acceptance of material shall in no way preclude further examination and testing at any time, during the course of

construction or subsequent warranty period, the Engineer suspects that the material is no longer properly represented by the acceptance sample. The acceptance at any time of any material incorporated into the work shall not bar its future rejection if it is subsequently found to be defective in quality or uniformity.

#### 221.7 - Measurement and Payment:

##### 221.7.1 - Measurement:

this work shall be measured (1) in Cubic Yards of completed-in-place soil-cement slope protection, grade-control structure, and/or utility tower protection between the limits shown by the specified lines, grades, and cross sections shown on the Plans; and (2) in tons of cement and tons of fly ash incorporated into the soil cement used for tests and for the slope protection, grade-control structure, and/or utility tower protection between the limits shown on the plans in accordance with the instructions of the Engineer.

##### 221.7.2 - Payment:

This work shall be paid for at the Contract unit price per cubic yard for Soil Cement (levees, tower and grade control), and at the Contract unit price per ton of cement and fly ash furnished, multiplied by the quantities obtained in accordance with Subsection 221.7.1. Such payment shall constitute full reimbursement for performing all work and for furnishing all equipment, labor and materials necessary to complete the soil-cement slope protection, grade-control structures, utility tower protection, dewatering, trench excavation, watering, mixing, placing, compacting, curing, inspection and testing assistance, and all other incidental operations. Any waste of fly ash, cement and/or soil cement by the Contractor during the handling, mixing, placing, etc., operations shall not be paid for.

#### 221.8 - Mix Design Methodology:

The design requirements for the soil-cement bank protection shall be such that it has a compressive strength of 700 psi at the end of seven (7) days plus 2% additional cementitious material (cement and fly ash) added for erosion resistance. The minimum acceptance strength shall be that developed as a result of adding 2% cementitious material (cement and fly ash) to the base determined. For example, if the mix design shows that 6% cementitious material is required to achieve 700 psi in seven (7) days, the total cementitious material content shall be  $6.0\% + 2.0\% = 8.0\%$ . Hence the governing strength shall be that strength which is acquired by the

mix design at 8%. A 24-hour test will be run to monitor the mix design on a daily basis. Experience has shown that 24-hour compressive strength results for moist cured samples are approximately 40 to 55 percent of the corresponding seven (7) day compressive strength results [moist cured for six (6) days and soaked in water for 24 hours]. In the example cited herein, once the design strength mix of 6.0% + 2.0% or 8.0% cementitious material is determined, a 24-hour test will be run using the mix to obtain a 24-hour compressive strength which will be used to monitor the daily output of the central plant. Seven (7) day samples will also be taken for final acceptance. The amount of cementitious material thus determined by laboratory testing shall continue to be monitored throughout the life of the project with modification as required to meet existing field conditions. This methodology shall also pertain to the development of a mix design for grade-control structures and utility tower protection with the exception that soil cement utilized for the aforementioned purposes shall have a compressive strength of 1000 psi at the end of seven (7) days plus 2% additional cementitious material.

221.9 - Mix Design for this Project:

For bidding purposes only, the estimated mix design for this project shall be as follows:

	<u>Bank Protection</u>	<u>Grade Control &amp; Utility Tower Protection</u>
Base Cementitious Material	11%	12%
Addition for Durability & Erosion	<u>2%</u>	<u>2%</u>
TOTAL REQUIRED	13%	14%

The percent of cementitious material (cement and fly ash) to be used in the mix shall be calculated to be the weight of cementitious material (cement and fly ash) divided by the total weight of the dry compacted soil cement. The actual mix design used on this project shall be determined by laboratory tests on material stockpiled after construction of the stockpile has been completed in accordance with Section 106 - Control of Material.

Fly ash shall be included in the soil cement at the discretion of the Engineer, based upon evaluation of the prices bid per ton for cement and for fly ash. Up to fifteen (15) percent of the total weight of cementitious material may be fly ash. Storage for fly ash and an additional scale for fly ash shall be provided by the Contractor conforming to Section 221.5.3 - Mixing, of these Special Provisions. Full compensation for equipping the batch

plant with fly ash storage silo and fly ash scales shall be considered as included in the contract unit price paid for Soil Cement (levees, tower and grade control), and no additional compensation will be allowed therefore whether or not fly ash is included in the soil cement mix design by the Engineer.

221.10 - Stockpiling of Aggregate:

Soil aggregate stockpiles shall be constructed on level, firm ground free of brush, trees, stumps, roots, rubbish, debris, and other objectionable or deleterious material and shall be located so as to provide a distance of not less than fifty (50) feet from the outside bottom edge of the conical stockpile built up under the processing plant conveyor or any other existing stockpile. The stockpiles shall be constructed in layers, each layer not exceeding two (2) feet in thickness. Ramps formed for stockpile construction shall be of the same material as that being stockpiled, and will be considered a part of the stockpile. Before steepening a ramp, any contaminated surface material shall be removed.

Stockpiled material should be thoroughly mixed throughout its depth, width, and length before utilization. The material should be homogeneous and uniform in color, gradation, and moisture throughout. Stockpiles material shall conform to the requirements of Section 106 - Control of Material, as revised by these Special Provisions.

Sampling of stockpiles will be done by the Engineer after the required amount of soil aggregate for the entire soil-cement job has been excavated and stockpiled. After the stockpiles have been sampled and approved, material shall not be added to them.

Stockpile(s) shall be completed and approved at least fourteen (14) days prior to start of soil-cement production. Mix design will then be performed by the Engineer, to determine job mix proportions.

221.11 - Testing Procedure for Determination of Cement Content Required for Soil-Cement Mixtures (A Modification of Arizona 220 Test Method):

221.11.1 - Description:

- (A) This method of test is intended for determining the percentage of portland cement and fly ash required in developing soil-cement mixtures by the determination of the compressive strength of molded specimens at varying cement contents.

(B) Equipment Required:

- (1) Mold - A cylindrical metal mold having a capacity of 1/30 cubic foot with an internal diameter of 4.0 plus/minus .005 inch and a height of 4.585 plus/minus .005 inch equipped with a detachable collar approximately 2-1/2 inches in height.
- (2) Rammer - A metal rammer manually or mechanically operated having a 2 inch diameter circular face and weighing 5.5 lbs. The rammer shall be equipped with a suitable arrangement to control the height of drop to a free fall of 12 inches above the elevation of the cement treated mixture.
- (3) Balance - A balance or scale of at least 5 kg. capacity sensitive to 0.5 gm.
- (4) Drying Oven - A thermostatically controlled drying oven capable of maintaining a temperature of 230 degrees plus/minus 9 degrees F (110 degrees plus/minus 5 degrees C).
- (5) Straightedge - A rigid steel straightedge 12 inches in length having one beveled edge.
- (6) Sieve - 3/4 inch sieve conforming to the requirements of the Specifications for Sieves for Testing Purposes (ASTM E-11-81 and AASHTO M92).
- (7) Miscellaneous mixing tools and pans.
- (8) Speedy Moisture Tester (optional).
- (9) Equipment required for the determination of the Compressive Strength of Cylindrical Concrete Specimens (ASTM C39, C42, C511).

