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SPECIAL PROVISIONS
FOR

RWCD FLOODWAY BOX CULVERT
APACHE BOULEVARD AT HIGLEY ROAD
MESA, ARIZONA

CONTRACT NO. FCD 86-16



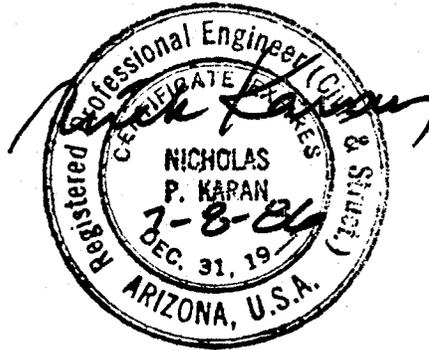
SUPPLEMENTARY TO MARICOPA ASSOCIATION OF GOVERNMENTS UNIFORM STANDARD
SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION EDITION OF 1979 AND REVISIONS
AND SUPPLEMENTS THERETO.

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SPECIAL PROVISIONS
FOR

RWCD FLOODWAY BOX CULVERT
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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 86-16

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INVITATION FOR BIDS
(Construction Contract)

Project:
RWCD Floodway Box Culvert
Apache Boulevard at Higley Road

Ref. Invitation FCD 86-16
Date: July 14, 1986
Issued by: Flood Control District
Maricopa County

Location:

Intersection of Apache Boulevard
(Main Street - U.S. 60) and Higley Road
in the City of Mesa, Arizona

SEALED BIDS, IN SINGLE COPY FOR THE WORK DESCRIBED HEREIN WILL BE RECEIVED UNTIL 2:30 P.M. LOCAL TIME AT THE PLACE OF THE BID OPENING, AUGUST 5, 1986, IN THE OFFICE OF THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, 3335 WEST DURANGO STREET, PHOENIX, ARIZONA 85009, AND AT THAT TIME PUBLICLY OPENED.

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 work consists of construction of a 5- 10' X 7' reinforced concreted box (RCB) culvert crossing Apache Boulevard and Higley Road; road approaches and improvements, temporary detours, off-site drainage including an 8' X 6' RCB, trap channel, 72" storm drain, spillway, signalization; etc., and relocation of all utilities which conflict with the proposed construction.

THE WORK SHALL COMMENCE WITHIN SEVEN (7) CALENDAR DAYS AND BE COMPLETED WITHIN ONE HUNDRED EIGHTY (180) 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.

A PRE-BID CONFERENCE WILL BE HELD ON JULY 23, 1986, AT 10:00 A.M. IN THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY CONFERENCE ROOM, 3335 WEST DURANGO STREET.

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

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
INVITATION FOR BIDS, FCD 86-16
INSTRUCTIONS TO BIDDERS

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

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

INVITATION FOR BIDS
NO. FCD 86-16

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

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

Unless called for, alternate bids will not be considered.

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

6. Submission of Bids. Bids must be sealed, addressed to the Chief Engineer and General Manager, Flood Control District of Maricopa County, 3335 West Durango, Phoenix, Arizona 85009, and marked to identify the bid to the referenced Contract FCD Number. Failure to appropriately identify the bid may result in a premature opening of, or a failure to open, such bid. The name of the bidder shall be on the outside of the envelope. (See MAG 102.9).
7. Withdrawal of Bids or Modifications. Bids may be withdrawn by written request received from the bidder prior to the time set for 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, FCD 86-16
 SPECIAL INSTRUCTIONS TO BIDDERS

Location of the Work

Intersection of Apache Boulevard (Main Street - U.S. 60) and Higley Road in the City of Mesa, 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 \$15.00 by check payable to the FLOOD CONTROL DISTRICT OF MARICOPA COUNTY. This payment will not be refunded.

APPROXIMATE QUANTITY

<u>QUANTITY</u>	<u>UNIT</u>	<u>DESCRIPTION</u>
2,320	L.F.	Curb & Gutter
355	L.F.	Water-Storm Drain
372	L.F.	5- 10' X 7' R.C.B.
13.5	L.F.	Ext. Exist. 2- 8' X 5'
124	L.F.	8' X 6' R.C.B.
886	S.Y.	Trapezoidal Channel
374	L.F.	72" R.C.P.
3,099	Ton	Asphalt Concrete
3,113	Ton	Aggregate Base
4,132	Ton	Select Material
10,992	S.F.	Sidewalk

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 ELLIG, CLERK
 BOARD OF DIRECTORS
 FLOOD CONTROL DISTRICT OF
 MARICOPA COUNTY

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
(Construction Contract)

BID FORM

Project: RWCD Floodway Box Culvert Invitation FCD 86-16
 Apache Boulevard at Higley Road Date: July 14, 1986

Location: Intersection of Apache Boulevard
 (Main Street - U.S. 60) and Higley Road
 in the City of Mesa, 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 Bidding Schedule.

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

The Undersigned certifies that the approved Plans, Uniform Standard Specifications for Public Works Construction, 1979 Edition (MAG) and revisions and supplements thereto, together with the Special Provisions, forms of Contract and Bond authorized by the Board of Directors and constituting essential parts of this Proposal, have been carefully examined, and also that the site of the work has been personally inspected.

The Undersigned declares that the amount and nature of the work to be done is understood and that at no time will misunderstanding of the Plans, Specifications, Special Provisions, or conditions to be overcome, be 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 therefor, the sum of various products obtained by multiplying each unit price, herein bid for work or materials, by the quantity thereof actually incorporated in the completed project, as determined by the Chief Engineer and General Manager, Flood Control District of Maricopa County.

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

BIDDING SCHEDULE

Project: RWCD Floodway Box Culvert
 Apache Boulevard at Higley Road

Contract: FCD 86-16

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 dollars	Unit Cost	Extended Amount
105.6-2	13	Ea.	Reset Street Light Poles			
205-1	10,329	S.Y.	Grading Roadway for Pavement			
206-1	2,033	C.Y.	Structural Excavation Per ADOT Spec. 203.4			
206-2	1,715	C.Y.	ADOT Spec. 601 Class S, F'c = 3000 PSI Concrete			
215-1	22,825	C.Y.	Drainage Excavation Per ADOT Spec. 203.4			
215-2	5,444	S.Y.	Grading Spillway			
310-1	3,113	Ton	Aggregate Base Type 1 (ABC Material) per ADOT Spec. 303			

BIDDING SCHEDULE

Project: RWCD Floodway Box Culvert
 Apache Boulevard at Higley Road

Contract: FCD 86-16

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 dollars	Unit Cost	Extended Amount
310-2	4,132	Ton	Aggregate Base Type 4 (Select Material) per ADOT Spec. 303			
315-1	8.0	Ton	Bituminous Prime & Tack Coat per Spec. Provisions Sec. 315 and 321-2.			
321-1	3,099	Ton	4" A.C. Pvmnt., 2 1/2-C 3/4 1 1/2" - D 1/2 per Spec. Provisions Sec. 321-1			
340-1	1,280	L.F.	Single curb per ADOT Dt1 C-05.10 "A", H = 7"			
340-2	1,483	L.F.	Curb & Gutter per ADOT Dt1 C-05.10 "A", H = 7"			

BIDDING SCHEDULE

Project: RWCD Floodway Box Culvert
 Apache Boulevard at Higley Road

Contract: FCD 86-16

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 dollars	Unit Cost	Extended Amount
340-3	1,788	L.F.	Concrete Median Paving per ADOT Spec. 908			
340-4	7,450	S.F.	Sidewalk per ADOT Dt1 C-05.20			
340-5	1,040	S.F.	Driveway per ADOT Dt1 C-05.20			
340-6	495	L.F.	Curb & Gutter per MAG Dt1 220			
340-7	3,542	S.F.	Sidewalk per MAG Dt1 230			
340-8	240	S.F.	Driveway per MAG Dt1 250			
340-9	342	L.F.	Ribbon Curb per MAG Dt1 220			

BIDDING SCHEDULE

Project: RWCD Floodway Box Culvert
 Apache Boulevard at Higley Road

Contract: FCD 86-16

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 dollars	Unit Cost	Extended Amount
340-10	1,050	S.F.	Driveway per Mesa Dt1 M-42			
345	2	Ea.	Adjust Manhole Per MAG 422			
350-1	10,636	S.Y.	Remove Pavement			
350-2	1,273	L.F.	Remove Single Curb			
350-3	342	L.F.	Remove Curb & Gutter			
350-4	1,710	L.F.	Remove Sidewalk			
350-5	1,788	S.F.	Remove Concrete Median			
350-6	284	L.F.	Remove 36" CMP			
350-7	4	Ea.	Remove Existing Wings on 2-8' X 5' RCB			

BIDDING SCHEDULE

Project: RWCD Floodway Box Culvert
 Apache Boulevard at Higley Road

Contract: FCD 86-16

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 dollars	Unit Cost	Extended Amount
350-8	3	Ea.	Remove Headwall			
350-9	15	L.F.	Remove CMU Wall & Handrail			
350-10	379	L.F.	Remove 12" ACP Waterline			
350-11	5	Ea.	Remove Traffic Signal Pole			
350-12	60	L.F.	Remove Guardrail			
350-13	273	S.Y.	Remove Gunite Spillway			
401-1	1	L.S.	Maintenance & Protection of Traffic per Spec. Provision 401			

BIDDING SCHEDULE

Project: RWCD Floodway Box Culvert
 Apache Boulevard at Higley Road

Contract: FCD 86-16

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 dollars	Unit Cost	Extended Amount
402-1	2	Ea.	Install "R" Poles per ADOT Std. TS 4-13			
402-2	4	Ea.	Install "A" Poles Per ADOT Std. TS 4-1			
402-3	358	L.F.	3" P.V.C. Conduit			
402-4	2	Ea.	Relocate Traffic Signal Pole			
405	1	Ea.	Adjust Survey Monument per ADOT Spec. 909			
415-1	564	L.F.	Guardrail per ADOT Dt1 C-10.23			
420-1	734	L.F.	C.L. Fence H = 6' per ADOT Dt1 C-12.60 "I"			

BIDDING SCHEDULE

Project: RWCD Floodway Box Culvert
 Apache Boulevard at Higley Road

Contract: FCD 86-16

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 dollars	Unit Cost	Extended Amount
505-1	2,512	C.Y.	ADOT Spec. 601 Class S, F'c = 3000 PSI Concrete			
505-2	886	S.Y.	Sprayed Conc. Trap Channel & 2- 8' X 5' RCB Aprons			
505-3	1	Ea.	Headwall per MAG 501-1 "U"			
505-4	3	Ea.	Catch Basin per ADOT Dt1 15.20, L=6'			
505-5	2	Ea.	Catch Basin per MAG Dt: 534 "E"			
505-6	55	L.F.	Bridge Fence Beam			
505-5.1	383,064	LBS.	ADOT Spec. 605 Steel Reinforcement			

BIDDING SCHEDULE

Project: RWCD Floodway Box Culvert
 Apache Boulevard at Higley Road

Contract: FCD 86-16

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 dollars	Unit Cost	Extended Amount
505-5.2	7,755	S.F.	6" X 6" - W I.5. X W 1.5. Welded Wire Fabric			
510-1	1	Ea.	72" Bulkhead			
510-2	1	Ea.	8' X 6' R.C.B. Bulkhead			
515-1	1	Ea.	72" X 11'-6" Steel Grate			
520-1	112	L.F.	Bridge Handrail per ADOT Dt1 H-3-1 "B"			
601.3-1	223	L.F.	Waterline Encasement per Plans			
601.3-2	115	L.F.	Sewerline Encasement per Plans			

BIDDING SCHEDULE

Project: RWCD Floodway Box Culvert
 Apache Boulevard at Higley Road

Contract: FCD 86-16

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 dollars	Unit Cost	Extended Amount
610.3	527	L.F.	12" A.C.P. Waterline			
610.6-1	2	Ea.	6" W.V. Box & Cover per MAG Dt1 391-1 "C"			
610.6-2	4	Ea.	12" Tapping Sleeve, Valve Box & Cover per MAG Dt1 340 & Dt1 391-1 "C"			
610.8-1	2	Ea.	Fire Hydrant per MAG Dt1 360			
610.11-1	20	L.F.	6" A.C.P. Waterline to Hydrant			
618-1	374	L.F.	72" S.D.			
618-2	140	L.F.	24" R.C.P.			
618-3	176	L.F.	18" R.C.P.			

