TOWN OF ADDISON

PUBLIC WORKS DEPARTMENT (214) 450-2871

Post Office Box 144 Addison, Texas 75001 16801 Westgrove

September 20, 1993

Mr. Gary Oshel, P.E.
Assistant City Engineer
City of Farmers Branch
P.O. Box 819010
Farmers Branch, Texas 75381

Re: Engineering services for the NDCWSC Sanitary Interceptor Sewer Phase II

Dear Gary:

On Addison's behalf, I have reviewed the proposed agreement and recommend that it be forwarded to the NDCWSC Board for their review and approval.

It is my understanding that Addison's financial portion of this agreement is 38.75% of the costs (a not to exceed fee of $61,505.94) and that the construction costs will be assigned in accordance with the percentages outlined in exhibit 'B' of the interlocal agreement dated March 18, 1991.

Sincerely yours,

John R. Baumgartner, P.E.
Director of Public Works

JRB/gmk

cc: Randy Moravec

FAX MESSAGE
CITY OF FARMERS BRANCH

DATE: 7-8-93

This is a 11 page transmission, including this cover page.

Our FAX telephone number is (214)241-6305.

In case of a problem with this FAX transmission or difficulty in transmitting to us please call CITY OF FARMERS BRANCH (214) 247-3131 EXT._____

TO: John Baumgartner

COMPANY: Addison, Town

FROM: Gary Oshel

SPECIAL INSTRUCTIONS:

FAX2.CHP

SHIMEK, JACOBS & FINKLEA
CONSULTING ENGINEERS

8333 Douglas Avenue, #820 Dallas, Texas 75225 (214) 361-7900

ROSS L. JACOBS, P.E.
I. C. FINKLEA, P.E.
JAMES E. LAUGHLIN, P.E.
RONALD V. CONWAY, P.E.
JOHN W. BIRKHOFF, P.E.
MATT ARMSTRONG, P.E.
JOE R. CARTER, P.E.
GARY C. HENDRICKS, P.E.

C. L. SHIMEK, P.E.

August 27, 1993

Mr. Gary M. Oshel, P.E.
Project Manager
North Dallas County Water
Supply Corporation
Post Office Box 819010
Farmers Branch, Texas 75381-9010

Re: Sanitary Interceptor Sewer Phase II

Dear Mr. Oshel:

We are enclosing a copy of our proposal to furnish professional engineering services on the Sanitary Interceptor Sewer Phase II project. Our proposal conforms to the various sections of your Standard Form of Agreement. Our proposal includes our proposed Scope of Work, our proposed Basis of Payment and Estimated Time for Completion for the services.

Based on our review of the proposed work, our current opinion of probable construction cost is approximately $1,770,000.00. This opinion is based on utilizing large diameter PVC sanitary sewer line as the sanitary sewer line construction material. We anticipate the line size varying from 15-inch in diameter to 30-inch in diameter. Our preliminary layout includes 13,250 linear feet of proposed line, 52 manholes and two TRA meter stations.

We certainly appreciate the opportunity to be of service to the North Dallas County Water Supply Corporation on this project. We are available at your convenience to discuss any questions you may have with our proposal to accomplish the project.

Sincerely,

John W. Birkhoff

John W. Birkhoff, P.E.

Enclosure

I. PROJECT DESCRIPTION

The Engineer shall provide the following services:

A. DESIGN PHASE

1. Review available sanitary sewer studies of the area to obtain design flows.

2. Make site visit to determine preliminary alignment of sanitary sewer line.

3. Plot preliminary alignment on 100 scale topographic maps. Alignment will generally follow that outlined in the Owner's request for qualifications for this project.

4. Identify areas along alignment that require special design considerations such as boring and traffic control.

5. Meet with Owner to discuss preliminary horizontal alignment.

6. Provide TU Electric, Lone Star Gas, Southwestern Bell Telephone and TCI CableVision with plan of preliminary alignment. Request information on their facilities.

7. Finalize horizontal alignment. Horizontal alignment will be established with an effort to save trees which may be along proposed route.

8. Size sanitary sewer line based on maximum anticipated flows provided by Owner. It is our understanding the Owner's generated flows were calculated based on maximum FAR zoning. Design will be based on Manning's equation with the pipe flowing full.

9. Review the velocity in the pipe for a flow of 25 percent of future anticipated flows.

10. Review various types of pipe available and make recommendation to Owner of acceptable pipe materials.

11. Meet with Owner to discuss preliminary vertical alignment of sanitary sewer line. Discuss with Owner areas requiring special design considerations.

12. Finalize vertical alignment. Vertical elevations along the route will be referenced to Owner supplied benchmarks.

13. Prepare design report in letter form outlining major design decisions and design criteria and provide five copies to the Owner.

14. Prepare construction plans on 24-inch x 36-inch reproducible sheets. Drawings shall generally be at a scale of 1-inch equals 20 feet.

15. Prepare technical specifications and contract documents.

16. Utilize City of Farmers Branch standard sanitary sewer construction details provided by the Owner.

17. Formulate an opinion of probable construction cost based on final design plans.

18. All construction plan sheets will be prepared utilizing AutoCAD Release 12 on DOS Version 5.0. No specific computer aided drafting and design specifications will be utilized. One copy of electronic files of design plans will be provided to the Owner under the following conditions:

    a. The electronic files are compatible with AutoCAD Release 12, operating on an IBM compatible PC using DOS Version 5.0.

    b. Engineer does not make any warranty as to the compatibility of these files beyond the specified release of the above stated software.

    c. Because data stored on electronic media can deteriorate undetected or be modified, the Owner agrees that the Engineer will not be held liable for completeness or correctness of electronic media after an acceptance period of thirty days after delivery of these files.

    d. The electronic files are instruments of our service. Where there is a conflict between the hard copy drawings and the electronic files, the hard copy files will govern in all cases.

    e. Both parties acknowledge mutual non exclusive ownership of the electronic files and each party may use, alter, modify or delete the files without consequence to the other party.

    f. All electronic files provided to the Owner will not contain engineers seal, handwritten dates and signatures.

19. All word processing will be prepared utilizing MS-Word Version 5.5 operating on 286 computers using DOS Version 5.0. These files will not be provided to the Owner.

B. BIDDING PHASE

1. Prepare and provide to the Owner one copy of a Notice to Contractors for their use in publicly advertising the project and send notices to limited number of contractors who undertake the type of work presented in the construction plans.

2. Sell bidding documents and maintain list of those contractors holding plans. Provide at no cost one copy of the documents to Texas Contractors and Dodge Reports.

3. Issue addendum to all plan holders to interpret and clarify bidding documents.

4. Assist the Owner at the bid opening.

5. Prepare Tabulation of Bids and provide one copy to each submitting contractor and five copies to the Owner.

6. Assist the Owner in evaluating the bids received. Make recommendation of award based on engineering considerations involved.

7. Assemble contract documents providing two copies to the Owner, two copies to the Contractor and one copy for the Engineer.