221.11.2 - Sample Preparation:

- (A) If the soil aggregate Sample is damp when received, it shall be dried until it becomes friable under a trowel. Drying may be accomplished by air drying or by the use of drying apparatus such that the temperature of the sample does not exceed 140 degrees F (60 degrees C).
- (B) After drying prepare the sample for testing by separating the aggregate retained on the 3/4 inch sieve and breaking

up the remaining soil aggregations to pass the 3/4 inch sieve in a manner which will avoid reducing the natural size of individual particles.

- (C) Select and prepare eight separate test charges of dry soil cement of approximately 2500 gm. each. Two samples are to be made for every cementitious material (cement and fly ash) percentage selected.
- (D) Add the first of the cementitious material (cement and fly ash) contents to be used and mix thoroughly together.

Example: If the percent of cementitious material selected is 10%

Dry Soil Weight	=	2250	gms.	(90%)
Portland Cement	=	212.5	gms.	( 8.5%)
Fly Ash	=	37.5	gms.	( 1.5%)
TOTAL	=	2500	gms.	(100%)

- (E) The moisture content to be added to each test charge is determined by making a maximum density-optimum moisture determination with the anticipated required cementitious material content (according to AASHTO T 99-74 Method C) and using this developed optimum-moisture thereafter for all specimens prepared.

#### 221.11.3 - Compaction:

- (A) Form a specimen by compacting a prepared mixture in the mold with the collar attached in three equal layers to give a total compacted depth of 5 inches. Compact each layer by applying 25 uniformly distributed blows from a 5.5 lb. (2.5 kg.) rammer dropping free from a height of 12 inches (305 mm). Following compaction, remove the extension collar, carefully trim the compacted mixture even with the top of the mold by means of a straightedge and weigh. Multiply the weight of the specimen (in gms.) by 0.06614 to obtain the wet weight per cubic foot. The factor 0.06614 is valid only if the volume of the mold is 1/30 cubic foot. If calibration shows any change in volume, a new factor shall be calculated.

NOTE: Assuming the mold has a volume of 1/30 (0.0333) cubic foot the factor is derived as follows:

$$.06614 = \frac{1}{0.0333 \text{ cu. ft.} \times 453.6 \text{ g./lb.}}$$

In case of a change in volume of the mold 0.0333 cu. ft. shall be replaced by the decimal fraction for the new volume.

- (B) Compact a duplicate specimen in the same manner as Step (A).
- (C) Extrude both samples from their respective molds using caution and place on glass or non-absorptive plates and store for curing in a moist condition, (i.e., a moist cabinet or a Moist Room meeting the requirement of ASTM C511-80).
- (D) Determine the moisture content of the prepared samples from the residue.
- (E) Determine the Wet Density and Dry Density of the samples.
- (F) Repeat steps (A) through (D) on additional samples with increased cementitious material content (in 2% increments) until a complete bracketing of specification requirements is met.

#### 221.11.4 - Determination of Compressive Strength:

- (A) All specimens must be cured as specified in a moist condition for six (6) days and then immersed for a period of 24 hours in water maintained at 73.4 plus/minus 3 degrees F (23 plus/minus 1.7 degrees C).
- (B) Specimens shall then be prepared for the compression test in accordance with ASTM C617.
- (C) The compressive strength of the cylinders shall then be determined in accordance with ASTM C39 and ASTM C42.
- (D) The results shall be reported in a format similar to that shown in the following report form.

MARICOPA COUNTY FLOOD CONTROL DISTRICT  
SOIL-CEMENT COMPRESSIVE STRENGTH TEST REPORT

MATERIAL \_\_\_\_\_ PROJECT NAME \_\_\_\_\_  
 IDENTIFICATION \_\_\_\_\_ LOT NUMBERS \_\_\_\_\_  
 SOURCE OF SAMPLE \_\_\_\_\_ CONTRACTOR \_\_\_\_\_  
 LOCATION OF SUPPLY \_\_\_\_\_ SAMPLED BY \_\_\_\_\_ DATE \_\_\_\_\_

% Cement By Weight / % Fly Ash By Weight									
I.D. Number									
Diameter (D)									
Area (In <sup>2</sup> )									
Height (L)									
Max. Load (LBS.)									
Compressive Strength (PSI)									
ASTM C42	L/D								
	Correction Factor								
Corrected Compressive Strength (PSI)									
Moisture %									
Wet Density - PCF									
Dry Density - PCF									
Time Sampled									
Location Placed (STA.)									

Tested By \_\_\_\_\_ Date \_\_\_\_\_ Reviewed By \_\_\_\_\_ Date \_\_\_\_\_

Remarks \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SECTION 225 - WATERING

In addition to the requirements of the Standard Specifications:

225.1 - Description:

Section 225.1 of the Standard Specifications is superseded by the following:

The work under this section shall consist of furnishing and applying all water required for the control of dust, for the safety and convenience of the traveling public, and for the reduction of the dust nuisance to adjacent property.

The Contractor shall obtain the necessary permits required under the County Air Pollution Statutes. It shall be the responsibility of the Contractor to keep the construction site moistened to prevent pollution of air, water and adjacent property.

225.3 - Construction Equipment:

The use of pressure pumps and spray bars on all sprinkling equipment used for the application of water will be required. The use of gravity flow spray bars and splash plates will not be permitted.

225.5 - Payment

There is no pay item for watering.

SECTION 350 - REMOVAL OF EXISTING IMPROVEMENTS

In addition to the requirements of the Standard Specifications:

350.1 - Description:

This work shall consist of the removal of existing fence, buildings, concrete pads, irrigation structures, canal and ditch lining, culverts, manholes, headwalls, sand piles, gravel piles, rock piles, and other miscellaneous items shown on the plans to be removed from within the limits of the work.

350.2 - Construction Methods:

All materials, unless designated on the plans or by the Engineer as to be salvaged or relocated, shall become the property of the Contractor and shall be immediately removed from the job site.

350.4 - Payment:

Payment for removal of all existing improvements will be made at the Contract lump sum price for Removal of Existing Improvements. This lump sum price shall be full compensation for the item complete, as described herein or on the plans.

SECTION 401 - TRAFFIC CONTROL:

Traffic control shall conform to the applicable paragraphs of Section 401 of the MAG Uniform Standard Specifications with revisions, the county supplement thereto and these Special Provisions.

