

CONSTRUCTION SPECIFICATIONS

FOR

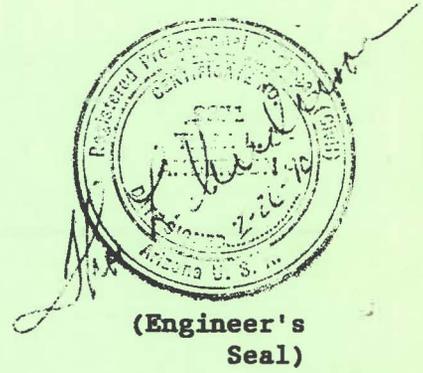
32ND STREET BRIDGE OVER THE ARIZONA CANAL DIVERSION CHANNEL

FCD CONTRACT NO. 89-76

CONSTRUCTION SPECIAL PROVISIONS

Prepared By:

CREEGAN + D'ANGELO
650 North Second Avenue
Phoenix, Arizona 85003



(Engineer's Seal)

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Flood Control District of MC Library
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2801 Durango
Phoenix, AZ 85009

PREPARED FOR:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Recommended By: Chick Karan Date: 3-7-90
Nicholas P. Karan, P.E., Chief
Engineering Division

Approved By: Stanley L. Smith Jr. Date: 3-9-90
STANLEY L. SMITH JR., P.E.
DEPUTY CHIEF ENGINEER
D.E. Sagramoso, P.E.
Chief Engineer and General Manager

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

ADDENDUM NO. 1

DATE: APRIL 2, 1990

FCD CONTRACT NO. 89-76

PAGE 1 OF 2

To Contract Documents

ENTITLED: 32ND STREET BRIDGE AT THE ARIZONA-CANAL DIVERSION CHANNEL AND UTILITY RELOCATIONS

OWNER: Flood Control District of Maricopa County

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

TO INVITATION TO BID AND BIDDING SCHEDULE:

- 1. On page 7 of 27 of the Invitation to Bid, under Item No. 505-3 of the Bidding Schedule, change the approximate quantity from "66,716" to "66,832".

TO CONSTRUCTION SPECIAL PROVISIONS:

- 1. On page SP-6 of 44, under "SUBSECTION 105.2 - PLANS AND SHOP DRAWINGS", add the following sentence to the end of the fifth paragraph (Drawings for shoring.....in the State of Arizona.):

"The Contractor shall evaluate the traffic plating details (identified as "Trench Plating Detail" on sheet 14 of 34 of the construction drawings), or provide other traffic plating details. The evaluation of the detail provided or the design of another traffic plating detail shall be prepared by and bear the seal and signature of a Professional Civil or Structural Engineer, licensed in the State of Arizona."

TO CONSTRUCTION DRAWINGS:

- 1. On Sheet 10 of 34; from the northeast pull box number 6, change the 1 1/2" sized conduits to 2" sized conduits.
- 2. On Sheet 10 of 34; in the FOUNDATION SCHEDULE, change foundation number 2 and foundation number 4 from Type "M" to Type "M Special" as shown on sheet 12 of 34.
- 3. On Sheet 10 of 34; in the FOUNDATION SCHEDULE, for foundation number 1 and foundation number 3 delete the Type "M" callout.
- 4. On Sheet 12 of 34; the dimension "D" in the POLE FOUNDATION DIMENSION SCHEDULE, is not applicable to this project.
- 5. On Sheet 22 of 34; in the table BRIDGE QUANTITIES (APPROXIMATE), change the reinforcing steel quantity from "66,716" to "66,832".

ADDENDUM NO. 1

DATE: April 2, 1990

FCD CONTRACT NO. 89-76

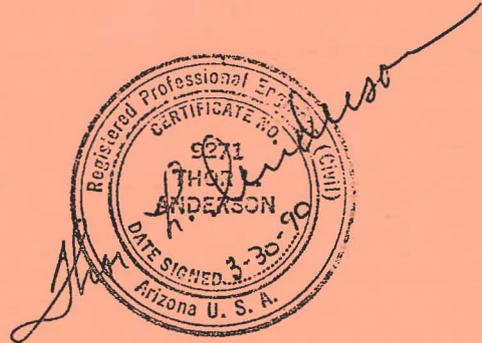
PAGE 2 OF 2

6. On Sheet 27 of 34; in SECTION B-B, change the 3 - #4 x 6'-0" to 3 - #8 x 8'-0" EACH FACE.
7. On Sheet 30 of 34; in the upper left hand corner, change the length of the 4 - 1 1/8" diameter anchor bolts from 1' - 10" to 5' - 4".


STANLEY L. SMITH JR., P.E.
DEPUTY CHIEF ENGINEER

D. E. Sagramoso, P.E.
Chief Engineer and General Manager
Flood control District of Maricopa County


Thor Anderson, P.E.
Creegan + D'Angelo



(Engineer's Seal)

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

PRE-BID MEETING

FCD Contract No. 89-76
32nd Street Bridge and Utility Relocations

DATE: March 26, 1990

TIME: 2:00 p.m.

Don Rerick opened the meeting by describing the project located at 32nd Street and Stanford Drive.

Using an aerial photo, the project was described as consisting of the bridge at 32nd Street over the future Arizona Canal Diversion Channel, the relocation of a 12" water line along the north side of Stanford Drive from 32nd Street east. Additional utility relocations include a storm sewer and sanitary sewer across 32nd Street just north of Stanford Drive. Associated with the bridge construction will be two three lane detours for a two phase construction of the bridge.

Comments from other District staff were then requested.

Leanna Cumberland, Contracts Branch Chief, commented on the MBE/WBE requirements, stating that the contractors are encouraged to have minority involvement in the contract.

There were no other comments from District staff or the District consultant.

The meeting was then turned over to questions from those in attendance.

Mr. Hector Cardona of U.S. West communications asked about the status of the SRP/USW relocations for the project.

Don Rerick said he would discuss this with Hector after the meeting, but stated that all such relocations must be completed before the Notice to Proceed. If for some reason this does not happen, the contractor will have to be notified at the pre-construction meeting.

Mr. Bill Huntington of CoreSlab asked if "two move-ins" will be required for the setting of the precast bridge slabs?

Mr. Thor Anderson responded to this question by noting that curing time for the first phase of the bridge deck construction will create a hiatus between the first phase and the second phase of the deck construction. The contractor can, if he wishes, try to devise a way to get around this.

This was the extent of the Pre-Bid meeting.

There being no further questions, the meeting was adjourned.

Attached with these meeting notes are:

1. Agenda for the meeting.
2. Meeting Attendance Roster.

PRE-BID MEETING

CONTRACT FCD 89-76

"32nd Street Bridge and Utility Relocations"

AGENDA

1. Introduction of Project
2. Introduction of Personnel - District and Consultant
3. Principal Project Features -
 - a. 32nd Street bridge - precast concrete and drilled caissons.
 - b. Construction of detours.
 - c. 1,276 L.F. of 12" water line.
 - d. Miscellaneous utility relocations.
4. Comments from District.
5. Comments from Consultant.
6. Questions from contractors.

CONSTRUCTION SPECIFICATIONS

FOR

32ND STREET BRIDGE OVER THE
ARIZONA CANAL DIVERSION CHANNEL

FCD CONTRACT NO. 89-76

CONSTRUCTION SPECIAL PROVISIONS

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PREPARED FOR:

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ATTENTION

ALL PROSPECTIVE BIDDERS

Some of the Bid Bonds previously received with bids for construction projects have not been in complete compliance with Arizona Revised Statutes (A.R.S.).

A.R.S. Sec. 34-201(A)(3) requires that every bid be accompanied by a certified check, cashier's check or surety bond for five percent (5%) of the amount of the bid.

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

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

Please take note and submit your bids accordingly.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FCD CONTRACT 89-76

32ND STREET BRIDGE OVER THE
ARIZONA CANAL DIVERSION CHANNEL

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(Area to left
reserved for
Engineer's Seal)

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
INVITATION TO BID**

BID OPENING DATE: April 10, 1990

LOCATION:

32nd Street at the Arizona Canal and Stanford Drive.

PROPOSED WORK:

Construct 32nd Street Bridge over future Arizona Canal Diversion Channel, 12" waterline along Standford Drive, and miscellaneous utility relocations.

BIDS:

SEALED BIDS for the proposed work will be received by the Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, Arizona 85009 until 2:00 p.m. (Phoenix time) on the above date and then publicly opened and read at 3335 W. Durango St., Phoenix, AZ 85009. No bids will be received after the time specified for bid opening. All bids must be submitted on proposal forms furnished by the Flood Control District and included in the Proposal Pamphlet. The Board of Directors reserves the right to reject any and all bids and to waive any informality in any bid received.

ELIGIBILITY OF CONTRACTOR:

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

The bidder shall be required to certify that it is appropriately licensed as a Contractor in the State of Arizona for performing the before-mentioned type of work. Verification shall be on the form provided herein.

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

In order to determine if bidder is entitled to the provisions of A.R.S. Sec. 34-241, all bidders shall submit, as a part of their proposal, an affidavit stating whether or not taxes have been paid for two successive years as provided in A.R.S. Sec. 34-241. The affidavit shall be in the form provided herein.

In the event a bidder challenges compliance with the tax provision, the successful bidder will be required to provide proof of compliance.

CONTRACT TIME:

All work on this Contract is to be completed within Two Hundred Ten (210) calendar days after date of Notice to Proceed.

MBE/WBE PARTICIPATION:

For this project, a goal of fifteen (15) percent is desired for Minority/Women-Owned Business Enterprises. Instructions and required forms are included in the Minority and Women-Owned Business Enterprise Program Section.

PRE-BID CONFERENCE:

A pre-bid conference will be held on March 26, 1990 at 2:00 p.m. in the Flood Control District conference room, 3335 W. Durango Street, Phoenix, Arizona 85009. It is in the best interest of prospective bidders to attend the Pre-bid Conference.

Questions or items for clarification may be addressed to the Chief, Contracts Branch, in writing, at least ten (10) days prior to bid opening date. Where appropriate, any answers or clarifications affecting the cost may be addressed to all bidders in an addendum. Under no circumstances will verbal interpretations or clarifications be given to individual contractors.

PROJECT PLANS, SPECIAL PROVISIONS AND CONTRACT DOCUMENTS:

Plans and Construction Specifications may be obtained from Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, Arizona 85009 upon payment of \$30.00 by check, payable to the FLOOD CONTROL DISTRICT of MARICOPA COUNTY. This payment will not be refunded. Mail orders for project documents must include an additional \$7.50 for first class U.S. postage and handling. The total \$37.50 will not be refunded. Regardless of circumstances, we cannot guarantee mail delivery. Each bid must be accompanied by a Bid Bond, cashier's or certified check or postal money Order equal to 5 percent (5%) of the bid, made payable to the FLOOD CONTROL DISTRICT OF MARICOPA COUNTY as a guarantee that if the work is awarded to the bidder, the bidder will within ten (10) days of receipt of the Proposal Acceptance, enter into proper contract and bond condition for the faithful performance of the work, otherwise, said amount may be forfeited to the said BOARD OF DIRECTORS as liquidated damages.

All bids are to be marked in accordance with Section 102.9 of the Uniform Standard Specifications and addressed to the Chief Engineer and General Manager, Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, Arizona 85009.

As provided for in the Agenda Information Form authorizing the Invitation to Bid.

PRINCIPLE ITEMS AND APPROXIMATE QUANTITIES

<u>ITEM</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>DESCRIPTION</u>
321	705	TON	Asphalt Concrete
502	1,031	LF	Drilled Shaft Foundations 36" Diameter
505	484	CY	Concrete
506	30	EA	Precast Concrete Girder
610	1,276	LF	12" DIP Waterline

PROPOSAL

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

Gentlemen:

The following Proposal is made for constructing FCD 89-76: 32nd Street Bridge Over the Arizona Canal Diversion Channel in the County of Maricopa, State of Arizona.

The following Proposal is made on behalf of

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

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

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

The Undersigned further proposes to execute the Contract Agreement and furnish satisfactory Bonds and Sureties within ten (10) days of receipt of Notice of Proposal acceptance, **TIME BEING OF THE ESSENCE**. The Undersigned further proposes to begin work as specified in the Contract attached hereto, and to complete the work within 210 calendar days from the effective date specified in the Notice to Proceed, and maintain at all times a Payment and Performance Bond, approved by the Board of Directors, each in an amount equal to one hundred percent of the contract amount. This Bond shall serve not only to guarantee the completion of the work on the part of the Undersigned, but also to guarantee the excellence of both workmanship and material and the payment of all obligations incurred, said Bonds and Sureties to be in full force and effect until the work is finally accepted and the provisions of the Plans, Specifications, and Special Provisions fulfilled.

A Proposal Guaranty in the amount and character named in the Invitation to Bid is enclosed amounting to not less than five (5) percent of the total bid, which Proposal Guaranty is submitted as a guaranty of the good faith of the Bidder and 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 his Proposal, if the Proposal is accepted and there should be failure on the part of the Undersigned to execute the Contract and furnish satisfactory Bonds and Sureties 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.

The Undersigned acknowledges receipt of the following addenda and has included their provisions in the proposal:

Addendum No. _____	Dated _____

The Undersigned has enclosed the required bid security to this Proposal.

