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PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS

PROJECT

S 823041 E

Sanitary Sewer Relocation
ACDC - 60th Ave. to 67th Ave.

PUBLIC WORKS/ENGINEERING DEPARTMENT

CITY OF GLENDALE
GLENDALE, ARIZONA

MAYOR

George R. Renner

COUNCILMEN

Richard Bellah
Joe A. Falbo
Bruce Heatwole

Robert L. Huffman
Quentin V. Tolby
Dillis R. Ward

CITY MANAGER

John L. Maltbie

CITY CLERK

Lavergne Behm

MAY 1984



EVANS, KUHN & ASSOCIATES, INC.

A118.532

ENGINEERING DIVISION

LIBRARY

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NOTICE TO CONTRACTORS

Sealed bids shall be mailed to the office of the City Manager, 7022 North 58th Drive, Glendale, Arizona 85301, or hand-delivered to the City Engineering office, 6402 West Glendale Avenue, Glendale, Arizona, no later than _____, for furnishing all plant, material, equipment and labor, and to complete construction of:

Sanitary Sewer relocation from 60th Ave. to 67th Ave., City Project
No. S823041 E.

At that time, the bids will be publicly opened and read aloud in the conference room at the City Engineering office, 6402 West Glendale Avenue, Glendale, Arizona. Any bid received after close of bids will be returned unopened.

Plans, specifications and contract documents may be examined, and copies may be obtained at _____

A non-refundable charge of \$ _____ shall be made for each set of plans and specifications issued from this office.

Each bid shall be in accordance with the plans, specifications and contract documents, and shall be made out on the Bid Form(s) included in the project specifications book; shall be accompanied by a certified or Cashier's check or bid bond for five percent (5%) of the amount of the bid, made payable to the order of the City of Glendale, Arizona. All proposal guarantees, except those of the three lowest qualified bidders, will be returned immediately following the opening and checking of proposals. The proposal guarantees of the three lowest qualified bidders will be returned immediately after the contract documents have been executed.

Bids will be opened and publicly read aloud immediately after the hour of closing at the above mentioned office. Certified or Cashier's checks, or bid bond, will be given as a guarantee that the successful bidder will enter into the contract if awarded him and shall be declared forfeited as liquidated damages if said bidder refuses to enter into said contract after being requested to do so by the City of Glendale, Arizona.

The City of Glendale reserves the right to reject any or all bids or waive any informality in a bid.

The City of Glendale is an equal opportunity employer and minority business enterprises and womens business enterprises are encouraged to submit bids.

CITY OF GLENDALE, ARIZONA

By: John L. Maltbie
City Manager

Dated:
Published:

SPECIAL NOTICE

BIDDER'S ATTENTION IS CALLED TO THE FACT THAT NO BID IS COMPLETE WITHOUT THE RETURN OF THIS BOOK OF PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS. ADDENDA SHALL BE ATTACHED INSIDE THE FRONT COVER OF THIS BOOKLET. BIDS WILL BE RETURNED UNOPENED, IF NOT SUBMITTED PROPERLY SEALED.

BIDS SHALL BE ENCLOSED IN SEALED ENVELOPES, MARKED IN THE OUTSIDE LOWER RIGHT-HAND CORNER, INDICATING:

- (1) THE BIDDER'S NAME;
- (2) THE PROJECT NUMBER;
- (3) THE TITLE OF THE PROJECT; AND
- (4) THE TIME AND DATE THE BIDS ARE TO BE RECEIVED.

INFORMATION FOR BIDDERS

1. PROPOSAL: Bids to receive consideration shall be made in accordance with the following instructions:

Before submitting a bid, bidders shall carefully examine the plans and specifications and contract documents, visit the site of the work, fully inform themselves as to all existing conditions and limitations, and shall include sums in the bid covering the cost of each item included in the contract.

Bids shall be properly executed upon the proposal form. Numbers shall be stated both in writing and in figures, and the signatures of all persons shall be in longhand. The completed forms shall be without interlineations, alterations, or erasures. In case of a difference in written words and figures in a proposal, the amount stated in written words shall govern.

Bids shall not contain any recapitulations of the work to be done. Alternative proposals will not be considered unless called for. No oral, telegraphic, telephonic, or modified proposals will be considered.

Bids shall be delivered to the City Engineering office, City of Glendale, on or before the day and hour set for the opening of bids in the "NOTICE TO CONTRACTORS", as published. Bids shall be enclosed in a sealed envelope bearing the title of the work and the name of the bidder. It is the sole responsibility of the bidder to see that his bid is received in proper time. Any bids received after the scheduled closing time for receipt of bids will be returned to the bidder unopened.

2. BID SECURITY: Each proposal shall be accompanied by a certified check or bid bond acceptable to the Owner, in an amount equal at least to five percent (5 %) of the proposal payable without condition to the Owner as a guarantee that the bidder, if awarded the contract, will promptly execute such contract in accordance with the proposal and in manner and form required by the contract documents, and will furnish good and sufficient bond for the faithful performance of the same. The bid securities of the three (3) lowest bidders will be retained until the contract is awarded, or other disposition made thereof. The bid securities of all bidders, except the three (3) lowest, will be returned promptly after the canvass of bids.

3. WITHDRAWAL OF BID: Any bidder may withdraw his bid, either personally or by telegraphing or by written request, at any time prior to the scheduled closing time for receipt of bids.

4. LATE BIDS: Bids received after the scheduled closing time for receipt of bids, as contained in these documents, will be returned to the bidder unopened.

5. AWARD OR REJECTION OF BIDS: The contract will be awarded to the lowest and best qualified responsible bidder complying with these instructions and with the "NOTICE TO CONTRACTORS". The City of Glendale, Arizona, however, reserves the right to accept or reject any or all bids or to waive any formalities in the bid.

6. BIDDERS INTERESTED IN MORE THAN ONE BID: No person, firm or corporation shall be allowed to make, file, or be interested in more than one (1) bid for the same work unless alternate bids are called for. A person, firm, or corporation who has submitted a sub-proposal to a bidder, or who has quoted prices on materials to a bidder is not thereby disqualified from submitting a sub-proposal or quoting prices to other bidders.
7. CONTRACT, BONDS AND INSURANCE: The form of contract, which the successful bidder as Contractor will be required to execute, and the forms of bonds and insurance form which he will be required to furnish are included in the contract documents and should be carefully examined by the bidder. The contract, bonds and insurance form will be executed in () original counterparts.
8. INTERPRETATION OF PLANS AND DOCUMENTS: If any person contemplating a bid for proposed contract is in doubt as to the true meaning of any part of the plans, specifications, or other proposed contract documents, or finds discrepancies in or omissions from the plans and specifications, he may submit to the Public Works/Engineering Department, a written request for an interpretation or correction thereof. The person submitting the request will be responsible for its prompt delivery. Questions received less than ninety-six (96) hours before the bid opening time shall not be answered. Any interpretation or correction of the proposed documents will be made only by Addendum, duly issued and a copy of such Addendum will be mailed or delivered to each person receiving a set of such documents. The City of Glendale will not be responsible for any other explanations or interpretations of the proposed documents.
9. ADDENDUM: Any Addenda issued during the time of bidding, forming a part of the documents received by the bidder for the preparation of his bid, shall be covered in the bid and shall be made a part of the contract.
10. ASSIGNMENT OF CONTRACT: No assignment by the Contractor of any contract to be entered into hereunder, or any part thereof, or of funds to be received thereunder by the Contractor, will be recognized by the Owner unless such assignment has had prior approval of the Owner and the Surety has been given due notice of such assignment in writing and has consented thereto in writing.
11. PLANS AND SPECIFICATIONS TO SUCCESSFUL BIDDER: The successful bidder may obtain five (5) sets of plans and specifications for this project from the City Engineer, at no cost.
12. TIME OF COMPLETION: The Contractor shall commence work under this project on or before the tenth day following receipt of the Notice to Proceed for that project from the City of Glendale and shall fully complete all work under the project within _____ consecutive calendar days from and including the date of receipt of such notice. The Contractor shall, at all times, during the continuance of the contract, prosecute the work with such force and equipment as is sufficient to complete all work within the time specified.
13. LIQUIDATED DAMAGES: Should the Contractor fail to complete the work under this contract within the time for completion stated in the preceding paragraph under "TIME OF COMPLETION", then the Contractor shall pay the City of Glendale, Arizona, liquidated damages for each and every calendar day of delay until the work is completed or accepted, subject to the provisions of Section 108.9, Standard Specifications for Public Works Construction, Maricopa Association of Governments.