BIDDING SCHEDULE

Project: RWCD Floodway Box Culvert
 Apache Boulevard at Higley Road

Contract: FCD 86-16

Item No.	Approximate Quantity	Unit	Description	Unit Cost (in writing) and /100 dollars	Unit Cost	Extended Amount
618-4	39	L.F.	15" R.C.P.			
625-2	1	Ea.	S.D. Manhole per MAG Dt1 520			
703-1	230	C.Y.	6" Dumped Rip-Rap			
703-2	120	S.Y.	Grouted Rip-Rap			

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

Total _____

The Undersigned further proposes to execute the Contract Agreement and furnish satisfactory Bonds within ten (10) days from the date of award, time being of the essence. The Undersigned further proposes to begin the work as specified in the Contract attached hereto, and to complete the work within the time limits as specified in the Special Provisions and maintain at all times a Contract Bond, approved by the Board of Directors, in an amount equal to one hundred percent (100%) of the total bid. This bond shall serve not only to guarantee the completion of the work on the part of the Undersigned, but also to guarantee the excellence of both workmanship and material and the payment of all obligations incurred, said Bond to be in full force and effect until the work is finally accepted and the provisions of the Plans, Specifications, and Special Provisions are fulfilled.

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

Date: _____, 19____.

IF BY AN INDIVIDUAL:

(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
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FOR
RWCD FLOODWAY BOX CULVERT
APACHE BOULEVARD AT HIGLEY ROAD
MESA, ARIZONA
FCD CONTRACT NO. FCD 86-16

SECTION 101.2 - DEFINITIONS AND TERMS

Change the definition of Budget Project to read as follows: A project financed by funds set aside in the annual budget or otherwise approved by the Board of Directors of the Flood Control District of Maricopa County.

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

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

SECTION 102 - ADDENDUMS AND SUBMISSION OF BIDDING SCHEDULE

It shall be the responsibility of prospective bidders to determine, prior to submission of a bid, if any addendums have been issued by the Flood Control District of Maricopa County. 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 which do not include appropriate addendums and show appropriate changes to the Bidding Schedule shall be invalid.

SECTION 102.4 - EXAMINATION OF PLANS
SPECIAL PROVISIONS AND SITE WORK

The submission of the bid shall be considered prima facie evidence that the bidder has made such examination of the site of proposed work and all documents pertaining to the work that there is no misunderstanding as to the quantities, conditions or nature of the work and no complaint or claim to such will be entertained.

This project is located at the intersection of APACHE BOULEVARD (Main Street - U.S. Hwy 60) and HIGLEY ROAD in the City of Mesa as shown on the plans.

SECTION 102.4 - EXAMINATION OF PLANS
SPECIAL PROVISIONS AND SITE WORK (Continued)

The work embraced herein and as shown on the plans for the construction of this project shall be done in accordance with the Maricopa Association of Governments (MAG) Uniform Standard Specifications for Public Works Construction dated 1979, together with the revisions thereto, and including, City of Mesa Supplements thereto, and the State of Arizona's Department of Transportation Highways Division Standard Specifications (ADOT) dated 1982 for Road and Bridge construction, together with the 1985 supplement thereto and the Special Provisions contained herein.

The herein contained Special Provisions supplement the MAG Uniform Standard Specifications and the City of Mesa Supplements to the MAG Uniform Standard Specifications and the ADOT Standards; however, in the case of conflict, these Special Provisions supersede the MAG Uniform Standard Specifications and the City of Mesa Supplement and the ADOT Standards.

The STANDARD SPECIFICATIONS referenced in these Special Provisions are the above MAG Uniform Standard Specifications and City of Mesa supplements. These Standard Specifications apply in their ENTIRETY, referenced herein or not.

SECTION 103.6 - CONTRACTOR'S INSURANCE

The contractor shall provide certified evidence of Public Liability and Property Damage Insurance as indicated.

SECTION 104 - SCOPE OF WORK

The work consists of installing 5- 10'x7' reinforced concreted box (RCB) culverts crossing Apache Boulevard and Higley Road; road approaches; detour roads; off-site drainage including an 8'x 6' RCB, 72" storm drain, spillway; etc., and relocation of all utilities which conflict with the proposed construction.

SECTION 104.1 - WORK TO BE DONE

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 CFS Part 5).

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.

SECTION 104.2.2 - DUE TO PHYSICAL CONDITIONS

The Contractor shall control the local drainage flow at the site during construction. Adequate pumping facilities shall be present to assist in this flow control and for construction dewatering. It should be noted that flooding in this area is partly the reason for this project.

SECTION 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.

SECTION 105.6 - COOPERATION WITH UTILITIES

When the Contractor's operations result in damage to any utility, the location of which has been brought to his attention, he shall assume full responsibility for such damage.

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

- Flood Control District of Maricopa County. 262-1501
- Mountain Bell Telephone Company. 263-3219
- Southwest Gas - Gas. 866-4297
- Arizona Public Service Company - Electric. 271-7014
- City of Mesa - Engineering Department (Water). 834-2512
- Roosevelt Water Conservation District 963-3414
- Location Staking (APS; S.W. Gas; Mtn. Bell) Blue Stake. . . . 263-1100

SECTION 105.7 - CO-OPERATION BETWEEN CONTRACTORS

The Contractor shall join his work with that of others in an acceptable manner. City of Mesa Projects No. 85-01.4 and 01.5, Higley Road from Main Street (Apache Blvd. to McKellips Road and parallel 72" storm drain may be under construction during the contract time for this project.

SECTION 105.8 - CONSTRUCTION STAKES, LINES AND GRADES

The project control lines (roadway and detour) and bench mark elevations are shown on the drawings and will be established by the Engineer. The Contractor shall establish offset stakes and temporary bench marks for referencing the designated construction lines and grades. The Contractor shall provide all rough grade, fine grade, and structural reference lines and shall be responsible for their conformance with the plans and specifications.

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

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

SECTION 106 - MATERIAL SOURCES

Mineral aggregate, aggregate base and select material shall be obtained from commercial sources. The Contractor shall pay all royalties or any other charges or expenses incurred in connection with the securing and hauling of the material. The Contractor will be required to furnish the Engineer with a list of his proposed commercial or other sources prior to use, and shall present satisfactory evidence that the material produced from any commercial or other source will meet the Standard Specifications and the Special Provisions contained herein.

SECTION 107.2 - PERMITS

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

SECTION 107.6 - PUBLIC CONVENIENCE AND SAFETY

The Contractor shall provide adequate site security and protection for pipes, box culverts, etc., to preclude the public entrance or access into them.

SECTION 108.4 - CONTRACTOR'S CONSTRUCTION SCHEDULE

The following factors may affect the scheduling of the Contractor's work and should be taken into consideration when the Work Construction Schedule is prepared:

1. City of Mesa, Projects No. 85-01.4 and 85-01.5, Higley Road from Main Street to McKellips Road and parallel 72" storm drain.
2. Phase construction is required. Refer to proposed construction phases and traffic routing on plans. Coordinate all traffic detours with City of Mesa Traffic Engineering Department.
3. Extension of exist RWCD box culvert shall be done during the dry-up period lasting approximately two weeks as set by the Roosevelt Water Conservation District as noted on the plans.

The Contractor shall submit his proposed Work Construction (Progress) Schedule to the Chief Engineer and General Manager for approval before starting the work.

The Contractor shall start work within seven (7) calendar days and complete all work on the project within one hundred eighty (180) calendar days after the date of Notice to Proceed.

SECTION 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.

SECTION 108.7 - DETERMINATION AND EXTENSION OF CONTRACT

The Contractor shall be responsible for having taken steps reasonably necessary to ascertain the nature and location of the work and the conditions which can affect the work and the cost thereof. Failure to do so will not relieve bidders from responsibility for successfully performing the work without additional expense to the Flood Control District. The Flood Control District assumes no responsibility for understandings, representations, or predictions concerning conditions of the work area during the period of the contract.

If performance of all or any part of the work is suspended, delayed, or interrupted by weather conditions an extension of the period for contract performance equal to the lost days will be granted by the Flood Control District. No claim for additional costs incurred because of such delay will be allowed.

SECTION 108.7 - DETERMINATION AND EXTENSION OF CONTRACT (Continued):

If the Contractor finds it impossible for reasons beyond his control to complete the work within the contract time as specified or as extended in accordance with the provisions of this Section, he may, at any time prior to the expiration of the contract time as extended, make a written request to the Engineer for an extension of time setting forth therein the reasons which he believes will justify the granting of his request. If the Engineer determines that the Contractor has proceeded with such diligence as would normally have ensured completion within the contract time, and that the reasons stated to justify a time extension are valid, he may extend the time for completion in such amount as conditions justify. The extended time for completion shall then be in full force and effect, the same as though it were the original time for completion.

SECTION 108.9 - FAILURE TO COMPLETE ON TIME:

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

SECTION 109.4.6 - GENERAL COMMENT:

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

An attempt has been made to determine the location of all underground utilities and to design the location and elevation of roads, catch basins and drainage pipes, culverts and structures so as not to interfere with the existing utilities, however, it shall be the Contractor's responsibility to co-operate with the pertinent utility companies so that any obstructing utility installation may be adjusted.

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

SECTION 109.4.6 - GENERAL COMMENT (Continued):

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

SECTION 206.2.1 - TEMPORARY SHEET PILING

Temporary sheet piling shall be constructed where shown on the plans. This sheet piling shall be removed upon completion of the permanent work, except that some sections may be left in place when so ordered by the Engineer. For purposes of this specification, temporary sheet piling shall be any type of adequately braced sheet pile wall which the Contractor elects to build to satisfy, and which does satisfy, the condition that existing facilities be properly retained during excavation for the placement of substructure or other facilities.

Materials of steel sheet piling shall conform to the requirement of ASTM A 328. Timber sheet piling shall conform to the requirements of Subarticle M.09.01-1. Materials other than steel or timber, or a combination of these may be used provided they are properly designed for the purpose intended.