BIDDING SCHEDULE

PROJECT: 32nd Street Bridge and Utility Relocations

CONTRACT: FCD 89-76

ITEM NO.	DESCRIPTION	APPROXIMATE QUANTITY	UNIT	UNIT COST (IN WRITING) AND /100 DOLLARS	UNIT COST (NUMBERS)	EXTENDED AMOUNT
206-1	Structural Excavation	962	CY			
206-2	Structural Backfill	90	CY			
301	Subgrade Preparation	2,368	SY			
310-1	Aggregate Base Course	519	TON			
310-2	Select Materials	17	TON			
321-1	A-1 1/2, Asphalt Concrete	230	TON			
321-2	C-3/4, Asphalt Concrete	322	TON			
321-3	D-1/2, Asphalt Concrete	153	TON			
329	Tack Coat	0.54	TON			
334	Preservative Seal	0.54	TON			
336-1	Pavement Replacement-Type A	36	SY			
336-2	Pavement Replacement-Type D	172	SY			
340-1	Concrete Curb and Gutter-Det. 220	170	LF			
340-2	Concrete Sidewalk - Det. 230	147	SF			
340-3	Concrete Driveway Entrance - Det. 250	499	SF			
345	Adjust Manhole Frame and Cover - Det. 422	1	EA			

BIDDING SCHEDULE

PROJECT: 32nd Street Bridge and Utility Relocations

CONTRACT: FCD 89-76

ITEM NO.	DESCRIPTION	APPROXIMATE QUANTITY	UNIT	UNIT COST (IN WRITING) AND /100 DOLLARS	UNIT COST (NUMBERS)	EXTENDED AMOUNT
350-1	Remove Existing Concrete Curb & Gutter	264	LF			
350-2	Remove Existing Concrete Sidewalk & Driveway	699	SF			
350-3	Miscellaneous Removals	1	LS			
401-1	Traffic Control	1	LS			
401-2	Uniformed, Off-Duty, Law Enforcement Officer	360	HRS			
405	Survey Monument, Type B - Det. 120-1	1	EA			
502	Drilled Shaft Foundations	1,031	LF			
505-1	Class "AA" Concrete - f'c = 4,000 psi	319	CY			
505-2	Class "A" Concrete - f'c = 3,000 psi	165	CY			
505-3	Reinforcing Steel	66,716	LB			
506	Precast Concrete Girder (Prestressed)	30	EA			
520	Pedestrian Fence	1	LS			
610-1	12" Restrained Joint Ductile Iron Pipe	276	LF			
610-2	12" Ductile Iron Pipe	1,000	LF			
610-3	Cut & Plug 12" Water Line	2	EA			

BIDDING SCHEDULE

PROJECT: 32nd Street Bridge and Utility Relocations

CONTRACT: FCD 89-76

ITEM NO.	DESCRIPTION	APPROXIMATE QUANTITY	UNIT	UNIT COST (IN WRITING) AND /100 DOLLARS	UNIT COST (NUMBERS)	EXTENDED AMOUNT
610-4	Cut & Plug 4" Water Line	2	EA			
610-5	Water Meter Box and Cover No. 1 - Det. 310 & 320	1	EA			
610-6	Ductile Iron Fittings (in excess of fittings shown on plans)	1,000	LB			
615	10" Vitrified Clay Sewer Pipe	107	LF			
618-1	Concrete Catch Basin - Type M-1 Det. P-1569	1	EA			
618-2	Concrete Catch Basin - Type N Det. P-1570	1	EA			
618-3	30" Catch Basin Connector Pipe	29	LF			
618-4	24" Catch Basin Connector Pipe	82	LF			
618-5	24" Pipe Collar Det. 505	2	EA			
618-6	30" Pipe Plug Det. 427	1	EA			
625	4' Dia. Precast Concrete Sewer Manhole	1	EA			
630-1	12" x 12" Tapping Sleeve & Valve	1	EA			
630-2	12" Valve	3	EA			
630-3	4" x 4" Tapping Sleeve & Valve	1	EA			
630-4	Install Water Valve Box - Type A Det. 391-1	6	EA			

IF BY AN INDIVIDUAL:

(NAME - TITLE) (ADDRESS)
DATE _____
(PHONE)

IF BY A FIRM OR PARTNERSHIP:

(FIRM NAME) (FIRM ADDRESS)
BY: _____ DATE _____
(NAME - TITLE) (PHONE)

** Name and Address of Each Member:

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

IF BY A CORPORATION:

(CORPORATE NAME) (CORPORATION ADDRESS)
BY: _____ DATE: _____
(PHONE)

TITLE: _____

* Incorporated under the Laws of _____

Names and Addresses of Officers:

(PRESIDENT) (ADDRESS)

(SECRETARY) (ADDRESS)

(TREASURER) (ADDRESS)

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

SURETY BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as Principal, (hereinafter called the Principal), and the _____, a corporation duly organized under the laws of the State of _____, as Surety, (hereinafter called the Surety), are held and firmly bound unto the Flood Control District of Maricopa County as Obligee, in the sum of ___ percent (___%) of the total amount of the bid of Principal, submitted by him to the Flood Control District of Maricopa County, for the work described below, for the payment of which sum, well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, and administrators, successors and assigns, jointly and severally, firmly by these presents, and in conformance with A.R.S. Sec. 34-201(A)(3).

WHEREAS, the said Principal is herewith submitting its proposal for FCD 89-76; 32nd Street Bridge Over the Arizona Canal Diversion Channel.

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

Signed and sealed this _____ day of _____, A.D., 1990.

Principal

Title

Witness:

Surety

Title

Witness:

VERIFICATION OF LICENSE

Pursuant to A.R.S. Sec. 32-1169, I hereby state that I hold a current contractor's license, duly issued by the office of the Registrar of Contractors for the State of Arizona, said license has not been revoked, that the license number is: _____; that my privilege license number (as required by A.R.S. Sec. 42-1305) is: _____; and that, if any exemption to the above licensing requirements is claimed;

(1) The basis for the claimed exemption is: _____ and;

(2) The names(s) and license number(s) of any general, mechanical, electrical, or plumbing contractor(s) to be employed on the work are:

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

DATE: _____ SIGNATURE OF LICENSEE: _____

COMPANY: _____

MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM

- A. The following conditions will apply in the calculation of the percentage attainment:
1. All MBE/WBE firms used in attainment of the goal must be certified with the Maricopa County Minority Business Office which is located in the Maricopa County Highway Department building, 3325 West Durango Street, Phoenix. In addition, only those firms certified at least seven calendar days prior to the bid opening will be considered in the attainment of the goal.
 2. Prime contractor subcontracts to MBE or WBE:
The MBE/WBE amount to be applied to the goal will be based on that portion (dollar value) of the contract that the MBE/WBE performs. For example, if a prime contractor subcontracts work amounting to \$100,000 of a contract for which the total project cost is \$1,000,000. the MBE/WBE participation will be credited as 10 percent.
 3. Prime Minority Contractor:
An MBE/WBE prime contractor will be credited with the MBE/WBE participation for that portion of the contract which they themselves perform plus that portions subcontracted to other MBE/WBE firms. For example, if an MBE/WBE prime contractor proposes to perform 50 percent of a project quoted at \$1,000,000 and subcontracts 25 percent to an MBE firm and 25 percent to a non-MBE/WBE firm, MBE/WBE participation will be credited as 75 Percent, or \$750,000.
 4. Minority-Non-Minority Joint Venture:
A joint venture consisting of MBE/WBE participation and non-MBE/WBE business enterprises, functioning as a prime contractor, will be credited with minority participation on the basis of the percentage of profit accruing to the MBE/WBE firm. For example, if a MBE/WBE and non-MBE/WBE joint venture proposes to perform 50 percent of a \$1,000,000 project and 50 percent of the joint venture profits (\$500,000) are to accrue to the MBE/WBE partner in the joint venture, MBE/WBE participation will be credited at 25 percent or \$250,000.
 5. Lower Tier Non-MBE/WBE Participation:
MBE/WBE subcontractors proposing to further subcontract to non-MBE/WBE contractors shall not have that portion of subcontracting activity considered when determining the percentage of MBE/WBE participation.

6. MBE/WBE Suppliers:

Any MBE/WBE supplier that manufactures or substantially alters the material or product it supplies will have that portion of activity considered when determining the percentage of MBE/WBE participation. Any MBE/WBE Wholesaler, Distributor, or Jobber that does not manufacture or substantially alter the materials or product it sells will be limited to 20 percent of the sale price when determining the percentage of MBE/WBE participation.

B. Required forms:

An affidavit is included as part of this section. The form must be completed within seven calendar days after the Notice of Award of Contract. The low bidder is required to submit a Minority/Women-Owned Business Enterprise Program MBE/WBE Participation Affidavit listing the MBE/WBE participation by MBE/WBE firm and the related dollar value of the MBE/WBE contract.

C. Requests for Pay:

Each Request for Pay must be accompanied by a Maricopa County Minority/Women-Owned Business Enterprise Program MBE/WBE Participation Report. The final pay request shall include a listing of total contract MBE/WBE participation.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
MINORITY/WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM

MBE/WBE PARTICIPATION ASSURANCES
AFFIDAVIT

The undersigned, fully cognizant of the Flood Control District of Maricopa County MBE/WBE Program requirements and of the goal established, hereby certifies that in the preparation of this bid,

(the entity submitting the bid)

(CHECK ONE)

- _____ Will meet the established goal for participation by Minority/Women-Owned Business Enterprises.
- _____ Will provide the necessary documentation to Minority Business Office to establish that a good faith effort was made.
- _____ Will not participate in the MBE/WBE Program.

The bidder will specify its MBE/WBE participation on the Intended Participation Affidavit or provide documentation of its good faith efforts not later than 4:00 p.m., the seventh calendar day following the bid opening. The required affidavit shall be obtained by the apparent first and second low bidders from the Minority Business Office, Maricopa County Highway Department Building, 3325 West Durango Street, Phoenix, Arizona 85009, following the opening and reading of bids; a sample affidavit form for reference purposes follows.

Name of Firm

Signature

Title

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
MINORITY/WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM
Actual Minority/Women-owned Participation

Name of Prime Contractor

FCD 89-76
Project Number

Contact Person

Total Amount of Contract

Street No.

City State Zip

<u>Minority/Women-owned Firm</u>	<u>Principal</u>	<u>Address</u>	<u>Type of Work</u>	<u>Subcontract Amount</u>
----------------------------------	------------------	----------------	---------------------	---------------------------

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

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

Signature

Title

Date

Copy to: Minority Business Office
Maricopa County Highway Department
3325 West Durango Street
Phoenix, Arizona 85009

MARICOPA COUNTY
MINORITY/WOMEN-OWNED BUSINESS ENTERPRISES PROGRAM

MBE/WBE PARTICIPATION REPORT
(To be attached with Request for Pay)

Date: _____

Contractor: _____

Contact Person: _____

Address: _____

Telephone: _____

Project: 32nd Street Bridge Over the

Arizona Canal Diversion Channel

Contract Number: FCD 89-76

For Pay Period of: _____

Subcontractor: _____

Person to Contact: _____

Address: _____

Telephone Number: _____

Type of Firm: _____

Class of Work: _____

Subcontract Amount: _____

Amount Earned _____

(Commission) This Period: _____

Total Earned by This Subcontractor: _____

Total MBE/WBE Contract Goal, %: 15

Total Cumulative MBE/WBE

Participation on This Contract, %: _____

MBE/WBE subcontract payment made
during this reporting period (yes or no): _____

cc: Minority Business Office
Maricopa County Highway Building
3325 West Durango Street
Phoenix, Arizona 85009

CONTRACT AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 1990, by and between FLOOD CONTROL DISTRICT OF MARICOPA COUNTY, hereinafter called the OWNER, acting by and through its BOARD OF DIRECTORS, and

hereinafter called the CONTRACTOR.

WITNESSTH: That the said CONTRACTOR, for and in the consideration of the sum of _____ to be paid to him by the OWNER, in the manner and at the times hereinafter provided, and of the other covenants and agreements herein contained, hereby agrees for himself, heirs, executors, administrators, successors, and assigns as follows:

ARTICLE I - SCOPE OF WORK: The CONTRACTOR shall construct, and complete in a workmanlike and substantial manner and to the satisfaction of the Chief Engineer and General Manager, a project for the Flood Control District of Maricopa County, designated as FCD Contract 89-76; 32nd Street Bridge Over the Arizona Canal Diversion Channel, and furnish at his own cost and expense all necessary machinery, equipment, tools, apparatus, materials, and labor to complete the work in the most substantial and workmanlike manner according to the Plans and Construction Specifications on file with the Flood Control District of Maricopa County, 3335 West Durango Street, Phoenix, Arizona, and such modifications of the same and other directions that may be made by the Flood Control District of Maricopa County as provided herein.

ARTICLE II - CONTRACT DOCUMENTS: The Construction Specifications (Invitation to Bid, Plans, Standard Specifications and Details, Special Provisions, Addenda, if any, Proposal, Affidavits, Performance Bond, Payment Bond, Certificates of Insurance, and Change Orders, if any,) are by this reference made a part of this Contract and shall have the same effect as though all of the same were fully inserted herein.

ARTICLE III - TIME OF COMPLETION: The CONTRACTOR further covenants and agrees at 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 in accordance with the requirements of A.R.S. Sec. 34-221, as amended. The CONTRACTOR agrees to discharge its obligations and make payments to its subcontractors and suppliers in accordance with A.R.S. Sec. 32-1129.

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

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

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

ARTICLE VIII - MBE/WBE PROGRAM: Flood Control District of Maricopa County will endeavor to ensure in every way possible that minority and women-owned business enterprises shall have every opportunity to participate in providing professional services, purchased goods, and contractual services to the Flood Control District of Maricopa County without being discriminated against on the grounds of race, religion, sex, age, or national origin.

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

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

PARTY OF THE FIRST PART

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PARTY OF THE SECOND PART

BY: _____
Printed Name

BY: _____
CHAIRMAN, BOARD OF DIRECTORS

BY: _____
Signature

DATE: _____

Title
DATE: _____

Tax Identification Number

RECOMMENDED BY:

CHIEF ENGINEER AND GENERAL MANAGER
FLOOD CONTROL DISTRICT OF
MARICOPA COUNTY

ATTEST:

CLERK OF THE BOARD

DATE: _____

LEGAL REVIEW

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

BY: _____
GENERAL COUNSEL, FLOOD CONTROL
DISTRICT OF MARICOPA COUNTY

DATE: _____

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

KNOW ALL MEN BY THESE PRESENTS:

That, _____
(hereinafter called the Principal), As Principal, and _____

_____ a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ (hereinafter called the Surety), as Surety, are held and firmly bound unto the Flood Control District of Maricopa County, in the County of Maricopa, State of Arizona (hereinafter called the Oblige), in the amount of _____

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

WHEREAS, the Principal has entered into a certain written contract with Flood Control District of Maricopa County, dated the ____ day of _____, 1990, for FCD Contract 89-76; 32nd Street Bridge Over the Arizona Canal Diversion Channel, which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall promptly pay all monies 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 was copied at length herein.

The prevailing party or any party which recovers judgement 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 _____, 1990.

PRINCIPAL SEAL

BY: _____

AGENCY OF RECORD

SURETY SEAL

BY: _____

BOND NUMBER.

POWER OF ATTORNEY SEAL

BY: _____

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 Flood Control District of Maricopa County, dated the ____ day of _____, 1990, for FCD Contract 89-76; 32nd Street Bridge Over the Arizona Canal Diversion Channel, which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the 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 was 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 _____, 1990.

