



COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
FRANKFORT

HENRY WARD
COMMISSIONER OF HIGHWAYS

January 13, 1966

ADDRESS REPLY TO
DEPARTMENT OF HIGHWAYS
DIVISION OF RESEARCH
132 GRAHAM AVENUE
LEXINGTON, KENTUCKY 40506

MEMORANDUM

H.3.6

TO: W.B. Drake
Assistant State Highway Engineer

SUBJECT: Research Report: "Obtaining Highway Engineering Services from Professional Engineers in Private Practice," Dean R.E. Shaver and Dr. J.W. Hutchinson, University of Kentucky Research Foundation; CH 12796.

In connection with the formulation and issuance of Official Order No. 73646, "Consulting Engineering Contracting Procedures," dated March 2, 1965, Commissioner Ward expressly sought independent, qualified counsel to further review and evaluate all matters pertaining to the codification of procedures for engaging consulting engineers to render ad hoc services to the Department. A contract was negotiated with the Kentucky Research Foundation to engage the Dean of the College of Engineering at the University of Kentucky and his associates, as he might delegate, to study the matter and to submit a report of findings and recommendations. The report enclosed herewith is the final submission and concludes the study agreement. Preliminary and interim drafts were reviewed by the Department, and all revisions mutually agreed upon have been made in the final report.

Respectfully submitted,

A handwritten signature in cursive script that reads "Jas. H. Havens".

Jas. H. Havens, Director
Division of Research

JHH:lhs

Enc:



COLLEGE OF ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING

Mr. James H. Havens
Director of Research
Kentucky Department of Highways
Materials Research Laboratory
132 Graham Avenue
Lexington, Kentucky

Dear Mr. Havens:

We are submitting herewith the final draft of the report on research relating to procedures for obtaining consulting engineering services and the establishment of consultant fees and qualifications (KYP-65-6: UKRF 201-05-00704-S3010).

The report is divided into two major parts:

- I. An assessment of current practices and trends based on information received from other state highway departments, the professional societies, the Bureau of Public Roads, and other public agencies.
- II. A review of Kentucky Department of Highways' policies and procedures in the light of current and recommended practices and current trends.

Our recommendations are contained in Part II and are also reflected in an accompanying "Recommended Statement of Consulting Engineering Contracting Policies and Procedures" (pages 22-47), which represents a suggested revision of Kentucky Department of Highways Official Order No. 73646, dated March 2, 1965.

In general, the practices followed in Kentucky were found to be a combination of the most desirable points of procedure represented in the replies from other state highway departments and recommended by the Bureau of Public Roads and the professional societies. The suggested revisions in statement of policy and procedures are therefore of a minor nature and are not aimed at any major changes of current practice in Kentucky.

We are pleased to have served in this capacity and would readily entertain suggestions for further work on this or other research of current interest to the Department of Highways.

Very truly yours,

A handwritten signature in cursive script that reads "John W. Hutchinson".

John W. Hutchinson
Associate Professor of Civil Engineering
Principal Investigator

A handwritten signature in cursive script that reads "R. E. Shaver".

R. E. Shaver
Dean, College of Engineering
Project Director

JWH/pam
cc: Dr. R. C. Bard

OBTAINING HIGHWAY ENGINEERING SERVICES
FROM
PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE

R. E. Shaver, Dean
College of Engineering
Project Director

Dr. John W. Hutchinson
Associate Professor of
Civil Engineering
Principal Investigator

A Report on Research Conducted

for the

Department of Highways
Commonwealth of Kentucky

by

The University of Kentucky Research Foundation

Lexington, Kentucky

December 1965

SYNOPSIS

Current state highway department procedures for obtaining private professional engineering services are reviewed and summarized as part of a study of the consulting engineering contracting policy and procedures of the Kentucky Department of Highways. The current bases used by state highway departments for establishment of fees for the professional services of Engineering Consultants, Attorneys, Right-of-Way Appraisers, Right-of-Way Buyers, and Architects are summarized, by state, in Table 1. In general, the consulting engineering contracting practices followed in Kentucky were found to be a combination of the most desirable points of procedure represented in the replies received from other state highway departments and recommended by the Bureau of Public Roads and the professional societies. The recommendations include a Statement of Consulting Engineering Contracting Policy and Procedures which, except for noted revisions, is a restatement of Kentucky Department of Highways Official Order No. 73646, "Consulting Engineering Contract Procedures," dated March 2, 1965.

OBTAINING HIGHWAY ENGINEERING SERVICES FROM PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE

Part I

CURRENT PRACTICE

This assessment of current procedures for obtaining private professional engineering services is based on information received from the highway departments of 48 states , the Commonwealth of Puerto Rico , and the District of Columbia . Supplemental information was obtained from the Bureau of Public Roads , Consulting Engineers Council , American Society of Civil Engineers , National Society of Professional Engineers and various other agencies and professional societies concerned with the use of professional engineering services .

SELECTION OF CONSULTANTS

Although the stated detail of procedures for selection of consultants varied widely in the replies received from the highway departments , there appear to be many important practices common to nearly all respondents .

Most state highway departments maintain an up-to-date file of particulars on consultants qualified to perform the types of professional services most often needed to supplement the work of their own staff . The respondents indicated that the usual policy for selection of consultants is to place major emphasis on experience , capacity , qualifications and current availability and somewhat less emphasis on rotation of assignments among a selected group of experienced engineers and

engineering firms. Attention is normally given to the following factors in selecting a firm or firms for consideration in connection with a particular job:

1. Past performance of consultants on similar contracts with the highway department.
2. Known current work loads of consultants.
3. Time and manpower requirements for the project under consideration.
4. Consultant staff size, training, experience, reputation and individual professional registration (biographical data on staff personnel are normally available from consultants).
5. Apparent financial capabilities of consultants.
6. Availability of consultants as related to geographic location and potential for communication.
7. Performance records of consultants on similar jobs for other clients.
8. Fees paid to consultants for the same or a similar type of project.
9. Ability to expand if the project is larger than is normally handled by available consultants (depends on several of the above factors, especially the reputation and abilities of key staff personnel).