The number and kind of barricades, signs, delineators, barriers and all other traffic control devices and the approval of the contractor's method of application of all traffic control measures, shall not relieve the contractor of the responsibility of protecting the work, the workmen and the traveling public.

A road closure of Van Buren Road for channel construction is required and is authorized. The Contractor shall place road closure signing at the intersections of Van Buren Road with Dysart Road, El Mirage Road and 115th Avenue. Complete road closure signing shall also be placed at both approaches to the channel construction site, while providing continuous access to state and county properties.

At the time of the pre-construction conference, the Contractor shall submit for review and approval a traffic control plan. The plan shall show all measures, including types of signs, barricades and sand berms with their placement and spacing. All advance warning signs shall be mounted on steel channels driven into the ground. Locations of all signs shall be coordinated with the County Traffic Engineering Department before placement (Contact Mr. K.C. Bone, Telephone No. 233-8676).

Prior to any excavation or construction, the Contractor shall install and maintain deceleration sand berms (approximately five feet high and twenty-eight feet wide) on Van Buren Road across the pavement on each approach of traffic to the channel construction site. Sand berms shall remain until the road is opened to the traffic or construction presents less of a hazard than the berms.

The Contractor shall provide and maintain all necessary signs, barricades and centerline vertical panels for five working days beyond any construction which prevents traffic from using the roadway, or acceptance of the project by the Flood Control District, whichever is greater.

No separate payment will be made for traffic control. Full compensation for performing all work and for furnishing all labor, equipment and materials required to erect, install, maintain and remove traffic control devices shall be considered as included in the payments for the other items of work shown on the bidding schedule.

SECTION 505 - CONCRETE STRUCTURES

In addition to the requirements of the Standard Specifications:

505.1 - Description:

The work under this Section shall include constructing headwalls, encasement of utility lines, and other concrete structures not specifically covered under other sections, as shown on the plans and in conformance with the requirements of the Standard Specifications.

505.2 - Payment:

Concrete structures will be measured by the cubic yard of concrete and pounds of reinforcing steel, placed to the lines and grades shown on the plans or as directed by the Engineer.

The accepted quantities of concrete structure, measured as provided above, will be paid for at the Contract unit prices specified in the bidding schedule, which prices shall be full compensation for the items, complete in place, including furnishing all materials, labor, tools and equipment, and performing all work necessary to complete the item in accordance with the details shown on the plans, the requirements of the Standard Specifications and Special Provisions, and the direction of the Engineer.

## SECTION 515 - STEEL STRUCTURES

In addition to the requirements of the Standard Specifications:

### 515.1 - Description:

The work under this section shall consist of the construction and/or installation of debris racks, safety racks, access barriers and flap gates.

Where the Contract Documents contain proprietary references pertaining to the items of work under this section, the Contractor's attention is directed to Subsection 106.4 - Trade Names and Substitutions of the Standard Specifications.

### 515.6 - Measurement:

Steel structures will be measured by the unit installed, placed at the locations shown on the plans or as directed by the Engineer.

### 515.7 - Payment:

Debris racks, safety racks, access barriers and flap gates will be paid for at the Contract unit price per each. These prices shall be full compensation for the work, including furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in furnishing and placing the materials, complete in place, as shown on the plans, specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

SECTION 526 - SHOTCRETE

526.1 - Description:

The work under this section shall consist of furnishing all materials and applying shotcrete on prepared surfaces for ditches, slopes under bridge structures, break out sections, pipe outlet aprons, flap-gate mounting collars and other similar construction at the locations and in accordance with the details shown on the plans and the requirements of these specifications.

Shotcrete shall be concrete conveyed through a hose and pneumatically applied using the wet-mix process.

The wet-mix process shall consist of premixing by mechanical methods a proportional combination of Portland Cement, aggregate, and water required to produce concrete, and conveying the concrete through the delivery hose to the special nozzle where additional compresses air is added at the nozzle prior to its discharge.

526.2 - Materials and Equipment:

Portland Cement and Water:

Portland Cement and mixing water shall conform to the requirements of Section 725.

Fine Aggregate:

Fine aggregate shall conform to the requirements of Section 725, except that it shall conform to the following gradation:

<u>Sieve Size</u>	<u>Percent Passing</u>
3/8 Inch	100
No. 4	95 - 100
No. 8	80 - 100
No. 16	50 - 85
No. 30	25 - 60
No. 50	10 - 30
No. 100	2 - 10

Coarse Aggregate:

Coarse aggregate shall conform to the requirements of Section 725, except that it shall conform to the following gradation:

<u>Sieve Size</u>	<u>Percent Passing</u>
1/2 Inch	100
3/8 Inch	85 - 100
No. 4	10 - 30
No. 8	0 - 10
No. 16	0 - 5

**Admixtures:**

Admixtures may be used with the concrete and shall conform to the requirements of Section 725.

**Reinforcing Steel:**

Reinforcing steel bars or welded wire fabric shall conform to the requirements of Section 727 and shall be placed as indicated on the contract plans.

**Equipment:**

Equipment for use with the wet-mix process shall be the pneumatic feed type; however, a positive displacement type may be used if permitted in writing by the Engineer. The pneumatic feed type shall be capable of discharging the premixed concrete accurately, uniformly and continuously through the delivery nose and to the gunning nozzle. The nozzle shall be fitted with an air ring for injecting additional compressed air into the premixed material flow. The size of the delivery hose shall be within the range of 1 1/4 to 2 1/2 inches.

**Air Supply:**

The air compressor shall have ample capacity to furnish an adequate supply of clean dry air for maintaining sufficient nozzle velocity for all phases of the work while simultaneously operating a blow pipe for clearing away the rebound. The air hose shall be equipped with a filter to prevent any oil or grease from contaminating the shotcrete.

A constant air pressure of not less than 80 pounds per square inch shall be maintained at the nozzle when using the wet-mix process and when the delivery hose length is 100 feet or less. The pressure shall be increased at least five pounds per square inch for each additional 50 feet of hose or fraction thereof.

**526.3 - Construction Requirements:**

**Concrete:**

The Contractor shall determine the mix proportions and shall

furnish concrete for pneumatic placement which contains a minimum of 658 pounds of Portland Cement per cubic yard of concrete, and which attains a minimum 28 day compressive strength of 3000 psi. Fine aggregate and coarse aggregate shall conform to the requirements of Subsection 526.2. The total mix shall contain, by weight, 15 to 20 percent coarse aggregate as a percent of total aggregate in the mix. In no case shall the slump be greater than four inches.

If ready-mixed concrete is used, it shall conform to the requirements of ASTM C94.