Temporary sheet piling shall be safely designed and shall be carried to adequate depths and braced as necessary for proper performance of the work. Construction shall be such as to permit excavation as required. Interior dimensions shall be such as to give sufficient clearance for construction of forms and their inspection and for batter pile clearance when necessary. Movements of sheet piling or bracing which prevent the proper completion of the substructure shall be corrected at the sole expense of the Contractor. No part of the temporary sheet piling or bracing shall be allowed to extend into the substructure without written permission of the Engineer.

Upon request the Contractor shall submit to the Engineer for his information plans showing the proposed method of construction prior to the start of such construction. The furnishing of such plans shall not serve to relieve the Contractor of any part of his responsibility for the safety of the work or for the successful completion of the project.

Unless otherwise ordered by the Engineer, all parts of the temporary sheet piling shall be removed upon completion of the work for which it was provided. The excavation shall be backfilled and properly compacted, prior to removal of piling unless otherwise permitted by the Engineer. Sheet piling may be left in place at the option of the Contractor if so permitted by the Engineer, provided that it is cut off at an elevation as directed by the Engineer and the cutoffs removed from the site.

SECTION 206.2.1 - TEMPORARY SHEET PILING (Continued):

Temporary sheet piling will be measured for payment by the number of square feet of temporary sheet piling completed and accepted, as computed from the horizontal and vertical payment limits shown on the plans or as ordered.

No measurements will be made of end extensions or returns necessary for the safety of the retained facility. Sheet piling left in place solely at the Contractor's option, with the Engineer's permission, will not have an additional payment at the contract unit price per square foot for "Sheet Piling Material Left in Place."

Payment for this work will be made at the contract unit price per square foot for "Temporary Sheet Piling", measured as described above, which price shall include all materials, equipment and labor incidental to the construction and removal of the temporary sheet piling required at the locations specified on the plans.

SECTION 301 - SUBGRADE PREPARATION:

Subgrade preparation shall also include the preparation of subgrades to the required line and grade for the curb and gutter and widening sections of the project located on Apache Boulevard, beyond the stationing designating the "Begin Project" and "End Project," and for those locations where aggregate base courses are to be used for Higley Road and other street or driveway turnouts, in addition to Apache Boulevard, in accordance with the plans or as directed by the Engineer.

Direct payment will NOT be made for excavation, drainage excavation, structural excavation, waste, haul, overhaul, clearing, rolling or for the disposal of waste materials, except as hereinafter noted.

Any disposal area selected by the Contractor shall be approved by the Engineer prior to its use as such. Disposal of waste in approved areas shall be made in such a manner that natural drainage will not be blocked or diverted except as directed by the Engineer.

The earthwork quantities shown on the plans are approximate and were determined during the design process. They are included to aid the bidder in formulating his bid.

Work under this item shall include the rolling and compacting shoulders to a minimum of ninety (90) percent proctor density and the grading and shaping of the special ditches.

SECTION 310 - UNTREATED BASE:

Select material and aggregate base shall conform to the requirements of Section 702 of the Standard Specifications. Aggregate base shall be crushed in accordance with Section 702.2. Select material shall be Type "A" and source shall be approved by Engineer.

The Contractor will be required to furnish the Engineer with certified weight tickets covering all of the select material and aggregate base placed on the project. Final pay quantities will be based upon the scale tickets accepted by the Engineer.

SECTION 315 - BITUMINOUS PRIME COAT:

Prime coat shall be applied only where new asphalt concrete pavement is less than four (4) inches in thickness. The bituminous material shall be Grade MC-70 (Table 712-2) liquid asphalt as determined by the Engineer. Prime coat shall be applied to the total width of the aggregate base material at the rate of 0.25 gallons per square yard unless otherwise specified by the Engineer. This is a contingent item.

SECTION 321.1 - ASPHALT CONCRETE PAVEMENT:

The bituminous material to be used shall be AC-40 complying with Table 711-1 of the Standard Specifications as revised in 1983.

The mineral aggregate shall meet the grading requirements for Mix Designation A-1 1/2 and D-1/2 in accordance with plans and Section 710 of the Standard Specifications.

In addition to pugmill type mixing plants, Drum Dryer Mixers will be allowed in accordance with Standard Specification 710.9. The moisture content of the bituminous mixture immediately behind the paver shall not exceed 3 percent.

The proper proportioning of the material at the cold feed shall be determined by the Contractor and approved by the Engineer prior to the production of asphalt concrete. Production shall not commence until calibration tests indicate that an acceptable product can be obtained.

SECTION 321.1 - ASPHALT CONCRETE PAVEMENT (Continued):

The correct proportion of each aggregate size introduced into the mixer shall be drawn from the storage bins by an approved type of continuous feeder which shall supply the correct amount of aggregate in proportion to the bituminous material and shall be so arranged that the proportion of each aggregate size can be separately adjusted. The continuous feeder for the aggregate size can be separately adjusted. The continuous feeder for the aggregate may be mechanically or electrically activated.

If the results obtained indicate that uniform proportioning of the aggregate from the bins or uniform and correct amounts of asphalt are not being delivered, the Engineer shall order that operations cease until proper corrections have been made.

The plant shall be equipped with a sampling device to take representative composite samples of the cold feed. If tests indicated noncompliance with specifications, operation shall cease until proper corrections have been made.

The production of the plant shall be governed by the rate required to obtain a thorough and uniform mixture of the materials. Mixing shall continue until the uniformity of coating, when tested in accordance with the requirements of AASHTO T-195, is at least 95 percent.

Where the compacted thickness of the asphalt pavement course is designated as 3 inches or less, the asphalt may be placed in one lift.

SECTION 321.2 - BITUMINOUS TACK COAT:

The tack coat shall be grade SS-1h (diluted). Tack coat shall be applied at the rate of 0.05 gallon per square yard.

Payment for bituminous tack coat will be by the ton of diluted mixture.

SECTION 336 - PAVEMENT MATCHING AND SURFACING REPLACEMENT

The Contractor shall include as an item under this section the replacement of the total parking area of the Circle K property as shown on the plans. Do not replace the pavement over the gasoline storage tanks, but match as is.

SECTION 350 - REMOVAL OF EXISTING IMPROVEMENTS:

The work under this item shall consist of the removal and disposal of any obstacle to construction, unless specifically called out on the plans to be saved, removed, or relocated by other agencies.

It shall also include the removal of existing traffic signal poles, cables and signals and the delivery of these poles and equipment to the Mesa City Traffic Department.

Arrangements for disposal of all waste material shall be the responsibility of the Contractor. If a Maricopa County landfill is selected for disposition of road construction waste and/or debris, a Maricopa County Landfill Use Permit will be required. Application for permit can be made at the Maricopa County Landfill Office, located at 3325 West Durango Street, Phoenix, Arizona 85009 (602-269-2661). Charges will be levied on a volume basis for each load delivered to the landfill in accordance with the current fee schedule available at the Landfill Office.

Call City of Mesa Dump and Sanitary Landfill at 941-3427 for disposal approval in Mesa.

SECTION 401 - TRAFFIC CONTROL:

Per Section 701 of ADOT Specification with construction phasing and detour routing as noted on the plans. In addition, the Contractor shall coordinate traffic control and detour routing and signing with the City of Mesa Traffic Engineering Department.

The Contractor shall provide and maintain safe and adequate access, including pavement surfacing of the detour for two-way traffic, at all times. Detour to bypass the construction zone shall be as shown on the plans. Construction and detour advance warning signs shall be as shown on the plans. Internal construction barricading and signing shall be required to provide access and guide traffic through the zone with a speed posted at 45 miles per hour.

All necessary signs and barricades shall remain three working days beyond acceptance of the project by the Owner.

Payment for providing and maintaining traffic control will be at the lump sum bid price in the proposal for ITEM - 401-1 Traffic Control. Such price shall include all traffic control devices and traffic control measures, such as warning and control signs, barricades, lighting devices, paint striping, delineators, flagmen and other appurtenant items related to traffic control and safety. Included in the price shall be the maintenance of the detour pavement surface and pavement striping for the detour.

SECTION 402 - TRAFFIC SIGNAL EQUIPMENT:

Work under this Section consists of furnishing and installing all traffic signal equipment including signals, polls, control box, street lights, pull boxes and electric conduit including loop detectors as detailed on the plans, stated in these Special Provisions, or as directed by the Engineer.

All traffic signal equipment and construction shall conform to Arizona Department of Transportation Standard Drawings and Specifications Sections 730 to 737. (See "1985 Supplemental Specifications to the ADOT Standard Specifications for Road and Bridge Construction," Edition of 1982) unless otherwise noted in the City of Mesa Traffic Signal Specifications (April 1985, rev. March 1986) attached as Appendix A of these Special Provisions except when equipment is reused or supplied by the City of Mesa.

SECTION 505 - CONCRETE STRUCTURES:

The work under this Section shall consist of constructing, in place, concrete culverts, catch basins, retaining walls, headwalls, curb and gutters and similar structures as shown on Standard Details and as detailed on the plans, or as directed by the Engineer.

Where ADOT Standard Details and applicable ADOT Standard Specifications apply, said ADOT Specifications, like all plan references, take precedence over Section 505 of the (MAG) Standard Specifications which otherwise apply.

Payment for the construction of concrete structures will be at the Contract Unit Price as listed in the Bid Schedule. The price will include all necessary labor, material and equipment.

SECTION 601.3 - PROTECTION OF EXISTING UTILITIES:

As part of this Section, the Contractor shall protect all existing water and sewer lines located below proposed culvert crossings, and having less than a three (3) foot clear span between surfaces (outside diameters) by encasing the existing lines as detailed on the plans, or as directed by the Engineer, all in accordance with Detail No. 507 of the Standard Details.

The encasement shall extend five (5) feet past the outside diameter of the proposed concrete culvert. The concrete shall be Class "A" conforming to Section 725 of the Standard Specifications.

When shown on the project plans, pipe shall be encased in concrete in accordance with the details shown on the project plans. Portland cement concrete shall be of the class and strength specified and shall conform to the requirements of ADOT Standard Specification Section 1006.

SECTION 618 - REINFORCED CONCRETE PIPE:

Work under this Section shall consist of furnishing and placing reinforced concrete pipe (rubber gasket) of the size, and the locations as called for on plans in accordance with Section 618 of the Standard Specifications.

ADOT Division of Highways Standard Drawing C-13.03 is to be used to determine the class of reinforced concrete pipe required for under a given depth of cover. Class IV pipe is the minimum acceptable.

The cost of any required pipe collars shall be included in the cost of installing reinforced concrete pipe unless otherwise specified herein.

SECTION 619 - REINFORCED BOX CULVERT:

Under this Section, the Contractor shall furnish and install all the equipment, material and manpower required for a complete reinforced box culvert (R.B.C.) as detailed on the plans, called for in the ADOT Standard Details and ADOT Standard Specifications, or as directed by the Engineer.

The materials, construction and installation shall conform to Section 505 of the Standard Specifications unless stated otherwise in the ADOT Standards.

Payment for the reinforced box culvert shall be in linear feet as listed in the Bid Schedule complete and in place. Included in the per linear foot cost shall be Bedding Material and Bagged Stone.