AGENCY OF RECORD

AGENCY ADDRESS

BOND NUMBER

POWER OF ATTORNEY

PRINCIPAL SEAL

BY: _____

SURETY SEAL

BY: _____

BY: _____

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

CERTIFICATE OF INSURANCE

CONTRACT FCD 89-76

PROJECT TITLE 32nd Street Bridge Over the ACDC

NAME AND ADDRESS OF INSURANCE AGENCY	INSURANCE COMPANIES AFFORDING COVERAGES
	Company Letter A
	Company Letter B
	Company Letter C
	Company Letter D
	Company Letter E
	Company Letter F
NAME AND ADDRESS OF INSURED	Company Letter 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	
	COMMERCIAL GENERAL <input checked="" type="checkbox"/> 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 PROPERTY DAMAGE each occurrence	Combined Single Limit 5,000
	COMPREHENSIVE AUTO <input checked="" type="checkbox"/> 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 checked="" type="checkbox"/> ENGINEERS PROFESSIONAL LIABILITY			EACH CLAIM AND ANNUAL AGGREGATE	
	<input checked="" type="checkbox"/> OTHER In addition to the Flood Control District, the City of Phoenix, Town of Paradise Valley, Maricopa County, and Creegan+D'Angelo shall be named additional insured.				

Except for Professional Liability Insurance and Workers' Compensation Insurance, the Flood Control District of Maricopa County is added as an additional insured in respect to liability arising in any manner out of the performance of any contract entered into between the insured and the Flood Control District or liability arising out of any services provided or duty performed by any party as required by statute, law, purchase order, or otherwise required. 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 thirty (30) days written notice to the District. THIS CERTIFICATE IS NOT VALID UNLESS COUNTERSIGNED BY AN AUTHORIZED REPRESENTATIVE OF THE INSURANCE COMPANY.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 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, CITY OF PHOENIX, TOWN OF PARADISE VALLEY, MARICOPA COUNTY, and CREEGAN + D'ANGELO 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, City of Phoenix, Town of Paradise Valley, Maricopa County, and Creegan + D'Angelo shall in all instances be indemnified against all liability, losses and damages of any nature for or on account of any injuries to or death of persons or damages to or destruction of property arising out of or in any way connected with the performance or nonperformance of this Agreement, except such injury or damage as shall have been occasioned by the negligence of the Flood Control District of Maricopa County, City of Phoenix, Town of Paradise Valley, Maricopa County, and Creegan + D'Angelo. The above cost of damages incurred by the Flood Control District of Maricopa County, City of Phoenix, Town of Paradise Valley, Maricopa County, and Creegan + D'Angelo or any of its departments, agencies, officers or employees, or others aforesaid shall include in the event of an action, court costs, expenses for litigation and reasonable attorney's fees.

Firm

Date

Principal

Title

SUBCONTRACTOR LISTING

Following is a listing of Subcontractors and material suppliers that are to be used in the event the undersigned should enter into contract with the Owner. This is not an exhaustive or inclusive list.

(Signature) _____

CONSTRUCTION SPECIAL PROVISIONS
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FCD CONTRACT 89-76
32ND STREET BRIDGE AT THE ACDC
AND
UTILITY RELOCATIONS

PROPOSED WORK:

The work includes the following major elements:

1. Construction of a bridge over the future ACDC.
2. Relocation of a 12-inch water line.
3. Relocation of miscellaneous utilities.

LOCATION OF THE WORK:

The project is located in Phoenix, Arizona at the intersection of 32nd Street and Stanford Drive, immediately north of the Arizona Canal.

SPECIFICATIONS:

Except as otherwise required in these Construction Special Provisions, construction of this project shall be in accordance with all applicable Maricopa Association of Governments (MAG) Uniform Standard Specifications and Uniform Standard Details, latest revision, and the latest revision of the City of Phoenix Supplements to the MAG Uniform Standard Specifications and Details, together with Maricopa County Highway Department Supplements to the Uniform Standard Specifications.

PRECEDENCE OF CONTRACT DOCUMENTS:

The City of Phoenix Supplements to MAG Specifications and Details will govern over the MAG Standard Specifications and Details. In case of a discrepancy or conflict, Project Plans will govern over both the City of Phoenix Supplements and MAG Standard Specifications and Details. These Construction Special Provisions will govern over the City of Phoenix Supplements and MAG Standard Specifications and Details and the Project Plans.

PAYMENT:

Payment will be made for only those items listed in the proposal and will not be made in accordance with the measurement and payment provisions of the Standard Specifications where this differs from the items listed in the proposal. All materials and work necessary for completion

of this project are included in proposal items. Any work or material not specifically referred to in these items is considered incidental to the item and included in the unit price.

WORK STANDARDS:

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

CONTRACT TIME:

The Contractor shall commence work within seven (7) calendar days after the date of the Notice to Proceed and complete all work within two hundred ten (210) calendar days after receipt of the Notice to Proceed. In the event the Contractor elects to work overtime, second shifts, or weekends to complete the work, that is not required by the Project Plans and these Special Provisions, the Contractor will be responsible to bear the additional costs that may be incurred by the Owner including engineering, inspections, testing, surveying and construction administration all in accordance with Section 108.5. These costs will be deducted from the monies due to the Contractor for each Payment Request. The costs associated with these items shall be incidental to the unit price items in the bid schedule.

NEGOTIATION CLAUSE:

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

WATER, LIGHT, POWER, HEAT, TELEPHONE:

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

PROGRESS SCHEDULE:

The Contractor shall submit a proposed work progress schedule to the Engineer for approval before starting work. Weekly updates shall be submitted to the Owner's Inspector at the weekly coordination meeting.

MATERIAL SOURCES:

Select Material, Aggregate Base, Mineral Aggregate, concrete, steel products and pipe 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 sources prior to

CONSTRUCTION SPECIAL PROVISIONS

use, and shall present certificates stating that the material produced from any commercial sources is in accordance with the Uniform Standard Specifications and these Special Provisions.

GENERAL:

It shall be the Contractor's responsibility to protect the structure and construction site from damage that may occur during the construction period and until final acceptance of the completed bridge by the Engineer.

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

No vehicular loads will be permitted on the bridges before the lapse of twenty-one (21) days from the date of the last pour of concrete for the bridge deck, unless approval is obtained in writing from the Engineer. The Contractor shall take special precautions to keep the area around the bridges properly barricaded and marked with flares to prevent automotive traffic from crossing the new bridge structures prior to the acceptance of the completed project by the Engineer.

The installation of any necessary conduits, brackets, or piping or any other facility or work which may be performed for the accommodation of any utility, other than as shown on the plans, 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.

GUARANTEE:

The Contractor shall guarantee the structures for one year against faulty materials, faulty workmanship, and failure to meet the specifications requirements. Said guarantee by the Contractor shall not apply to damage caused by earthquakes or other acts of God, land subsidence or faulty operations or any abuse of the structures by others.

SUBSECTION 101.2 - DEFINITIONS AND TERMS:

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

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

District. Whenever the word District is used in these Specifications, it shall mean the Flood Control District of Maricopa County.

Consultant. Whenever the word Consultant is used in these Specifications, it shall mean Creegan + D'Angelo.

SECTION 102- ADDENDA & SUBMISSION OF BIDDING SCHEDULE:

It shall be the responsibility of prospective bidders to determine, prior to submission of a bid, if any addenda have been issued. This may be accomplished by calling 602-262-1501, from 8:00 a.m. to 4:00 p.m., Monday through Friday, holidays excluded. Any addendum issued, if not already bound into the Special Provisions, must be included as a part of the Special provisions, and any quantities on the Bidding Schedule requiring change shall be adjusted by pen and ink to the new figure.

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

SUBSECTION 102.4 - EXAMINATION OF THE SITE:

The Contractor shall visit the site and become familiar with existing conditions and the proposed construction requirements prior to submittal of its bid.

SUBSECTION 102.5 - PREPARATION OF PROPOSAL:

The bidder's Arizona State Contractor's License number and classifications shall be shown on the proposal. The Contractor shall be appropriately licensed as a Contractor in the State of Arizona for performing the work in this Project.

SUBSECTION 103.6 - CONTRACTOR'S INSURANCE:

Concurrently with the execution of the contract, the Contractor shall furnish a Certificate of Insurance using the included Certificate of one of equal working, that names the additional insured as set out in the Certificate and in 103.6.1 (D) below. The certificates shall also name the additional insured as Certificate Holders. The types of insurance and the limits of liability shall be as indicated on the included form.

Sub-Subsection 103.6.1 (D):

Add Creegan + D'Angelo, Maricopa County, City of Phoenix, Town of Paradise Valley, and other entities mentioned on the included Certificate of Insurance as additional insured.

Sub-Subsection 103.6.2:

The Contractor shall indemnify and hold harmless the Owner, the Consultant, the Owner's Representative, and any jurisdiction or agency issuing permits for any work involved in the project, and their consultants, and each of their Directors, officers, employees and agents from and against all losses, expenses, damages (including damages to the work itself), attorneys' fees, and other costs, including costs of defense which any of them may incur with respect to failure, neglect or refusal of the Contractor to faithfully perform the work and all of the Contractor's obligations

under the contract. Such costs, expenses, and damages shall include all costs, including attorney's fees incurred by the indemnified parties in any lawsuit to which they are a party.

Sub-Subsection 104.1.2 - Traffic Regulations:

- A. 32nd Street shall be considered a major street.
- B. All traffic and/or traffic control devices on this project shall be provided, maintained and/or controlled as specified in the City of Phoenix Traffic Barricade Manual, latest revision.
- C. Permission to restrict City streets, sidewalks, and alleys (street closure permits) shall be requested as specified in Section III of the Traffic Barricade Manual.
- D. Unless otherwise provided for in the following "Special Traffic Regulations" all traffic on this project shall be regulated as specified in Section IV of the Traffic Barricade Manual.

Sub-Subsection 104.1.3 - Special Traffic Regulations:

During the construction period, the Contractor shall provide for the following special traffic considerations:

- A. Construction in 32nd Street including the bridge, the water line, miscellaneous utility relocations, storm drains, paving, and sidewalks maintain three lanes (two south and one north) from 6:00 a.m. to 10:00 a.m. Monday through Friday, three lanes (two north and one south) from 3:00 p.m. to 7:00 p.m., and at least two lanes (one north and one south) at all other times.
- B. Construction in Stanford Drive including the water line relocation and miscellaneous. Prior to closing Stanford Drive, maintain one lane each way and access to driveways and mailboxes. After closing Stanford Drive, maintain access from the east to driveways and mailboxes.
- C. Pedestrian Access and Bike Paths: Provide and maintain clean, safe and adequate pedestrian walkways, sidewalks, and crosswalks free of dirt, mud, dust, debris, equipment and material storage at all times. During times when traffic is routed on the Phase I and Phase II detours, pedestrian walkways shall be protected from the construction zone by handrails, fences or barriers. During the Phase II detour, when the temporary pedestrian walkway bridge is required, the Contractor shall remove the walkway only for short periods during the day when the bridge interferes with the work. The walkway bridge is to be in place all other times.
- D. Provide an off-duty police officer at the 32nd Street and Stanford Drive intersection to assist in traffic control whenever 32nd Street traffic is reduced to two lanes, or when Stanford Drive is open and the traffic signals are inoperative.

SUBSECTION 104.2 - BORING LOGS AND SOILS REPORT:

The soil boring logs are included in the project for the Contractor's information only. No guarantee is made of the accuracy of the boring logs in the soils report. The Contractor shall make his own determination as to soil and subsurface conditions and shall complete his work in

whatever material and under whatever condition he may encounter or create, without extra cost (except as modified in MAG). Existing moisture conditions shall be no basis for claim for additional monies or time extensions. The Contractor shall manipulate the existing soil as required to achieve stable soil conditions and the required densities.

Sub-Subsection 104.2.2:

Due to Physical Conditions: Paragraph *B). In the first sentence delete the following words:

"backfill or bedding"

SUBSECTION 105.2 - PLANS AND SHOP DRAWINGS:

The Contractor shall furnish the Engineer with shop drawings, layout diagrams, manufacturer's catalog data, and detailed information, in sufficient detail to show complete compliance with all specified requirements, covering but not limited to the following items:

1. Detailed sequence of construction
2. Concrete mix designs
3. Precast girders
4. Reinforcing steel
5. Metal handrail and fencing
6. Roadway and sidewalk expansion joints
7. Bearing pads
8. Shoring and bracing plans for structure excavation
9. False work plans and design calculations
10. Fabricated pipe and design data, including rubber gaskets
11. Precast manhole risers
12. Castings
13. Utility protection plans
14. Water pipe, valves, fittings, service connections
15. Traffic signal devices

The number of copies of 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: Six (6) copies. Two (2) copies will be returned to the Contractor.

Drawings for shoring and bracing plans for structure excavation and falsework plans shall be prepared by and bear the seal and signature of a Professional Civil or Structural Engineer, licensed in the State of Arizona.

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

CONSTRUCTION SPECIAL PROVISIONS

After the review has been completed, the above drawings, lists, samples, design calculations, and other data will be stamped either "Approved", "Not Approved" or "Approved as Noted". "Approved" or "Approved as Noted" submittals shall become a part of the Contract Documents and the fabrications furnished shall conform to the submittal. "Not Approved" submittals shall be resubmitted.

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

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

SUBSECTION 105.6 - COOPERATION WITH UTILITIES:

An attempt has been made to determine the location of all underground utilities and drainage pipes, culverts and structures; however, it shall be the Contractor's responsibility to cooperate with the pertinent utility companies so that any obstructing utility installation may be adjusted. Should the Contractor's operations result in damage to any utility, the location of which has been brought to his attention, he shall assume full responsibility for such damage.

Prior to any excavation work, Contractor shall call for Blue Stake to identify the location of known utilities.

Prior to or concurrent with the construction of this project, private utility companies will be relocating their facilities within the project area. The Contractor shall coordinate his construction efforts with these companies to minimize conflicts and construction delays.

The Contractor shall coordinate his work with Salt River Project (SRP), U.S. West Communications and the City of Phoenix for the deactivation of the traffic signals at 32nd Street and Stanford Drive. The SRP power pole at the southeast corner of the intersection, will remain in place to provide electrical and communication service for the traffic signals. SRP will remove and relocate this pole when the Contractor has scheduled and coordinated the traffic signal deactivation time. Mr. Chuck Hughes of SRP (236-2090) is to be provided a minimum of two weeks prior notice for deactivation, and removal of pole.