#### Preparation of Surfaces:

The surfaces on which shotcrete is to be placed shall be finely graded to the lines and grades shown on the project plans or established by the Engineer. The surfaces shall be thoroughly compacted and shall be uniformly moistened so that water will not be drawn from the freshly placed shotcrete.

#### Forms and Ground Wires:

Forms shall be of plywood sheathing or other suitable material and shall be true to line and grade and sufficiently rigid to resist deflection during placement of the shotcrete. Forms shall be constructed to permit the escape of air and rebound during the gunning operations.

Ground or gauging wires shall be installed where necessary to establish the thicknesses, surface planes, and finish lines of the shotcrete.

#### Steel Reinforcement:

Steel reinforcement shall be as shown on the project plans and shall conform to the requirements of Subsection 505.5 of the Standard Specifications.

#### Placement:

The velocity of the shotcrete as it leaves the nozzle shall be maintained uniform and at a rate approved by the Engineer for the given job conditions. The nozzle shall be held nearly perpendicular to the working surface and at a proper distance, generally between two and five feet, to insure maximum compaction with minimum rebound of the shotcrete.

Rebound or previously expended material in the shotcrete mix shall not be used in any portion of the work. All rebound shall be removed prior to final set and before placement of the shotcrete on adjacent surfaces.

Shotcrete shall not be applied during any precipitation which is of sufficient intensity to cause the in-place shotcrete to run. Shotcrete shall not be applied during wind conditions that cause separation of the nozzle flow.

Shotcrete shall not be applied when a descending ambient air temperature falls below 40 degrees F or until an ascending air temperature rises above 35 degrees F. Temperature shall be taken in the shade away from artificial heat.

#### Quality Control Testing:

Tests to determine the physical quality of the shotcrete will be performed by the Engineer during the work. Test panels and cores shall be prepared and cured by the Contractor.

Four test panels at least 24 inches square and at least 6 inches thick shall be prepared for each 50 cubic yards or each half-day's placement, whichever results in the greater number, by gunning shotcrete mix on to a piece of plywood form. One core shall be taken from the center of each panel for compressive strength tests and for visual examination. Cores shall have a minimum diameter of three inches and an L/D of at least one. The cores shall not be taken from the panels until the panel shotcrete has been cured for 14 days.

The cores will be tested for a minimum compressive strength of 3000 psi at 28 days. Core strengths will be corrected for L/D as specified in ASTM C42.

Conditions for compressive strength acceptance shall be as specified under Subsection 120.2 of these Special Provisions.

The cut surfaces of the test specimens will be carefully examined for soundness and uniformity of the material and shall be free from laminations and sand pockets.

#### Construction Joints:

Expansion joints one-quarter inch wide and three-quarters inch deep shall be formed or tooled in shotcrete ditch lining. The joints shall be transverse to the direction of ditch flow and shall be spaced not less than eight feet and not more than twelve feet apart.

#### Finishing:

After the shotcrete has been placed as nearly as practicable to the required thickness and shape outlined by forms and ground

wires, the surface shall be checked with a straightedge and any low spots or depressions shall be brought up to proper grade by placing additional shotcrete in such a manner that the finished surface shall be smooth and uniform.

Surfaces of existing concrete or shotcrete against which new shotcrete is to be placed shall be thoroughly cleaned and moistened immediately prior to placing the new shotcrete. Construction joints shall be constructed as shown on the plans.

**Curing:**

The shotcrete surfaces, and the shotcrete test panels surfaces, shall be kept continuously moist for at least seven days, beginning immediately after finishing, by means of either a water spray or fog system capable of being applied continuously or by liquid membrane-forming compound or by polyethylene sheeting conforming to the requirements specified in ASTM C171 for Moisture Loss and for Thickness. If polyethylene sheeting is used, it shall be white opaque and adjoining sheets shall overlap at least 12 inches and the laps secured to provide an airtight and windproof joint. If liquid membrane-forming compound is use, it shall be Type I conforming to the requirements of ASTM C309 and the application rate shall be 100 square feet per gallon.

**526.4 - Method of Measurement:**

Shotcrete will be measured by the cubic yard computed between the limits shown on the plans or limits otherwise directed by the Engineer.

**526.5 - Basis of Payment:**

Payment for shotcrete will be made at the Contract unit price per cubic yard, complete in place, including welded wire fabric, joint construction, and all other materials, labor, tools, and equipment and performing all work necessary to complete the item in accordance with the details shown on the plans, the requirements of the Standard Specifications and Special Provisions, and directions of the Engineer. Ditch excavation will be paid for as Channel Excavation in accordance with the requirements of Section 203. No separate payment will be made for ditch embankment. Reinforcing steel, with the exception of welded wire fabric but including dowels, will be paid at the Contract unit price per pound, complete in place.

Any Contract unit price adjustments for compressive strength deficiencies will be made in accordance with the requirements of Subsection 725.11 of the Standard Specifications and Subsection 120.2 off these Special Provisions.

## SECTION 618 - STORM DRAIN CONSTRUCTION WITH CONCRETE PIPE

In addition to the requirements of the Standard Specifications:

### 618.1 - Description:

The work under this section shall consist of furnishing and installing reinforced concrete pipe, at the locations and to the grades and slopes indicated on the plans. Work shall also include the removal and relocation of an existing 48" RCP Storm Drain, owned by the Arizona Department of Transportation, within the limits indicated on the plans including salvage of pipe and the reinstallation of 73+ linear feet on the new alignment shown on the plans, and including backfilling of the trench from which the existing 48" RCP is removed.

### 618.2 - Construction Methods:

Reinforced concrete pipe bedding for the relocated 48" RCP shall conform to the requirements indicated on the plans. Care shall be taken to avoid damage to the existing 48" RCP during excavation and removal. Damage to the pipe caused by the Contractor's operations and/or methods shall be repaired or replacement pipe provided at no additional cost to the Flood Control District. The Contractor shall dispose of the excess 48" RCP not needed for the relocation.

### 618.5 - Measurement:

Reinforced concrete pipe will be measured by the linear feet of pipe laid, measured along the pipe invert. Relocated 48" RCP will be measured by the linear feet of pipe laid on the new alignment, measured along the pipe invert.

### 618.6 - Payment:

Reinforced concrete pipe and relocated 48" RCP will be paid for at the Contract unit price per linear foot as provided above, for each size and strength of pipe, complete in place.

These prices shall be compensation in full for furnishing and installing, or relocating, the various items as specified and shown on the plans, including: removal of obstructions and structures, and construction of brick and mortar plugs in 60-inch RCP's; materials; labor; excavation; removal, salvage and disposal of existing 48" pipe; handling of existing 48" pipe; shoring; bedding; backfilling; compacting; water; testing; joint materials; joining; collars; field closures; and all other items incidental to the work.