The Contractor shall construct the reinforced box culverts in phases to meet the detour/traffic control requirements in Section 401 of these Special Provisions.

SECTION 900 - ENGINEERS FIELD OFFICE

Under this item the Contractor shall provide a separate field office for the use of the Department's Engineering Consultant (Engineer) within the limits of the project. The field office shall consist of a temporary building or trailer providing a minimum of 200 + square feet of enclosed space and shall be provided with adequate lighting, ventilation and means of ingress and egress suitable to the intended use. The office shall be equipped with heating and cooling equipment capable of maintaining an ambient air temperature of 75 degrees F. + 5 degrees, a potable water supply and a separate enclosed sanitary facility with flush toilet and lavatory conforming with applicable sanitary codes. The office shall be furnished with a lockable office desk, five (5) chairs (min), drafting table with stool, two (2) multi-station telephones with separate lines, one (1) lockable fire-resistant two-drawer legal size file cabinet, hanging files that will store six sets of progress plans, and one (1) ten-digit electric printing calculator with paper tape for printouts which shall be maintained and fully supplied with paper tape at all times.

SECTION 900 - ENGINEER'S FIELD OFFICE (Continued):

The Engineer will approve the location of the office. The office shall remain on the project site for up to 30 calendar days following completion and acceptance of the work by the Flood Control District (or the construction phase of the work where landscape establishment is involved). The office shall be fully equipped with all utilities in service and shall be acceptable to the Engineer prior to commencement of any construction activity.

The Contractor shall be responsible for maintaining the office and all facilities and equipment therein in good working condition. Utility costs shall be the responsibility of the Contractor as well as any fees for permits, sanitary, water, electrical or gas hookups, installation charges, etc.

The office quarters shall be located convenient to the working site and shall be separated or fully partitioned and lockable from any space used or occupied by the Contractor. Ownership and liability for the office quarters shall remain with the Contractor throughout.

Windows shall be included of a type that will open and close conveniently, shall be sufficient in number and size to provide adequate light and ventilation, and shall be fitted with locking devices and screens. The entrance shall be secure, screened, fitted with a lock for which two keys shall be furnished. All keys to the construction field office shall be furnished to the Engineer and will be kept in their possession while the office is being used by them.

Upon completion of the work and following removal of the office and any appurtenant structures, utilities, surfacing, etc., the affected areas shall be either restored to their former condition or improved as may be specified on the project plans.

METHOD OF MEASUREMENT: This work will not be measured for payment directly.

BASIS OF PAYMENT: Payment for this work will be included in the overall project cost and shall include furnishing, maintenance and subsequent removal of all items listed above including all labor, materials, equipment, all utility hookup charges, maintenance, and all monthly utility charges.

SECTION 901 - PROJECT IDENTIFICATION

Furnish and erect one (1) project sign 4 feet by 8 feet painted with two coats of paint as per attached sample. No other signs will be permitted on the Project Site. Sign shall meet all code requirements for temporary signs. Located as directed by Engineer. Contractor shall assume responsibility for obtaining any permits or paying any fee associated with Project Sign. No separate payment will be made for this sign and payment therefor shall be included in the overall project cost.

CONSTRUCTION SPECIAL PROVISIONS

FOR

RWCD FLOODWAY BOX CULVERT
APACHE BOULEVARD AT HIGLEY ROAD
MESA, ARIZONA

CONTRACT NO. FCD 86-16

APPENDIX A

CITY OF MESA
TRAFFIC SIGNAL SPECIFICATIONS

APRIL 1985
Rev. March, 1986

CITY OF MESA
TRAFFIC SIGNAL SPECIFICATIONS
APRIL, 1985
Rev. March, 1986

- P. 1 - Specifications and Standards Used
- P. 2 - Chapter 1: Electrical Material List and Drawings
- P. 3 - Chapter 2: Traffic Signal Controller Equipment
- P. 19 - Chapter 3: Traffic Signal Poles, Foundations and Mast Arms
- P. 21 - Chapter 4: Electrical Conduit for Traffic Signals
- P. 22 - Chapter 5: Pull Boxes for Traffic Signals
- P. 23 - Chapter 6: Luminaire
- P. 25 - Chapter 7: Vehicle Signal
- P. 27 - Chapter 8: Pedestrian Signal
- P. 28 - Chapter 9: Ped. Push Button
- P. 28 - Chapter 10: Traffic Signal Mounting Assemblies
- P. 29 - Chapter 11: Loop Detectors
- P. 31 - Chapter 12: Conductors for Traffic Signals
- P. 33 - Chapter 13: Remove Traffic Signal

CITY OF MESA
TRAFFIC SIGNAL SPECIFICATIONS
APRIL, 1985
Rev. March, 1986

Specifications and Standards incorporated in this document.

1. ARIZONA DEPARTMENT OF TRANSPORTATION GENERAL SPECIFICATIONS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING: 1973.
2. ARIZONA DEPARTMENT OF TRANSPORTATION SUPPLEMENTAL SPECIFICATIONS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING: MARCH 19, 1985.
3. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION, TRAFFIC CONTROL SYSTEMS, STANDARDS PUBLICATION: TS 1-1983.
4. INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION, INC., WIRE AND CABLE SPECIFICATIONS: Current.
5. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS: U.S.D.O.T./ F.H.A.: 1983.
6. AMERICAN ASSOCIATION OF STATE AND HIGHWAY TRANSPORTATION OFFICIALS - CURRENT.

CHAPTER 1

Electrical Material List and Drawings:

The contractor shall note that approval by the Traffic Engineer is required before ordering or installing any material that is to be used on the project. Before ordering any materials, the contractor shall submit to the Traffic Engineer six (6) copies of a complete list of materials that he proposes to incorporate into the project.

The list shall be considered as the electrical material list for the project and shall contain relevant information necessary for personnel responsible for maintenance of the system to procure exact replacement of any and all materials on the project. Incomplete or partial material lists will not be accepted for approval.

The materials on the list shall be identified by Contract Bid Item Number and shall include the brand or trade names, schedules of instructions, catalogue cuts, and identifying numbers. The materials shall be clearly identified in any catalogue cuts furnished by the contractor. The designations or nomenclature of the materials used in the contract documents shall be noted on the material list where applicable.

When intersectional lighting is called for on the project plans, the contractor shall submit six (6) copies of photometric data indicating the vertical light distribution, vertical control limits and lateral light distribution classifications for each type of luminaire submitted for approval. In addition, the contractor shall submit data from the luminaire manufacturer detailing lamp socket positions with respect to lamps and refractors furnished for each IES light distribution type specified.

The contractor shall furnish schematic diagrams of the controller and auxiliary equipment at the time the control cabinet with controller is delivered. Four (4) sets of the schematic wiring diagram and a mylar or second original shall be furnished with each control cabinet. The schematic diagram shall show in detail all circuits and components. Such components shall be identified by name or number in such a manner as to be readily interpreted.

There shall be no substitutions for any of the materials on the list without prior written approval by the Traffic Engineer. Any changes to the material list shall be requested in writing. If requested by the Traffic Engineer, the contractor shall submit for inspection and approval, samples of both specified and proposed substitute items at no cost to the City. The City will not be liable for any electrical materials ordered or purchased, or labor performed prior to approval.

CHAPTER 2

Traffic signal controller equipment

Section 2.01 - Description of work:

The work under this item consists of furnishing and installing, complete and functioning, traffic signal controller equipment and shall include the foundation, anchor bolts and all required excavation, backfill and other incidentals in accordance with the project plans and specifications.

2.10 Traffic Signal Controller Equipment

2.11 General

The traffic controller equipment shall consist of electrical apparatus necessary for the operation and timing of a traffic signalized intersection. This shall include the controller cabinet and/or the auxiliary controller cabinet, controller unit, and specified auxiliary equipment. The auxiliary equipment shall include appurtenances such as flasher controls, detection, power assembly, signal load switches, conflict monitor unit, pre-emptor controller, coordinator, time switches, external logic, and accessories as indicated in the Special Provisions.

2.12 Specifications

These Specifications for traffic controller assembly items shall include the current edition of NEMA Publication TS-1 at the date of the Contract.

If an item of equipment that does not conform to these Specifications of the Special Provisions is accepted by the City for use on a specific project, it shall be understood that such an approval shall apply to that specific project only and shall not mean automatic approval for any future projects.

2.13 Product Liability

The City reserves the right to reject the use of controller assembly items in which the manufacturer of such items does not have at least one million dollars of product liability insurance.

2.14 Required Data Submittals

The Contractor's material proposal shall include complete technical information, shop drawings, photographs, graphs, circuit diagrams, instruction manuals, and any other necessary documents to fully describe the proposed traffic controller or auxiliary equipment items.

At the time of delivery, the Contractor shall furnish three sets of instruction books and an itemized price list for each type of equipment, their subassemblies, and their replacement parts.

The instruction books shall include the following information:

Table of Contents

Operating Procedure

Theory of Operation

Step by step maintenance and troubleshooting information for the entire assembly and for all components capable of being adjusted

Circuit Wiring Diagrams

Pictorial Diagrams of Parts Locations

Parts Numbers

The instruction manuals shall include itemized parts lists. The itemized parts list shall include the manufacturer's name and part number for all components (such as IC's, diodes, switches, relays, etc.) used in each piece of equipment. The list shall also include cross-references to parts numbers of other manufacturers who make the same replacement part.

2.15 Equipment Warranty

Each item furnished under this bid shall be warranted by the supplier against all defects in design, materials and workmanship for a period of 18 months following receipt by City of Mesa or 12 months from date of installation, whichever occurs first.

If a malfunction in the controller unit or auxiliary equipment occurs during the warranty period, the supplier shall, within 72 hours after notification (excluding Saturday and Sunday), furnish a like controller unit, module, or auxiliary equipment, for use while the warranted unit is being repaired. The isolation of any malfunction and the repair and/or replacement of any device within the warranty period shall be the responsibility of the supplier.

After the supplier has repaired and returned the equipment, the City shall return the spare component to the supplier.

Critical default on the part of the supplier on this warranty may result in suspension by the City of the right of the supplier to furnish equipment on future projects.

2.16 Test and Pre-Approval Requirements

A. General

All traffic controller equipment items shall meet the applicable environmental and testing standards of NEMA Publication TS-1.

B. Pre-Approval of Components

The City will only accept controller unit bids from manufacturers of suppliers who can demonstrate that their traffic controller assemblies have acceptable field maintenance histories. The following manufacturers and respective controller models are considered acceptable by the City:

N.E.M.A. Controller Units:

Automatic Signal, L.F.E. Corp.

Series 312
Series 314
Series 318

Econolite Control Products, Inc.

KMC 2000
KMC 4000
KMC 8000
N 2000

Multisonics Corp.

911 B

Transyt Corp.

1880

Traffic Control Technology

DM-200
DM-400
DM-800

Other manufacturers or suppliers wishing to bid shall furnish with the bid a detailed accounting of their products field maintenance experience and a list of jurisdictions currently using the product. This list should include the name of the jurisdiction, a name of a contact within that jurisdiction, a phone number and an address.