14. CITY OF GLENDALE TRANSACTION PRIVILEGE TAX: The City of Glendale transaction privilege tax shall be waived under the conditions of this contract; however, the Contractor shall be responsible for reporting and payment of all other county, state or federal taxes.
15. PRE-BID CONFERENCE: A pre-bid conference will be held on _____ in the conference room at the City Engineering office, 6402 West Glendale Avenue, Glendale, Arizona. Bidders, contractors, and other interested parties are invited to attend this conference which will be conducted by the Owner and Engineer to answer any questions.

GENERAL CONDITIONS

1. GENERAL: By Ordinance No. 1110 New Series, the City of Glendale adopted the "Uniform Standard Specifications for Public Works Construction", which are sponsored and distributed by the Maricopa Association of Governments. Copies of these documents, with revisions, are on file in the office of the Clerk of the City of Glendale, and are hereby made a part of these Contract Documents.

Whenever in the Uniform Standard Specifications, the words "The Contracting Agency" are used, the meaning shall be the City of Glendale.

In all cases where ASTM, AASHTO, AWWA, USAG, Federal, City of Phoenix, MAG Specifications, Maricopa County, Arizona State Highway, or other standard specifications are referred to, unless otherwise stated, revisions, supplements or addenda issued on or before the date of this contract, shall prevail.

In the event of any conflict between these project specifications and the requirements of the plans, detail drawings, MAG Standard Details and Specifications, these project specifications shall prevail.

2. DEFINITIONS: The following terms, as used in or pertaining to the Contract Documents, are defined as follows:

CITY: The word "City" refers to the City of Glendale, Arizona. The official representative of said City in these proceedings shall be the City Engineer.

CONTRACTOR: The word "Contractor" means the person, firm, or corporation with whom the Contract is made by the City.

MATERIALS: The term "Materials" includes, in addition to materials incorporated in the project, equipment and other material used and/or consumed in the performance of the work.

SUBCONTRACTOR: The word "Subcontractor" includes those having a direct contract with the Contractor and those who furnish material worked to a special design according to the plans and/or specifications for this work, but does not include those who merely furnish materials not so worked.

ENGINEER: The word "Engineer" means a person, firm, or corporation duly authorized by the City Engineer to act for him in staking out work, inspecting materials and construction, and interpreting plans and specifications.

CONTRACT DOCUMENTS: The words "Contract Documents" mean the Notice to Contractors, Information for Bidders, General Conditions, Special Provisions, Proposal, Contract, Payment Bond, Performance Bond, Certificates of Insurance, Plans and Addenda thereto.

3. PERMITS: The City has obtained certain required permits which are included in the project specifications, but it will be the duty of the Contractor to determine that all the necessary permits have been obtained. The Contractor shall, at his own expense, obtain all required permits which have not been furnished by the City. A no-fee permit will be issued for work in the City of Glendale right-of-way and easement.

4. RIGHTS-OF-WAY: The City will provide rights-of-way and easements for all work specified in this Contract, and the Contractor shall not enter or occupy with man, tools, equipment or materials any private ground outside the property of the City of Glendale, Maricopa County, Arizona, without the consent of the Owner.

5. PROPOSAL QUANTITIES: It is expressly understood and agreed by the parties hereto that the quantities of the various classes of work to be done and material to be furnished under this Contract, which have been estimated as stated in the Proposal, are only approximate and are to be used SOLELY for the purpose of comparing, on a consistent basis, the proposals offered for the work under this Contract; and the Contractor further agrees that the City will not be held responsible if any of the quantities shall be found incorrect; and the Contractor will not make any claim for damages or for loss of profits because of a difference between the quantities of the various classes of work as estimated and the work actually done. If any error, omission, or mis-statement is found to occur in the estimated quantities, the same shall not invalidate this Contract or release the Contractor from the execution and completion of the whole or any part of the work in accordance with the specifications and the plans herein mentioned, or for the prices herein agreed upon and fixed therefore, or excuse him from any of the obligations or liabilities hereunder, or entitle him to any damages or compensation except as may be provided for in this Contract.

6. PROTECTION OF FINISHED OR PARTIALLY FINISHED WORK: The Contractor shall properly guard and protect all finished or partially finished work, and shall be responsible for the same until the entire contract is completed and accepted by the City Engineer. He shall turn over the entire work in full accordance with the specifications before final settlement shall be made.

7. RESPONSIBILITY FOR DAMAGE CLAIMS: The Contractor shall indemnify and save harmless the City and its officers, agents and representatives from all suits, actions, loss, damage, expense, cost or claims of any character or nature brought on account of any injuries or damages sustained by a person or property arising out of the work done in fulfillment of the construction of the improvement under the terms of this agreement, or on account of any act or omission by the Contractor or his agents, or from any claims or amounts arising or recovered under Workmen's Compensation Laws or any other law, bylaw, ordinance, or order or decree.

8. LOSSES AND DAMAGES: All loss or damage arising out of the nature of the work to be done or from the action of the elements, or from any unforeseen circumstances in the prosecution of the same, or from any unusual obstructions or difficulties which may be encountered in and/or during the prosecution of the work, or from any casualty whatsoever of every description, shall be sustained and borne by the Contractor at his own cost and expense.

9. HINDRANCES AND DELAYS: No charge shall be made by the Contractor for hindrances or delays from any cause during the progress of the work embraced in this Contract; but such delays, if due to no fault or neglect of the Contractor, shall entitle the Contractor to an extension of time, allowed for completing the work, sufficient to compensate for the delay, the amount of the delay to be determined by the City Engineer, provided the Contractor shall give said City Engineer immediate notice in writing of the cause of such delay.

10. CHARACTER OF WORKMEN: None but skilled foremen and workmen shall be employed on work requiring special qualifications.

When required by the City Engineer, the Contractor shall discharge any person who is, in the opinion of the Engineer, disorderly, dangerous, insubordinate, incompetent, or otherwise objectionable. The Contractor shall keep the City harmless from damages or claims for compensation that may occur in the enforcement of this section of the specifications.

11. LAWS AND REGULATIONS: This Contract shall be governed by and constructed in accordance with the laws of the State of Arizona. The Contractor shall keep himself fully informed of all existing and future City and County Ordinances and Regulations and State and Federal Laws in any manner affecting the work herein specified. He shall at all times observe and comply with said Ordinances, Regulations, or Laws.

12. SUBCONTRACTS: Subcontracts shall be in accordance with, and the Contractor shall be bound by, the following provisions:

All subcontracts shall be subject to the approval of the City.

All subcontracts shall be in writing and shall provide that all work to be performed thereunder shall be performed in accordance with the terms of the Contract.

Certified copies of any and all subcontracts shall be furnished to the office of the City Engineer; however, prices may be omitted.

Subcontracts shall conform to the regulations governing employment of labor.

The subcontracting of any part of the work will in no way relieve the Contractor of his responsibility under the Contract.