## SECTION 901 - MOBILIZATION

### 901.1 - Description:

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

### 901.2 - Method of Measurement:

Mobilization will be measured for payment by the lump sum as a single complete unit or work.

### 901.3 - Basis of Payment:

The amount bid for mobilization shall not exceed three percent (3%) of the total Contract bid price excluding the bid price for mobilization,. Should the bidder exceed the foregoing three percent (3%), the Flood Control District will make the necessary adjustment to determine the total amount bid based on the arithmetically correct Proposal.

The amount bid shall include the furnishing and maintaining of services and facilities noted under Subsection 901.1 - Description, to the extent and at the time the Contractor deems them necessary for his operations, consistent with the requirements of the work and the Contract.

The amount bid shall be payable to the Contractor whenever he shall have completed ten percent (10%) of the contract work. For the purposes of this item, 10% of the work shall be considered completed when the total of payments earned, as reflected by estimates of the work done, as set forth in Subsection 109.7 - Payment for Bond Issue and Budget Projects, not including the amount bid for this work, shall exceed 10% of the total amount of the Contractor's bid for this Contract.

Unless provided for elsewhere, the cost of required insurance, bonds, and permits and/or any initiation of the Contract work may be included in this work.

The adjustment provisions in Section 104 and the retention of funds provisions in Section 109 shall not apply to the item of Mobilization.

When other Contract items are adjusted as provided in Section 104, and if the costs applicable to such items of work include mobilization costs, such mobilization costs will be considered as

recovered by the Contractor in the lump sum paid for mobilization, and will be excluded from consideration in determining compensation under Section 104.

## SECTION 902 - FIELD OFFICE

### 902.1 - Description:

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

The office shall be a building or mobile trailer, meeting the requirements specified, which shall be erected at a location convenient to the Project. The office may be in the same building or mobile trailer as office space of the Contractor, provided that such office is separated from the area used by the Contractor by a wall or door with an adequate locking device and has at least two doors to the outside.

The Contractor may furnish equivalent facilities in an existing building provided such facilities and buildings are located to provide convenient service.

### 902.2 - Facilities:

General Construction: The Field Office shall be an approved and weatherproof building or mobile trailer meeting the specified requirements. The structures shall have a minimum ceiling height of seven (7) feet and shall be provided with weatherproof doors equipped with adequate locking devices. Windows shall also be provided with adequate locking devices.

#### 902.2.1 - General Requirements

- (A) Lighting - Electric light, non-glare type luminaires to provide a minimum illumination level at desk height level.
- (B) Heating & Cooling - Adequate electrically powered equipment to maintain an ambient air temperature of 72 degrees F plus or minus 8 degrees.
- (C) Telephones - Two telephones with separate numbers linked with conference call capability for the exclusive use of the Engineer. Long distance phone calls made on these lines will be paid for by the Flood Control District.
- (D) Toilet - A commode and wash sink in a separately enclosed room within the building or mobile trailer, properly ventilated and complying with applicable sanitary codes. Contractor shall provide water service.

- (E) Maintenance - The Contractor shall maintain all facilities and furnished equipment in good working condition.
- (F) Fire Extinguisher - Two non-toxic, dry chemical, fire extinguishers meeting Underwriters Laboratories, Inc. approval for Class A, Class B, and Class C fires with a minimum rating of 2A: 10B: 10C.
- (G) Contractor shall provide electric power.

#### 902.2.2 - Specific Requirements:

In addition to the general requirements, the office shall have a minimum of 500 square feet of clear floor space, excluding the toilet area, with at least two outside doors. The furnishings shall be as follows:

- 4 - Suitable office desks with drawers, locks and keys.
- 4 - Office chairs, padded swivel type.
- 1 - Drafting table, adjustable height, 3 feet by 6 feet.
- 1 - Table, 2 1/2 feet by 6 feet, conference type.
- 4 - Folding chairs, padded metal for conference use.
- 1 - Draftsmans stool.

#### 902.3 - Construction Details:

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

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

#### 902.4 - Payment:

Payment will be on the basis of the Lump Sum contract price for Field Office. Incremental payment of 1/10 the Lump Sum shall be made for each month of occupancy by the Engineer during the period of Contract until the full lump sum price has been paid. Payment will begin the first month that the office is fully equipped, serviced as specified, and made available for occupancy. In the

event that final acceptance of Contract work occurs before the tenth Contract month, the Engineer will authorize payment of the full balance of the Lump Sum price upon final acceptance.

No payment will be made for occupancy and services during periods of Contract extension of time where engineering charges are assessed.

The Lump Sum price shall include full compensation for the cost of all labor, material, equipment, ground rental and utility charges (including monthly service charges, but excluding charges for long distance phone calls) necessary to complete the work.

## SECTION 903 - CONSTRUCTION SURVEYING AND LAYOUT

### 903.1 - Description:

The work under this section shall consist of furnishing all materials, personnel, and equipment, and of performing all work of surveying, except surveying for control points and right-of-way points specifically designated herein to be provided by the Engineer, required to construct all elements of the project as shown on the Plans, specified in the Contract Documents, or as directed by the Engineer. This shall include, but shall not be limited to stake out, layout, and elevations for roadways, channels, bank protection, pipes, structures, forms and appurtenances as shown and required, consistent with the current practices of the Flood Control District. The work shall be performed by competently qualified personnel acceptable to the Engineer. All surveying work shall be done under the direction of a registered land surveyor employed by the Contractor.

The Engineer will survey, stake and/or monument, and provide to the Contractor, on the date of construction notice to proceed, the following survey points which are shown on the plans:

1. All channel right-of-way angle points.
2. All temporary construction easement angle points.
3. All channel control line angle points.
4. All east levee and west levee P.C. points, P.T. points and angle points.

Measurement of all items pay quantities will be the responsibility of the Engineer.

When utility adjustments are a part of the Contract, the Contractor shall perform all layout work and set all control points, stakes, and references necessary for carrying out all such adjustments.

### 903.2 - Materials, Personnel and Equipment:

The Contractor shall not employ or engage the services of any person or persons in the employ of the Flood Control District or its designated agent on the project for the performance of any of the work as described herein.

Materials and equipment shall include, but not necessarily limited to, vehicles for transporting personnel and equipment; properly adjusted and accurate survey equipment; straightedges, stakes, flagging, and all other devices necessary for checking, marking, establishing, and maintaining lines, grades, and layout to perform

the work called for in the Contract. The Contractor shall furnish competent personnel to perform the survey work and layout.

The Contractor shall furnish all necessary traffic control including flagging for the Contractor's survey and staking operations. Traffic control shall be in accordance with the requirements of Section 401 of the Standard Specifications.