C. CONSTRUCTION PHASE

1. Assist the Owner during the Preconstruction Conference.

2. Issue notice to contractor to proceed with construction on behalf of the Owner.

3. Review shop drawings, catalog data, schedules, laboratory reports, shop and mill tests of materials and equipment submitted by the contractor. This review is for the benefit of the Owner and covers only general conformance with the information given by the Contract Documents. The contractor is to review and stamp his approval on the submittals prior to submitting to Engineer and review by the Engineer does not relieve the contractor of any responsibility such as dimensions to be confirmed and correlated at the job site, appropriate safety measures to protect workers and the public, or the necessity to construct a complete and workable facility in accordance with the contract documents.

4. Make periodic visits to the site to observe the progress and quality of the executed work and to formulate an opinion in general if the work is proceeding in accordance with the intent of the design concepts and in conformance with the contract documents. (This is not full time on-site representation).

5. Issue instructions from the Owner to the Contractor, issuing necessary interpretation and clarification of contract documents, preparing change orders with Owner's approval.

6. Prepare monthly pay requests from information provided by the Owner's on-site representative. Make recommendation to Owner for issuing payment to the contractor.

7. Accompany the Owner during their final inspection of the project.

8. Prepare record drawings from information received from the Owner's on-site representative and from information received from the contractor.

D. ADDITIONAL SERVICES

1. Design Field Surveys

   a. Obtain permission to survey on private property.

   b. Conduct field surveys.

   c. Download and process field notes.

2. Set permanent horizontal control for project at six locations along project route. This will include setting points in existing permanent structures along the route.

3. Meet with business community and interested parties to present horizontal alignment. Obtain input from concerned parties.

4. Attend approximately eight North Dallas County Water Supply Corporation Board Meetings.

5. Delineate required permanent utility easements, temporary construction easements and right-of-way required for the proposed sanitary sewer line and review requirements with the Owner.

6. Prepare field note descriptions and plats required for land or easement acquisition by the Owner. Furnish the Owner two copies of each document for each property. No other on the ground survey for property work will be undertaken. Preparation of 25 descriptions and plats are included in the Scope of Work.

7. Set centerline alignment west of Midway Road and along Inwood Road with stakes and flagging every 500 feet and at changes in horizontal alignment one time for property owners to see impact of improvement.

8. Undertake geotechnical work to bore a maximum of fourteen locations with a maximum overall depth of 210 feet. The materials will be tested and the results made available to Contractors. This work will be undertaken by a geotechnical subconsultant. The results of this task will be to draw the log of borings on the construction plans for the contractors general information. Ground water levels at the time the borings are made will be recorded and shown in the construction plans.

9. Reproduction of preliminary and final documents for review by Owner, distribution to utility companies and for preparation of contract documents. Potential bidders will purchase plans for bidding purposes.

10. Provide construction staking for vertical control, horizontal control and cut states every one hundred feet along the proposed line.

SECTION 3 - PAYMENT

Owner shall pay Engineer for all services outlined in this agreement and performed by the Engineer on the basis herein described below:

Design Phase

A lump sum fee of $96,288.00. Engineering design shall be invoiced to the Owner monthly in amounts based on the Engineer's estimate of completion of design phase.

Bidding Phase

A lump sum fee of $2,300.00. Engineer shall bill Owner upon receipt of bids from contractors and recommended to Owner for award of a contract.

Construction Phase

A lump sum fee of $14,692.00. Engineer shall invoice Owner based on the actual dollar amount percentage of completion of the construction.

Additional Services

Additional services shall be as established in Section I - PROJECT DESCRIPTION, Item D, and shall be paid based on salary cost times a multiplier of 2.30 with expenses at invoice cost times a multiplier of 1.15 and computer run time at twenty five dollars per hour. A maximum not to exceed amount of $48,495.00 is established for additional services without authorization from the Owner.

Design Surveys	$15,400.00
Establishment of Permanent Horizontal Control	$ 1,450.00
Attend One Business Community Meeting	$ 550.00
Attend Eight Water Supply Corporation Meetings	$ 5,520.00
Easement and Right-of-Way Work	$ 7,350.00
Set Centerline Alignment for Property Owners	$ 1,175.00
Construction Staking	$ 2,500.00
Geotechnical Investigation (Subconsultant)	$10,000.00
Printing of Documents (Subcontractor)	$ 4,550.00
Total	**$48,495.00**

SECTION 5 - TIME FOR PERFORMANCE

a. Engineer shall perform all services as provided for under this agreement in a proper, efficient and professional manner in acccordance with the following estimated schedule:

Description of Service	Estimated Time For Completion (Time in Months)
Design Phase	5
Bidding Phase	1
Construction Phase	6

REIMBURSABLE METHODS

APPLICABILITY. Most commonly used for assignments where the exact scope of engineering work to be performed cannot be predetermined, or where the scope of services is likely to be modified during the course of the work. In addition, it is not an unusual practice to employ reimbursable methods of compensation for projects to be designed for construction; for this type of application, the Consulting Engineer normally furnishes the Client a budget, and the work is accomplished by a series of appropriations. Partial payments are usually based on monthly billings.

SALARY COST TIMES A MULTIPLIER, PLUS DIRECT NON-SALARY EXPENSES. The multiplier that is applied to salary cost* is a factor which compensates the Consulting Engineer for overhead,* plus a reasonable margin for contingencies, interest on investment capital, readiness-to-serve, and profit. The exact multiplier to be used in any case depends upon the size and complexity of the assignment, the proportionate use of key personnel, the organizational structure and experience of the consulting firm, and other factors.

For average conditions, the multiplier ranges from 3.0 to 2.0, with 2.5 times salary cost normally considered adequate. Non-salary expenses* (including subcontract expenses) are reimbursed by the Client at actual invoice cost plus an agreed service charge for handling.

SCHEDULE OF REIMBURSABLE CHARGES. An alternative reimbursable method preferred by some clients is an agreed schedule of reimbursable charges, which lists the various classification of engineering, technical, and non-technical employees, and the hourly billing rate of each classification. Non-labor expenses are billed at invoice cost, plus a service charge for handling.

PER DIEM. Personal services are often charged on a per diem basis, a method particularly well suited to court work or similar assignments involving intermittent personal services. The Consulting Engineer is compensated for all the time he devotes to the work, including travel time; and he is reimbursed for travel, subsistence, and out-of-pocket expenses incurred while away from his home office.

For services in court, or where the consulting Engineer appears as an expert, a per diem charge is considered to have been earned for each day of such appearance, even though the Consultant may not be called to testify or, if called, may complete his testimony in a fraction of the day.

Per diem charges for Consulting Engineers should be commensurate with the nature of the assignment, and with the experience and professional standing of the Consultant.