13. STAKING AND INSPECTION: The Public Works/Engineering Department of the City of Glendale shall be notified at least seventy-two (72) hours prior to the start of construction. Both inspection and staking shall be provided by the City. Benchmarks and survey stakes shall be preserved by the Contractor and, in case of their destruction or removal by him or his employees or agents, shall be replaced by the City Engineer at the Contractor's expense; and the Contractor and his sureties shall be liable therefore.

Staking or inspection by the City of Glendale shall not be considered as direct control of the individual workman and his work. The direct control shall be solely the responsibility of the Contractor.

14. DUST PREVENTION: The Contractor shall take whatever steps, procedures, or means required to prevent abnormal dust conditions due to his construction operations in connection with this Contract. The dust control measures shall be maintained at all times during construction of the project, to the satisfaction of the Engineer, in accordance with the requirements of the "Maricopa County Health Department Air Pollution Control Regulations".

15. EXCESS MATERIAL: Excess material shall be removed from the work site and wasted at a location approved by the Engineer. Broken concrete and asphalt may be delivered to the Glendale Sanitary Landfill located at 115th Avenue and Glendale Avenue. The prevailing regulations and fee schedule will not be waived for work under this project. All materials, to be disposed of at the landfill, shall be weighed and disposed of at the prevailing rate.

16. ELECTRIC POWER AND WATER: The Contractor shall make his own arrangements for electric power and water. Subject to the convenience of the City, he may be permitted to connect to existing facilities where available, but he shall meter and bear the cost of such power or water. Fire hydrant meters may be obtained from the City of Glendale. Installation and removal of meters should be scheduled at least twenty-four (24) hours in advance through the Public Works/Field Operations Department at 931-5561. A \$325.00 deposit is required for each meter. The cost of the water is at the prevailing rate.

17. PRE-CONSTRUCTION CONFERENCE: PROGRESS SCHEDULE:

a. The Contractor shall meet with the Engineer for a pre-construction conference prior to commencing work. At this time, the Contractor shall submit a progress schedule showing the order in which he proposes to carry out the work, the dates on which he will start the several phases of the work, and the contemplated date for completion of each phase.

b. After the work is in progress, the Contractor shall submit supplementary progress schedules of the progress to date and projected to completion with each pay request submitted in accordance with Paragraph 20, "PAYMENTS TO CONTRACTOR", of these General Conditions. Schedule changes requiring an increase in the City's Engineering personnel on the project shall not be put into effect until the Engineer has made arrangements for additional personnel.

18. MAINTENANCE OF IRRIGATION FACILITIES: Where irrigation facilities interfere with construction, the Contractor shall remove and replace the affected irrigation facilities to its original condition. Final acceptance of replaced facilities will depend upon final approval of the Engineer.

19. CLEAN-UP: After all work under this Contract is completed, the Contractor shall remove all loose concrete, lumber, wire, reinforcing, debris, and other materials not incorporated in the work, from the site of the work. Clean-up shall include the removal of all excess pointing mortar materials within pipes and removal of oversize rocks and boulders left after finish grading. The Contractor shall provide for the disposal of all waste products, debris, etc.; and shall make necessary arrangements for such disposal.

20. PAYMENTS TO CONTRACTOR: The measurements of quantities and the payments to the Contractor shall be in accordance with MAG Uniform Standard Specifications for Public Works Construction, Part 100 - General Conditions, Section 109 - Measurements and Payments.

Payments will be made on the basis of itemized monthly statements provided by the Contractor and shall be submitted with an updated progress schedule in accordance with the standard specifications and these General Conditions. Three (3) copies of the itemized statement should be submitted to the office of the City Engineer. After verification, payments will be mailed by the Finance Department.

The City will make a partial payment to the Contractor on the basis of an estimate prepared by the Contractor, and approved by the City Engineer, for work completed through the last day of the preceding calendar month.

The City will retain ten percent (10%) of each such estimate until acceptance of the project and final payment.

Upon 100% completion and acceptance of the project, and with the request for final payment, the Contractor shall complete and submit the lien waiver form which is included in these specifications.

21. EXISTING UTILITIES: The Contractor is hereby advised that the location of all utilities, as shown on the plans, may not be complete nor exact and the Contractor shall satisfy himself as to the exact location of the utilities by contacting the utility companies before proceeding with the work. The Contractor shall be responsible for any damage done to public or private property.

Utility companies and other interested parties have been provided with construction plans and the construction schedule for this project. The Contractor shall comply with MAG Specifications 105.6 to cooperate with the utility companies.

22. ENERGIZED AERIAL ELECTRICAL POWER LINES: The utility company 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 a minimum ten (10) feet clearance between the lines and all construction equipment and personnel. (See: OSHA Std. 1926.550(a)15). As an additional safety precaution, Contractors should also be instructed to call the utility company to arrange, if possible, to have these lines de-energized or relocated when the work reaches their immediate vicinity. The cost of such temporary arrangements would be borne by the Contractor. The utility company can often respond to such requests if two days advance notice is given, but some situations may require up to sixty (60) days lead time for relocation or other arrangements.

23. SURVEY CONTROL POINTS AND MONUMENTS: Existing survey monuments indicated on the plans or found during construction shall be protected by the Contractor, and in the event removal is necessary, removal and replacement shall be performed by permission of the Engineer, under direct supervision of the Engineer or his authorized representative. Survey monuments shall be constructed to conform to the requirements of MAG Specifications, Section 405, and Standard Details.

24. APS GAS FACILITIES EXPOSED DURING CONSTRUCTION: The Contractor, upon exposing a gas line during construction, shall call Arizona Public Service, 271-7171. The APS gas patrolman will respond, usually within an hour, to inspect the line. Minor cuts or abrasions to the pipe coating will be rewrapped and tracer wire will be reconnected at no cost to the City or the Contractor.

SPECIAL PROVISIONS

1. GENERAL

In the event of any conflict between these project specifications and the requirements of the plans or detail drawings, these project specifications shall prevail.

The Contractor shall maintain a complete set of Contract Plans and Specifications at the project site. The Contract Plans and Specifications must be readily available at all times.

2. LAYOUT OF WORK

Immediately after being awarded the contract and during the progress of construction, the Contractor shall exercise proper precautions to verify figures shown on drawings, plans and construction stakes, and report any errors to the Owner. Failure to do so will relieve the Owner from any claim or damage due to such errors.

The Contractor shall conduct his work from permanent monuments and staking established by the Owner's Engineer and shall be entitled to rely on the accuracy of said work. The Contractor will be held responsible for the proper execution of the work to such lines and grades as may be established or indicated by the Owner's Engineer and all stakes or other marks thus established shall be preserved by the Contractor until their removal is authorized by the Owner.

Any permanent monuments or stakes set by the Owner's Engineer that are disturbed or destroyed by the Contractor's work force or those under his control shall be replaced at the Contractor's expense. The Contractor will have the option of hiring the Owner's Engineer directly for required restaking, or the Engineer will provide the required restaking under the Owner's contract, and the Owner will adjust the job payments to the Contractor accordingly.

In the event of any discrepancy between the drawings and figures written thereon, the figures, unless obviously incorrect, are to govern over scaled dimensions. In the case of any discrepancy between the General conditions and Special Provisions, the Special Provisions are to govern. Special Provisions shall govern over Specifications and Plans.

3. COORDINATION OF WORK

The Contractor shall coordinate this work with that of any other Contractors working on the project site so that efficient prosecution of all work in progress on the project site will be obtained.

4. AS-BUILT DRAWINGS

A. The Contractor shall maintain, on the job site, a set of fullsize reproducible Contract Drawings, or a set of fullsize blueline or blackline prints. On these, he shall mark all as-built conditions, locations, configurations, and other details which may vary from the details represented on the original drawings. This master record of as-built conditions, including all revisions made necessary by addenda, change orders, and the like shall be maintained up-to-date during the process of the work.