Prior to the reopening of Stanford Drive and the reactivation of the traffic signals, SRP will reinstall the power pole near the new southeast approach slab. The pole reinstallation is required prior to the reactivation of the traffic signals. SRP will reinstall this pole when the Contractor has scheduled and coordinated the traffic signal reactivation time. Mr. Chuck Hughes of SRP (236-

CONSTRUCTION SPECIAL PROVISIONS

2090) is to be provided a minimum of thirty days prior notice for reactivation, and reinstallation of the pole.

Private utility relocations include, but are not limited to the following:

1. Salt River Project - Relocation of power pole and street light southeast corner of Stanford Drive and 32nd Street.
Relocation of power pole at Station 9+74 of Stanford Drive.
2. Southwest Gas - Installation of the 2-inch gas line through the Contractor installed 4-inch PVC in the bridge edge beam and under the new approach slab. Contractor shall not install southeast section of the approach slab as shown on the plans until this gas connection has been made by Southwest Gas. Contractor shall provide Southwest Gas at least three weeks prior notice when this relocation can be made. Contact Mr. Ron Morency of SWG at 484-5306.
3. Dimension Cable and U.S. West Communications- Relocation from Stanford Drive STA-7+00 to approximately STA 14+00 north side of underground cable.

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

Flood Control District	262-1501 - Bob Payette
U.S. West Communications	831-4777 - Curt Sayer
Salt River Project (Power)	236-2090 - Chuck Hughes
Salt River Project (Irrigation)	236-2956 - Tim Phillips
Blue Stake (Location Staking)	
(U.S. West, S.R.P.)	263-1100
Town of Paradise Valley	948-7412 - Bill Meade
City of Phoenix Streets and Traffic	262-6566 - Marsh Hollan
City of Phoenix Water and Wastewater	261-8229 - Jerry Arakaki
Southwest Gas Corporation	484-5306 - Ron Morency
Dimension Cable Services	866-0072 Ext. 361 - John Barnett

Sub-Subsection 105.6.1 - Salt River Project:

The Salt River Project maintains energized aerial electrical power lines in the immediate vicinity of this project. Do not consider these lines to be insulated. Construction personnel working in proximity to these lines are exposed to an extreme hazard from electrical shock. Contractors, their employees, and all other construction personnel working on this project must be warned of the danger and instructed to take adequate protective measures, including maintaining following minimum clearances between the lines and all construction equipment and personnel:

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1. For persons or any tools or materials used by such persons:
 - a. For lines rated 50 kV or less, six feet of clearance.
 - b. For lines rated over 50 kV, six feet plus $4/10$ of an inch for each kV over 50 kV.
2. For mechanical equipment or hoisting equipment, or any load of such equipment, any part of which is capable of vertical, lateral or swinging motion:
 - a. For lines rated 50 kV or less, ten (10) feet of clearance.
 - b. For lines rated over 50 kV, ten (10) feet plus $4/10$ of an inch for each kV over 50 kV.

See A.R.S. 40-360.42

Contractors must promptly notify the Salt River Project at 236-8888 to arrange to have the necessary safety precautions undertaken before commencing any work. See A.R.S. 40-360.43. The cost of such arrangements will be borne by the Contractor. The Salt River Project can often respond to such requests if two (2) days advance notice is given, but some situations may require up to sixty (60) days lead time for relocation or other arrangements.

SUBSECTION 105.8 - CONSTRUCTION STAKES, LINES AND GRADES:

The project control lines and benchmark elevation are shown on the drawings and will be established by the Engineer. The Contractor shall establish offset stakes and temporary benchmarks 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, or licensed civil engineer.

The Contractor shall furnish field books to be used for recording survey data and field notes. These books shall be available for inspection by the Engineer at any time and shall become the property of the Engineer upon completion of the work.

The Engineer reserves the right to make inspections and random checks of any portion of the staking and layout work. If, in the Engineer's opinion, the work is not being performed in a manner that will assure proper control and accuracy of the work, he will order any or all of the staking and layout work redone at no additional cost.

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.

SUBSECTION 105.10 - INSPECTION OF WORK:

Prior to final acceptance by the Engineer, the work will be subject to the inspection and acceptance by the City of Phoenix and the Town of Paradise Valley. City or Town inspectors have the right to visit the site at any time, without notice. All requests or comments with respect to the work from the City or Town will be through the Engineer.

CONSTRUCTION SPECIAL PROVISIONS

SUBSECTION 106.3 - PLANT INSPECTION:

Off-Site Inspection

The Contractor shall be responsible for all expenses, including but not limited to travel and per diem expenses, for required inspections by the Engineer and/or the cost of inspection and testing by an independent testing laboratory as required by and at the discretion of the Engineer for any inspection of precast concrete girders manufactured outside of a fifty-mile radius from the City limits of Phoenix, Arizona.

SUBSECTION 106.5 - CONTRACTOR'S MARSHALING YARDS:

Contractor shall obtain approval of the Engineer when using vacant property, District property or City property, to park and service equipment and store material for use. The Contractor shall obtain all appropriate licenses and permits required for such use. The District has a 70-foot x 300-foot parcel available for the Contractor's use. The parcel has a 70-foot frontage on the west side of 32nd Street and is approximately 300-feet deep. The parcel's southern boundary is the Salt River Project Arizona Canal right-of-way. The parcel is overgrown and has a vacant house structure. If used by the Contractor, a temporary fence shall be provided along the limits of the property used and all clearing, demolition and disposal of refuse shall be at the Contractor's expense. Costs for all work necessary to prepare this site will be considered incidental to the project. Additional details for acceptable use of the property and property limits can be obtained from Bob Payette, Chief of Construction and Operations of the District (262-1501). If the Contractor elects to use this property, he must state his intent to do so at the pre-construction meeting.

For the use of private or public property as a marshaling yard, the Contractor shall meet the following requirements:

- A. The Contractor shall notify adjacent property owners/residents of this proposed use.
- B. Any use of vacant property adjacent to or near the project for parking or servicing equipment and/or storing material will require the Contractor to obtain written approval from the property owner. This approval shall contain any requirements which are a condition of this approval.
- C. A copy of the property owner's approval shall be submitted along with the Contractor's request to the Engineer for approval for the use of the marshaling yard in connection with the project. An appropriate distance from adjacent property will be set by the Engineer on a case-by-case basis based on the size and type of equipment to be used on the project.
- D. The yard shall be fenced and adequately dust-proofed in a manner such as to preclude tracking of mud onto paved City streets.
- E. Work in yard shall be scheduled so as to comply with the City Noise Ordinance.

CONSTRUCTION SPECIAL PROVISIONS

- F. Equipment, materials and temporary construction facilities, shall be located so as to minimize impact on adjacent properties. A sound barrier may be required if deemed necessary by the Engineer.
- G. The Contractor shall clean marshalling yards promptly upon completion of use.
- H. Contractor's request for approval shall specify in detail how he or she proposes to comply with D through G above.

SUBSECTION 107.2 - PERMITS:

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

A no-charge permit is required from the City of Phoenix and the Town of Paradise Valley for work in their right-of-way.

A permit from Salt River Valley Water Users Association for work in their right-of-way will be acquired by the District.

SUBSECTION 107.9 - PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE:

The Contractor shall provide a temporary 6-foot high, chain-link fence along the limits of the Temporary Construction Easement (TCE) located beyond the street right-of-way on the west side of 32nd Street.

The Contractor shall protect from damage the existing wall, landscaping and irrigation system on the northeast corner of Stanford Dr. and 32nd Street. Should the overhanging branches of the large mesquite tree or oleanders interfere with the detour or bridge construction or prove to be a hazard to traffic, the Contractor shall, at his expense, have the tree and shrubs professionally pruned by experienced and reputable personnel. Should the existing irrigation system become damaged and unusable during construction, the Contractor shall be responsible at his expense for its repair and for watering the existing trees and shrubs until such time as the irrigation system is operational. Should the wall or any of the existing landscaping be destroyed due to construction efforts, the Contractor shall compensate the District for a replacement of the same size and type.

SUBSECTION 107.11 - CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTY AND SERVICES:

The Contractor shall provide continuous access to the service roads on both sides of the Arizona Canal for SRP service vehicles and personnel.

SUBSECTION 108.4 - CONTRACTOR'S CONSTRUCTION SCHEDULE:

Construction of this project will be phased as shown on the plans. The bridge structure will be constructed in two sections in a manner that will permit traffic to be maintained at all times in accordance with the Section 104.1.3 Special Traffic Regulations, Section 401 and as shown on the Project Plans.

The following construction sequence is illustrative only. The Contractor shall prepare and submit to the Engineer for review a detailed sequence of construction and determine all methods and procedures necessary to complete the project within the specified contract time.

Phase I

1. Construct new sanitary sewer manhole at the northeast corner of Stanford Drive and 32nd Street and the new 10-inch sanitary sewer across 32nd Street. The 10-inch sewer will be plugged on the west side of 32nd Street and remain dry.

The existing 8-inch sanitary sewer along the east side of 32nd Street will remain in service throughout construction. A portion of the existing 8-inch sewer will be under the new bridge and pass between the new drilled shafts.

2. Construct new 24-inch and 30-inch storm drain across 32nd Street and to the west. Construct lower portions of inlets so as to not interfere with the detours to be constructed later. Temporarily plug pipe ends and provide structural covers over the inlets to support detour pavement and traffic loads.
3. Connect water services along Stanford Drive to the existing 12-inch water main. Remove existing 4-inch water line and construct new 12-inch water main in Stanford Drive. Connect water services to new 12-inch water main and abandon existing 12-inch water main.
4. Southwest Gas will reroute the 2-inch gas line along the east side of 32nd Street to a temporary location. Upon completion of the 4-inch PVC conduit within the bridge superstructure, Southwest Gas will install the 2-inch gas line in the 4-inch PVC conduit.
5. Close Stanford Drive to through traffic. Deactivate traffic signals. Remove signal poles and return to the City of Phoenix Traffic Signal Shop as specified in Section 800.1.
6. Construct bridge foundations (drilled shafts and abutment beams). Drilled shaft and abutment excavations shall be covered as required to maintain traffic along 32nd Street. Prior to drilling shafts adjacent to the existing water, sewer and gas line at the east end of Abutment 2, the Contractor shall excavate to expose the lines and verify their location. The Contractor shall also verify with Terry Hughes of Southwest Gas (484-5306) that the gas line has been taken out of service.
7. Construct and open three lane detour (Phase I) along the west side of 32nd Street.

CONSTRUCTION SPECIAL PROVISIONS

8. Excavate to 1-foot below bridge girders and construct bridge superstructure and approach slabs (Phase I) on the east side of 32nd Street.

Phase II

1. Construct and open three lane detour (Phase II) along the east side of 32nd Street over completed bridge superstructure. Remove Phase I detour.
2. Excavate to 1-foot below bridge girders and construct bridge superstructure and approach slabs (Phase II) on the west side of 32nd Street.
3. Complete curb, sidewalk, drainage pipe, catch basin, and driveways on west side of 32nd Street.
4. Remove detour (Phase II) and complete approach slabs, curb, sidewalk, drainage pipe, driveway, and catch basin on east side of 32nd Street. Complete Stanford Drive paving.
5. Complete 32nd Street paving while maintaining 32nd Street traffic.
6. Construct traffic signals and complete striping and pavement markings.
7. Reactivate traffic signals and open traffic to Stanford Drive.

SUBSECTION 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.

SUBSECTION 108.9 - FAILURE TO COMPLETE ON TIME:

The actual cost per calendar day incurred by the District for Consultant Administrative and Inspection Services on this project will be added to the daily charges as indicated by TABLE 108, LIQUIDATED DAMAGES, as shown in the MAG Uniform Standard Specifications (not in the Phoenix Supplement), 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 as adjusted by the Engineer. Nothing contained in this provision shall prohibit the District from deducting from monies due or to become due to the Contractor any other costs incurred by the District directly attributable to the delay in completing this contract.

SECTION 201 - CLEARING AND GRUBBING:

The work under this item consists of removal and disposal of all trees, stumps, asphaltic pavement, and structures within the limits of the project as required or as shown on the plans. Materials shall be disposed of off-site. Also see Section 350 in these Special Provisions.

CONSTRUCTION SPECIAL PROVISIONS

Payment of this item will be incidental to and included in the price for BID ITEM 350.3 MISCELLANEOUS REMOVALS.

SECTION 205 - ROADWAY EXCAVATION:

Roadway excavation shall conform to Section 205 of the Uniform Standard Specifications.

No separate payment will be made for this item. Payment for all work under this section, including watering and compacting, shall be included in BID ITEM 301 - SUBGRADE PREPARATION.

SECTION 206 - STRUCTURE EXCAVATION AND BACKFILL:

Structure excavation and backfill shall conform to Section 206 of the Uniform Standard Specifications.

The Contractor shall provide shoring or other means of support for excavation to protect detour road, underground utilities and private property during construction. Prior to excavating for the construction of the abutments, the Contractor shall submit to the Engineer for approval, a complete detailed trench cover plan prepared by and bearing the seal and signature of a Professional Civil or Structural Engineer, licensed in the State of Arizona.

Structure backfill behind the abutments and wing walls shall be compacted in accordance with Table 601-2, Type III of the Uniform Standard Specifications.

All backfill behind the bridge abutments and wing walls shall consist of free-draining granular material with not more than 5% passing a #200 sieve and a PI less than 7. Backfill shall be placed in horizontal lifts consistent with the maximum material size and type of compaction equipment in use and compacted to a minimum of 95% of the maximum density at the optimum moisture content plus or minus 3% as determined in accordance with ASTM D-2922, D-3017, D-698 or D-1556. Compaction equipment should be maintained at least two (2) feet from the structure.

Structure backfill against the bridge abutments shall be completed to an elevation approximately one foot below the girder bearing level prior to placement of the bridge girders. Backfill above that elevation shall not be performed until the concrete bridge deck has been in place a minimum of 7 days.

Payment for Structural Excavation will be made at the price per cubic yard for BID ITEM 206.1. Payment for Structure Backfill will be made at the price per cubic yard for BID ITEM 206.2.

SECTION 210 - BORROW EXCAVATION:

No borrow material is available within the ACDC right-of-way. Borrow material may be obtained from roadway or structural excavation or from sources away from the project site and shall be subject to approval by the Engineer.

CONSTRUCTION SPECIAL PROVISIONS

No separate payment will be made for this item. Payment for all work under this section, including watering and compacting, shall be included in BID ITEM 301 - SUBGRADE PREPARATION.