**See Definition of Terms in Appendix. Salary cost, as defined, normally ranges between 125 percent and 135 percent of direct salaries.*

PERCENTAGE OF CONSTRUCTION COST*

APPLICABILITY. Normally used for projects to be designed for construction where there is a reasonable relationship between construction cost and the engineering cost of design. The *Basic Charge* in percent covers those services described in Section II as the *Basic Services.*

The Special Services for a project to be designed for construction are usually furnished directly by the Client, or by the Consulting Engineer, on the basis of salary cost times a multiplier. For the Special Services, the multiplier varies from 3.0 to 2.0. Direct non-labor costs for Special Services are reimbursed at invoice cost plus a nominal surcharge for handling.

USE OF CURVES. The curves of median compensation which follow are a plot of the compensation for Basic Services in percent versus the construction cost of the work authorized at one time by the Client. They represent *median compensation; the appropriate compensation for any given assignment may vary above or below these curves,* depending upon the relative complexity and various other factors.** It is emphasized that the curves should only be used to compare historical composite experience with compensation determined by detailed cost analysis for any specific assignment. The curves should not be used to fix or determine such compensation.

Curves A and B, page 15, are the current version of those prepared by the American Society of Civil Engineers for general engineering works, and reflect the composite experience and judgment of Consulting Engineers throughout the United States, as indicated by responses to a detailed questionnaire.

Curve C, page 17, applies to project types which experience has demonstrated require relatively higher engineering cost per construction dollar.

Alterations and changes to existing structures and facilities necessitate substantially more engineering services than new work. Basic compensation for alteration work should be increased by at least one-third above the median compensation illustrated by the curves.

*See Definition of Terms in the Appendix.

FAX MESSAGE
CITY OF FARMERS BRANCH

DATE: 8/19/93

This is a 8 page transmission, including this cover page.

Our FAX telephone number is (214)241-6305.

In case of a problem with this FAX transmission or difficulty in transmitting to us please call CITY OF FARMERS BRANCH (214) 247-3131 EXT._____

TO: JOHN BAUMGARTNER

COMPANY: ADDISON

FROM: GARY OSIEL

SPECIAL INSTRUCTIONS:
FOR YOUR REVIEW AND COMMENTS

FAX-2.CHP

SHIMEK, JACOBS & FINKLEA
CONSULTING ENGINEERS

8333 Douglas Avenue, #820 Dallas, Texas 75225 (214) 361-7900

ROSS L. JACOBS, P.E.
I. C. FINKLEA, P.E.
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JOHN W. BIRKHOFF, P.E.
MATT ARMSTRONG, P.E.
JOE R. CARTER, P.E.
GARY C. HENDRICKS, P.E.

C. L. SHIMEK, P.E.

August 18, 1993

VOID

Mr. Gary M. Oshel, P.E.
Project Manager
North Dallas County Water
Supply Corporation
Post Office Box 819010
Farmers Branch, Texas 75381-9010

Re: Sanitary Interceptor Sewer Phase II

Dear Mr. Oshel:

We are enclosing a copy of our proposal to furnish professional engineering services on the Sanitary Interceptor Sewer Phase II project. Our proposal conforms to the various sections of your Standard Form of Agreement. Our proposal includes our proposed Scope of Work, our proposed Basis of Payment and Estimated Time for Completion for the services.

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We certainly appreciate the opportunity to be of service to the North Dallas County Water Supply Corporation on this project. We are available at your convenience to discuss any questions you may have with our proposal to accomplish the project.

Sincerely,

John W. Birkhoff

John W. Birkhoff, P.E.

Enclosure

I. PROJECT DESCRIPTION

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1. Review available sanitary sewer studies of the area to obtain design flows.

2. Make site visit to determine preliminary alignment of sanitary sewer line.

3. Plot preliminary alignment on 100 scale topographic maps. Alignment will generally follow that outlined in the Owner's request for qualifications for this project.

4. Identify areas along alignment that require special design considerations such as boring and traffic control.

5. Meet with Owner to discuss preliminary horizontal alignment.

6. Provide TU Electric, Lone Star Gas, Southwestern Bell Telephone and TCI CableVision with plan of preliminary alignment. Request information on their facilities.

7. Finalize horizontal alignment. Horizontal alignment will be established with an effort to save trees which may be along proposed route.

8. Size sanitary sewer line based on maximum anticipated flows provided by Owner. It is our understanding the Owner's generated flows were calculated based on maximum FAR zoning. Design will be based on Manning's equation with the pipe flowing full.

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13. Prepare design report in letter form outlining major design decisions and design criteria and provide five copies to the Owner.

14. Prepare construction plans on 24-inch x 36-inch reproducible sheets. Drawings shall generally be at a scale of 1-inch equals 20 feet.

15. Prepare technical specifications and contract documents.

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17. Formulate an opinion of probable construction cost based on final design plans.

18. All construction plan sheets will be prepared utilizing AutoCAD Release 12 on DOS Version 5.0. No specific computer aided drafting and design specifications will be utilized. One copy of electronic files of design plans will be provided to the Owner under the following conditions:

    a. The electronic files are compatible with AutoCAD Release 12, operating on an IBM compatible PC using DOS Version 5.0.

    b. Engineer does not make any warranty as to the compatibility of these files beyond the specified release of the above stated software.

    c. Because data stored on electronic media can deteriorate undetected or be modified, the Owner agrees that the Engineer will not be held liable for completeness or correctness of electronic media after an acceptance period of thirty days after delivery of these files.

    d. The electronic files are instruments of our service. Where there is a conflict between the hard copy drawings and the electronic files, the hard copy files will govern in all cases.

    e. Both parties acknowledge mutual non exclusive ownership of the electronic files and each party may use, alter, modify or delete the files without consequence to the other party.

    f. All electronic files provided to the Owner will not contain engineers seal, handwritten dates and signatures.

19. All word processing will be prepared utilizing MS-Word Version 5.5 operating on 286 computers using DOS Version 5.0. These files will not be provided to the Owner.

B. BIDDING PHASE

1. Prepare and provide to the Owner one copy of a Notice to Contractors for their use in publicly advertising the project and send notices to limited number of contractors who undertake the type of work presented in the construction plans.

2. Sell bidding documents and maintain list of those contractors holding plans. Provide at no cost one copy of the documents to Texas Contractors and Dodge Reports.

3. Issue addendum to all plan holders to interpret and clarify bidding documents.

4. Assist the Owner at the bid opening.

5. Prepare Tabulation of Bids and provide one copy to each submitting contractor and five copies to the Owner.

6. Assist the Owner in evaluating the bids received. Make recommendation of award based on engineering considerations involved.

7. Assemble contract documents providing two copies to the Owner, two copies to the Contractor and one copy for the Engineer.

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1. Assist the Owner during the Preconstruction Conference.

2. Issue notice to contractor to proceed with construction on behalf of the Owner.

3. Review shop drawings, catalog data, schedules, laboratory reports, shop and mill tests of materials and equipment submitted by the contractor. This review is for the benefit of the Owner and covers only general conformance with the information given by the Contract Documents. The contractor is to review and stamp his approval on the submittals prior to submitting to Engineer and review by the Engineer does not relieve the contractor of any responsibility such as dimensions to be confirmed and correlated at the job site, appropriate safety measures to protect workers and the public, or the necessity to construct a complete and workable facility in accordance with the contract documents.