B. Upon completion of work and prior to final acceptance, the as-built drawings shall be turned over to the Owner.

5. SUBSTITUTION OF EQUIPMENT

Approved equals may be substituted for that specified. Any revisions or other work made necessary by such substitution shall be approved in writing by the Engineer, prior to construction, and the cost of these revisions shall be borne by the Contractor.

6. EXISTING PUBLIC UTILITIES

This shall not be a separate pay item.

A. Before starting excavation and during construction, the Contractor shall notify at least 48 hours (or the time required by respective agency or utility) in advance, all agencies and utilities which may be affected by the excavation or construction.

B. The Contractor shall make arrangements as are necessary to make any emergency repairs. The Contractor, at his expense, shall lower, raise, protect or relocate water mains, gas mains, telephone conduits, sewers, or other utilities interfering with construction of the project, with the consent and to the satisfaction of the Owner.

C. The Contractor shall maintain in continuous service all sewers, fire hydrants, irrigation or drain ditches, flumes, pipes, and other water courses which he may encounter during the prosecution of the work; and in no case shall interfere with, divert, or obstruct the flow of water in any such sources without first securing permission from the Engineer and Owner of same item.

D. The Contractor shall maintain continuous service of utilities to all residents and businesses, and utility owners all must be notified in advance.

E. The Contractor at his expense, shall protect all power and/or telephone or other poles by supporting, shoring, temporary or permanent relocation, bracing, or other means acceptable to the respective utility owner(s).

F. The Contractor shall properly support, and protect existing utilities paralleling, crossing over or under any proposed improvements, all water services, sewers and sewer service, gas mains and gas service, telephone conduits, or any other underground services in a manner satisfactory to the Owner.

G. Should any damage occur, the Contractor shall notify the Owner of the utility at once and render every assistance possible to repair the damage and restore the service. No extra compensation will be made for any repair of any service or utility damaged by the Contractor nor for any damage incurred through neglect or failure to provide adequate protection to existing utilities.

7. LIMITS OF CONTRACTOR'S OPERATIONS AND STORAGE OF MATERIAL AND EQUIPMENT

A. Available space on the job site may be used for the storage of materials and equipment. The location and extent of areas so used shall be designated and approved by the Engineer. It shall be clearly understood that the responsibility for the protection and safekeeping of equipment and materials on or near the site will be entirely that of the Contractor and that no claim shall be made against the Owner by reason of any act of any employee or trespasser. It shall be further understood that should any occasion arise necessitating access to the sites occupied by the stored materials and equipment, the Contractor shall promptly move same.

B. The Owner shall have the right to enter the premises for the purpose of doing work not covered by the Contract Documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the work, or the restoration of any damaged work, except such as may be caused by agents or employees of the Owner.

8. INSPECTION

Inspection of the work will be performed by the Owner an/or the Owner's representatives. Representatives of either shall have at all times, the right to inspect any portion of the project at any time.

9. SOILS REPORT

The soils report is furnished only for information purposes and shall not constitute a part of the contract documents. The Contractor shall verify all information furnished in the soils report.

P R O P O S A L

Place _____

Date _____

Proposal of _____,

a Corporation organized and existing under the laws of the State of _____;

a partnership consisting of _____;

or an individual trading as _____.

TO THE HONORABLE MAYOR AND COUNCIL
CITY OF GLENDALE
GLENDALE, ARIZONA

Gentlemen:

the undersigned hereby proposes and agrees to furnish any and all required labor, materials, construction equipment, transportation and services for the construction of:

Project Sanitary sewer relocation from 60th Ave. to 67th Ave.,

Project No. S82304E

in strict conformity with the plans and specifications for the following unit prices:

(Extension of these unit prices on the basis of estimated quantities and the totaling of these extensions are for the purpose of comparing bids only. The mathematics of such extensions and totaling will be checked and corrected by the Public Works/Engineering Department, before evaluating the bids, and the lowest of such corrected and checked totals will determine the lowest bids.)

NOTE: IN CASE OF DISCREPANCY, THE AMOUNT SHOWN IN WORDS SHALL GOVERN.

For Project No. _____

BID SCHEDULE

Pay Item No.	Unit and Approx. Quantities	DESCRIPTION UNIT BID PRICE IN WORDS	Unit Bid Price DOLLARS & CENTS	Amount Bid DOLLARS & CENTS
1	L.F. 2,862	21" V.C.P., 26' to 32' deep _____ and ___ /100 Dollars per _____		
2	L.F. 420	15" V.C.P., 0' to 8' deep _____ and ___ /100 Dollars per _____		
3	L.F. 40	15" V.C.P., 8' to 10' deep _____ and ___ /100 Dollars per _____		
4	L.F. 476	15" V.C.P., 10' to 12' deep _____ and ___ /100 Dollars per _____		
5	L.F. 640	15" V.C.P., 12' to 14' deep _____ and ___ /100 Dollars per _____		
6	L.F. 790	15" V.C.P., 14' to 16' deep _____ and ___ /100 Dollars per _____		
7	L.F. 80	15" V.C.P., 16' to 18' deep _____ and ___ /100 Dollars per _____		
8	L.F. 20	15" V.C.P., 18' to 22' deep _____ and ___ /100 Dollars per _____		
9	L.F. 120	15" V.C.P., 22' to 26' deep _____ and ___ /100 Dollars per _____		
10	L.F. 718	15" V.C.P., 26' to 30' deep _____ and ___ /100 Dollars per _____		

For Project No. _____

BID SCHEDULE

Pay Item No.	Unit and Approx. Quantities	DESCRIPTION UNIT BID PRICE IN WORDS	Unit Bid Price		Amount Bid	
			DOLLARS & CENTS		DOLLARS & CENTS	
11	Ea. 14	5' Dia. Manhole, 10' deep _____ and ___ /100 Dollars per _____				
12	Vert. Foot 200	Extra depth manhole _____ and ___ /100 Dollars per _____				
13	Vert. Foot 35	Manhole drop connection _____ and ___ /100 Dollars per _____				
		TOTAL BID PRICE _____ and ___ /100 Dollars per _____				
		_____ and ___ /100 Dollars per _____				
		_____ and ___ /100 Dollars per _____				
		_____ and ___ /100 Dollars per _____				
		_____ and ___ /100 Dollars per _____				
		_____ and ___ /100 Dollars per _____				
		_____ and ___ /100 Dollars per _____				

The undersigned hereby declares that he has visited the site(s) and has carefully examined the contract documents relating to the work covered by the above bid or bids.

Upon receipt of notice of the acceptance of this bid, he will execute the formal contract attached within ten (10) days, and will deliver a one hundred percent (100%) Performance Bond for the faithful performance of this Contract, together with a one hundred percent (100%) Payment Bond.

The bid security attached, with endorsement, in the sum of five percent (5%) of the total bid, is to become the property of the City of Glendale, Arizona, in the event the Contract and Bonds are not executed within the time set forth, as liquidated damages for the delay and additional work caused thereby.

The undersigned has checked carefully all the above figures and understands that the City of Glendale, Arizona, will not be responsible for any errors or omissions on the part of the undersigned in making up this bid.

The undersigned understands that the Mayor and Council of the City of Glendale, Arizona, reserves the right to reject any or all bids or to waive any informalities in the bid.

Respectfully submitted,

Contractor

By _____

(Complete business address)

Bidder shall signify receipt of all Addenda here (if any):

BID BOND
(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 City of Glendale, a municipal corporation as
Obligee, in the sum of _____ percent (%) of the total amount of the bid of
Principal, submitted by him to the Mayor and Council of the City of Glendale,
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. 34-201.

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

NOW, THEREFORE, if the City of Glendale shall accept the proposal of
the Principal and the Principal shall enter into a contract with the City of
Glendale, 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
City of Glendale the sum of money set forth above as liquidated damages for
failure of the Principal to enter into the contract, then this obligation shall
be null and void, otherwise to remain in full force and effect.