#### 903.3 - Survey Records:

The Contractor shall keep complete field notes for all surveying performed, including layout surveys, bench mark and temporary bench mark surveys, cut staking and fill staking, slope staking, and grade staking. The Contractor shall submit copies of all survey field notes and recorded survey data to the Engineer within seven (7) calendar days after the surveying is performed.

The type of field book used for recording data and field notes shall be approved by the Engineer prior to use. Field notes, maps of survey, etc. shall be stamped by a registered land surveyor and all set monuments shall be tagged or stamped pursuant to Arizona Revised Statute 32-101, Article 5. All field notes, sketches, etc. shall be neat, well organized and legible. Erasures shall not be permitted in the field book. If it is determined that the original figure is incorrect, a line shall be drawn through it and the correction shall be made above it.

#### 903.4 - Construction Requirements:

The Contractor shall protect and save from harm all survey points provided by the Engineer. The Contractor shall replace and/or restore all Engineer-provided survey points which are removed, damaged or disturbed by any cause after the date of construction notice to proceed.

Prior to beginning any survey operations, the Contractor shall furnish to the Engineer for his approval, a written outline detailing the method of staking and marking of stakes, grade control for various courses of materials, referencing, structure control, etc.

The Contractor shall trim trees, brush, and other interfering objects, not inconsistent with the plans, from survey lines in advance of all survey work to permit accurate and unimpeded work by his stake-out survey crews.

The locations and lengths shown on the plans for pipes shall be considered to be approximate. The ordering lengths for pipes shall be determined after the Contractor accurately stakes the

proposed pipes and associated embankment slopes in the planned locations. After staking each pipe, and before ordering the pipe, the Contractor shall inform the Engineer that the staking has been performed and is ready for the Engineer's review and approval. The Contractor shall obtain the Engineer's written approval of the ordering lengths prior to completing the orders.

The exact position of all work shall be established from control points, baseline transit points, or other points of similar nature which are shown on the plans and/or modified by the Engineer. Any error, apparent discrepancy, or absence in or of data shown or required for accurately accomplishing the stake-out survey shall be referred to the Engineer for interpretation or furnishing when such is observed or required.

The Contractor shall place two offset stakes or references at each station of the channel control line, west levee control line, east levee control line, and the temporary easement control line, and at such intermediate locations as the Engineer may direct. From computations and measurements made by the Contractor, these stakes shall be clearly and legibly marked with the correct station number, offset and cut or fill so as to permit the establishment of the exact station and line location and elevation during construction. If markings become faded or blurred for any reason the markings shall be restored by the Contractor when directed by the Engineer. The Contractor shall locate and place all cut, fill, slope, fine grade, or other stakes and points, as the Engineer may direct for the proper progress of the work. All control points shall be properly guarded and flagged for easy identification.

Drainage structures and associated embankment slopes shall be staked out by the Contractor at the locations and elevations shown on the plans. Before starting excavation, forming or reinforcing steel placement for drainage structures the Contractor shall inform the Engineer that the staking has been completed and is ready for the Engineer's review and approval. The Contractor shall obtain the Engineer's written approval of the staking before proceeding with the construction.

Structures shall be accurately profiled and structure control points shall be set and checked to assure the proper construction or installation of each structure. Profiles shall be approved by the Engineer prior to constructing or installing each structure. All profile survey data shall be entered in field books and preserved as a permanent project record.

All required rights-of-way and easement limits shall be established, staked, and referenced by the Contractor from the points provided by the Engineer, concurrent with the construction stake-

out survey. Spacing of Contractor's right-of-way and easement stakes shall not exceed two hundred (200) feet. Rights-of-way and easement limits shall be staked by or under the direction of a registered land surveyor. The Contractor shall supply proof to the Engineer that such work is being performed by or supervised by a registered land surveyor.

Bench marks for borrow pits shall be established by the Contractor.

Permanent survey marker locations, if required, shall be established and referenced by the Contractor.

The Contractor shall be responsible for the accuracy of his work and shall maintain all reference points, stakes, etc. throughout the life of the contract. Damaged or destroyed points, bench marks or stakes, or any reference points made inaccessible by the progress of the construction shall be replaced or transferred by the Contractor. Any of the above points, which may be destroyed or damaged shall be transferred by the Contractor before they are damaged or destroyed. All control points shall be referenced by ties to acceptable objects and recorded. Any alterations or revisions in the ties shall be so noted and the information furnished to the Engineer immediately. All stake-out survey work shall be referenced to the control lines shown on the Plans. All computations necessary to establish the exact position of the Contractor. All computation, survey notes and other records necessary to accomplish the work shall be neatly made. The originals of such computations, survey notes, and other records shall become the property of the Flood Control District and shall be delivered to the Engineer not later than the date of acceptance of the work.

Any discrepancies in grade, alignment, earthwork quantities, locations, and/or dimensions detected by the Contractor shall immediately be brought to the attention of the Engineer. No changes in the project plans will be allowed without the approval of the Engineer and a supplemental agreement to the contract.

During the progress of the construction work, the Contractor will be required to furnish all of the surveying and stake-out incidental to the proper location by line and grade for each phase of the work. For any operation requiring extreme accuracy, the Contractor shall restake with pins or other acceptable hubs located directly adjacent to the work at a spacing directed by the Engineer.

Any existing stakes, iron pins, survey monuments, or other markers defining property lines which might be disturbed during construction, shall be properly tied into fixed reference points before being disturbed and shall be accurately reset in their proper position upon completion of the work.

903.5 - Method of Measurement:

Construction surveying and layout will be measured as a single complete unit of work.

Two and three person survey party will be measured by the hour to the nearest half hour.

903.6 - Basis of Payment:

Payment for construction survey and layout will be by the lump sum and will be made as follows:

For each of the first and second months of the contract, a payment in the amount of either \$10,000.00 or 15 percent of the contract amount bid for construction survey and layout, whichever is the lesser amount, will be made.

Ninety percent of the remaining contract amount for construction survey and layout will have been paid when 80 percent of the total contract amount, excluding the items of construction surveying and layout, and mobilization, has been paid. The 90 percent will be paid on a monthly basis prorated on the basis of the Contractor's progress.

The remaining portion of the contract amount bid for construction survey and layout will be paid upon completion and acceptance of the contract work.

The total amount to be paid under the item of construction surveying and layout shall not exceed the contract amount bid for that item.

The items of two and three person survey party are established for the purpose of compensating the Contractor for additional staking and layout required as a result of extra work ordered by the Engineer.

The Engineer will be the sole judge as to whether the additional work shall be performed by the Contractor or by the Flood Control District.

The amount bid per hour for a two-person or three-person survey party shall include the cost of all materials, equipment, labor, subsistence, and benefits necessary to complete the extra work. The amount bid shall include the cost necessary to mobilize the crews and the travel time to and from the project for one time only, for each instance of extra work required.