4. Make periodic visits to the site to observe the progress and quality of the executed work and to formulate an opinion in general if the work is proceeding in accordance with the intent of the design concepts and in conformance with the contract documents. (This is not full time on-site representation).

5. Issue instructions from the Owner to the Contractor, issuing necessary interpretation and clarification of contract documents, preparing change orders with Owner's approval.

6. Prepare monthly pay requests from information provided by the Owner's on-site representative. Make recommendation to Owner for issuing payment to the contractor.

7. Accompany the Owner during their final inspection of the project.

8. Prepare record drawings from information received from the Owner's on-site representative and from information received from the contractor.

D. ADDITIONAL SERVICES

1. Design Field Surveys

   a. Obtain permission to survey on private property.

   b. Conduct field surveys.

   c. Download and process field notes.

2. Set permanent horizontal control for project at six locations along project route. This will include setting points in existing permanent structures along the route.

3. Meet with business community and interested parties to present horizontal alignment. Obtain input from concerned parties.

4. Attend approximately eight North Dallas County Water Supply Corporation Board Meetings.

5. Delineate required permanent utility easements, temporary construction easements and right-of-way required for the proposed sanitary sewer line and review requirements with the Owner.

6. Prepare field note descriptions and plats required for land or easement acquisition by the Owner. Furnish the Owner two copies of each document for each property. No other on the ground survey for property work will be undertaken. Preparation of 25 descriptions and plats are included in the Scope of Work.

7. Set centerline alignment west of Midway Road and along Inwood Road with stakes and flagging every 500 feet and at changes in horizontal alignment one time for property owners to see impact of improvement.

8. Undertake geotechnical work to bore a maximum of fourteen locations with a maximum overall depth of 210 feet. The materials will be tested and the results made available to Contractors. This work will be undertaken by a geotechnical subconsultant. The results of this task will be to draw the log of borings on the construction plans for the contractors general information. Ground water levels at the time the borings are made will be recorded and shown in the construction plans.

9. Reproduction of preliminary and final documents for review by Owner, distribution to utility companies and for preparation of contract documents. Potential bidders will purchase plans for bidding purposes.

10. Provide construction staking for vertical control, horizontal control and cut states every one hundred feet along the proposed line.

SECTION 3 - PAYMENT

Owner shall pay Engineer for all services outlined in this agreement and performed by the Engineer based on a salary cost times a multiplier of 2.3 with expenses times 1.15 and computer services at twenty five dollars per hour with a maximum not to exceed of $205,795.00 without written authorization as outlined below:

Design Phase	$130,000.00
Bidding Phase	$ 2,300.00
Construction Phase	$ 25,000.00
Additional Services:	
Design Surveys	$ 15,400.00
Establishment of Permanent Horizontal Control	$ 1,450.00
Attend One Business Community Meeting	$ 550.00
Attend Eight Water Supply Corporation Meetings	$ 5,520.00
Easement and Right-of-Way Work	$ 7,350.00
Set Centerline Alignment for Property Owners	$ 1,175.00
Construction Staking	$ 2,500.00
Geotechnical Investigation (Subconsultant)	$ 10,000.00
Printing of Documents (Subcontractor)	$ 4,550.00
Total Not to Exceed	**$205,795.00**

157,300 / 1,770,000 = 8.89

113,200

48,495

SECTION 5 - TIME FOR PERFORMANCE

a. Engineer shall perform all services as provided for under this agreement in a proper, efficient and professional manner in acccordance with the following estimated schedule:

Description of Service	Estimated Time For Completion (Time in Months)
Design Phase	5
Bidding Phase	1
Construction Phase	6

SECTION 3 - PAYMENT

Owner shall pay Engineer for all services outlined in this agreement and performed by the Engineer on the basis herein described below:

Design Phase

A lump sum fee of $96,288.00. Engineering design shall be invoiced to the Owner monthly in amounts based on the Engineer's estimate of completion of design phase.

Bidding Phase

A lump sum fee of $2,300.00. Engineer shall bill Owner upon receipt of bids from contractors and recommended to Owner for award of a contract.

Construction Phase

A lump sum fee of $14,692.00. Engineer shall invoice Owner based on the actual dollar amount percentage of completion of the construction.

Additional Services

Additional services shall be as established in Section 1 - PROJECT DESCRIPTION, Item D, and shall be paid based on salary cost times a multiplier of 2.30 with expenses at invoice cost times a multiplier of 1.15 and computer run time at twenty five dollars per hour. A maximum not to exceed amount of $48,495.00 is established for additional services without authorization from the Owner.

Design Surveys	$15,400.00
Establishment of Permanent Horizontal Control	$ 1,450.00
Attend One Business Community Meeting	$ 550.00
Attend Eight Water Supply Corporation Meetings	$ 5,520.00
Easement and Right-of-Way Work	$ 7,350.00
Set Centerline Alignment for Property Owners	$ 1,175.00
Construction Staking	$ 2,500.00
Geotechnical Investigation (Subconsultant)	$10,000.00
Printing of Documents (Subcontractor)	$ 4,550.00
Total	**$48,495.00**

FAX MESSAGE

CITY OF FARMERS BRANCH ENGINEERING DEPARTMENT

DATE: 8/23/93

This is a 5 page transmission, including this cover page.

Our FAX telephone number is 214/241-6305.

In case of a problem with this FAX transmission or difficulty in transmitting to us, please call **CITY OF FARMERS BRANCH ENGINEERING DEPARTMENT AT 214/919-2588.**

TO: John Baumgartner

COMPANY: Addison

FROM: Jerry Murawski

SPECIAL INSTRUCTIONS: Excerpt from CEC guide for selection and negotiating professional engineering services.

Fee Negotiation

Example #2 - Fee Calculation

The scope of the project is the design of an expansion and rehabilitation of an existing wastewater treatment facility. The owner uses EJCDC contract documents. The estimated construction cost is $6,064,000. Fee factors are as follows.