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

Witness: _____

Principal
Title

Witness: _____

Surety
Title

C O N T R A C T

THIS AGREEMENT, made and entered into this _____ day of _____, 19____, by and between the City of Glendale, Arizona, a municipal corporation, organized and existing under and by virtue of the laws of the State of Arizona, party of the first part, hereinafter designated the Owner, and _____

_____ ,
of the City of _____, County of _____,
and State of _____, party of the second part, hereinafter
designated the Contractor.

WITNESSETH: That the said Contractor has covenanted, and agreed, for and in consideration of the payments made as provided for in the proposal and specifications, to the Contractor by the said Owner, and under the penalty expressed in the bond hereto attached, at his proper cost and expense to do all the work and furnish all materials, tools, labor, and all appliances and appurtenances called for by the Agreement, free from all claims, liens and charges whatsoever, in the manner, and under the conditions hereinafter specified, that are necessary for the construction of:

PROJECT Sanitary Sewer relocation from 60th Ave. to 67th Ave.,

City Project No. S823041 E.

The work done and materials and equipment furnished shall be strictly pursuant to and in conformity with the specifications and plans. The specifications and drawings furnished by the Contractor with his proposal and the additional drawings or prints and other information to be furnished by the Contractor in accordance with the specifications are made a part of this Agreement when and as approved by the City of Glendale, Arizona are intended to be complementary and all specifications, plans, drawings, or prints furnished by the Contractor and approved by the City of Glendale shall be complementary therewith. Any work appearing in or upon the one and not mentioned in the others shall be executed according to the true intent and meaning of the said specifications and plans, drawings, or prints the same as though the said work were contained and described in all.

The Notice to Contractors, Information for Bidders, Special and Technical Provisions, Proposal, Bid Bond, Payment Bond, Performance Bond, Appendix, Plans and Addenda thereto, are hereby understood to be a part of this Contract.

It is further covenanted and agreed that the work shall be executed under the direction and supervision of the City of Glendale, Arizona, or its properly authorized agents, on whose inspection all work shall be accepted or rejected.

The City shall have full power to reject or condemn all materials furnished or work performed under this contract which do not conform to the terms and conditions herein expressed.

To prevent all disputes and litigation, it is further agreed by and between the said City of Glendale, Arizona, and said Contractor, that the Public Works/ Engineering Department, City of Glendale, shall determine all questions in relation to the work and the construction thereof, and it shall in all cases decide all questions which may arise relative to the execution of the work under this contract on the part of the said Contractor and its estimates and decisions shall be final and conclusive; and such estimates and decisions, in case any question may arise, shall be a condition precedent to the right of said Contractor to receive any money or compensation for anything done or furnished under this contract.

IN WITNESS WHEREOF, () 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 herein written.

ATTEST:

CITY OF GLENDALE, ARIZONA
PARTY OF THE FIRST PART (OWNER)

(SEAL)

City Clerk

Title

APPROVED: (AS TO FORM)

City Attorney

WITNESSES:

PARTY OF THE SECOND PART (CONTRACTOR)

Title

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 City of Glendale, a municipal corporation,
(hereinafter called the Obligee), in the amount of _____
_____ Dollars (\$ _____), for the payment whereof; the
said Principal and Surety bind themselves, and their heirs, administrators,
successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has entered into a certain written contract
with the Obligee, dated the _____ day of _____, 19____,
to construct _____

_____ 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
said Principal shall faithfully perform and fulfill all the undertakings,
covenants, terms, conditions and agreements of said contract during the
original term of said contract and any extension thereof, with or without
notice to the Surety, and during the life of any guaranty required under the
contract and shall also perform and fulfill all the undertakings, covenants,
terms, conditions, and agreements of any and all duly authorized modifications
of said contract that may hereafter be made, notice of which modifications to

the Surety being hereby waived; then the above obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Title 34, Chapter 2, Article 2, of the Arizona Revised Statutes, and all liabilities on this bond shall be determined in accordance with the provisions of said Title, Chapter, and Article, to the extent as if it were copied at length herein.

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

Witness our hands this _____ day of _____, 19____

Principal Seal

By: _____

Surety Seal

By: _____

Agency of Record

Agency Address

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 City of Glendale, a municipal corporation,
(hereinafter called the Obligee) in the amount of _____
_____ Dollars (\$ _____), for the payment whereof; the
said Principal and Surety bind themselves, and their heirs, administrators,
successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has entered into a certain written contract
with the Obligee, dated the _____ day of _____, 19____,
to construct _____

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 sub-contractors in the prosecution of the
work provided for in said Contract, then this obligation shall be void, other-
wise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond having been required of the said
Principal in order to comply with the provisions of Title 34, Chapter 2,
Article 2, of the Arizona Revised Statutes, all rights and remedies on this

bond shall inure solely to such persons and shall be determined in accordance with the provisions, conditions, and limitations of said Title, Chapter and Article, to the same extent as if they were copied at length herein.

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

Witness our hands this _____ day of _____, 19____

Principal _____ Seal

By: _____

Surety _____ Seal

By: _____

Agency of Record _____

Agency Address _____

CITY OF GLENDALE, ARIZONA
PUBLIC WORKS/ENGINEERING DEPARTMENT
CERTIFICATE OF INSURANCE

The _____
certifies that the following insurance policies have been issued on behalf of

Name of Insured _____

Address of Insured _____

Name and Address of Additional Named Insured: City of Glendale, Arizona
7022 North 58th Drive
Glendale, Arizona 85301

Type of Insurance	Policy No.	Eff. Date	Exp. Date	Limits of Liability
(1) Workmen's Compensation				Statutory
(2) Contractors Protective Bodily Injury				\$500,000 ea. occur.
(2) Contractor(s) Protective Property Damage				\$100,000 ea. accid. \$100,000 aggregate
(3) Contractual Bodily Injury				\$500,000 ea. occur.
(3) Contractual Property Damage				\$100,000 ea. accid. \$100,000 aggregate
(4) Automobile Bodily Injury and Property Damage				\$500,000 ea. occur.

When the project includes construction of a new, or modification of an existing building (in addition to the above types):

- (5) Fire and Extended Coverage plus Vandalism and Malicious Mischief - for the Full Amount of the Contract.

Policy No. Eff. Date Exp. Date

Policy Includes Coverage For:

- (1) a. Damage caused by blasting.
b. Damage caused by collapse or structural injury.
c. Damage to underground utilities.
- (2) Liability assumed in construction agreements and other types of contracts or agreements in effect in connection with insured operations.
- (3) All owned, hired or non-owned automotive equipment used in connection with the insured operation.

It is agreed that none of these policies will be cancelled or changed so as to affect this certificate until ten (10) days written notice of such cancellation or change has been delivered to the City of Glendale.

It is further agreed that:

These policies shall not expire until all work has been completed and the project has been accepted by the City of Glendale. (If a policy does expire during the life of the Contract, a renewal Certificate of the required coverage must be sent to the City of Glendale not less than five (5) days prior to expiration date.) The Contractor hereby agrees to indemnify and save harmless the City of Glendale and any jurisdiction or agency issuing permits for any work included in the project, their officers, agents and representatives from all suits, actions, loss, damage, expense, cost, or claims of any character or any nature brought

on account of any injuries sustained by any person or property arising out of the work done in fulfillment of the construction of the improvement under the terms of this agreement, or on account of any act or omission by the Contractor or his agents, or from any claims or amounts arising or recovered under Workmen's Compensation laws or any other law, by-law, ordinance, or order or decree.

This Certificate is not valid unless countersigned by an authorized representative of the Insurance Company.