SECTION 211 - FILL CONSTRUCTION:

The work under this section consists of constructing embankments for the detours and approach roadways. The material required for the construction of the fill shall be suitable material obtained as specified in SECTION 210 - BORROW EXCAVATION.

Prior to the placement of fill material, all loose soil, vegetation, any roadside debris, concrete, pavement, and existing structures within the proposed fill areas shall be completely removed. Depressions and ditches shall be cleaned of all loose or wet soils and widened to accommodate compaction equipment. Sloping surfaces shall be benched to provide a level surface for fill placement.

All exposed subgrade surfaces shall be scarified, brought to the proper moisture content and compacted for a minimum depth of eight (8) inches.

The fill shall be compacted in horizontal lifts to subbase level. The depth of the uncompacted lifts shall not exceed eight (8) inches.

Compaction shall be to a minimum of 95% of the maximum density as determined in accordance with ASTM D-2922, D-3017, D-698 or D-1556 within a moisture content range of plus or minus 3% of optimum.

No separate payment will be made for fill construction and the cost of these items shall be included in the contract price bid for related items.

SECTION 301 - SUBGRADE PREPARATION:

Subgrade preparation shall consist of shaping the roadway subgrades to the grades and cross-sections for the new roadways, new detour road and bridge approach slabs as shown on the plans and in accordance with Section 301 of the Uniform Standard Specifications.

This item shall also include all work necessary for the construction of ditches, any excavation, filling, grading, shaping and miscellaneous grading work between the back of curb or edge of pavement and the right-of-way or construction easement.

Width of measurement for payment along new detour roads will be from the outside edge of the concrete barrier to the edge of the existing pavement, as shown on the plans.

Subgrade preparation between 32nd Street STA 15+30 and 17+00 shall consist of recompacting the existing aggregate base course after the removal of the detour and existing pavement. Measurement for payment shall be the width taken from the lip of the left gutter to the edge of the new pavement as shown on the plans.

CONSTRUCTION SPECIAL PROVISIONS

Payment for all work under this section shall be at the contract unit price per square yard bid for BID ITEM 301 - SUBGRADE PREPARATION.

SECTION 310 - UNTREATED BASE:

Select Material and Aggregate Base shall conform to the requirements of Section 702 of the Uniform Standard Specifications. Select Material and Aggregate Base shall be crushed in accordance with Section 702.2. Select Material shall be Type "A".

The Contractor will be required to furnish the Engineer 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.

Payment for untreated base will be made on the basis of the price bid per ton for BID ITEM 310-1, AGGREGATE BASE and BID ITEM 310.2, SELECT MATERIAL.

SECTION 321 - ASPHALT CONCRETE PAVEMENT:

Asphalt concrete pavement shall consist of furnishing and placing a plant-mixed asphalt concrete road surfacing material to the compacted thickness shown on the plans and in accordance with Section 321 of the Uniform Standard Specifications.

The mineral aggregate shall meet the grading requirements within the range of the specified tolerances for Mix-Designation A-1½, C-3/4 or D-½ in accordance with Section 710 of the Uniform Standard Specifications and the City of Phoenix Supplement to the Uniform Standard Specifications.

The Contractor shall furnish certified weight tickets covering all plant-mixed asphalt concrete placed on the project.

New detour pavement shall be constructed to the lines and grades as shown on the plans. Where detour grades require overlay construction, existing asphaltic concrete pavement shall be prime coated. Existing portland cement concrete pavement shall be covered with 15 lbs. asphalt impregnated building paper prior to placing the overlay. C-3/4 mix shall be used for the leveling course and D-½ mix shall be used to "feather match" the surface for a smooth transition.

Stanford Drive pavement at the east edge of the bridge shall be constructed to the lines and grades as shown on the plans. Pavement materials and thicknesses shall be as shown on the plans.

Payment for this item will be made at the contract unit price bid per ton for BID ITEM 321.1, A-1½ - ASPHALT CONCRETE; BID ITEM 321.2, C-3/4 - ASPHALT CONCRETE; and BID ITEM 321.3, D-½ - ASPHALT CONCRETE.

SECTION 324 - PORTLAND CEMENT CONCRETE STREET PAVEMENT:

PCC street pavement shall consist of furnishing and placing portland cement concrete pavement to the thickness and details shown on the plans and in accordance with Section 324 of the Uniform Standard Specifications.

CONSTRUCTION SPECIAL PROVISIONS

Payment for Portland Cement Concrete Street Pavement will be made under other sections. For bridge approach slabs, see Section 505 - CONCRETE STRUCTURES.

SECTION 329 - TACK COAT:

Tack coat shall be applied to asphaltic concrete or portland cement concrete surfaces to be overlaid by new asphaltic concrete as directed by the Engineer.

Payment for emulsified bituminous tack coat will be at the contract unit price bid per ton, diluted, for BID ITEM 329 - TACK COAT.

SECTION 334 - PRESERVATIVE SEAL:

A preservative seal shall be applied to asphaltic concrete pavements as directed by the Engineer.

Payment for Preservative Seal shall be at the contract unit price bid per ton, for BID ITEM 334 - PRESERVATIVE SEAL.

SECTION 336 - PAVEMENT MATCHING AND SURFACE REPLACEMENT:

Existing pavements which are to be matched by the new roadway pavement shall be trimmed to a neat, straight and vertical edge. The trimmed edges shall be painted with a light coat of emulsified asphalt immediately prior to constructing the new abutting pavement.

Trenches for utilities and excavations required for structures or removals shall be backfilled in accordance with the plans and Section 601 of the Uniform Standard Specifications. Where vehicular traffic will cross such trenches and excavation, the Contractor shall install temporary pavement in accordance with Section 601.5.4. Temporary pavement shall be C-3/4 mix with a minimum thickness of 2 inches.

Payment for temporary pavement will be made in accordance with BID ITEM 321.2.

Payment for Pavement Matching and Surface Replacement will be made by the square yard in accordance with BID ITEMS 336.1 Type A and 336.2 Type D.

SECTION 340 - CONCRETE CURB AND GUTTER, SIDEWALK AND DRIVEWAYS:

Work under this item shall conform to Section 340 of the Uniform Standard Specifications and shall include concrete curb and gutter, concrete sidewalk and concrete driveway entrance.

All concrete shall be Class B and shall conform to Section 725 of the Uniform Standard Specifications.

All concrete items shall conform to the Standard Details and the details shown on the plans.

CONSTRUCTION SPECIAL PROVISIONS

Payment for these items will be made at the unit price bid per lineal foot for BID ITEM 340.1 - CONCRETE CURB AND GUTTER, and the unit price bid per square foot for BID ITEM 340.2 - CONCRETE SIDEWALK, and BID ITEM 340.3 - CONCRETE DRIVEWAY ENTRANCE.

SECTION 345 - ADJUSTING FRAMES, COVERS, VALVE BOXES AND WATER METER BOXES:

Work under this section shall consist of adjusting existing manhole frames and covers, and valve boxes as indicated on the plans or as designated by the Engineer and in accordance with Section 345 of the Uniform Standard Specifications and the applicable MAG Standard Detail.

Payment for these items will be made at the unit price bid for: BID ITEM 345 - ADJUST SANITARY SEWER MANHOLE FRAME AND COVER.

SECTION 350 - REMOVAL OF EXISTING IMPROVEMENTS:

The work under this section shall consist of removing and disposing of any obstacle to construction whether it is shown on the plans or not, unless it is specifically called out on the plans to be removed or relocated by other agencies, and shall be in accordance with Section 350 of the Uniform Standard Specifications.

The removal of the existing asphalt concrete pavement necessary to construct the new pavement and the removal of the detours shall be included in this item. The removal and replacement of the fence on the west side of 32nd Street as required for construction is also included. Also included are the removal and replacement of a portion of the sidewalks on the 32nd Street bridge over the Arizona Canal and the asphaltic concrete sidewalk along Stanford Drive under the new water line work.

The disposal of all waste materials removed under this item shall be the responsibility of the Contractor. The disposal site shall be approved by the Engineer.

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 (Telephone 269-2661). Charges will be levied on a volume basis for each load delivered to the landfill in accordance with the current fee schedule.

Payment for the removal of existing improvements will be at the contract unit price as follows:

BID ITEM 350.1 REMOVE EXISTING CONCRETE CURB AND GUTTER - per lineal foot
BID ITEM 350.2 REMOVE EXISTING SIDEWALK AND DRIVEWAYS - per square foot
BID ITEM 350.3 MISCELLANEOUS REMOVALS - per lump sum for total job

SECTION 401 - TRAFFIC CONTROL:

Traffic control shall conform to the Traffic Control Plans included in the project plans and applicable paragraphs of Section 401 of the Uniform Standard Specifications, the City of Phoenix Barricade Manual and as specified herein. This section includes all traffic control devices and

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traffic control measures, such as warning and control signs, barricades, lighting devices, sand barrel crash cushion, temporary concrete barriers, paint striping of the detours, new bridges and completed roadways, delineators, flagmen and other appurtenant items related to traffic control and safety. It also includes removal of all temporary control devices at the completion of the work and the maintenance of the detour pavement surface and pavement striping.

The number and types of barricades, signs, delineators, barriers and all other traffic control devices shown on the Traffic Control Plan are considered to be a minimum. However, the traffic control plans shall not relieve the Contractor of the responsibility of protecting the work, the workmen and the traveling public.

The Contractor shall provide and maintain safe and adequate access, including pavement surfacing of the detour at all times. Detour to bypass the construction zone shall be as shown on the plans.

Contractor shall not reduce lanes on 32nd Street or the detours without approval of the Engineer. (See Section 104.1.3 Special Traffic Regulations and Section 108.4 Contractor's Construction Schedule.)

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

Upon completion of the construction of the bridges and approach roadways, the Contractor shall restore the paint striping to the new configuration shown on the plans.

Payment for providing all traffic control devices, their maintenance, installation and removal will be at the lump sum price in BID ITEM 401.1. Payment for a uniformed, off-duty, law enforcement officer as required under Sub-Subsection 104.1.3 - Special Traffic Regulations, shall be at the hourly rate established by the City in BID ITEM 401.2.

SECTION 405 - MONUMENTS:

The work under this item consists of furnishing and installing a survey monument at the intersection of 32nd Street and Stanford Drive.

Survey marker shall conform to MAG 120-1. Survey marker location shall be established under the direct supervision of a Professional Civil Engineer or Land Surveyor, licensed in the State of Arizona.

The Contractor shall drill 2-inch diameter by 4-inches deep hole in the new concrete deck slab and set the survey marker in epoxy grout.

Payment for survey marker will be made at the unit price for BID ITEM 405 - SURVEY MARKER.

SECTION 424 - PARKWAY GRADING:

Parkway grading shall be in accordance with Section 424 of the Uniform Standard Specifications.

CONSTRUCTION SPECIAL PROVISIONS

Parkway grading will not be a separate pay item and all costs for this item shall be included under ITEM 301 - SUBGRADE PREPARATION.

SECTION 502 - DRILLED SHAFT FOUNDATIONS:

The work under this section shall govern the construction of foundations consisting of "reinforced cast-in-place concrete shafts". Shafts shall be constructed in accordance with the details and dimensions shown on the plans. Drilled shafts shall be considered that portion of the piers below the cap beam.

All concrete materials shall be in accordance with the requirements of Section 725 of the Uniform Standard Specifications. Reinforcing steel shall conform to the requirements of Section 727 of the Uniform Standard Specifications.

The Contractor shall perform all excavation required for the shafts through whatever subsurface materials encountered to the dimensions and elevations shown on the plans. All holes shall be examined for straightness and any hole, which on visual inspection from the top, shows more than six (6) inches deviation from the center of the hole at the bottom shall be rejected and redrilled at no additional cost to the District. Suitable casings shall be furnished and placed when required to prevent caving of the hole before concrete is placed therein.

If the size of the shafts adjacent to the channel cannot be maintained within 2" of the shaft diameter as shown on the plans for the depth of the future channel wall, or if over drilling will narrow the future channel width, Sonotube or other approved method shall be used to control the shaft diameter and location.

All loose material existing at the bottom of the hole after drilling operations have been completed shall be removed before placing concrete in the hole. Material resulting from drilling holes shall be used in the adjacent roadway or disposed of as directed.

Before any personnel enter the caisson drill holes for cleaning or inspections purposes, the Contractor shall install a suitable casing or shield for protection against caving.

The use of water for drilling operations or for any other purpose where it may enter the hole will not be permitted. Surface water shall not be permitted to enter the hole, and all water that may have infiltrated the hole shall be removed from the hole before concrete is placed therein. The bottom of the casing shall be maintained not less than one foot below the top of the concrete during withdrawal and placing operations, unless otherwise permitted by the Engineer.

Placing of Reinforcing Steel:

The steel reinforcing cage shall be completely formed at the surface and lowered in one continuous operation with a crane of sufficient capacity. Clearance between the reinforcing steel and the walls of the excavation shall be accomplished by the use of spacer blocks which are firmly tied to the reinforcing cage in such a manner that they will not become disconnected or disoriented during lowering of the cage into the hole.

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Concrete Mix Design:

Portland Cement concrete shall be Class "AA" with a minimum 28-day compressive strength of 4,000 psi. The concrete shall be of a pumpable mixture which will settle under its own weight. Admixtures, as needed to prevent segregation of the mix and allow free flow through the placing equipment, may be added by the Contractor. Type II Low Alkali Portland Cement shall be used.

Placement of Concrete:

Concrete shall be placed by pumping through a combination ~~hose~~ and tremie pipe. The tremie pipe shall be of a rigid, watertight pipe for the full length of the pier and shall not be less than six inches in diameter. The concrete shall be vibrated to insure that the concrete in the shaft is dense and homogeneous.

The Contractor shall furnish a pump with the minimum capacity of pumping sixty (60) cubic yards per hour at a pumping head of two hundred (200) feet.

The Contractor is required to have second (backup) pump on-site during concreting operations unless the Contractor can verify to the Engineer that delivery of a second pump to the site can be made on 45 minutes or less notice. No cold joints will be allowed in the shaft concrete.

Reinforcing steel shall be in place and tremie pipe shall be inserted to the tip of the hole before concrete placement is started. Concrete shall be placed in a continuous operation. The delivery pipe shall be slowly withdrawn as the elevation of the concrete in the hole rises, but the discharge end of the pipe shall, at all times, be maintained a maximum of 5.0 feet above the surface of the concrete.