Fee Adjustment Factors

• Level of information required on plans/drawings. Since this is a rehab and expansion project, it will be necessary to show detailed existing information on the plans.	0.10
• Project requirements. Since part of the project is a rehab, it is more complex than a grass roots project. The project is complex in that numerous disciplines are required for the design effort.	0.50
• Existing data. Owner has as-built drawings for the existing project.	-0.10
• Risk/liability. Owner limits liability not to exceed fee and uses EJCDC indemnification language.	-0.05
• Time required for owner review/approvals. Owner has committed to turn reviews around in two weeks.	0.00
• Number of submittals/owner reviews. Owner requests two additional submittals - a 50% and 90% submittal.	0.10
• Schedule for completing work. Owner and engineer agreed to a reasonable schedule during negotiations.	0.00
• Payment schedule. Owner historically takes 45 to 60 days to pay invoices.	0.01
• Owner requested subconsultants. Owner has a 20% M/WBE requirement.	0.02
• Owner participation in project/partnering. Owner requires monthly review meetings which is reasonable.	0.00
• Construction inspection limiting participation of engineer. Engineer will serve as resident representative for the owner. Fees for resident representative will be considered additional services and paid for outside of basic services fees.	0.00
• Coordination with other entities. Project requires TWC review.	0.01
• Environmental regulations. The project is located in an environmentally sensitive area and requires coordination with an environmental engineer.	0.05
• Other external factors. There are no anticipated "not-in-my-back-yard" or governmental constraints that will increase the amount of work required by the engineer.	0.00
Total Fee Factor	0.64

Formula

C = 0.64
P = 6.064
A = 1.00

$$F = \frac{12(1.64)}{(6.064/1.00)^{0.1}} = 16.43\%$$

Engineering Fee = $6,064,000(0.1643) = $996,315

Example #1 - Fee Calculation

The scope of the project is the design of a new roadway through an undeveloped area. The owner is a developer and uses the EJCDC contract documents. The estimated construction cost is $6,064,000. Fee factors are as follows.

Fee Adjustment Factors

• Level of information required on plans/drawings. Since this is a new roadway, it will not be necessary to show detailed existing information on the plans.	-0.10
• Project requirements. Project is a grass roots project and should be fairly straightforward.	-0.20
• Existing data. Owner has completed schematic design plans for part of the project representing about 10% of the preliminary design effort.	-0.02
• Risk/liability. Owner limits liability not to exceed fee and uses EJCDC indemnification language.	-0.05
• Time required for owner review/approvals. Owner is to complete reviews within 10 working days of submittal.	0.00
• Number of submittals/owner reviews. Owner requests submittal at the end of preliminary engineering and final design only.	0.00
• Schedule for completing work. Owner and engineer will work out mutually agreeable schedule for final design once preliminary design is approved.	0.00
• Payment schedule. Owner contractually agrees to pay within 10 days of receipt of invoices.	0.00
• Owner requested subconsultants. Owner has no M/WBE requirement.	0.00
• Owner participation in project/partnering. Owner requires monthly review meetings.	0.00
• Construction inspection limiting participation of engineer. Engineer will serve as resident representative for the owner. Fees for representative will be considered additional services and paid for outside of basic services fees.	0.00
• Coordination with other entities. The project will require local agency reviews involving the engineer.	0.05
• Environmental regulations. Owner has addressed all environmental issues.	0.00
Total Fee Factor	-0.32

Formula

$C = -0.32$

$P = 6.064$

$A = 1.00$

$$F = \frac{12(0.68)}{(6.064/1.0)^{0.1}} = 6.81\%$$

Engineering Fee = $6,064,000(0.0681) = $412,958

Where,

F = Engineering fee as a percent of construction cost
C = Sum of fee factors (See Table A)
A = Cost index factor
P = Construction cost in millions of dollars

Where,

A = $CCI_{current}/CCI_{1993}$
CCI = *Engineering News Record* construction cost index
CCI_{1993} = 3484.85 (Dallas, Texas - March 1993)

Any formula developed for standardized work should be adjusted to reflect the specific scope of services required for a particular project. Table A "Fee Adjustment Factors" includes a few of the factors which impact the cost of providing services and the value of the services to the owner. The factors and factor values should be used only as a guideline for developing a more detailed list of variables which apply to a specific project.

Table A - Fee Adjustment Factors

Technical Factors	Factor Values
1. Level of information required on plans/drawings	-0.20 to 0.10
2. Project requirements a. scope of services b. rehab vs. grass roots project c. interface with other contracts/consultants d. numerous disciplines required e. alteration/modification of existing facility f. complexity of project	-0.20 to 0.33
3. Existing data, e.g. a. preliminary engineering report b. as-constructed drawings/specifications	-0.35 to 0.20
Owner Controlled Factors	**Factor Values**
1. Risk/liability (base standard of risk limited to fee)	-0.10 to 0.10
2. Time required for owner review/approvals (2 weeks standard)	0.0 to 0.20
3. Number of submittals/owner reviews	Add 0.05 for each submittal in addition to preliminary and final
4. Schedule for completing work - fast-track vs. reasonable schedule	0.0 to 0.20
5. Payment schedule - 30 days after receipt of invoice	0.01 for each late 30-day period
6. Owner requested subconsultants	0.05 to 0.15 of the value of the subcontract
7. Owner participation in project/partnering	0.0 to 0.20
8. Construction inspection limiting participation of engineer	0.05 to 0.20
External Factors	**Factor Values**
1. Coordination with other entities	0.0 to 0.12
2. Environmental regulations	0.0 to 0.12
3. "Not-in-my-back-yard"/citizen's involvement	0.0 to 0.20
4. Governmental constraints	0.0 to 0.20

Cost Plus Fixed Fee

Under a cost plus fixed fee agreement, the consulting engineer is reimbursed for the actual costs of all services and supplies related to the project, including:

- Salary costs
- Overhead
- Direct nonsalary expenses
- Fixed fee (profit)

The cost plus fixed fee basis requires, as a prerequisite to equitable negotiations, that the owner and the consulting engineer define and agree upon the scope of services the consulting engineer is to perform. Such definition of the scope of work is essential to enable the consulting engineer to estimate costs and equitable fee amount. A true cost plus fixed fee does not have a "not to exceed" amount.

Lump Sum

The lump sum method of compensation is frequently used for investigations and studies and for basic services on design projects where the scope and complexity of the assignment are clearly and fully defined.

The lump sum amount is the sum total of estimated engineering costs for salaries, overhead and nonsalary expenses, an allowance for contingencies, interest on invested capital, readiness to serve, value of services to the owner, and a reasonable amount for profit.

A lump sum agreement should contain a clearly stated time period during which the services will be performed and a provision for adjustment of compensation if the project is delayed for reasons beyond the consulting engineer's control. For design services, there should be a provision for changes required after approval of the preliminary design, scope changes throughout the duration of the assignment, and a clear understanding as to where the final approval authority lies.

Method Related to Construction Costs

Owners and engineers who have worked together repeatedly on numerous projects with standardized design and documentation requirements and standardized construction materials may be able to correlate engineering costs to construction costs. It is recommended that the method related to construction cost be used in determining fees only after the owner and consulting engineer have a sufficient history working together to determine a baseline, and only for projects with construction costs over $250,000.

Quite often professionals within public agencies lacking sufficient experience may seek guidance in negotiating reasonable compensation for engineering services. Where available, local, regional or national surveys or historical data may serve to provide helpful guidance to public agency professionals.

Weighing the results of one or more formulas may be another method that a public agency may chose to consider in obtaining guidance during the negotiation process. While by no means flawless or exhaustive, the following is intended to illustrate one of several techniques that may be useful to public agencies and should be modified depending upon all facts and circumstances involved:

$$*F = \frac{12(1+C)}{(P/A)^{1}}$$

*Formula based on providing basic services in "Services for Construction Projects" in this manual.