The supplier shall have a certificate of analysis on file with the Traffic Engineer for each N.E.M.A. specified component to be furnished with this bid. The certificate of analysis shall attest that all applicable tests set forth in NEMA TS-1 have been performed on the type and model of the submitted equipment and that the results were in conformity with the requirements of the NEMA Standards. This does not mean that each piece of equipment has to be tested, but that the manufacturer has performed sample testing on the same equipment types and models that are proposed for use.

The certificate of analysis shall be signed by an officer having legal authority to bind the manufacturer or supplier.

The City reserves the right to perform NEMA tests or other tests on any of the equipment supplied by the Contractor.

2.20 Traffic Signal Controller Units

2.21 General

The purpose of this Specification is to describe minimum acceptable design and operational requirements for traffic signal controllers.

A traffic signal controller shall consist of an electrical device devoted to the selection and timing of traffic movements. Each controller shall provide all the features, functions and phasing operations as indicated in the Special Provisions.

2.22 Solid State Digital Controllers

A. General

The solid state digital controllers shall utilize modular construction, solid state circuitry, and digital timing techniques. Integrated or discrete semiconductor devices shall be used exclusively. No vacuum or gaseous tubes shall be used except for indicator lights. No electro-mechanical timers or synchronous motors shall be employed. All controller logic shall have high noise immunity.

All solid state components shall be standard production types and shall be available from any industrial electronics supply house. All components shall be available from the controller or device manufacturer or from a supply house for a minimum of five years from the date of purchase. All components shall be amply derated with respect to heat dissipating capacity and rated voltage.

The design life of all components under 24 hour a day operation in their electrical applications shall be not less than ten years.

All components shall be clearly identifiable by markings on circuit boards or parts numbers on pictorial diagrams.

The digital timing techniques and repeatability shall be per NEMA standards.

The controllers shall conform to all applicable NEMA Standards.

The controller shall consist of plug-connected modules. All the solid state components shall be contained on the printed circuit module boards. No special tools shall be required to remove the modules from the controller.

The printed circuit boards shall be arranged in functional groupings. These boards shall be fabricated from epoxy glass laminate NEMA grade G-10 or G-11, with a minimum weight of two ounces of copper per square foot. The copper track shall have adequate cross section to carry the designed current capacity. All contact surfaces shall be of non-corrosive construction. The board shall be designed to permit the easy removal and replacement of all components without damage to the board of its circuits. Each individual printed circuit board shall be identified by a serial number or parts number clearly stamped or etched on the board.

Each module by functional design shall be electrically and mechanically interchangeable with other controllers of the same model, controller series, or frame type.

Any phase timing module which times more than one phase shall be programmable to permit the selective disabling of unused phases without removing the controller unit from operating an intersection.

Any modules that have a 120 volt AC input shall be properly fused within the controller.

The controller's interfaces and power supply shall be of adequate design to accommodate the maximum module configuration possible for the controller without rewiring or mechanically reconstructing the controller.

All interchangeable connectors shall be keyed to prevent their insertion into the wrong receptacle of the controller.

The controller's housing shall be an integral frame assembly constructed of non-ferrous metals. The housing shall conform to all NEMA requirements.

B. Actuated, Solid State Digital Controllers

1. General

The actuated solid state digital controller shall be designed for the operation of traffic signals with fully actuated or semi-actuated timing of the traffic signals including operation with auxiliary equipment.

All controller units shall conform to NEMA Standards.

Each actuated controller shall be furnished with the required number of phases, phase sequence, phase timing features, and all other control functions that are specified herein, on the plans, or in the Special Provisions.

2. Actuated Controller Types

Actuated controllers shall be designated on the plans, or Special Provisions with the following alphanumeric codes.

3. Type DAN Controller

The type DAN controller shall mean a digital actuated controller that conforms to NEMA Standards, these Specifications, the Special Provisions, and the Plans.

The first number in the code type shall mean the following:

DAN-2-__ Two phase frame housing
 DAN-4-__ The frame housing shall be capable of containing up to four phases
 DAN-8-__ The frame housing shall be capable of containing up to eight phases

The second number in the code type shall mean the following:

DAN-__-1 Semi-actuated with pedestrian timing
 DAN-__-2 Fully actuated without pedestrian timing
 DAN-__-3 Fully actuated with pedestrian timing
 DAN-__-4 Fully actuated with density and pedestrian timing

As an example, a DAN-4-3 controller would mean a solid state digital actuated controller that conforms to NEMA, has a frame housing capable of containing up to four phases, and has fully actuated phases with pedestrian timing.

4. Types of Phase Timing

The following list of phase timing types shall be used to identify the timing functions for each of the controller's phases. The timing period for each type shall be not less than the minimum required by NEMA.

- Type S Timing - shall be a non-actuated timing function for semi-actuated phase operation.
- Type A Timing - shall be an actuated timing function for actuated phase operation with locking or non-locking vehicle detection modes.
- Type D Timing - shall be an actuated volume density timing function for actuated phase operation.
- Type P Timing - shall be either a non-actuated or an actuated timing function, which shall be used exclusively for the timing of a pedestrian phase. It may be used alone or concurrent with other types of phase timing.

5. Overlap Phases

Controllers with more than two phases shall contain internal NEMA programmable overlap logic and driver outputs. The NEMA type overlaps shall be programmed by a NEMA program board assembly with hard wire jumpers, of which shall be easily accessible inside the controller.

6. DAN Frame Sizes

The type DAN controller shall be limited to two, four, and eight phase frames. The frames shall not exceed the maximum dimensions specified by NEMA except that the maximum frame height shall be 15 inches. The frames shall permit equipment interchangeability.

7. Phase Sequence Operation

Each phase and associated overlap phases of a single ring controller shall be sequentially timed as indicated on the plans. Dual ring controllers shall be sequentially timed per ring and concurrently timed per non-conflicting phase. Dual ring controllers shall be capable of being programmed for the dual entry mode of operation.

8. Controller Input/Output Functions and Connector Pin Assignments

The controller shall provide all the NEMA input/output functions and the additional functions shown below. The A, B, and C. connector and their pin assignments shall be the same as shown in Table 13-3 of Part 13 page 4 of NEMA TS1 for two, four, and eight phase controller units and their cables.

All controller connector cables shall be not less than seven foot in length.

All A and B connectors shall include specified future four and eight phases functions.

All the pin assignments shall be wired to the controller cabinet terminals for future use.

Auxiliary connectors shall only be permitted on Type MPU controllers as specified in the Special Provisions.

9. Volatile Memory

Volatile memory is not acceptable. Unit shall operate from EEPROM memory.

10. Standard Functions

All controller functions specified by NEMA shall be furnished as specified in these Specifications. Special functions shall be furnished as specified in the Special Provisions.

The standard functions shall be the NEMA specified features and shall include the following functions on a per phase, per ring, and per unit basis:

Time Settings

Phase Intervals

Actuation Modes

Change and Clearance Intervals

Phase Selection

Detection Calls and Storage

Recall Modes - Min. Veh., Max. Veh., Non-Actuate, and Ped.

Inputs and Outputs

11. Indicators

All indicators shall be the sub-miniature type and may be either incandescent lamps or solid state. Incandescent lamps shall be replaceable from the front of the panel.

All function readouts shall include a digital phase, interval and timing readout for each of the controller unit rings.

12. Controller Programming

Programmed timing entries shall be front panel programmed without the use of tools or software. The programming of the controller's selectable functions and phase timing intervals shall be set by thumbwheel switches, programming pins, or front panel keyboard entry.

All programming pins shall be the printed circuit receptacle, non-corrosive, tuning fork type. The pin contactor shall fit any standard 0.055 inch to 0.073 inch board. The pins shall be rated 600 Volt RMS at 5 Amperes.

13. Pre-programmable Minimum Timing

Any controller with a minimum clearance programming option shall be programmed to guarantee a minimum clearance time as follows:

- a. Minimum yellow time; three seconds
- b. Minimum pedestrian clearance, five seconds

Means shall be provided to inhibit the guaranteed minimum yellow on any exclusive pedestrian phase in use.

2.30 Auxiliary Control Equipment

2.31 General

The auxiliary equipment described in this section shall be supplied as specified.

All auxiliary equipment shall conform to any current published NEMA Standards pertaining to that device.

2.32 Solid State Flashers

The flasher unit shall be a solid state NEMA type flasher. The flashers shall have the number of circuits as described in the Special Provisions.

All the flashers shall be constructed of repairable, relay modules. Each relay module shall have the specified ampere capacity and shall operate with zero point switching.

The flasher shall turn on within ± 5 degrees of the zero voltage point of the line sinusoid and shall turn off within ± 5 degrees of the zero current point of the line sinusoid. The flashing rate shall be 55 to 60 flashes per minute with a 50 percent duty cycle.

Solid State flashers shall be of the following types:

- Type 1 - 20 amperes per circuit, single circuit
- Type 2 - 10 amperes per circuit, dual circuit
- Type 3 - 15 amperes per circuit, dual circuit

The flashers shall intermate with a six pin Cinch-Jones, S-2406-SB socket. The flasher shall either have a support bracket or shall be mounted in a rack frame.

2.33 General Purpose Load Relays

A. General

General purpose load relays shall be for the purpose of providing special circuiting or operational requirements. The relays shall be of the following types:

- Type 1 - Single-pole, double contact, double throw
- Type 2 - Double-pole, double throw

General purpose relays shall intermate with a Cinch-Jones Type 8 pin socket or an approved equal. The relay shall be covered with a clear dust cover, which shall be secured to the relay base with a fastening device.

B. Electrical Requirements

The relay contact points shall be of fine silver or silver alloy, or a superior alternate material, and shall be capable of carrying a load of 30 amperes per contact at 120 volts, 60 Hz.

C. Load Test

The relay shall show no failure while making, carrying, and breaking a 10 ampere, 120 volt, traffic signal lamp load through 10,000 cycles at the rate of 10 cycles per minute. The duty cycle shall be 50 percent on and 50 percent off. Each relay shall be capable of making, breaking, and carrying the current (including inrush current upon contact closure) for a 1,000 watt tungsten lamp load without burning, pitting, or otherwise failing for at least one million operations.

D. Overload Test

The relay shall be electrically and mechanically operative after a momentary current of 100 amperes at 120 volts is applied to the set of closed contacts at least five times with a minimum of two minutes between applications of current. The relay shall not break down or flash over while carrying a load of 30 amperes at 120 volts for at least 50 cycles at the rate of five cycles per minute. The duty cycle shall be 50 percent on and 50 percent off.

E. Dielectric Strength Test

The relay shall withstand 1,500 volts at 60 Hz. between insulated parts and between current carrying parts and grounded or non-current carrying parts.

2.34 Conflict Monitors

The conflict monitor shall conform to Part 6 of NEMA Publication TS 1-1983 and these Specifications.

In addition to the NEMA Specifications, the conflict monitor shall conform to the following requirements:

1. A 12 channel monitor shall be furnished unless specified otherwise.
2. Fully programmable monitors shall be programmed with soldered wire jumpers on a NEMA interchangeable programming card. Jumpered channels shall represent nonconflicting phases. Non-jumpered channels shall be in conflict with any other channel.

When a malfunctioning monitor is replaced in the field, the replacement monitor shall be field programmable without the use of tools.

The jumper numerical sequence shall be standard NEMA matrix.