Non-Destructive Testing:

If in the opinion of the Engineer it is necessary to test the soundness of the concrete placed under this section, the testing will be accomplished by a non-destructive method. For testing, the Contractor shall install four (4), three- (3) inch I.D. Schedule 80 PVC pipe axially into each shaft to be tested. The pipe shall be tied to the reinforcing cage and capped at the bottom and located as determined by the Engineer. No separate payment will be made for the furnishing and placing of the three-inch PVC pipes.

The non-destructive testing, if required, will be performed by the District under separate contract and will be accomplished at no cost to the Contractor.

Payment for the drilled shaft foundations including excavation, casings, concrete and reinforcement will be at the contract unit price bid per lineal foot for BID ITEM 502 - DRILLED SHAFT FOUNDATIONS. No additional payment will be made for metal casings left in place or for reinforcement extending into the abutments.

SECTION 505 - CONCRETE STRUCTURES:

The work under this section shall consist of furnishing all labor, materials and equipment for the construction of the cast-in-place concrete portions of the bridge structure, including the deck

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abutments, edge beam, approach slabs and sidewalks, in accordance with the plans and Section 505 of the Uniform Standard Specifications.

All concrete materials shall be in accordance with the requirements of Section 725 of the Uniform Standard Specifications. Reinforcing steel shall conform to the requirements of Section 727 of the Uniform Standard Specifications.

For admixtures, the Contractor shall furnish Certificates of Compliance conforming to the requirements of M.A.G. Subsection 106.2 for each type of admixture furnished. Admixtures containing chlorides will not be acceptable for concrete containing uncoated reinforcing steel or embedded metal items.

The concrete finish for the bridge sidewalks shall be a light broomed texture. The concrete finish for the bridge deck shall be textured with an artificial turf drag in accordance with the requirements of Section 324.3.7 of the City of Phoenix 1987 supplement to the M.A.G. Uniform Standard Specifications.

Hand brooms shall be provided and available at the job site at all times when finishing and texturing concrete. The finishing operation shall be completed before the water sheen disappears on newly placed concrete. Water shall not be applied to the surface to be finished at any time during floating or finishing except in the form of fog spray. Fogging equipment shall be capable of applying water in a fine mist in sufficient quantity to abate rapid evaporation of mixing water because wind, high temperatures or low humidity.

Deck slab, edge beam and approach slabs shall be Class "AA" concrete with a minimum 28-day compressive strength of 4,000 psi.

All other concrete shall be Class "A" with a minimum 28-day compressive strength of 3,000 psi.

Structural steel items imbedded in the concrete are incidental to Class AA or Class A concrete.

Payment for all work under this Section will be at the unit price bid per cubic yard for BID ITEMS 505.1 CLASS "AA" CONCRETE; BID ITEM 505.2 CLASS "A" CONCRETE; and unit price bid per pound for BID ITEM 505.3 - REINFORCING STEEL.

No separate payment will be made by grade for reinforcing steel Grade 40 and Grade 60.

SECTION 506 - PRECAST PRESTRESSED CONCRETE GIRDERS:

The work under this section shall consist of furnishing and erecting the bridge girders as shown on the plans in accordance with the AASHTO Standard Specifications for Highway Bridges dated 1989 and Section 506 of the Uniform Standard Specifications.

Portland Cement Concrete for Precast Prestressed Girders shall be:

Class "S" Concrete $f'_c = 5,000$ psi

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Erection and fabrication tolerances shall meet the requirements of SECTION 505 - CONCRETE STRUCTURES.

The elastomeric bearing pads shall meet the requirements of Section 25 - Elastomeric Bearings of the AASHTO Standard Specifications for Highway Bridges dated 1977 (revised to date).

The structural steel anchors shall conform to Section 770 of the Uniform Standard Specifications.

Payment will be at the unit price bid per each for BID ITEM 506 - PRECAST CONCRETE GIRDERS.

No separate payment will be made for the elastomeric bearing pads, structural steel, anchor bolts, prestressing steel, reinforcing steel or other embedded items necessary to the furnishing and erecting of the girders complete-in-place.

SECTION 520 - PEDESTRIAN FENCE:

Furnish and install the pedestrian fence shown on the plans.

Payment:

Pedestrian fence will be paid at the lump sum price for BID ITEM 520. The price shall be full compensation for furnishing all labor, materials, tools and equipment, and doing all work involved, including anchors, fabrication, coating and erecting the fence in place as shown on the plans .

SECTION 601 - TRENCH EXCAVATION, BACKFILL AND COMPACTION:

Trench Excavation, Backfill and Compaction for water and sewer lines, as shown on the plans, shall be in accordance with SECTION 601 of the Uniform Standard Specifications.

No separate measurement and payment will be made for this item and all costs are to be included with the unit prices for BID ITEMS 610.1 through 610.6 WATER LINES; BID ITEM 615 for SEWER PIPE; and BID ITEMS 618.1 through 618.6 for CONNECTOR PIPES.

SECTION 610 - WATER LINE CONSTRUCTION:

Work under this section shall consist of cutting, plugging and removal of the existing 4-inch water line, construction of the new 12-inch ductile iron pipe water line, installation of water service lines and abandoning the existing 12-inch water line. Work under this section shall be done in accordance with the plans and Section 610 of the Uniform Standard Specifications.

Water service to the residences along Stanford Drive is presently provided by means of the existing 4-inch water line. The new 12-inch water line will be installed in the location of the existing 4-inch water line. Water service connections which are presently attached to the 4-inch water line will be temporarily connected to the existing 12-inch water line to permit removal of the 4-inch water line. Upon removal of the 4-inch water line and construction of the new 12-inch water line, the service connections will be attached to the new 12-inch water line. The existing 12-inch water line will be abandoned.

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Pipe for the new 12-inch and 4-inch water lines shall be ductile iron pipe, conforming to Section 750 of the Uniform Standard Specifications. Restrained joints shall be provided as shown on the plans. Acceptable restrained joint methods shall be tie rods in accordance with MAG Detail 302 or welded clamping ring as supplied by Pacific States Cast Iron Pipe Company, or approved equal.

Any water meter boxes and/or covers damaged by the Contractor during course of construction shall be replaced in kind at his expense. Water meter boxes and covers shall be Type 1, 2 or 3 in accordance with MAG Details 310, 311, and 320.

Payment for Water Line Construction will be at the contract unit price as follows:

- BID ITEM 610.1 12-inch Restrained Joint Ductile Iron Pipe - per lineal foot
- BID ITEM 610.2 12-inch Ductile Iron Pipe - per lineal foot
- BID ITEM 610.3 Cut and Plug 12-inch Water Line - per each
- BID ITEM 610.4 Cut and Plug 4-inch Water Line - per each
- BID ITEM 610.5 Water Meter Box and Cover - per each
- BID ITEM 610.6 Ductile Iron Fittings (in excess of fittings shown on plans) - per pound

SECTION 615 - SEWER LINE CONSTRUCTION:

Work under this section shall consist of the construction of the new 10-inch sewer line, and plug as shown on the plans and shall be in accordance with Section 615 of the Uniform Standard Specifications.

The new 10-inch sewer line will not be placed in service until a future sanitary sewer is constructed. A tracer wire and marker shall be installed at the west end of the new 10-inch sewer line for future locating.

Payment for 10-inch sewer line will be at the contract unit price for BID ITEM 615 per lineal foot.

SECTION 618 - STORM DRAIN CONSTRUCTION WITH CONCRETE PIPE:

The work under this section shall consist of construction of storm drain pipe, concrete catch basins, pipe collars, and pipe plugs as shown on the plans and in accordance with Section 618 of the Uniform Standard Specifications.

Catch basins, pipe plugs, and pipe collars shall conform to the details and standard details shown on the plans. Portland cement concrete for storm sewer appurtenances shall conform to Section 505 of the Uniform Standard Specifications.

The westerly end of the storm sewer pipe shall be plugged in accordance with MAG Detail 427 and shall have tracer wire and marker installed for future locating.

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Measurement and payment will be made at the contract unit prices as follows:

- BID ITEM 618.1 CONCRETE CATCH BASIN-TYPE M - per each
- BID ITEM 618.2 CONCRETE CATCH BASIN-TYPE N - per each
(Price to include excavation, backfill, concrete, reinforcing and appurtenances incidental to the completed catch basin.)
- BID ITEM 618.3 30-INCH CONNECTOR PIPE - per lineal foot
- BID ITEM 618.4 24-INCH CONNECTOR PIPE - per lineal foot
(Price to include excavation, bedding, pipe and backfill.)
- BID ITEM 618.5 24-INCH PIPE COLLAR - per each
- BID ITEM 618.6 30-INCH PIPE PLUG - per each

SECTION 625 - MANHOLE CONSTRUCTION AND DROP SEWER CONNECTIONS:

The work under this section shall consist of construction of a new manhole complete in place. Payment for sewer manhole construction will be made at the unit price for BID ITEM 625 per each.

SECTION 630 - TAPPING SLEEVES, VALVES AND VALVE BOXES ON WATER LINES:

The work under this section shall consist of providing and installing tapping sleeves, valves and valve boxes on water lines.

Payment will be made at the contract unit prices as follows:

- BID ITEM 630.1 12x12-INCH TAPPING SLEEVE AND VALVE - per each
- BID ITEM 630.2 12-INCH VALVE - per each
- BID ITEM 630.3 4x4-INCH TAPPING SLEEVE AND VALVE - per each
- BID ITEM 630.4 INSTALL WATER VALVE BOX - per each

SECTION 631 - WATER TAPS AND METER SERVICE CONNECTIONS:

The work under this section shall consist of providing and installing new water taps to existing services for relocation of the 12-inch water line.

The Contractor shall contact the City of Phoenix Water Department for the tap to the existing 12" water main for the temporary service connection. The Contractor shall install the service saddle and provide the corp stop per City of Phoenix Modified MAG Detail P-1342. The City will make the actual tap to the main. The Contractor should contact Mr. Andy Brown of the City Water Department at 495-7683.

Payment will be made at the contract unit price as follows:

- BID ITEM 631.1 1-INCH WATER SERVICE CONNECTION (TEMPORARY)-per lineal foot
- BID ITEM 631.2 1-INCH WATER SERVICE CONNECTION (PERMANENT)-per lineal foot
- BID ITEM 631.3 2-INCH WATER SERVICE CONNECTION - per lineal foot

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SECTION 800 - TRAFFIC SIGNALS, SIGNING AND STRIPING:

SUBSECTION 800.1 - TRAFFIC SIGNAL POLES AND FOUNDATIONS:

Traffic signal poles and foundations shall conform to the plans and special details shown on the traffic signal plans and the specifications shown on the City of Phoenix Detail Sheet which has been included in the traffic signal plan sheets. All poles shall be City of Phoenix Type M. The existing pole mounted controller cabinet is to be relocated from the existing Type "A" pole to the newly installed "M" pole on the southeast corner.

The following procedures for traffic signal work shall be used by the Contractor (City of Phoenix Procedures, dated 6-7-89).

Scope

The following procedures shall be the sole responsibility of the Contractor constructing or relocating City of Phoenix traffic signal equipment, except as noted. These procedures are in addition to other applicable specifications and policies of the City of Phoenix, Maricopa Association of Governments, and the Arizona Department of Transportation.

Procedures

1. The City of Phoenix, Traffic Signal Shop (262-6733), shall be notified ten (10) working days prior to beginning any traffic signal work.
2. Existing traffic signal equipment shall remain operational and in full view of the intended traffic at all times until activation of new equipment. If necessary, temporary overhead cable shall be provided to maintain operation of signal equipment, as stated in Section V of the City Traffic Barricade Manual.
3. Underground conduit (including electrical conductors), junction boxes, controller foundations and pole foundations shall be installed as indicated on the approved project plans. Concrete shall be Class A, in accordance with Section 505 of the Uniform Standard Specifications. Pole foundations shall cure a minimum of seven (7) days prior to standing poles.
4. Traffic signal poles, mast arms, signal heads, pedestrian heads, pedestrian pushbuttons, controllers and electrical service panels and any and all related traffic signal equipment shall be installed as indicated on the approved project plans. The Contractor is to supply any wire or cable for these projects.
5. A qualified journeyman electrician, who has successfully completed a recognized 4-year electrical apprenticeship program, or equivalent training, shall be on site at all times during the construction/installation of traffic signal equipment (i.e., all items cited in No. 4 above, as well as the pulling conductors). Conductor splices shall only be made by said journeyman electrician, or by a person enrolled in a recognized 4-year electrical apprenticeship program, while under the direct supervision of the journeyman.

6. Equipment cited in No. 4 above may be picked up from the Traffic Signal Shop, 2631 South 22nd Avenue, thirty (30) days after receipt of a written list of required items and quantities. Incidental material, not specifically cited in No. 4 above, are to be supplied by the Contractor. Mechanical devices and personnel for loading equipment onto vehicles of transport shall be provided by the party picking up such equipment.
7. Foundation bolts, bolt cages, and IMSA multi-conductor cable may be secured from the City as in No. 6 above. Conductor wires, other than IMSA cable, are to be supplied by the Contractor. Power service shall be 3-wire, #8 AWG or as specified. Shielded cable for Telco and loop detector lead-ins shall be Beldon 8720 or Clifford of Vermont 16-2PE30ALM-1X-J30-19T (Style 2106).
8. The City of Phoenix shall be reimbursed, at cost, for all equipment and materials supplied in accordance with Nos. 4, 6 and 7 above.
9. Installation of signal heads and pedestrian heads shall conform to the Standard Mounting Detail. All heads shall be covered until activation, except 12-inch mast-arm heads, which shall NOT be installed until the day of activation. These coverings must be maintained in good repair.
10. When all equipment and wiring are in place and ready to be activated.
 - First; Give the Traffic Signal Shop forty-eight (48) hours advance notification.
 - Second; Have equipment and wiring inspected and approved by the Traffic Signal Shop.
 - Third; Provide for off-duty Police Officer control of the intersection at the time of activation.
 - Fourth; Make necessary conduit splices and pull in new conductors throughout entire conduit run (i.e. junction box to junction box). At existing signals, City forces will then splice the conductors in the junction boxes, thereby deactivating the old equipment and activating the new equipment. At new signals, the Contractor shall make conductor splices, as in No. 5 above.
11. Any existing equipment identified by the Traffic Signal Shop as salvagable shall be removed and delivered, in good order, to 2631 South 22nd Avenue and unloaded where designated. A credit will be made against the cost cited in No. 8 above for returned equipment. No used IMSA cable will be accepted as salvagable for credit.
12. Remnants of nonused signal equipment, foundations, conduits, junction boxes, etc., not identified in No. 11 above shall be removed and disposed with.