Payment for traffic control and flagging required for surveying and layout shall be considered as included in the lump sum amount bid for construction surveying and layout. Traffic control and flagging necessary because of the additional staking and layout required as a result of extra work ordered by the Engineer, shall conform to the requirements of Section 401 - Traffic Control. No direct payment will be made for traffic control, its cost being considered incidental to the survey work.

No payment will be made for resetting of stakes, references, bench marks, and other survey control.

Payment will be made as follows:

<u>Pay Item</u>	<u>Pay Unit</u>
Construction Surveying and Layout	Lump Sum
Two-Person Survey Party	Hour
Three-Person Survey Party	Hour

**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:

\_\_\_\_\_



CONTRACT FCD 85-37

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 85-37  
Agua Fria River Improvements; Buckeye Road to I-10  
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 85-37

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

WHEREAS, the Principal has entered into a certain written contract with the Obligee, dated the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, for \_\_\_\_\_

\_\_\_\_\_ 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 85-37  
PAYMENT BOND

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 \_\_\_\_\_

\_\_\_\_\_ 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\_\_\_\_.

\_\_\_\_\_  
PRINCIPAL SEAL

\_\_\_\_\_  
AGENCY OF RECORD

BY: \_\_\_\_\_

\_\_\_\_\_  
AGENCY ADDRESS

\_\_\_\_\_  
SURETY SEAL

BY: \_\_\_\_\_

CONTRACT NO. FCD 85-37  
PERFORMANCE BOND

\_\_\_\_\_  
POWER OF ATTORNEY SEAL

BY: \_\_\_\_\_

INDEMNIFICATION AND INSURANCE

It is further agreed that:

- a. Contractor shall indemnify, defend and save harmless the Flood Control District of Maricopa County and/or any of its agents, officials and employees, from any and all claims, demands, suits, actions, proceedings, loss, cost, and damages, including any attorney's fees and/or litigation expenses, which may be brought or made against or incurred by the Flood Control District of Maricopa County on account of loss of or damage to any property or for injuries to or death of any person, caused by, arising out of, or contributed to, in whole or in part by reasons of any alleged negligent act, professional error or omission, or negligence of Contractor, its employees, agents, representatives, or subcontractors, their employees, agents or representatives in connection with or incident to the performance of this Agreement, or arising out of Workers' Compensation claims, Unemployment Compensation Claims or Unemployment Disability Compensation Claims of Employees of Contractor and/or its Subcontractor or claims under similar such laws or obligations. Contractor's obligation under this Section shall not extend to any liability caused by the negligence of the Flood Control District of Maricopa County, or its employees.
  
- b. The Contractor shall provide and maintain, and cause its subcontractors to provide and maintain, the following minimum insurance coverage:
  - (1) Comprehensive General Liability Insurance with the minimum combined single limit of Fifteen Million Dollars (\$15,000,000) each occurrence. The policy shall include coverage for bodily injury and personal injury, broad form property damage, blanket contractual, contractor's protective and products and completed operations.
  
  - (2) Comprehensive Automobile Liability Insurance with a combined single limit for bodily injury and property damage of not less than Five Million Dollars (\$5,000,000) each occurrence with respect to Contractor's vehicles (whether owned, hired, non-owned), assigned to or utilized in the performance of this Contract.
  
- c. The policies required by Sections b(1) and (2) shall name the Flood Control District of Maricopa County, its agents, officials and employees as additional insured and shall specify that the insurance afforded Contractor shall be primary insurance and that any insurance coverage carried by the Flood Control District of Maricopa County, shall be excess coverage and not contributory insurance to that provided by the Contractor. Said policy shall contain a severability of interest provision.

d. Failure on the part of the Contractor to procure and maintain the required liability insurance and provide proof thereof to the Flood Control District of Maricopa County within Thirty (30) days following commencement of a new policy, shall constitute a material breach of the contract upon which the District may immediately terminate this Agreement. Prior to the effective date of this Contract, the Contractor shall furnish the Flood Control District of Maricopa County with copies of a Certificate of Insurance drawn in conformity with the above insurance requirements. The Flood Control District of Maricopa County reserves the right to request and receive certified copies of any or all of the above policies and/or endorsements.

\_\_\_\_\_

Date

\_\_\_\_\_

Contractor

SOUTHERN PACIFIC TRANSPORTATION COMPANY  
INSURANCE FORM

Southern Pacific Transportation Company

INSURANCE REQUIREMENTS FOR CONTRACTORS (Form 7345)

1. Comprehensive General Liability With Contractual Liability Endorsement
  - Combined single limit of at least \$2 million.
  - Railroad is named as additional insured.
  - Contractual liability endorsement must have exclusions for operations within 50 feet of a railroad and for XCU hazards deleted.
  - Railroad must have 30 days notice of cancellation or modification.
  
2. Comprehensive Automobile Liability Policy
  - Combined single limit of at least \$2 million.
  - Railroad is named as additional insured.
  - Railroad must have 30 days notice of cancellation or modification.
  
3. A certificate of insurance to which is attached, an endorsement in the form of Railroad's Form 7345-B will be acceptable in lieu of a certified copy of the policy in all states except Texas. When a certified copy of the policy is submitted, review will be expedited if the following items are marked with a tab or a paper clip:
  - The page showing the limits on the policy.
  - Endorsement showing Railroad named as additional insured and requiring that Railroad be given 30 days notice of cancellation or modification.
  - Contractual liability endorsement.
  - Endorsement removing exclusions from contractual liability endorsement for operations within 50 feet of a railroad and for XCU hazards.

COMPREHENSIVE GENERAL AND AUTOMOBILE LIABILITY ENDORSEMENT

Attached to certificate of insurance for and hereby certified to be part of the following policy or policies having the following expiration dates:

Policy No.	Company Providing Policy	Expiration Date
------------	--------------------------	-----------------

The scope of the insurance afforded by the policy(ies) designated in the attached certificate is not less than that which is afforded by the Insurance Service Organizations or other "Standard Provisions" forms in use by the insurance company in the territory in which coverage is afforded.

Such Policy(ies) provide for or are hereby amended to provide for the following:

1. The named insured is \_\_\_\_\_
2. SOUTHERN PACIFIC TRANSPORTATION COMPANY

("Railroad")\* is included as an additional insured with respect to liability arising out of the hazards or operations under ALL AGREEMENTS entered into between the named insured and Railroad, whether or not liability is attributable to negligence of the named insured or Railroad. In the event it is intended that this endorsement is applicable to only one agreement, the agreement is described as follows:

The insurance provided hereunder applies as though separate policies are in effect for both the named insured and Railroad.