3. The Unit shall have an active indicator for each channel.
4. All monitor connector cables shall be not less than six feet in length.
5. Ability to monitor a simultaneous field display of red and yellow and register a conflict/switch failure if both are active.

2.35 Digital Loop Detector Unit

The digital loop detectors shall conform to N.E.M.A. TS-1, Section 7, Section 11 - 1983.

In addition to the N.E.M.A. specifications, the detectors shall conform to the following requirements:

1. Each detector unit shall be the shelf mounted type with two complete detector channels.
2. Each detector shall sequentially energize its loop inputs to eliminate cross talk.
3. Each channel shall retune and detect properly, immediately following reconnection of the broken (open) circuit. Previous "open" loop/lead-in connections shall be held in memory for recall and verification via a front panel "open loop test" switch.
4. Each detector unit shall be provided with a loop test switch position to verify loop system integrity and reduce maintenance costs. The "open loop test" position shall indicate a previous fault via the front panel indicator. The memory shall remain intact and can be queried repeatedly. Existing detections shall not be reset and the memory shall only be reset by power interruption as by pressing the circuit breaker/reset button on AC powered units, or removing and reinserting the plug-in detector units.

5. Each channel shall include a 16 position thumbwheel switch to allow selection of 8 pulse sensitivities, 7 presence levels and an "off" position. The sensitivity setting shall offer 2:1 steps over a range of 128:1 to enable selection of the proper sensitivity (threshold) to insure detection of all licensed motor vehicles (including 50cc motorcycles) without detecting automobiles in the adjacent lane, moving or stopped, within 36" of the loop(s) described in the following configurations, each with 50', 500', and 1000' of lead-in cable.

Three-turn loops:

- a) Single 6' x 6' loop
- b) Four 6' x 6' loops - Series/Parallel connected
- c) Four 6' x 6' loops - Series connected
- d) Three 6' x 6' loops in series with special bicycle loop for left turn applications

Two-turn loops: (note) Long loops require special configuration such as the "Quadrupole" to insure adjacent lane rejection (i.e. left turn lanes).

- a) Single 6' x 40' loop
- b) Single 6' x 60' "Quadrupole" loop

2.40 2Ø steel control cabinet shall be A.D.O.T. Type III with a type II pedestal cabinet base.

2.50 8Ø Steel Control Cabinet shall be A.D.O.T. Type V

2.60 2Ø and 8Ø Control Cabinet Special Provisions

1. Computer interface panel. Connected to controller cabinet to perform all of its functions.
2. Fluorescent light with on/off switch.
3. Convenience outlet.
4. Ventilating fan with variable thermostat switch.
5. Air filter.
6. Test switch panel for detectors and pedestrian actuation.
7. Police panel with a main power switch, switch for automatic and flashing operation. (Flashing operation to drop power to controller unit, and to signal monitor unit.)
8. Operations switches for automatic/flashing, and stop timing inside cabinet.
9. When monolithic integrated circuits are of such special design that they preclude the purchase of identical components from any wholesale electronics distributor or any component manufacturer, one exact duplicate monolithic integrated circuit shall be furnished with each 10 or fraction thereof, monolithic integrated circuits supplied.
10. Load switch relay modules that are interchangeable and repairable.
11. Back up timing P.R.O.M. as per C.O.M. specifications if primary program memory is volatile.

2.61 2Ø Back Up P.R.O.M.

City of Mesa
TRAFFIC SIGNAL TIMING/OPERATION
Back Up Prom: 2Ø

INTERSECTION:

T./O. DESIGN RRS 2-84
CEB

T./O. INSTALLED _____

OFFSET:

	ØA	ØB
	Ø1	Ø2
*Mode	E	E
Function	Func	Code
Walk	10	10
Ped. Cl	20	20
Min.		
S/A		
MXV		
PSG		
TBR		
TTR		
MNG		
MX1	30	30
MX2		
Yellow	5	5
All Red	2	2
SFO		
FLW		
Direction		

*Mode: 0 - ph. not used
A - Locking
B - Non-locking
C - Min. veh. rec.
D - Max. veh. rec.
E - Ped.
F - Non/Act.

COMMENTS: I. Start up sequence:
1. (5) seconds all red
2. Ø1 green.
II. 3 seconds red revert
III. No last car passage

2.62 80 Back Up P.R.O.M.

City of Mesa
 TRAFFIC SIGNAL TIMING/OPERATION
 Back Up Prom: 80

INTERSECTION:

T./O. DESIGN RRS 2-83
CEB

T./O. INSTALLED _____

OFFSET:

	ØA	ØB							
	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	
*Mode	D	E	D	E	D	E	D	E	
Function	Func Code								
Walk		10		10		10		10	
Ped. Cl		20		20		20		20	
Min.									
S/A									
MXV									
PSG									
TBR									
TTR									
MNG									
MX1	15	30	15	30	15	30	15	30	
MX2									
Yellow	3	5	3	5	3	5	3	5	
All Red	0.5	2	0.5	2	0.5	2	0.5	2	
SFO									
FLW									
Direction									

- *Mode: 0 - ph. not used
 A - Locking
 B - Non-locking
 C - Min. veh. rec.
 D - Max. veh. rec.
 E - Ped.
 F - Non/Act.

- COMMENTS: I. Start up sequence:
 1. (5) seconds all red
 2. Ø2 - Ø6 green.
 II. 3 second red revert
 III. No last car passage

2.63 Computer Interface Panel

(SEE ATTACHED DIAGRAM)

COMPUTER INTERFACE PANEL

INPUT TO REMOTE CONTROL UNIT

1	MINOR WALK R1 (AC)
2	PH 8 RED (AC)
3	PH 7 RED (AC)
4	PH 6 RED (AC) (ARTERY)
5	PH 5 RED (AC)
6	PH 4 RED (AC)
7	PH 3 RED (AC)
8	PH 2 RED (AC) (ARTERY)
9	PH 1 RED (AC)
10	CODED BIT C R2
11	CODED BIT C R1
12	CODED BIT B R2
13	CODED BIT B R1
14	DET 8
15	DET 7
16	DET 6
17	DET 5
18	DET 4
19	DET 3
20	MINOR WALK R2 (AC)
21	FLASH (AC)
22	PREEMPT (AC)
24	PHONE LINE
25	PHONE LINE
28	AC-
29	LOGIC GND
31	MINOR PED DET R1
32	MINOR PED DET R2
33	PREEMPT
34	SF1
35	SF2
36	DET 1
37	DET 2

37 PIN D CONNECTOR (MALE)

OUTPUT FROM REMOTE CONTROL UNIT

1	FORCE OFF R1
2	FORCE OFF COMMON
3	HOLD NORM. OPEN
4	HOLD NORM. CLOSED
5	HOLD COMMON
6	NON ARTERIAL RECALL
9	SIDE STREET CALL
14	SPECIAL FUNCTION 2
15	CNA NORM. OPEN (ISO)
16	CNA NORM. CLOSED (ISO)
17	CNA COMMON (ISO)
18	SPECIAL FUNCTION 1
20	FORCE OFF R2
21	FLASH COMMON
22	FLASH NORM. CLOSED
23	FLASH NORM. OPEN
24	SKPHXA
25	OPEDXA
27	CHASSIS
28	AC-
29	OMIT COMMON
31	AC+
34	CNA COMMON
36	CNA NORM. OPEN

37 PIN D CONNECTOR (MALE)

2.70 Cabinet painting

A steel control cabinet shall be painted inside and out with two coats of white enamel as per section 5 of the ADOT General Specifications.

2.80 Traffic Controller Equipment - 2Ø Description

- I. Traffic controller equipment - 2Ø
 - A. Controller unit - Type DAN-2-4
 - B. Timing:
 - Ø1 Type D and P timing
 - Ø2 Type D and P timing
 - C. Conflict Monitor - 6 channel: See C.O.M. Specifications, 6/12 channel N.E.M.A. Conflict Monitor
 - D. Flasher - Type 3: All vehicle phases red.
 - E. Detection - Quantity (2) units: See C.O.M. Specifications, digital loop detector
 - F. Cabinet - Type III (with Type II Pedestal): Painted white enamel inside and outside.

It shall be assembled to accomplish the vehicle and pedestrian phasing as shown on plan, and to interface with the Remote Control Unit.

2.90 Traffic Controller Equipment - 8Ø Description

- II. Traffic controller equipment - 8Ø
 - A. Controller unit - Type DAN-8-4
 - B. Timing:
 - Ø1 Type A timing
 - Ø2 Type D and P timing
 - Ø3 Type A timing
 - Ø4 Type D and P timing
 - Ø5 Type A timing
 - Ø6 Type D and P timing
 - Ø7 Type A timing
 - Ø8 Type D and P timing
 - C. Conflict monitor - 12 channel: See C.O.M. Specifications 6/12 channel N.E.M.A. conflict monitor.
 - D. Flasher - Type 3: All vehicle phases red.
 - E. Detection - Quantity (4) units: See C.O.M. Specifications, digital loop detector.
 - F. Cabinet - Type V: Painted white enamel inside and outside.

It shall be assembled to accomplish the vehicle and pedestrian phasing as shown on plan, and to interface with the Remote Control Unit.

2.91 Traffic Signal Controller Equipment Testing

2.92 The construction contractor shall have the above delivered to the City of Mesa, Traffic Signal Shop 660 North Mesa Drive, Mesa, Arizona 85201 for testing.

2.93 After the controller equipment tests are approved, the contractor shall pick up the traffic signal controller equipment, haul them to the job site and install as specified.

- 2.95 Method of Measurement:
Traffic signal controller equipment will be measured as a unit for each cabinet installed.
- 2.96 Basis of Payment:
The accepted quantities of traffic signal controller equipment measure as provided above, will be paid for at the contract price each, which price shall be full compensation for the work, complete in place, as specified and described herein and as shown on the project plans.

CHAPTER 3

Traffic Signal Poles, Foundations and Mast Arms

- 3.01 Traffic Signal Poles
- 3.02 The work shall consist of furnishing and installing traffic signal and highway lighting poles, including anchor bolts, internal wiring, and other incidentals, in accordance with the project plans and the Specifications.
- 3.03 Material standards for traffic signal and lighting supports shall be in conformance with AASHTO Standard Specifications for Structural Supports of Highway Signs, Luminaires and Traffic Signals, 1975 Edition. All supports shall be designed to withstand 80 MPH winds.
- 3.04 Method of Measurement:
Poles will be measured as a unit for each pole installed.
- 3.05 Basis of Payment:
The accepted quantities of poles, measured as provided above, will be paid for at the contract unit price each for the type of pole called for in the bidding schedule, which price shall be full compensation for the work complete in place, as specified and described herein and as shown on the project plans.

3.10 POLE FOUNDATIONS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING:

3.11 The work shall consist of furnishing and installing pole foundations in accordance with the project plans and Specifications. The work shall include all excavations and backfill, the furnishing and placing of all conduit, elbows, concrete, grounding wire and connections. Concrete shall be Structural Concrete Class S ($f'c = 3,000$) for J and Q pole foundations and Structural Concrete Class S ($f'c = 2,500$) for all other pole foundations. Concrete shall conform to the requirements of Section 601 of the Standard Specifications.