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The Contractor shall remove and salvage all existing traffic signal and lighting equipment as specified on the project plans. The work shall also include the removal and disposal of foundations. Salvagable material shall be dismantled and stockpiled, prior to project completion, as directed by the Engineer.

All equipment damaged or destroyed by improper care of handling shall be replaced with new equipment. Unless otherwise specified, it shall be the responsibility of the Contractor to remove and dispose of all discarded materials not salvaged. Holes resulting from removal of pull boxes, foundations, and other material shall be backfilled and compacted with material equivalent to the surrounding area.

The accepted quantities for furnishing all labor and materials and installing the traffic signal including foundations, signal heads, mounting assemblies, mast arms, luminaires, paint, pedestrian signals, pedestrian pushbuttons, etc. in accordance with the project plans will be paid for at the contract lump sum price for BID ITEM 800.1 which price shall be full compensation for the work, complete in place.

SUBSECTION 800.2 - ELECTRICAL CONDUIT:

The work under this section includes furnishing and installing PVC conduit required for traffic signals and all PVC pipes for future utilities as shown on the plans. Electrical conduit shall conform to Section 732 of the Arizona Department of Transportation Standard Specifications for Road and Bridge Construction - 1987. All electrical conduit shall be Schedule 40.

Payment for Electrical Conduit shall be at the contract lump sum price for BID ITEM 800.2.

SUBSECTION 800.3 - LOOP DETECTORS:

Loop detectors shall conform to the specifications shown on the traffic signal construction plans, the City of Phoenix furnished Detail Sheet which has been included in the traffic signal plans and City of Phoenix Specifications for inductive loops. Conductors for loops located in concrete pavement are to use Pyrotex M.I. Cable, specification number 309/4 LH.

The accepted quantities for installing all detector loops shown on the project plans will be paid for at the contract lump sum price, for BID ITEM 800.3 which shall be full compensation for the work, complete in place.

SUBSECTION 800.4 - PULL BOX NO. 5:

Pull boxes shall be installed in accordance with the details and specifications shown on the City of Phoenix furnished Detail Sheet. All pull boxes are to have concrete lids labeled with the words "Traffic Signals".

Payment for Pull Boxes, No. 5 shall be at the contract unit price for BID ITEM 800.4 per each.

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SUBSECTION 800.5 - STRIPING AND PAVEMENT MARKING:

Sub-Subsection 800.5.1 - Permanent Pavement Markings:

Description:

The work under this section shall consist of cleaning and preparing the pavement surface, furnishing all materials and applying white or yellow chlorinated rubber traffic paint and reflective glass beads at the locations and in accordance with the details shown on the plans, MUTCD, the requirements of these specifications, or as directed by the Engineer.

Materials:

Pavement Marking Paint:

A. General

All material used in the formulation of the pavement marking paint shall meet the requirements herein specified. Any materials not specifically covered shall meet the approval of the Engineer.

B. Composition Requirements

The permanent pavement marking paint shall consist of the following components with all percentages specified being by weight:

(1) Pigment Composition: Percent by weight of total pigment.

	<u>White</u>	<u>Yellow</u>
Titanium Dioxide, Rutile (ASTM D476, Type II 92% min.)	24.0-26.0	7.0-9.0
Medium Chrome Yellow (ASTM D211, Type III 87% min.)		15.0-17.0
Zinc Oxide (ASTM D79 American Process Type)	7.5-9.5	7.0-9.0
Magnesium Silicate (ASTM D605)	36.0-38.0	35.0-37.0
Calcium Carbonate (ASTM D1199, Type GC, Grade I or II)	28.0-30.0	31.0-33.0
Antisettling Agency (Bentone 34 or Claytone 40) See Note 1		

(2) Vehicle Composition: Percent by weight.	<u>White and Yellow</u>
Alkyd Resin Solution-See Note 2	21.3 min.
Chlorinated Rubber (Parlon S20 or Alloprene X20)	16.4 min.
Chlorinated Paraffin (Fed. Spec. MIL-C 429C, Type I)	11.3 - 13.3
Lead Driver 24% (ASTM D600, Class B)	0.2 - 0.4
Cobalt Driver 6% (ASTM D600, Class B)	0.05 - 0.25
Antiskinning Agent (Exkin or Equivalent) See Note 4	0.45 - 0.55
Stabilizer (Propylene Oxide) See Note 4	
Toluene (ASTM D362)	26.1 max.
Heptane (Technical Grade)	6.5 - 8.5
Methyl Ethyl Ketone (ASTM D740)	14.7 min.
Methanol (ASTM D1152)	0.2 - 0.4

Note 1: Sufficient dispersing and suspending agent shall be added to prevent excessive settling.

Note 2: Alkyd Resin Solution: The medium oil soya-modified alkyd resin shall be supplied as 59 to 61 percent non-volatile solids in VM & P Naphtha (TT-N-95b Type I). The resin solids shall contain an oil acid content of 48 to 55 percent: a phthalic anhydride content of 33 to 37 percent and an acid number of 8 maximum. The alkyd resin solution shall have a maximum of 9 (Gardner). The alkyd resin solution, reduced to 45 percent solids with VM & P Naphtha, shall have a viscosity of D to G (Gardner-Holdt). No rosin will be permitted. The oil fatty acids shall be of vegetable origin, either alkali refined soya bean oil or the fatty acids of soya bean oil having a minimum iodine number of 115. No recovered oil marine or soya food fatty acid derivatives shall be used. The alkyd resin solution must tolerate a 500 percent by weight dilution with VM & P Naphtha. A solution containing alkyd resin solution, chlorinated rubber, methyl ethyl ketone, toluene and heptane in the proportions given in the vehicle composition shall be clear, transparent

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and show no separation after storage of 24 hours in a three-quarter full test tube at 26.7° + 2.8° C. (80° - 5° F.)

Note 3: Sufficient antiskinning agent shall be used to prevent skinning. Material shall be added at the proper time during the manufacturing of the paint so as to minimize losses due to volatilization and maximize retention in the packaged product.

Note 4: Other approved stabilizers: Styrene Oxide - 3 pounds per 100 gallons of paint; Thermolite 813 - 0.5 pounds per 100 gallons of paint.

C. Manufacturing Formulations

The typical formula which may serve as a guide for the paint manufacture is as follows: (Yield is approximately 100 gallons.)

	POUNDS	
	White	Yellow
Titanium Dioxide	150	50
Medium Chrome Yellow		100
Zinc Oxide	50	50
Magnesium Silicate	224	224
Calcium Carbonate	175	200
Antisettling Agent (Claytone)	5	5
Methanol	2	2
Alkyd Resin Solution (60% non-volatile)	130	130
Chlorinated Rubber (93% non-volatile)	100	100
Chlorinated Paraffin	75	75
24% Lead Drier	2	2
6% Cobalt Drier	1	1
Antiskinning Agent (Exkin)	3	3
Stabilizer (Propylene Oxide)	3	3
Toltent	160	160
Heptane	45	45
Methyl Ethyl Ketone	90	90
	<u>1215</u>	<u>1240</u>

D. Quantitative Requirements of Mixed Paint:

	<u>White</u>	<u>Yellow</u>
Pigment:		
Percent by weight-See Note 5	48.9-50.6	49.9-51.6
Total Solids:		
Percent by weight	69.4 min.	70.0 min.
Non-Volatile Vehicle:		
Percent by weight vehicle	48.9 min.	38.9 min.
Viscosity:		
K.U. at 77 F	76±8	76 + 8
Weight per Gallon:		
Pounds	12.1±0.2	12.4±0.2
Fineness of Grind:		
Hegman gauge, North Standard Scale	3 min.	3 min.
Drying Time:		
Minutes	1 - 4	1 - 4
Directional Reflectance:	80 min.	50 min.
Uncombined Water:		
Percent by weight of paint	1.0 max.	1.0 max.
Coarse Particles and Skins:		
retained on a No. 325 mesh sieve, percent by weight of pigment.	1.0 max.	1.0 max.

Note 5: The extracted pigment upon analysis shall conform to the quantitative compositional requirements.

(3) Qualitative Requirements:

(1) Color of Yellow paint:

The color of the yellow paint shall visually match color chip No. 33538 of Fed. Std. 595 (Note 6). In case of dispute, the color shall be within the green and red tolerance limits when compared with the standard color chips of "Highway Yellow Color Tolerance Chart" U.S. Department of Commerce, Bureau of Public Roads PR Color No. 1, June 1965.

(2) Condition in Container:

The paint shall not show excessive settling in freshly-opened full can and shall be easily redispersed with a paddle to a smooth homogeneous state. The paint shall show no curdling, livering, caking, gelling or thixotropic properties, lumps, skins or color separation.

(3) Skinning:

The paint shall not skin within 48 hours in a three-quarter filled, tightly closed container.

(4) Storage Stability:

The paint shall show a viscosity increase of not more than five (5) Krebs units above the original viscosity and the degree of settling shall have a rating of six (6) or better (Note 7). When stored for twelve (12) months the paint must be usable, the drying time shall be as specified and the consistency range shall be -68 to 84 Krebs units.

(5) Flexibility and Adhesion:

The paint shall show no cracking, flaking or loss of adhesion when tested as specified. Apply a wet film thickness of 0.005 inches with a film applicator to a 3 by 5-inch tin panel weighing 0.39 to 0.51 lbs. per sq. ft., previously cleaned with a Hydrocarbon Solvent and lightly buffed with steel wool. Dry the paint film at 70° to 80° F. in a horizontal position for 18 hours, then bake in an oven at 122° ± 4° F. (47.8° C. to 52.2° C.) for two hours, cool to room temperature for at least ½ hour and bend over a ½ inch diameter rod and examine, without magnification.

(6) Water Resistance:

The paint shall show no softening, blistering, loss of adhesion or other evidence of deterioration other than a slight loss in gloss when tested as specified. Apply a wet film thickness of 0.015 inches with a film applicator to a clean glass plate. Let dry in a horizontal position at room temperature (70° to 80° F.) for 72 hours. Immerse one-half the painted plate in distilled water at room temperature for 18 hours as specified in method 6011 of Fed. Test Method Std. No. 141, allow to dry for two hours and examine.

(7) Dilution Stability:

The thinned paint shall be uniform and show no separation, curdling or precipitation after reduction in the properties of eight parts by volume of the package material with not more than one part by volume of the appropriate thinner for each type of paint.

(8) Spraying Properties:

The paint as received or diluted no more than specified above, shall have satisfactory spraying properties when applied (and held in a horizontal position) to tinplate or aluminum surfaces at a wet film thickness of approximately 0.015 inch. The sprayed film shall dry to

a smooth uniform finish, free from roughness, grit, unevenness and other surface imperfections. The paint shall show no streaking or separation when placed on clean glass.

(9) Bleeding:

The bleeding characteristics shall be determined in accordance with ASTM D969. The test panels shall be evaluated according to ASTM D868, and the degree of resistance to bleeding shall have a numerical rating of six (6).

Note 6: Apply a wet film of 0.015 inches to a tin panel; let dry for 24 hours and compare color.

Note 7: Storage stability shall be determined in accordance with ASTM D1309 Settling Properties of Traffic Paints During Storage; ASTM D869 Evaluating Degree of Settling; and Consistency, Krebs-Standard Method 4281 of Federal Test Method Std. No. 141.

E. Manufacturing Requirements:

(1) Inspection:

The manufacturer shall advise the Engineer when paint is to be manufactured and shall furnish the Engineer free access to all parts of the plant and shall furnish every reasonable facility for sampling both the paint and the raw materials during the process of manufacturing.

All materials used in formulation shall meet the requirements herein specified. Any materials not specifically covered shall meet the approval of the Engineer.

(2) Testing:

All tests will be conducted in accordance with the latest test methods of the American Society for Testing and Materials, Federal Test Method Standard No. 141, and methods in use by Materials Services, Highways Division, and the Arizona Department of Transportation. Where both an ASTM and Federal Test Method is available for new materials or the finished product, the ASTM test method will prevail.

Evidence of adulteration or improper formulation shall be cause for rejection.

(3) Packaging:

The finished paint shall be homogeneous, free of dirt, water and other foreign matters. The paints shall be strained immediately prior to canning.

All shipping containers must comply with Federal Interstate shipping standards of the Department of Transportation, and be stamped 17-H in accordance with the standards. The containers must be lined so as to prevent attack by the paint. The lining must not come off the container as skins.

All containers of paint shall be labeled with weatherproof markings, showing the color, manufacturer's name, date of manufacture, tare weight, net weight, gross weight and manufacturer's batch number on the side of drum and also on the lid.

Reflective Glass Beads:

(A) General:

The beads shall be manufactured from glass of a composition designated to be highly resistant to traffic wear and to the effects of weathering.

The glass beads shall be moisture-proof, contain less than 1/4 of one percent moisture by weight, and be free of trash, dirt, or other deleterious materials.

Beads shall be essentially free of sharp angular particles showing milkiness or surface scoring or scratching. Beads shall be water white in color.

(3) Physical Requirements:

(1) Gradation:

When tested by the method provided in AASHTO M-247 (by use of US Standard Sieves) the grade sizes of the beads shall be as follows:

<u>Size of Sieve</u>	<u>Percent Passing</u>
No. 20	100
No. 30	75 - 95
No. 50	15 - 35
No. 100	0 - 5

(2) Roundness:

When tested by the method provided in ASTM D1155-53 (Procedure B except paragraphs (F) and (G) are deleted) beads retained on any screen specified in the gradation requirements shall contain a minimum of 70% true spheres.

(3) Index of Refraction:

When tested by a liquid immersion method at a temperature of 25° C., the beads shall have an index of refraction of 1.50 to 1.57.

(4) Specific Gravity:

The specific gravity of the beads shall be in the range 2.40-2.60 when tested in accordance with the following procedures:

Place 100 grams in an oven at 110°C. for 1 hour.

Remove beads and place in a desiccator until the sample is cool.

Remove approximately 60 grams of beads from the desiccator and weigh the sample accurately.

Pour the beads slowly in a clean 100 ml. graduated cylinder containing 50 ml. of isopropyl alcohol. Make certain that air is not entrapped among the beads.

The total volume, minus 50, will give the volume of the beads.