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ASCE—MANUALS AND REPORTS ON ENGINEERING PRACTICE—NO. 45

Consulting Engineering

A GUIDE FOR THE ENGAGEMENT OF ENGINEERING SERVICES

AMERICAN SOCIETY of CIVIL ENGINEERS

improvement programs; preparation of land development plans, urban plans and regional plans; and the investigation of environmental conditions and preparation of assessment statements, with subsequent planning to improve or maintain those conditions. Such planning often requires the coordination of the interdisciplinary work of many engineering and nonengineering disciplines.

4. Appraisals, Valuations, and Rate Studies. These services may include investigations and analyses of capital and operating costs, overhead, financial costs, and revenues as needed to evaluate property or to recommend establishment of prospective rates.
5. Assistance in Financial Matters. The Engineer may be called on by the Client to render advice and financial counsel on sources of capital and possible government assistance. The Engineer may also be asked to estimate operating costs, fixed charges (interest and debt retirement), and probable income from the project. These factors may determine the date of final bond retirement and the financial attractiveness of the project as indicated by the ratio of annual income to total annual costs. The Engineer may also act as responsible agent to certify that the terms and conditions of bond issues are carried out.
6. Construction Management. These services include applications of managerial and decision-making techniques to the different phases of the constructions process.
7. Inspection and Testing of Materials and Equipment. These services include tests of materials and equipment under established codes and standards, specialized inspection of equipment and materials used in industry and construction, and other inspection required by a Client.
8. Operational Services. At the completion of construction, the Engineer may be responsible for start-up of operations on the project. The Engineer may: establish an efficient operating staff; set up job classifications and salaries; organize the purchasing of supplies; and develop charts for recording input, output, and other necessary data. Observations and reports on project operations may also be performed by the Engineer's own staff.

Services for Design-Type Projects

These services include planning, design, and development work. They differ from "consultation, investigations, and reports" in that

engineering design, working drawings, specifications, and other similar documents are produced in anticipation of construction. These services are usually based on preliminary studies and an analysis of project requirements and feasibility.

In this manual, engineering services for design-type projects are differentiated into two separate categories, i.e., Basic Services and Special Services. The reason for making this distinction is that historical cost data are available for Basic Services that are more or less common to most design-type projects, and this is a useful reference during negotiations. Special Services vary from project to project according to the wishes and capabilities of the Client, and are subject to the negotiation of appropriate additional compensation to the Engineer. As an example, the function of a Resident Project Representative is designated as a Special Service rather than a Basic Service because the nature and extent of such representation will depend upon the size and complexity of each project, applicable codes, construction time, and the Client's organization and facilities.

Basic Services

Basic Services usually required on civil engineering projects, where both design and some Client representation during construction are contracted for, are accomplished in three distinct and sequential phases, as follows:

1. Preliminary Phase	Preliminary studies, layouts, and cost estimates.
2. Design Phase	Preparation of design drawings, specifications, and contract documents.
3. Construction Phase	Basic representation of Client during construction.

1. *The Preliminary Phase.*—This phase involves establishment of the general size and scope of the project, and its location on the site. The preliminary Basic Services may include:

a. Consultation with the Client, clarification and definition of the project requirements, review of available data, and discussions of general scheduling. Conferences may also be held as required with, e.g., approving and regulatory agencies and with affected utilities.
b. Advice to the Client about necessary field information to be furnished by the Client or obtained from others. These special services may include, e.g., reconnaisance surveys, geotechnical

information, hydrological data; laboratory tests; zoning, deed and other land use restriction information; and environmental assessment statements.

c. Provision of a general economic analysis of the Client's requirements, applicable to various alternatives.

d. Preparation of a report containing schematic layouts, sketches, and conceptual design criteria with appropriate exhibits. The report should consider any problems involved and alternative solutions available, and should state the Engineer's findings and recommendations, with opinions of probable costs for the project. Due to conditions beyond the Engineer's control, these preliminary estimates cannot be guaranteed. If the Client is another engineering organization or architectural firm, the preliminary phase may be accomplished by the Client, and the Consulting Engineer may initiate service with the design phase.

2. *The Design Phase.*—This phase of project development is usually undertaken only after the Client has approved the preliminary design report and estimate. The basic services for this design phase may include:

a. Preparing final drawings indicating the nature and extent of the project and specifications. This is done on the basis of accepted preliminary design documents and an estimate of probable project costs.

b. Planning for and assisting the Client in obtaining necessary field services and information for design. This information may include field surveys, photogrammetry, traffic studies, and soils investigations. Such information is normally furnished by the Client or through the Engineer for the Client's account.

c. Furnishing the necessary engineering data to apply for regulatory permits as required by local, state or Federal authorities. This is distinguished from and does not include detailed applications and supporting documents for government grants-in-aid or planning grants that can be furnished as Special Services.

d. Preparing and furnishing to the Client a specified number of copies of drawings, specifications, and other contract documents, for final review by the Client and by approving authorities.

e. Preparing basic documents related to construction contracts for review and approval by the Client (and Client's legal advisors, and other advisors). These may include: Contract agreement forms; general conditions and supplementary conditions where

appropriate; invitations to bid and instructions to bidders. Assistance to the Client in the preparation of other contract-related documents is often provided.

3. *The Construction Phase.*—Services under this phase are undertaken only after the advertisement for bids for construction contracts, or after the award of a contract or contracts by the Client. The basic services in this phase may include:

a. *Office Engineering*

(1) Assistance to the Client in securing bids, tabulation and analysis of bid results, and furnishing recommendations on the award of construction contracts.

(2) Consultation with and advice to the Client as to the acceptability of subcontractors and other persons and organizations proposed by the Prime Contractor or Contractors, when such advice is required by the bidding documents.

(3) Consultation with and advice to the Client as to the acceptability of substitute materials and equipment proposed by the Contractor or Contractors when substitution prior to the award of contracts is allowed by the bidding documents.

(4) Consultation with and advice to the Client during construction.

(5) Preparation of elementary and supplementary sketches required to resolve problems due to actual field conditions encountered.

(6) Checking detailed construction drawings and shop and erection drawings submitted by the Contractor or Contractors for compliance with design concepts.

(7) Reviewing laboratory, shop, and mill test reports on materials and equipment.

b. *Field Engineering*

(1) Making periodic visits to the project site at intervals appropriate to the various stages of construction to observe, as an experienced and qualified design professional, the progress and the quality of the executed work, and then informing the Client.

(2) Issuing instructions from the Client to the Contractor or Contractors, issuing necessary interpretations and clarifications of contract documents, preparing required change orders, requiring special inspections and testing of the work, and making decisions as to acceptability of the work.

(3) Determining amounts of progress payments due, based on completion of the work, and recommending issuance of such payments by the Client.

(4) Observing initial operation of the project, or of performance tests required by the specifications.
(5) Making a final inspection and reporting on completion of the project, including recommendations concerning final payments to Contractors and release of retained percentages, if any.