3.12 Material standards for traffic signal and lighting supports shall be in conformance with AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1975 Edition. All supports shall be designed to withstand 80 MPH winds.

3.13 Each pole foundation shall have 25' of number 4 bare copper conductor coiled and placed at the bottom of the excavation before the concrete is placed and shall be connected to the pole grounding screw in the hand hole.

3.14 Pole foundations will be measured for payment as single units installed.

3.15 The accepted number of pole foundations will be paid for at the contract unit price for each type of pole foundation called for in the bidding schedule, which price shall be full compensation for the item complete, in place as specified and described herein and as shown in the project plans.

3.16 Anchor bolts installed in the foundation will be paid for under the respective pole item.

3.20 MAST ARM FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING:

3.21 The work shall consist of furnishing and installing traffic signal and intersectional lighting mast arms, in accordance with the project plans and the Specifications.

3.22 Material standards for traffic signal and lighting supports shall be in conformance with AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1975 Edition. All supports shall be designed to withstand 80 MPH winds.

3.23 Method of Measurement:

Mast arms will be measured as a unit for each mast arm installed.

3.24 Basis of Payment:

The accepted quantities of mast arms, measured as provided above, will be paid for at the contract unit price each for each type of mast arm called for in the bidding schedule, which price shall be full compensation for the work, complete in place, as specified and described herein, and as shown on the project plans.

CHAPTER 4

ELECTRICAL CONDUIT FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING:

4.01 The work shall consist of furnishing and installing electrical conduits, including jacking, drilling, excavating, backfilling and compacting, in accordance with the project plans and the Specifications. Open trench excavation across an existing roadway shall not be permitted without the written permission of the Engineer.

4.02 Conduits shall be installed under existing pavement by approved jacking or drilling methods. Open trench excavation across an existing roadway shall not be permitted without the written permission of the Engineer, see Section 4.03k of the General Specifications for Traffic Signals and Highway Lighting.

4.03 Method of Measurement:
Conduit will be measured by the linear foot from the center of pull boxes and the edge of foundations along the centerline of the conduit installed. Conduit inside pull boxes and foundations will not be measured for payment.

4.04 Basis of Payment:
The accepted quantities of conduit, measured as provided above, will be paid for at the contract unit price per linear foot for each type of conduit called for in the bidding schedule, which price shall be full compensation for the work, complete in place, as specified and described herein and as shown on the project plans.

CHAPTER 5

PULL BOXES FOR TRAFFIC SIGNALS

5.01 The work shall consist of furnishing and installing all pull boxes, including excavation and backfill, necessary to complete the work in accordance with the project plans and City of Mesa Specification (Mesa Standard Detail M-56). Pull boxes shall be reinforced concrete.

5.02 With a pull box assembled, the box shall not fail nor the cover deflect more than 1/4 inch when tested with a vertical force, of 1,500 pounds applied to a 1/2 inch by 3 inch by 6 inch steel plate centered on the cover.

5.03 Method of Measurement:
Pull boxes will be measured as a unit for each pull box installed.

5.04 Basis of Payment:
The accepted quantities of pull boxes, measured as provided above, will be paid for at the contract unit price each for each type of pull box called for in the bidding schedule, which price shall be full compensation for the work, complete in place, as specified and described herein and as shown on the project plans.

CHAPTER 6

LUMINAIRE (L1413) 90° HORIZONTAL CUTOFF STREET LIGHTING FIXTURE

6.01 GENERAL

To furnish and install a street lighting fixture in accordance with the requirements of this specification and designed for roadway lighting with a built-in multiple ballast for use with 310 Watt High Pressure Sodium lamps with the general shape as shown.

6.10 REQUIREMENTS

6.11 A. Housing

1. The housing shall be designed for 90 degree light cutoff and maximum light levels for ANSI/IES Type III distribution pattern.
2. The housing shall have an integral slipfitter for a two (2) inch mast arm.
3. All metal parts of the unit, i.e. hardware, shall be of non-corrosive material.
4. The finish on the housing shall be a baked on enamel applied by an electrostatic process.

6.12 B. Refractor

1. The refractor shall be a heat and impact resistant clear flat glass lense.
2. The refractor shall be seated in the supporting frame with a compression resistant gasket of approved material to form a watertight seal.

6.13 C. Reflector

1. The reflector shall be of formed aluminum and have a highly polished anodic surface.
2. The reflector edge shall have a high-quality gasket of approved material which when closed against the refractor shall firmly seat to seal the optical system against entrance of gaseous or particulate material.
3. Reflector shall be specifically designed to produce an ANSI/IES distribution pattern equal to the G.E. M400A cutoff fixture.
4. The fixture must be able to meet the following IES recommended levels for the spacing, mounting height, and overhang shown on the drawings:

AVERAGE MAINTAINED FOOTCANDLES	.84
AVERAGE TO MINIMUM RATIO	3:1
MAXIMUM TO MINIMUM RATIO	12:1

5. The optical assembly shall contain an activated charcoal filter to filter out both gaseous and particulate materials.

6.14 D. Ballast

1. The ballast shall be securely mounted to the upper or lower housing.
2. The ballast shall be prewired at the factory and suitable for high ambient temperature operation.
3. The ballast shall be the lag regulating type, for use with a single lamp with a primary power factor of 90% or higher.
4. The ballast shall meet the following requirements:
 - a. Running current, maximum - 2.1 amperes
 - b. Total wattage, maximum - 400 watts
 - c. Operating voltage, +10% - multiple voltage (120, 240)

6.15 E. Socket

1. The socket shall be high-quality, rugged, porcelain, mogul type with corrosion-resistant clamp-type terminals which will position the lamp properly with respect to the reflector and refractor.
2. The socket shall be provided with a heat-resistant gasket for sealing the optical systems.
3. The socket position shall be set at the factory. The position shall be two above the center position.

6.16 F. Lamp

1. The lamp shall be a 310 watt high pressure sodium lamp.

6.17 G. Control Receptacle

1. The housing shall be supplied with an EEL-NEMA standard three (3) terminal, twist-lock photoelectric control receptacle.

6.20 Method of Measurement:

Luminaires will be measured as a unit for each type of luminaire installed.

6.30 Basis of Payment:

The accepted quantities of luminaires, measured as provided above, will be paid for at the contract unit price each, which price shall be full compensation for the work, complete in place, as specified and described herein and as shown on the project plans.

CHAPTER 7

Polycarbonate Vehicle Signals, 8" and 12"

7.01 The work shall consist of furnishing and installing polycarbonate vehicular signals and shall also include all back plates, visors, lamps, internal wiring and other incidentals required in accordance with the project plans and specifications.

7.02 Specification

7.03 Section Housing

1. One piece molded, ultraviolet and heat stabilized, flame retardant polycarbonate unit.
2. Integral serrated locking rings adjustable in 5% increments.

7.04 Lamp Receptacle

1. Heat resistant molded phenolic.
2. Rotatable through 360°
3. Prewired with #18 A.W.G. 105°C type. Color coded leads with quick disconnect terminals.

7.05 Section Housing Door

1. One piece, molded, ultraviolet and heat stabilized, flame retardant polycarbonate unit.
2. Shall be assembled so that an energized lamp cannot swing out with door.

7.06 Optical System Lens

1. Polycarbonate to conform to Institute of Transportation Engineers standards.

7.07 Reflector

1. To conform to Institute of Transportation Engineers standards.

7.08 Color

1. The housing and door shall be molded of one color polycarbonate material throughout.
2. Color - black, as per specifications.

7.09 Backplate

1. Louvered flat sheet aluminum.
2. Color - dull black to match housing and door, as per specifications.

7.10 Visor

1. One piece, ultraviolet and heat stabilized, flame retardant polycarbonate.
2. Tunnel visor
3. Underside color - dull black, as per specifications.
4. Outside color - black to match housing and door.

7.20 Traffic Signal Lamps

7.21 The contractor shall supply the energy efficient krypton gasfilled type of lamps. The lamps shall meet the following requirements:

1. 60 Watt, 120-125 Volt, AT19 bulb, 7500-8500 User hours, 610 lumens; 90 Watt, 120-125 Volt, AT19 bulb 7500-8500 User Hours, 1040 lumens 135 Watts, 125-130 Volt, AT21 bulb, 5500-6500 User Hours, 1750 lumens.
2. Lamps must have projection type filaments supported at seven points.
3. Light Center Length shall be as follows: LCL-2 7/16" for 8" Lens Housing LCL - 3" for 12" Lens Housing.
4. Life rating guaranteed by lamp manufacturer for one year.
5. Lamps must be etched with manufacturer's name, watts, volts and hours of burning life.
6. Lamps must have aluminum reflector disc.
7. Lamps must have built-in fuse wire to prevent damage to socket and electrical controls. Base shall be brass.
8. Lamps must meet or exceed Beam Candlepower Specifications of Adjustable Face Traffic Control Signal Head by Institute of Transportation Engineers.
9. Wattage, lumens, voltage, percent krypton fill, and Beam Candlepower Specifications shall be supported by a report from a recognized independent testing laboratory. This test report shall be submitted with the material list.
10. Amount of krypton gas used must be no less than 80 percent of total fill gas in the lamp.

The lamps shall be installed in each size and type of signal indication as follows:

- 135 Watts - all 12 inch indications
- 90 Watts - for 8 inch red indications
- 60 Watts - for 8 inch yellow and green indications

7.30 Method of Measurement:

Vehicle signals will be measured as a unit for each indication installed.

7.31 Basis of Payment:

The accepted quantities of vehicle signals measured as provided above, will be paid for at the contract unit price each of the type of indication called for in the bidding schedule, which price shall be full compensation for the work complete, as described and specified herein and on the project plans.

CHAPTER 8

Pedestrian Signals

8.01 The work shall consist of furnishing and installing pedestrian signals in accordance with the project plans and specifications.

8.02 The pedestrian signals shall be the energy efficient solid state neon type with international man/hand symbols both in the same housing. The maximum energy used shall be 20 watts. The visor shall be the crate type and shall be 1.5 inches deep. The maximum overall dimensions including the installed visor shall be 18.5" W x 18.75" H x 9" D.

8.03 The entire unit shall have a factory warranty of five years against defects in workmanship or materials.

8.04 Color - Black, as per specifications.

8.05 Method of Measurement:
Traffic signal and pedestrian indications will be measured as a unit for each indication installed.

8.06 Basis of Payment:
The accepted quantities of traffic signal and pedestrian indications, measured as provided above, will be paid for at the contract unit price each of the type of indication called for in the bidding schedule, which price shall be full compensation for the work complete, as described and specified herein and on the project plans.

CHAPTER 9

Pedestrian Push Button:

9.01 The work shall consist of furnishing and installing pedestrian push buttons, including push button placards, internal wiring and other incidentals required in accordance with the project plans and the Specifications.

9.02 All pedestrian push button stations shall receive a minimum of two coats of Dull Black Enamel, per Section 1003-4 of the Standard Specification.

9.03 Method of Measurement:

Pedestrian push buttons will be measured as a unit for each pedestrian push button installed.

9.04 Basis of Payment:

The accepted quantities of pedestrian push buttons, measured as provided above, will be paid for at the contract unit price each, which price shall be full compensation for the work complete, as specified and described herein and as shown on the project plans.