3. The limits of liability under the policy(ies) are not less than those shown on the certificate to which this endorsement is attached.
4. Cancellation or material reduction of this coverage will not be effective until thirty (30) days following written notice to:

Mr. W. C. Dunn  
 Division Engineer  
 Southern Pacific Transportation Co.  
 400 East Toole Avenue  
 Tucson, Arizona 85701

Address By registered or certified mail

5. Contractual liability coverage for liability assumed by this insured under said agreement or agreements with Railroad.
6. This insurance is primary and insurer is not entitled to any contribution from insurance in effect for Railroad.
7. All policy or endorsement limitations relating specifically to operations on or near railroad property are eliminated.
8. Broad Form Property Damage endorsement.
9. So-called X, C and U (or similar) limitations are not effective as respects operations by or for the named insured on or adjacent to Railroad's property.
10. In the event of reduction or exhaustion of the applicable aggregate limit or limits of liability under the primary policy or policies referred to in the attached certificate of insurance solely by reason of losses paid thereunder on account of occurrences during the policy period, the excess policy, if any, referred to herein shall (i) in the event of reduction, apply as excess of the reduced limit of liability thereunder; and (ii) in the event of exhaustion, continue in force as though it were primary insurance.

The term "Railroad" includes successors, assigns and affiliated companies of Railroad and affiliates thereof, and other railroad company operating upon or over Railroad's tracks with Railroad's permission, and the officers, employees and agents of any of the foregoing.

\_\_\_\_\_  
Insurance Company

Date: \_\_\_\_\_, 19\_\_\_\_

By \_\_\_\_\_  
Signature of Authorized Representative

## CONTRACTOR'S RIGHT OF ENTRY

This Agreement, dated \_\_\_\_\_, 19\_\_\_\_, by and between \_\_\_\_\_  
\_\_\_\_\_, a corporation, herein called "Railroad", and \_\_\_\_\_  
\_\_\_\_\_, herein called "Contractor": \_\_\_\_\_

### Witnesseth:

1. For the period not to extend beyond \_\_\_\_\_, 19\_\_\_\_,  
Railroad hereby permits Contractor to enter upon the property of Railroad in the vicinity of \_\_\_\_\_  
\_\_\_\_\_ as may be necessary in connection with work to be performed on Railroad premises by Contractor under agreement  
with \_\_\_\_\_, and for no other purpose.

2. Contractor agrees to

(a) Perform that portion of the work on Railroad premises in accordance with plans and specifications approved by Railroad in such manner and at such times as shall not endanger or interfere with Railroad's operations and in accordance with the regulations of Railroad and instructions of Railroad's representative. Contractor shall submit to Railroad for approval all construction details, falsework and other incidentals not detailed in plans, insofar as they affect Railroad.

(b) Maintain, at Contractor's expense, competent flagmen to protect and control movement of vehicles and equipment of Contractor while upon Railroad premises.

(c) Notify Railroad at least five (5) working days before commencing work on Railroad premises and within five (5) working days after such work is completed

(d) Keep all equipment, tools and materials stored at least fifteen (15) feet from the center line of any operable track. Explosives or other highly inflammable substances will not be stored on Railroad premises without the prior approval of Railroad's representative.

(e) Remove all of Contractor's tools, equipment and materials from Railroad premises promptly upon completion of work, restoring Railroad premises to the same state and condition as when Contractor entered thereon.

(f) Reimburse Railroad for all cost and expense incurred by Railroad in connection with said work, including without limitation the expense of furnishing such inspectors, watchmen and flagmen as Railroad deems necessary, the installation and removal of falsework beneath tracks, and restoration of Railroad's property to the same condition as when Contractor entered thereon, or to a condition satisfactory to Railroad's representative.

(g) Remove any lien against Railroad's property arising from performance of work hereunder by Contractor or any subcontractor.

3. Contractor agrees to release, defend and indemnify Railroad from and against all loss, damage, claims, costs, expenses and liability for bodily injury to or death of any persons and loss of or damage to any property and loss of use thereof (including but not limited to employees, subcontractors, agents, invitees and the property of each party hereto) arising out of or in any way connected with the work under said agreement upon or adjacent to Railroad property, whether or not caused or contributed to by the presence or operation of Railroad trains, engines, cars or other equipment, structures or facilities of Railroad or any other party, or by negligence or alleged negligence on the part of any of Railroad's agents, employees, contractors, subcontractors or invitees. In the event any part of the provisions of this section are determined by any statutory enactment or judicial decision to be void or unenforceable, then this section shall not fail in its entirety but will be enforceable to the extent permitted by law. For the purposes of this section, the term "Railroad" shall include any other railroad company using Railroad property with Railroad's consent and any affiliate, subsidiary or lessor of Railroad.

4. Prior to the start of work or occupancy of premises under this agreement, Contractor agrees to procure and maintain, at its sole cost and expense, the following kinds of insurance with an insurer or insurers and form satisfactory to Railroad:

Comprehensive general and automobile liability insurance with contractual liability endorsement and products and completed operations hazards included, which shall provide coverage for limits of not less than \$2,000,000 bodily injury liability and property damage liability, combined single limits.

Contractor agrees to furnish Railroad with a certificate of insurance to which will be attached an endorsement, the form of which is included as a separate part of this agreement, marked Exhibit "A". Liability of Contractor under Section 3 hereof shall not be limited to coverage provided under said insurance policies.

5. Contractor shall deposit with Railroad the sum of \_\_\_\_\_

Dollars (\$\_\_\_\_\_) representing the estimated expense to be incurred by Railroad in connection with said work.

If there is no amount indicated in the blank space provided above for the deposit to be made by Contractor, in lieu of such deposit Contractor shall cause the attached surety bond to be executed by a reliable surety acceptable to Railroad, condition upon the faithful performance of the provisions of this agreement.

6. The permission herein given shall not be assigned by Contractor without the prior written consent of Railroad, except in the case of subcontractors who shall be deemed agents of Contractor subject to the terms of this agreement.

7. No vehicular crossing over Railroad's track shall be installed or used by Contractor without prior written permission of Railroad.

8. No work shall be done between the hours of 6:00 p.m. and 6:00 a.m., nor on Saturdays, Sundays or legal holidays without prior written permission of Railroad.

9. At request of Railroad, Contractor shall remove from Railroad premises any employee of Contractor or any subcontractor who fails to conform to the instructions of Railroad's representative in connection with work on Railroad premises, and any right of Contractor to enter upon Railroad premises shall be suspended until such request of Railroad is met. Contractor shall indemnify Railroad against any claim arising from the removal of any such employee from Railroad premises.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed in duplicate the day and year first above written.

RAILROAD

By \_\_\_\_\_  
(TITLE)

CONTRACTOR

By \_\_\_\_\_  
(TITLE)