Date:

Countersigned by

Signature

CITY OF GLENDALE, ARIZONA
PUBLIC WORKS/ENGINEERING DEPARTMENT

CONTRACTOR'S AFFIDAVIT
REGARDING
SETTLEMENT OF CLAIMS

PROJECT _____

To the City of Glendale, Arizona

Gentlemen:

This is to certify that all lawful claims for materials, rental of equipment and labor used in connection with the construction of the above project, whether by subcontractor or claimant in person, have been duly discharged.

The undersigned, for the consideration of \$ _____, as set out in the final pay estimate, as full and complete payment under the terms of the contract, hereby waives and relinquishes any and all further claims or right of lien under, in connection with, or as a result of the above described project. The undersigned further agrees to indemnify and save harmless the City of Glendale against any and all liens, claims of liens, suits, actions, damages, charges and expenses whatsoever, which said City may suffer arising out of the failure of the undersigned to pay for all labor performance and materials furnished for the performance of said installation.

Signed and dated at _____, this _____
day of _____, 19_____.

Contractor

By _____

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

The foregoing instrument was subscribed and sworn to before me this _____
day of _____, 19_____.

Notary Public

My Commission Expires _____

SANITARY SEWER RELOCATION
59th Avenue to 67th Avenue
Glendale, Arizona



Prepared for

Evans, Kuhn & Associates, Inc.
727 E. Bethany Home Road, Suite 225
Phoenix, Arizona



THOMAS-HARTIG & ASSOCIATES, INC.
SOIL & FOUNDATION ENGINEERS



THOMAS-HARTIG & ASSOCIATES, INC.

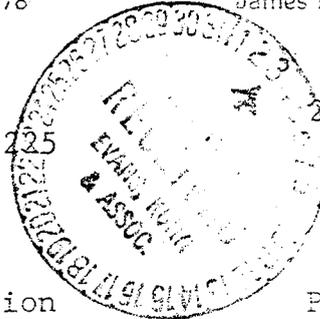
SOIL AND FOUNDATION ENGINEERS

Tom W. Thomas, P.E.
Harry E. Hartig, P.E.

2720 South Hardy Drive
Tempe, Arizona 85282
(602) 968-8778

John P. Boyd, P.E.
Charles H. Atkinson, P.E.
Glen K. Copeland, P.E.
James R. Morrow, Lab Director

Evans, Kuhn & Associates, Inc.
727 E. Bethany Home Road, Suite 225
Phoenix, Arizona 85014



April 1984

ATTN: Mr. Mike Khazoom, P.E.

Project: Sanitary Sewer Relocation
59th Avenue to 67th Avenue
Glendale, Arizona

Project No: 84-344
Supplement No. 1

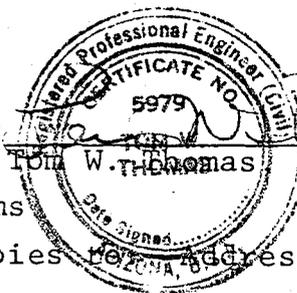
In accordance with your request, we have reviewed our soil engineering report relative to excavation conditions.

It is understood that the sewer line is located in some areas as close as 25 feet to the north property line of the project easement. As stated in our report, it is estimated that unbraced excavations would probably have to be sloped approximately 45 degrees (1.0 horizontal to 1.0 vertical). Therefore, to maintain the excavation within the easement will require that the lower portions of the deeper excavations be braced. The bracing system must be the type that can be installed in a medium to dense granular deposit which contains some cobble size (+6") materials.

This supplement shall be attached to the original report and shall become a part thereof. Please do not hesitate to call if you have any questions or if we may be of further assistance.

Respectfully submitted,
THOMAS-HARTIG & ASSOCIATES, INC.

By: 
Tom W. Thomas P.E.



Reviewed by: 
Harry E. Hartig P.E.



/cms
Copies to Addressee (3)



THOMAS-HARTIG & ASSOCIATES, INC.

SOIL AND FOUNDATION ENGINEERS

Tom W. Thomas, P.E.
Harry E. Hartig, P.E.

2720 South Hardy Drive
Tempe, Arizona 85282
(602) 968-8778

John P. Boyd, P.E.
Charles H. Atkinson, P.E.
Glen K. Copeland, P.E.
James R. Morrow, Lab Director

Evans, Kuhn & Associates, Inc.
727 E. Bethany Home Road, Suite 225
Phoenix, Arizona 85014

23 March 1984

Attention: Mr. Mike Khazoom, P.E.

Project: Sanitary Sewer Relocation
59th Avenue to 67th Avenue
Glendale, Arizona

Project No: 84-344

In accordance with your authorization, test borings were drilled and resistivity measurements were accomplished at six (6) locations along the alignment for the proposed sewer line. The test boring locations are indicated on the accompanying site plan, and the results of the soil boring logs and resistivity tests are attached herewith.

The test borings were to be drilled a few feet beyond the bottom of the sewer line, however, at 4 of the 6 locations, the test drilling refused on sand, gravel and cobble materials at shallower depths. The following tabulation presents a generalization of the sewer line depth and subsoil stratification.

Test Boring	Surface Elevation	Sewer Invert Elev. - Depth	Subsoil Stratification:	
			Clay-Sand	Sand, Gravel & Cobbles
1	1218' ±	1183' - 35'	0 - 13'	13' - 20'*
2	1218' ±	1186' - 32'	0 - 11'	11' - 13'*
3	1218' ±	1189' - 29'	0 - 7'	7' - 12'*
4	1219' ±	1194' - 25'	0 - 7'	7' - 11'*
5	1217' ±	1202' - 15'	0 - 10'**	10' - 19'
6	1217' ±	1205' - 12'	0 - 13'**	13' - 14'

*Depth that test drilling refused.

**Upper 4 to 5 feet is fill material (old canal embankment materials).

Samples of the auger cuttings were obtained during the test drilling, and five (5) samples were selected for laboratory gradation and plasticity index testing. These laboratory test results are also attached.

In accordance with your request, we present the following comments relative to excavating, sheet piling, and bedding of the sewer line. The comments are based upon an assumption that the granular subsoils extend for the full depth of the sewer line excavation. To verify this assumption, considerations should be given to supplementing the test drilling with a number of large diameter (36 inch) auger borings.

1. Due to the presence of granular subsoils at relatively shallow depths, and the relatively deep sewer invert, unbraced excavations would probably have to be sloped approximately 45 degrees (1.0 horizontal to 1.0 vertical).
2. Due to the medium to dense condition of the granular subsoils, and some cobble size materials within the deposit, driving sheet piling will be very difficult and may not be possible in some areas, particularly if the percentage of cobbles increases with depth.
3. Due to the expected difficult backfilling conditions against the deep sewer line, and relatively small sewer line (15 and 21 inch diameter), considerations should be given to utilizing a select bedding material not only beneath the sewer line, but also against the pipe to a depth of 12 inches above the top of the pipe. The granular subsoils from the excavation will not be suitable as bedding materials unless the oversize gravels and cobbles are removed.

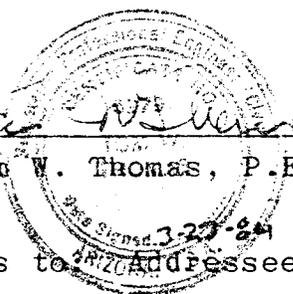
The soil resistivity was measured using a four-terminal "Vibroground Model 260" resistivity meter. The soil resistivity was measured using a number of electrode spacings to better determine the

variation in soil resistance with depth. As determined by the test results, the subsoils were found to possess relatively high resistance indicating no need for additional testing.

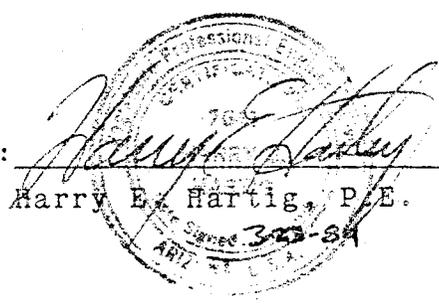
Please do not hesitate to call if we may be of further service to you.