CHAPTER 10

Traffic Signal Mounting Assemblies:

10.01 The work shall consist of furnishing and installing signal mounting assemblies in accordance with the project plans, the TS-9 series and the Specifications.

10.02 All traffic signal mounting assemblies shall receive a minimum of two coats of Dull Black Enamel, per Section 1002-4 of the Standard Specifications.

10.03 Method of Measurement:

Traffic signal mounting assemblies will be measured as a unit for each assembly installed.

10.04 Basis of Payment:

The accepted quantities of mounting assemblies, measured as provided above, will be paid for at the contract unit price each of the type of mounting assembly called for in the bidding schedule, which price shall be full compensation for the work, complete, as specified and described herein and as shown on the project plans.

CHAPTER 11

Loop Detectors For Traffic Signals:

- 11.01 The work consists of furnishing and installing loop detectors for the traffic signals, in accordance with the project plans and the Specifications.
- 11.02 The work shall include all conductors, sawcut sealant, sawcuts and other incidentals required to install loop detectors in the pavement up to and including termination of conduit and conductors in adjacent pull box.
- 11.03 Before and after the sawcut sealant has been installed, the contractor shall perform an insulation-resistance-to-ground test. The insulation-resistance-to-ground of each loop circuit shall be measured and recorded in the presence of the Engineer. The insulation-resistance-to-ground shall be at least 50 megohms when measured at a voltage between 400 volts and 600 volts D.C.
- 11.04 The test results shall be in writing, dated, and submitted to the Traffic Engineer.
- 11.05 Any loop detector that does not meet the above requirement or cannot be tuned to the Engineer's satisfaction shall be replaced by the contractor at no cost to the Department.
- 11.06 Detector Installation:
All detectors shall be installed as shown on the project plans, City of Mesa standard drawing, and as directed by the Engineer.
- 11.10 Type of Loop Wire:
The wire used in the roadway loops shall be Copper #16 AWG, 7 strand, XLP.

11.14 Sawcut sealant:

Sawcuts shall be sealed with W. R. Meadows loop sealant or an approved equal.

11.15 Hold Down Tabs:

Hold down tabs shall be installed in the sawcut on top of the wire every two feet. The tabs shall be installed after the loop wire and prior to the sealant installation. The tabs shall be separate pieces of "foam backing rope" at least one inch in length, which shall be bent and wedged tightly down into the sawcut.

11.16 Method of Measurement:

Loop detectors for traffic signals will be measured as a unit for each loop detector installed.

11.17 Basis of Payment:

The accepted quantities of loop detectors, measured as provided above, will be paid for at the contract unit price each for the type of loop called for in the bidding schedule, which price shall be full compensation for the work complete, as specified and described herein and as shown on the project plans.

CHAPTER 12

Conductors (For Traffic Signals)

12.01 The work shall consist of furnishing and installing electrical conductors, including splicing, tagging of conductors, signal phase grouping and grounding required in accordance with the project plans and Specifications.

12.02 Signal circuit conductors, for mast arm mounted signal heads, shall be run continuous without splicing from the signal heads to the terminal blocks in the saddle type mounts on pole.

12.03 The grounded equipment bond wire shall have green insulation. The green insulation shall be removed in the pull box.

12.04 Ground Resistance Test:

A ground resistance test shall be performed for each service ground rod for the traffic signal. Tests shall also be performed for the coiled wire foundation grounds for the signal poles.

The ground resistance shall be measured with a three terminal fall of potential, direct reading, battery powered earth, tester with 0.50 to 500 ohm scale or better. The 25 ohm reading shall be approximately in the middle of the scale. The test shall be performed with a Biddle No. 250260 direct reading earth tester or an approved equal or better tester. The test shall be performed according to the manufacturer's instructions. The auxiliary copperclad ground rods shall be driven into the ground a minimum of three feet. The lateral spacing for each test rod shall be given in writing on the test report form and the spacing shall be approved by the Engineer.

Each test shall be performed in the presence of the Traffic Engineer. Tests performed in the absence of the Traffic Engineer shall not be acceptable. The test results shall be written down, dated, and given to the Traffic Engineer.

If the ground resistance, for either the traffic signal on roadway lighting ground rods, is above 25 ohms then an additional 5/8 inch diameter by 10 foot long copperclad ground rod shall be installed at least 15 feet from the original rod and shall be bonded to it. The test shall then be repeated for the two rod system if requested by the Traffic Engineer.

The test shall be performed when the soil is dry. The contractor shall not add any chemicals, salts, or salt solutions to any portion of the grounding system.

12.10 Method of Measurement:

Conductors will be measured on a lump sum basis.

12.11 Basis of Payment:

The accepted quantities of conductors, measured as provided above, will be paid for at the contract lump sum price, which price shall be full compensation for the work, complete, as specified and described herein, and as shown on the project plans.

CHAPTER 13

Remove Traffic Signals

13.01 The work shall consist of removing and salvaging the existing traffic signals in accordance with the project plans and the Specifications. The work shall also include the relocation and/or modification of existing traffic signals as required during construction.

13.02 Continuous Operation of Traffic Signals:
It shall be the responsibility of the contractor to insure that existing traffic signals be kept in effective operation for the benefit of the traveling public during construction of the roadway and appurtenances, except when shutdown is permitted to allow for modification of final removal of the systems.

The traffic signal system shutdowns shall be limited to normal working hours. During these periods of shutdown, police officers shall manually direct traffic. At all other times, the traffic signal system shall remain operational.

Existing traffic signal indications shall be maintained in effective operation. Pedestrian indications shall be maintained or provided where these units are now in operation. Likewise, nighttime operation of intersectional lighting shall be maintained at signalized intersections where luminaires now exist.

During construction, the maintenance and timing of the traffic signal controller shall be the responsibility of the City, all other maintenance such as head adjustment, pole relocation, lamp replacement, etc., shall be the responsibility of the contractor.

The contractor shall, for maintenance of electrical systems, have labor and the necessary equipment available on a 24-hour per day schedule. The contractor shall also designate a man (and his telephone number) who will be available for emergency maintenance calls after normal working hours.

13.10 Remove and Salvage:
The contractor shall remove and salvage specified material associated with the existing traffic signal. All salvaged material shall be the property of the City and shall be dismantled and stockpiled as directed by the Traffic Engineer in the field. Material broken or damaged by the contractor shall be replaced with new and like material at the contractor's expense. It shall be the responsibility of the contractor to remove and dispose of all traffic signal equipment and materials not salvaged.

Cavities resulting from the removal of pull boxes, foundation or other material shall be backfilled and compacted with material equivalent to or better than the surrounding material.

13.11 Method of Measurement:

Remove Traffic Signals will be measured on a lump sum basis.

13.12 Basis of Payment:

The accepted quantities of Remove Traffic Signals, measured as provided above, will be paid for at the contract lump sum price, which price shall be full compensation for the work, complete, as specified and described herein, and as shown on the project plans.

CITY OF MESA
TRAFFIC SIGNAL GROUP
PAINT SPECIFICATIONS

Entire pole and mast arm assembly shall be spray painted with two (2) coats of finish paint. Allow first coat to dry a minimum of 48 hours before second coat is applied. Touch up as needed after pole assemblies are erected.

- P A I N T -

Luminaire Mast Arm and Pole
(above paint line):

PERVO #1726 - Liquid Aluminum or approved equal

Traffic Signal Mast Arm & Pole

PERVO #2487 - School Bus Yellow or approved equal

City of Mesa

TRAFFIC SIGNAL GROUP

I.M.S.A. Cable 19-1-84 (PVC) 14 AWG Solid Copper
Phase Code

R = Red Y = Yellow G = Green B = Blue
BL - Black W = White O = Orange (stripe)

- 20 Conductor -

Cable #1. (1 black tape)

<u>Phase</u>	<u>Conductor Color</u>	<u>Comments</u>
Ø1 veh.	R, YL G	Inside conductor bundle
Ø2 veh.	R, Y, G (BL)	" " "
Ø3 veh.	R, B, G (W)	" " "
Ø4 veh.	R (G), O (G), B (R)	" " "
Ø2 ped. WALK	B	" " "
Ø2 ped. D.W.	BL	" " "
Ø4 ped. WALK	B (BL)	Outside conductor bundle
Ø4 D.W.	B (W)	" " "
Ø2 push button	R	" " "
Ø4 push button	O	" " "
Ø2, Ø4 push button	W (BL)	Common to Chassis Ground
* * * * *	* * * * *	* * * * *

- 20 Conductor -

Cable #2. (No tape)

<u>Phase</u>	<u>Conductor Color</u>	<u>Comments</u>
Ø5 veh.	R, Y, G	Inside conductor bundle
Ø6 veh.	R, Y, G (BL)	" " "
Ø7 veh.	R, B, G (W)	" " "
Ø8 veh.	R (G), O (G), B (R)	" " "
Ø6 ped. WALK	B	" " "
Ø6 ped. D.W.	BL	" " "
Ø8 ped. WALK	B (BL)	Outside conductor bundle
Ø8 ped. D.W.	BL (W)	" " "
Ø6 push button	BL (R)	" " "
Ø8 push button	BL (W)	" " "
Ø6, Ø8 push button	W (BL)	Common to Chassis Ground

Marking Tape per Phases

Ø1 = 1 red tape	Ø5 = 2 red tape
Ø2 = 1 white tape	Ø6 = 2 white tape
Ø3 = 1 blue tape	Ø7 = 2 blue tape
Ø4 = 1 green tape	Ø8 = 2 green tape

CONTRACT FCD 86-16

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 herein contained, 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 86-16, RWCD Floodway Box Culvert Apache Boulevard at Higley Road and to completely 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 construction of said improvements and to completely construct the same and install the material therein, as called for by this agreement free and clear of all claims, liens, and charges whatsoever, in the manner and under the conditions specified within 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.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PARTY OF 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: _____

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

AGENCY OF RECORD

BY: _____

AGENCY ADDRESS

SURETY SEAL

BY: _____

POWER OF ATTORNEY SEAL

BY: _____

CONTRACT NO. FCD 86-16
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____.

AGENCY OF RECORD

PRINCIPAL SEAL

By: _____

AGENCY ADDRESS

SURETY SEAL

CONTRACT NO. FCD 86-16
PERFORMANCE BOND

BY: _____

POWER OF ATTORNEY SEAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

CERTIFICATE OF INSURANCE RWCD FLOODWAY BOX CULVERT

CONTRACT FCD 86-16 PROJECT TITLE APACHE BOULEVARD AT HIGLEY ROAD

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

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

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

The Flood Control District of Maricopa County is added as an additional insured as respects work done for the District by the named insured as required by statute, contract, purchase order or otherwise requested. It is agreed that any insurance available to the named insured shall be primary of other sources that may be available. It is further agreed that no policy shall expire, be cancelled or materially changed to effect the coverage available to the District without fifteen days written notice to the District. THIS CERTIFICATE IS NOT VALID UNLESS COUNTERSIGNED BY AN AUTHORIZED REPRESENTATIVE OF THE INSURANCE COMPANY.

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

DATE ISSUED _____

AUTHORIZED REPRESENTATIVE _____

It is further agreed that:

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

Date _____ Contractor _____