Calculate the specific gravity as follows:

$$\text{Specific Gravity} = \frac{\text{Weight of Sample}}{\text{Volume of the Sample}}$$

(5) Chemical Stability:

Beads which show any tendency toward decomposition, including surface etching, when exposed to atmospheric conditions, moisture, dilute acids, or alkalis or paint film constituents, may be required to demonstrate satisfactory reflectance behavior, prior to acceptance, under such tests as may be prescribed.

(C) Moisture Proofing:

All glass beads shall have a moisture-proof overlay consisting of water repellent material applied during the process of bead manufacture. The beads so treated shall not absorb moisture in storage and shall remain free of clusters and lumps and shall flow freely from dispensing and testing equipment.

The beads shall pass the test for water repellency and free flow using the following equipment:

(1) Test bag:

The bag used is approximately 10½ inches x 17½ inches after sewing. The material used in the construction of the bag is unbleached cotton sheeting with a thread count of 48 x 48. The material before sewing is approximately 18 inches x 22 inches. The cloth is folded in half lengthwise and stitched in the shape of an "L" with the short side left open at the top. The material can be obtained from selected manufacturers of cloth and paper packaging. The finished bag may also be obtained from the manufacturer of the glass beads.

Newly fabricated bags must be thoroughly washed with hot water and detergent and rinsed before use to remove the sizing which may be present in the cloth. Subsequent to the initial washing, the bags need only be rinsed clean of beads from previous tests and dried thoroughly before use.

(2) Funnel:

The funnel used is a standard laboratory funnel with a top opening diameter of 125 mm and 150 mm stem length. The inside diameter of the stem is between 9 and 10 mm. This funnel is available from most laboratory glassware supply houses. Corning No. 6100 or equal.

(3) Ring Stand and Clamp.

(4) Balance accurate to 0.1 grams.

(5) Distilled water.

Moisture Testing Procedure:

Glass beads shall be tested for compliance to specification requirements. Testing shall be conducted at standard conditions of temperature ($25^{\circ} \pm 1^{\circ}$ C.) and humidity (50 ± 5 percent R.H.) and shall consist of the following procedure or an approved alternate:

Weigh 900.0 grams of glass beads into a clean, dry, flat-bottomed pan.

Dry beads at 150° C. for two hours.

Cool beads to room temperature ($25^{\circ} \pm 1^{\circ}$) in a desiccator.

Using the clean, pre-washed bag described under apparatus section, turn the bag inside-out so that the sewn seam and seam-allowance are on the outside.

Quantitatively transfer the beads into the inverted cotton bag.

Grasp the gathered top of the bag with one hand and lower the bag into a container of distilled water until the beads are approximately one inch below the water level. The container shall be of such dimensions that the bag does not contact the bottom or sides during immersion. Each bag shall be immersed individually. Do not allow one bag to contact another if multiple tests are run.

Remove the bag after 30 seconds of immersion time.

Cradle the bottom of the bag uniformly in the palm of one hand and twist the top neck of the bag until the twisted bag is compressed firmly against the beads. Twist until excess water no longer drips from the bag.

After the excess water has been squeezed from the bag, allow the bag to unwind.

Gather the top of the bag and clamp. Suspending the bag on a ring stand or other support such that the bottom or sides of bag do not contact the support.

After a standing time of 2 hours at room temperature ($25^{\circ} \pm 1^{\circ} \text{ C.}$), remove bag from support. Mix sample thoroughly by holding the bottom seam allowance in one hand and gathered neck of the bag in the other, invert bag and shake up and down 5 times.

Transfer the sample into a clean, dry funnel of the type described under apparatus. If consecutive tests are run, be sure the funnel is clean, dry and free of beads from prior tests.

The entire sample shall flow through the funnel without stoppage.

At the start of the test only, it is permissible to lightly tap the stem of the funnel to initiate flow.

Small quantities of beads which have adhered to the side of the funnel or stem shall not be cause for failure.

Construction Requirements:

Equipment:

The traffic paint and beads shall be placed on the pavement by a spray-type, self-propelled pavement marking machine except that temporary striping during construction may be placed with other equipment designed for application of paint and beads.

The application equipment to be used on roadway installation shall have, as a minimum, the following characteristic and/or apparatus:

The machine shall be capable of applying a clear-cut 4-inch line or lines.

The machines shall be equipped with a mechanical device capable of placing a broken reflectorized line with a 10-foot painted segment and 30-foot gap.

The machine shall be equipped with an air-operated glass bead drop-in dispenser controlled by the spray gun mechanism.

A glass bead dispenser which is capable of placing the glass beads into the paint line as the paint is applied to the pavement, shall be utilized. This dispenser shall provide satisfactory marking and delineation.

Application:

Pavement markings shall be applied when the pavement surface is dry and the weather is not foggy, rainy, or otherwise adverse to the application of markings. The surface shall be free from excess asphalt or other deleterious substances before traffic paint, beads or primer are applied.

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The contractor shall remove dirt, debris, grease, oil, rocks or chips from the pavement surface before applying markings. The method of cleaning the pavement surface and removal of detrimental material is subject to approval by the Engineer and shall include sweeping and the use of high-pressure air spray. The placing of traffic markings shall be done only by personnel who are experienced in this work.

The volume of paint in place shall be determined by measuring the paint tank with a calibrated rod. At the option of the Engineer, if the striping machine is equipped with air-atomized spray units (not airless) and paint gauges, the volume of paint may be determined by utilizing said gauges.

The quantity of glass reflectorizing beads in place shall be determined by measuring the glass reflectorizing bead tank with a calibrated rod.

The Contractor shall provide the necessary personnel and equipment to divert traffic from the installation area where the work is in progress and during drying time when, in the opinion of the Engineer, such diversion of traffic is necessary.

Tolerances for Placing Paint, Beads, and Primer:

The length of painted segment and gap shall not vary more than 6 inches in a 40-foot cycle.

The finished line shall be smooth, aesthetically acceptable and free from undue waviness.

Painted lines shall be 4, 8, or 12 inches wide as shown on the plans with a tolerance of plus or minus 1/8 inch and shall be placed at a minimum rate of 16 gallons per mile for a solid 4-inch line and 4 gallons per mile for a broken 4-inch line, based on a 10-foot stripe and a 30-foot gap (40-foot cycle aggregate).

Glass reflectorizing beads shall be applied on the wet paint at a minimum rate of 6 pounds to each gallon of paint.

Wet mil thickness shall not be less than 15 mils.

Sub-Subsection 800.5.2 - Preformed Pavement Markings:

Description:

The work under this item shall consist of furnishing all materials, preparing the pavement surface and applying preformed reflectorized pavement marking, arrows and legends to the pavement in accordance with the details shown on the project plans and the requirements of these specifications.

Preformed pavement markings shall be a general purpose high durability retroreflective pliant polymer film for preformed striping and markings to be used for finished permanent markings and shall be capable of performing as specified herein when subjected to high traffic volumes and severe wear conditions such as repeated shear action from crossover or encroachment, starting,

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stopping, and turning movements, and shall conform to Section 705 of Standard Specifications for Road and Bridge Construction, Arizona - 1987.

Materials:

General:

Certificates of Compliance conforming to the requirements of these specifications shall be submitted.

Preformed plastic pavement marking material shall consist of a homogeneous, extruded, pre-fabricated white or yellow thermoplastic film of specified thickness and width that shall be capable of being affixed to non-bleeding bituminous or portland cement concrete. It shall contain reflective glass spheres uniformly distributed throughout the entire cross section and bonded to the top surface of the material. The preformed plastic film shall be weather resistant and through normal traffic wear shall show no appreciable fading, lifting or shrinkage or significant tearing, roll back or other signs of poor adhesion through the useful life of the marking.

When extruded, the plastic film without adhesive shall be a minimum of 0.060 of an inch thick. The plastic film as supplied shall be of good appearance, free of cracks and discolorations and the edges shall be clean-cut and well defined. The plastic film may be supplied complete with a precoated, factory-applied pressure sensitive adhesive backed with a protective release paper or it may be furnished with separate adhesive as recommended by the manufacturer. Whether the adhesive is precoated or supplied separately, the adhesive shall be such as to allow the plastic film to be repositioned on the pavement surface to which it is applied before permanently fixing it in its final position with a downward pressure.

Composition Requirements:

The preformed plastic pavement marking material shall consist of the following components:

	<u>Minimum Percent by Weight</u>
Resins and Plasticizers	20
Pigments	30
Reflective glass spheres	20

Physical Requirements:

1) Color:

The pigments shall be selected and blended to provide a white or yellow marking film which conforms to standard highway colors throughout the expected life of the film.

2) Bend Test:

The plastic film shall be sufficiently flexible so that at a temperature of 78-82° F. an unmounted piece of material (without adhesive and paper backing), three inches by six inches in size, may be bent over a one-inch mandrel until the end faces are parallel and one inch apart without showing any fracture lines in the uppermost surface.

3) Tensile Strength:

The plastic film (without adhesive or paper backing) shall have a minimum tensile strength of 40 psi when a specimen six inches long by one inch wide is tested in accordance with the requirements of ASTM D638. The rate of pull of the test shall be 0.25 of an inch per minute. The test shall be conducted at a temperature between 70 and 80° F. The elongation shall be no greater than 75 percent.

4) Plastic Pull Test:

A six-inch long by one-inch wide section of the plastic film (without adhesive and paper backing) shall support a dead load weight of four pounds for not less than five minutes at a temperature between 70 and 80° F.

5) Abrasion Resistance:

The plastic film shall have a maximum loss in weight of 0.25 grams in 500 revolutions when abraded according to Federal Test Method Standard No. 141, Method 6192, using H-18 calibrate wheels with 1,000 gram load on each wheel.

6) Performance Testing:

The following are approved Preformed Pavement Marking Materials:

Stamark Brand Series 5730/5731
3M Corporation
St. Paul, Minnesota 55144

Stamark Brand Series 350/351
3M Corporation
St. Paul, Minnesota 55144

Ferro/Cataphote
Ferro Corporation
P. O. Box 2369
Jackson, Mississippi 39225-2369

Materials other than those listed above may be used but must be approved by the Engineer prior to use.

Reflective Glass Spheres:

General Requirements:

The spheres shall be manufactured from glass of a composition designed to be highly resistant to traffic wear and to the effects of weathering.

During manufacture of the preformed plastic pavement marking material, reflective glass spheres shall be mixed into the material in the amounts indicated. A layer of reflective glass spheres shall be bonded to the top surface of the preformed pavement marking materials.

Physical Requirements:

1) Roundness:

The roundness of the glass spheres shall be determined in accordance with the requirements of ASTM D1155. A minimum of 75 percent of the spheres shall be water-white true spheres free from imperfections of all types including air inclusions, film, scratches, clusters and surface scoring.

2) Index of Reflection:

The glass spheres used with the preformed pavement marking material shall have reflective index of not less than 1.50 when tested by the liquid immersion method at 25° C.

3) Gradation:

The size of the glass spheres shall be such that performance requirements for the preformed pavement marking material shall be met.

4) Chemical Resistance:

The glass spheres shall withstand immersion in water and acids without undergoing noticeable corrosion of etching and shall not be darkened nor otherwise noticeably decomposed by sulfides. The test for chemical resistance shall consist of placing three to five gram portions of the sample in each of three pyrex glass beakers or porcelain dishes; one sample shall be covered with distilled water, one with a 3M solution of sulfuric acid and the other with a 50% solution of sodium sulfide. After one hour of immersion, the glass spheres of each sample shall be examined microscopically for evidence of darkening and frosting.

Construction Requirements:

The Contractor shall install preformed pavement markings at the locations shown on the project plans, as specified in the special provisions, or as directed by the Engineer. Preformed marking tape shall be applied manually or with the tape applicators approved by the tape manufacturer. All markings shall be applied in accordance with the manufacturer's recommendations and as specified herein. Preformed pavement markings shall not be applied over other markings or old paint unless specified in the project plans or directed by the Engineer. The Contractor shall

remove all old markings and prepare the surface for application in accordance with these specifications and as directed by the Engineer.

Preformed pavement markings shall be applied to surfaces that are free of moisture and thoroughly cleaned of loose, foreign or other material that may adversely affect bonding. The Contractor shall remove all dirt, dust, grease, oil or other detrimental material from the road surface. The method of cleaning the surface is subject to approval by the Engineer and shall include sweeping and the use of high-pressure air spray. Newly placed surfaces need not be cleaned unless, in the opinion of the Engineer, the surface has become contaminated to the extent that cleaning is necessary to provide proper bonding.

Preformed pavement markings shall be applied immediately after the surface has been prepared or as soon as possible after placement and completion of new pavement. At the time of application, the road surface temperature shall not be less than 60 degrees F. and the pavement surface shall be absolutely dry. For temporary markings, the weather conditions noted above may be waived, at the Engineer's discretion, to obtain a traffic stripe prior to allowing traffic to traverse the roadway. Despite the required minimum surface temperature and surface condition, the Engineer, at any time, may require that work cease or that the work day be reduced in the event of weather conditions, either existing or expected, which would have an adverse affect upon the working conditions.

The contractor shall immediately correct all misalignments when so ordered by the Engineer. The misaligned portions shall be removed and installed in accordance with these specification. All areas marked with preformed marking tape shall be ready for traffic immediately after applications.

The application of preformed pavement markings shall be in accordance with the recommendations of the manufacturer of the material and these specifications; however, minor changes will be allowed if such are shown to produce an equal or better application and is approved by the Engineer. Failure to satisfactorily adhere to the pavement shall be reason for disallowing the use of any particular type of marking material. Approval for use of any type of marking material is subject to satisfactory performance under traffic.

Basis of Payment:

Pavement striping and preformed pavement markings of the type specified, will be paid for at a contract lump sum price for the total painted line and preformed markings shown on the plans, which price shall be full compensation for the work complete, as described and specified herein and on the project plans.

Pavement symbols and legends measured as provided above, will be included in this lump sum prices, which price shall be full compensation for the work complete, as described and specified herein and on the project plans.

Sub-Subsection 800.5 - Payment for Permanent Pavement Markings and Preformed Pavement Markings shall be at the contract lump sum price for BID ITEM 800.5 - STRIPING AND PAVEMENT MARKING.

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SECTION 800.6 - CONDUCTORS FOR TRAFFIC SIGNALS:

Conductors for traffic signals shall be provided to the sizes and types as shown on the plans.

Payment for conductors shall be at the contract lump sum price for BID ITEM 800.6 - CONDUCTORS FOR TRAFFIC SIGNALS.

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