Respectfully submitted,
THOMAS-HARTIG & ASSOCIATES, INC.

By: Tom W. Thomas
Tom W. Thomas, P.E.
/cms
Copies to Addressee (3)



Reviewed by: Harry E. Hartig
Harry E. Hartig, P.E.



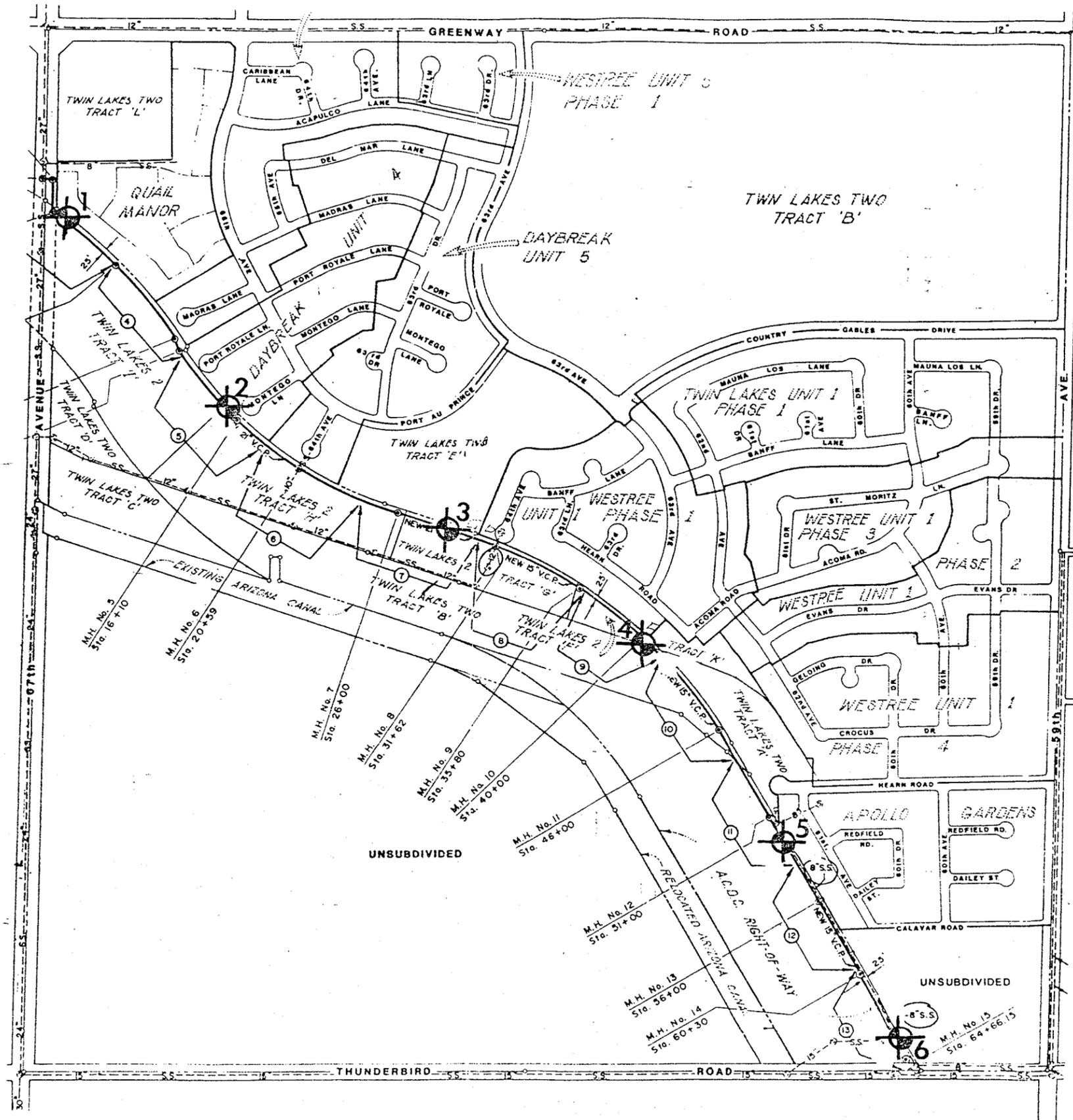
FIELD RESULTS

Site Plan

Legend of Test Drilling Operations

Soil Boring Logs

Soil Resistivity Tests



LEGEND



Location of Test Borings

LEGEND

SOIL CLASSIFICATION ASTM: D2487

COARSE-GRAINED SOIL

MORE THAN 50% LARGER THAN 200 SIEVE SIZE

Symbol	Letter	DESCRIPTION	MAJOR DIVISIONS
	GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES. LESS THAN 5% - 200 FINES	GRAVELS More than half of coarse fraction is larger than No. 4 Sieve size
	GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES. LESS THAN 5% - 200 FINES	
	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES. MORE THAN 12% - 200 FINES	
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES. MORE THAN 12% - 200 FINES	
	SW	WELL-GRADED SANDS OR GRAVELLY SANDS. LESS THAN 5% - 200 FINES	SANDS More than half of coarse fraction is smaller than No. 4 sieve size
	SP	POORLY-GRADED SANDS OR GRAVELLY SANDS. LESS THAN 5% - 200 FINES	
	SM	SILTY SANDS, SAND-SILT MIXTURES MORE THAN 12% - 200 FINES	
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES MORE THAN 12% - 200 FINES	

FINE-GRAINED SOIL

MORE THAN 50% SMALLER THAN 200 SIEVE SIZE

Symbol	Letter	DESCRIPTION	MAJOR DIVISIONS
	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	SILTS AND CLAYS Liquid limit less than 50
	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
	OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY	
	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS	SILTS AND CLAYS Liquid limit greater than 50
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
	PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	

log denotes visual approximation unless accompanied by mechanical analysis and Atterberg limits.

GRAIN SIZES									
U.S. STANDARD SERIES SIEVE					CLEAR SQUARE SIEVE OPENINGS				
	200	50	16	4	3/8"	3"	6"		
SILTS & CLAYS DISTINGUISHED ON BASIS OF PLASTICITY	SAND			GRAVEL		COBBLES	BOULDERS		
	FINE	MEDIUM	COARSE	FINE	COARSE				
MOISTURE CONDITION (INCREASING MOISTURE →)									
DRY	SLIGHTLY DAMP		DAMP	MOIST	VERY MOIST	WET (SATURATED)			
			(PL)					(LL)	

DEFINITIONS

Penetration Resistance — Blows per foot using 'A' rod and 140 lb. hammer with 30 inch free fall unless otherwise noted.

N Standard Penetration Resistance (ASTM:D1586), 2.0 inch O.D. split barrel sampler.

C Continuous Penetration Resistance, 2.0 inch O.D. Bull Nose.

R Penetration Resistance, 2.42 inch I.D. Ring Sampler

Sample Type

R - Ring T - Shelby Tube S - Standard Split Barrel B - Block
G - Grab C - Cutting V - Vertical Face Cut

CONSISTENCY			RELATIVE DENSITY	
CLAYS & SILTS	BLOWS/FOOT*	STRENGTH‡	SANDS & GRAVELS	BLOWS/FOOT*
VERY SOFT	0-2	0-1/4	VERY LOOSE	0-4
SOFT	2-4	1/4-1/2	LOOSE	4-10
FIRM	4-8	1/2-1	MEDIUM DENSE	10-30
STIFF	8-16	1-2	DENSE	30-50
VERY STIFF	16-32	2-4	VERY DENSE	OVER 50
HARD	OVER 32	OVER 4		

* Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-1/4 inch I.D.) split spoon (ASTM D-1588).