Special Services

Special Services required during the development of any design-type project include many studies, reports, and actions beyond the scope of the basic services of the Consulting Engineer. Many of these services relate to decisions of management as to the feasibility, scope, and location of the project. The research, assembly of engineering data, and acquisition of property may involve many professional specialists in engineering and other fields. Because Special Services vary greatly in scope, complexity, and timing, they are normally negotiated as separate and additional elements of service whenever required. These services are often negotiated by the Consulting Engineer acting on behalf of the Client.

Special Services frequently required are:

a. Soils investigations—including test borings, sampling and analyses, and recommendations.
b. Studies, tests, and process determinations to establish design criteria for water and wastewater treatment facilities.
c. Detailed mill, shop or laboratory inspections, or both, of materials and equipment.
d. Land surveys, establishment of boundaries and monuments, and related office computations and drawings.
e. Engineering surveys for design and construction and photogrammetry.
f. Technical observation of construction by a full-time resident project engineer or representative, and by a supporting staff as required. Such services are distinguished from periodic site visits as defined under Basic Services.
g. Additional copies of reports, drawings, and documents beyond the number specified in the Basic Services agreement.
h. Extra travel and subsistence for the Engineer and staff beyond that normally required, when authorized by the Client.
i. Assistance to the Client as an expert witness in litigation arising from project development or construction, and in hearings before approving and regulatory agencies.

j. Investigation involving detailed consideration of operation, maintenance, and overhead expenses; preparation of rate schedules; earning and expense statements, feasibility studies, appraisals, valuations, and material audits or inventories required for certification of force account construction performed by the Client.
k. Preparation of detailed applications and supporting documents for government grants or advances for public works projects.
l. Plotting, computing, and filing subdivision plots; staking of lots; and related land planning and partitioning activities.
m. Performance of infiltration and inflow studies in connection with sanitary and storm sewer systems.
n. Performance of environmental assessment statements and assistance to the Client related to public hearings.
o. Preparation of operating instructions and manuals for facilities, training of personnel, and assistance in operation of facilities.
p. Design to meet unusual criteria such as earthquakes, hurricanes, tornadoes, or blast, or to satisfy unique or abnormal tolerances; dynamic analysis or testing related to such specialized design.

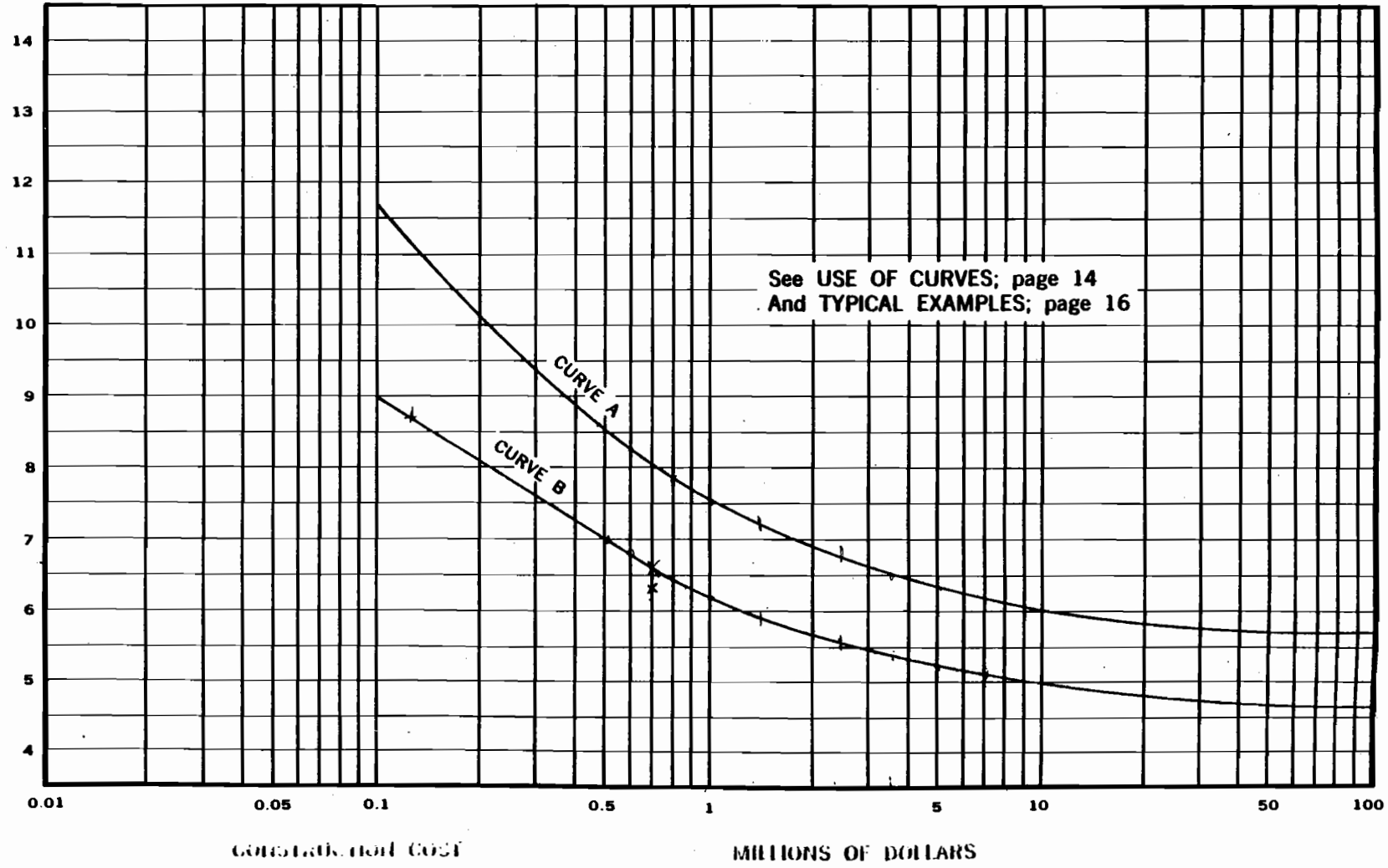
NOTES: **(1) When Construction Cost is under $50,000, use reimbursable basis of compensation.**

(2) Construction cost below is the work authorized at one time. However, where the work is to be accomplished in a number of separate construction contracts, then each such project element should be evaluated on an individual basis, with additional compensation to the Engineer.

(3) The Basic Charge presented below represents median compensation. The appropriate compensation for any given assignment may vary above or below the curve, depending upon complexity.