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

SOIL BORING LOG

NO. 4 *ELEV: 1219 ft. ± SIZE OF HOLE 7 in. FIELD ENGR. M.F. DATE 3/13/84

DEPTH FT	PENETRATION RESISTANCE BLOWS FT		SAMPLE TYPE	DRY DENSITY PCF	MOISTURE CONTENT	DESCRIPTION	SOIL CLASSIFICATION	GRAIN SHAPE			RELATIVE DENSITY			PLAS- TICITY			CONSIS- TENCY			CEMEN- TATION			
	C	N						WELL SORTED	ANGULAR	SUBANGULAR	SUBROUNDED	LOW	MED	HIGH	NONE	LOW	MEDIUM	HIGH	SOFT	FIRM	STIFF	VERY STIFF	HARD
1					sli damp	Sandy Clay; light brown to brown, stratified with some clayey sand (SC) lenses, some gravels to 2".	CL	X	X								X						X
2					damp																		
3																							
4																							
5																							
6					mist																		X
7																							
8					damp	Clayey Sand & Gravel Mixture; light brown to gray brown, stratified with sandy-gravel (SP-SM) lenses, some cobbles below 10 feet.	GC-SC	X	X	X	X	X	X										XX
9																							
10			S	----	NR																		
11																							
12																							
13																							
14																							
15																							
16																							
17																							
18																							
19																							
20																							

NR - No Sample Recovery

Auger refusal at 11 feet

*From profile plans received.

Ground water encountered: none

NOTE: The data presented on the boring logs represents subsurface conditions only at the specific locations and at the time designated. This data may not represent conditions at other locations and/or times. This boring data was compiled primarily for design purposes, and should not be construed as part of the plans governing construction or defining construction techniques. Bidders are fully responsible for interpretations or conclusions they draw from the boring log.

Project No. 84-344

THOMAS-HARTIG & ASSOCIATES, INC.

SOIL BORING LOG

NO. 5 *ELEV: 1217 ft. ± SIZE OF HOLE 7 in. FIELD NO. M.F. DATE 3/13/84

DEPTH FT.	PENETRATION RESISTANCE BLOWS/FT.		SAMPLE TYPE	LAB. DESIGNATION	MOISTURE CONTENT	DESCRIPTION	SOIL CLASSIFICATION	SPT			CONE			PENETRATION			OTHER		
	C	N&R						WELL	POOR	GOOD	BL	SL	PT	SP	CM	CM	CM	CM	CM
1						damp Fill: Canal Embankment; highly stratified with clayey sand (SC)-sandy clay (CL) and sand-silty sand (SP-SM), some gravels to 2 inches.	FILL												
2																			
3																			
4																			
5	**	11	R	95.6	18.9														
6						damp Clayey Sand; light brown to gray brown, stratified with sand-silty sand (SP-SM) lenses, gravels that increase in percent and size with depth.	SC	X	X		X	XX							XX
7																			
8																			
9																			
10		44	S																
11						damp Clayey Sand & Gravel Mixture; light brown to brown with lenses of clean sand (SP).	GC-SC	X	X	X	XX	X							XX
12																			
13						NOTE: No cobble size materials encountered.													
14																			
15																			
16																			
17																			
18																			
19																			
20																			

*From profile plans received. Stopped test drilling at 19 feet
 **Approximate depth of fill. Exact depth difficult to determine due to similarity with native soils.
 Ground water encountered: none
 Project No. 84-344
 THOMAS-HARTIG & ASSOCIATES, INC.

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SOIL BORING LOG

NO 6 *ELEV: 1217 ft. ± SIZE OF HOLE 7 in. FIELD ENGR M.F. DATE 3/13/84

DEPTH FT	PENETRATION RESISTANCE BLOWS FT		SAMPLE TYPE	CORRECTION FOOT	MOISTURE CONTENT	DESCRIPTION	CLASSIFICATION	SPT				BLAST		CPT		SEMI		OTHER			
	C	N						LOW	MED	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH			
1						damp Fill: Canal Embankment: to highly stratified with clayey very sand (SC)-sandy clay (CL)	FILL														
2						damp and sand-silty sand (SP-SM), some gravels to 2 inches.															
3																					
** 4																					
5		18	S	----		damp Clayey Sand: light brown to gray brown, stratified with sand-silty sand (SP-SM) len- ses, gravels that increase in percent and size with depth.	SC	X	X	X	X	X							X	X	
6																					
7																					
8																					
9						damp Clayey Sand & Gravel Mixtures light brown to gray brown, stratified with sandy-gravel (GP-GW) lenses, some cobbles below 13 feet.	GC- SC	X	X	X	X	X	X							X	X
10		26	S	----																	
11																					
12																					
13																					
14																					
15																					
16																					
17																					
18																					
19																					
20																					

*From profile plans received. Stopped test drilling at 14 feet

**Approximate depth of fill.
Exact depth difficult to
determine due to similarity
with native soils.

Ground water encountered none

Project No. 84-344
THOMAS-HARTIG & ASSOCIATES, INC

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REPORT ON FIELD TESTS

DESCRIPTION:

Date 3/22/84

Location Noted below

Material Subsoil

Performed By D. Thomas

TESTED: In-place four-terminal resistivity testing

RESULTS:

<u>Location</u>	<u>Electrode Spacing</u>	<u>Depth of Measurement</u>	<u>Soil Resistivity (ohm/cm³)</u>
1	10 ft.	0 - 10 ft.	13406
1	20 ft.	0 - 20 ft.	18576
1	30 ft.	0 - 30 ft.	23843
1	32 ft.	0 - 32 ft.	24820
2	10 ft.	0 - 10 ft.	4309
2	20 ft.	0 - 20 ft.	18462
2	30 ft.	0 - 30 ft.	23671
2	32 ft.	0 - 32 ft.	23165
3	10 ft.	0 - 10 ft.	10629
3	20 ft.	0 - 20 ft.	15512
3	30 ft.	0 - 30 ft.	18672
3	32 ft.	0 - 32 ft.	19917
4	10 ft.	0 - 10 ft.	10246
4	20 ft.	0 - 20 ft.	15895
4	30 ft.	0 - 30 ft.	18959
4	32 ft.	0 - 32 ft.	19917
5	10 ft.	0 - 10 ft.	8809
5	20 ft.	0 - 20 ft.	18193
5	30 ft.	0 - 30 ft.	22694
5	32 ft.	0 - 32 ft.	23900
6	10 ft.	0 - 10 ft.	8139
6	20 ft.	0 - 20 ft.	13980
6	30 ft.	0 - 30 ft.	19247
6	32 ft.	0 - 32 ft.	20530

Project No. 84-344
THOMAS-HARTIG & ASSOCIATES, INC.

LABORATORY RESULTS

Sieve Analysis and Plasticity Index Tests

REPORT ON LABORATORY TESTS

SAMPLE:

Date 3/22/84

Source Noted below

Type Auger Cuttings

Material Surface and subsoils

Sampled By Frede

TESTED: Sieve analysis and Plasticity index

RESULTS:

Sample	LL	PI	Sieve Size -					Accum. % Passing					* Class	
			200	100	50	30	16	8	4	3/4"	1"	2"		3"
1; 0 - 8'	32	15	51	62	70	78	86	92	96	100				CL
1; 8 - 13'	31	13	20	25	30	36	45	59	75	100				SC
1; 13 - 20'	33	15	14	17	20	24	29	36	45	66	72	100		GC
5; 5 - 10'	40	17	29	34	39	44	50	60	73	93	93	100		SC
5; 10 - 19'	41	13	17	22	26	33	42	52	65	85	85	100		SC

*Materials of larger sizes (probably 3" to 6") were present within the deposit but were not recoverable with the 7 inch diameter flight auger drilling.

* Unified Soil Classification