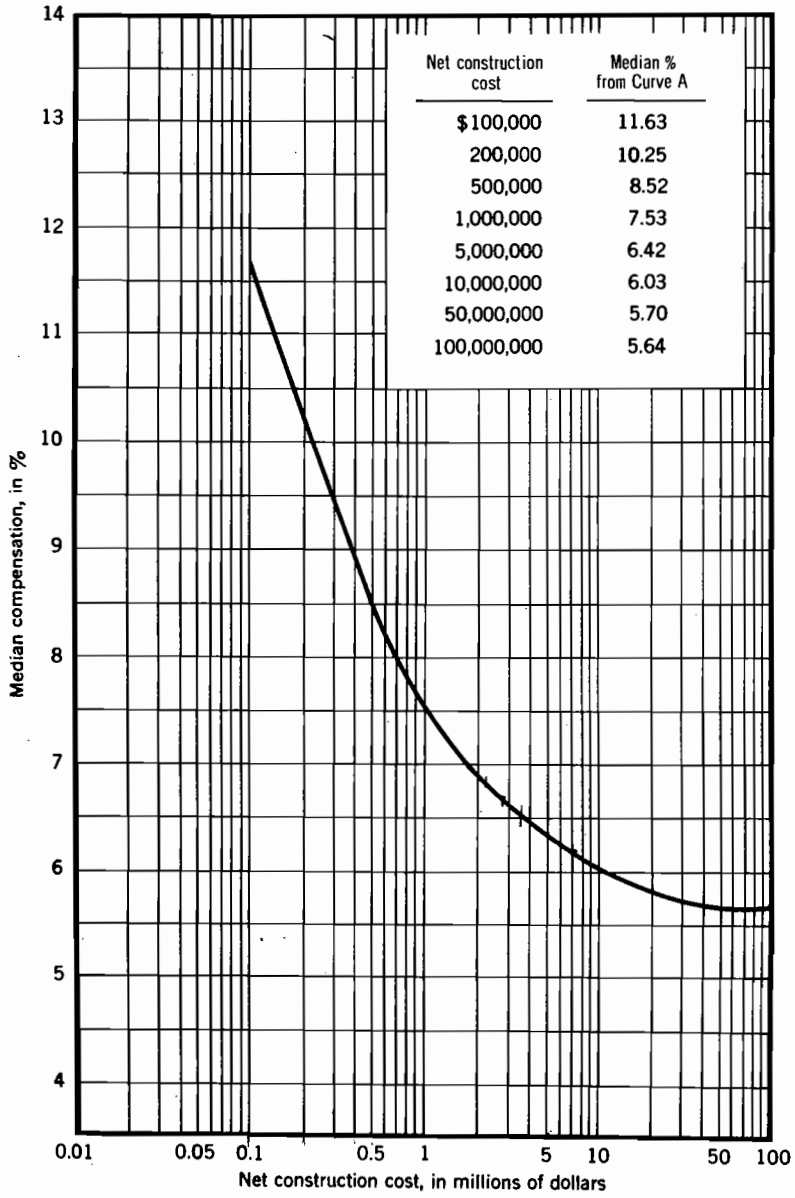
(4) Compensation for alteration work should be increased by at least one-third above the median compensation illustrated.

(5) Curve A and Curve B are consistent with Curve A and Curve B in Manual 45, published by the American Society of Civil Engineers. New curves will be issued as subsequent revisions are published by ASCE.



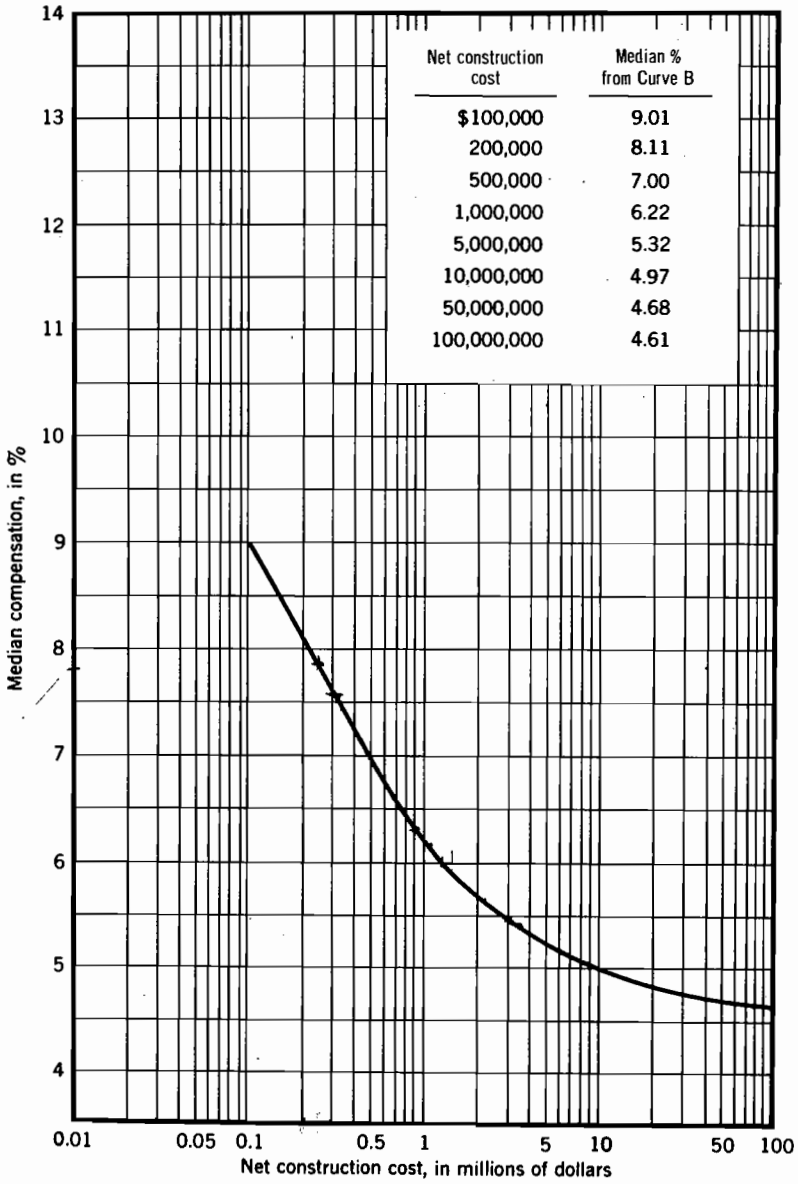
Curves of Median Compensation

CURVES A AND B



Net construction cost	Median % from Curve A
$100,000	11.63
200,000	10.25
500,000	8.52
1,000,000	7.53
5,000,000	6.42
10,000,000	6.03
50,000,000	5.70
100,000,000	5.64

IG.1.—CURVE A, MEDIAN COMPENSATION FOR BASIC SERVICES EXPRESSED AS A PERCENTAGE OF NET CONSTRUCTION COST FOR PROJECTS OF ABOVE-AVERAGE COMPLEXITY (1980)



Net construction cost	Median % from Curve B
$100,000	9.01
200,000	8.11
500,000	7.00
1,000,000	6.22
5,000,000	5.32
10,000,000	4.97
50,000,000	4.68
100,000,000	4.61

FIG. 2.—CURVE B, MEDIAN COMPENSATION FOR BASIC SERVICES EXPRESSED AS A PERCENTAGE OF NET CONSTRUCTION COST FOR PROJECTS OF AVERAGE COMPLEXITY (1980)