In most states one man, usually the Highway Commissioner, the Chief Engineer or an Assistant Chief Engineer, is assigned the task of selecting consultants. In some highway departments, the person in charge of the particular activity requiring outside professional engineering services (surveying and mapping, bridge design, planning, etc.) is

required to select the consulting firms to be considered for the job. In other cases, the selections are made by a standing committee of three or four key personnel.

All of these procedures appear to be wholly in keeping with the intent of statements of recommended practice in the various professional society guides and other literature. (1-9)* However, the trend indicated by replies received from state highway departments is toward assignment of key staff personnel to a committee or board having responsibility for selection of consultants and negotiation of contracts. Both the need for continuity and the extensive record keeping involved in these activities seem to favor the assignment of more than one person to the task.

ESTABLISHMENT OF FEES

Fees paid by state highway departments for professional services and the bases currently used for determination of fees are summarized in Table 1 (pages 48-53). This summary is included as an illustration of the great variety of methods currently used for determination of engineering consultant fees. Most of these methods are described in a seventy page summary prepared by the Consulting Engineers Council. (10)

Although consideration of many different local economic, social and legal factors is reflected in these methods, the great variation in both the fees and the basis for establishment of fees is largely due to the varying amounts of information and services (advance planning

* Superscribed numbers in parentheses refer to entries in list of references, page 54.

guidance, traffic studies, soils investigations, aerial photography, computer services, manual surveys, etc.) provided to the consultants.

A majority of the states have indicated that highway department personnel make an estimate of the complexity and construction cost of the project prior to considering such questions as, (1) "Should a consultant be retained to handle the project or some phases of the project?" and (2) "Which group or class of consultants, from the department list, should be considered?" This estimate is based on preliminary studies conducted by highway department personnel. Then, if further preliminary studies, reports or designs are to be accomplished by a consultant, this work is normally handled in a contract separate from other phases of the project (final design, preparation of plans and specifications and construction inspection).^{*}

The most commonly used basis of fees for preliminary studies and reports is salary cost times a multiplier, resulting in a contract for cost plus a lump sum. Preliminary work is normally so indeterminate in scope that a single lump sum is deemed inequitable. However, in those states where the amount of information provided by state forces eliminates most of the uncertainties involved, the basis of consultant fees is often the same for all phases of the project, including some preliminary studies

*Use of the term "preliminary engineering" has been avoided because of differences in its interpretation by the professional societies, the Bureau of Public Roads and the state highway departments. The term "construction supervision" is interpreted by the courts to mean "in responsible charge of construction" (directing the construction activities) and, therefore, should not be used to signify "construction inspection."

and surveys. In such cases the contract amount is normally in the form of a single lump sum for all of the engineering consultant's services, as suggested by the Bureau of Public Roads. ⁽¹¹⁾

The following items are usually considered in fee estimation:

1. An estimate of the State's cost of doing the proposed engineering work with State forces.
 - a. Man-hour basis
 - b. Average cost per road-mile or per square foot of bridge deck.
2. Average design cost per mile of road or per square foot of bridge deck for similar work previously performed for the State by the same consultant.
3. Average design cost per mile or per square foot for similar work by other consultants in the State.
4. Historical average costs of engineering work of a similar nature expressed as a percentage of construction cost.
5. A production cost analysis prepared by the consultant for the particular job (for more complicated projects such as unusual structure or interchange design and tunnel design).

The estimated fee for any given project is normally considered to be the approximate center of a range within which the negotiated contract amount must lie. Both the upper and lower limits are generally within five percent of the estimated fee.

The above reference to a "percentage of construction cost" must not be interpreted as an indication of method of payment. Among the

five common methods of payment (fixed lump sum; fixed lump sum plus expenses; straight time charges, hourly or per diem; retainer on annual or other basis; and percentage of estimated or actual construction cost), the fixed lump sum, with provisions for extra work on a fixed man hour cost basis is most often reflected in the sample contract documents submitted by the state highway departments. The fixed lump sum is sometimes established, and frequently justified in part, by use of the ASCE, ARBA or other guides giving suggested percentages of construction costs, but none of the states use a percentage of construction cost as the method of payment. The Bureau of Public Roads will not approve consultant contracts which provide for payment of a percentage of construction cost. (11,12)

In those states where a fixed lump sum is established by use of the curves representing percentages of construction cost, either the old edition of the ASCE curves⁽⁷⁾ or the current figure 2 ASCE⁽¹⁾ and ARBA⁽⁶⁾ curves are usually specified. This reflects the general trend away from use of the higher percentages of construction cost recommended in these guides.

The replies from some states contained no mention of a percentage of construction cost; some contained comments to the effect that suggested percentages of construction cost were too high for projects below \$2,000,000; some contained comments to the effect that a percentage of construction cost is not a good basis for establishing fees; several were accompanied by special curves, based on local conditions within the state, and reflecting considerably lower percentages than are recommended in the ASCE and ARBA guides.

The trend appears to be away from the use of a percentage of construction cost except as a check on the more definitive man hour basis of determining consultant fees. The engineering profession is fully aware of both the trend and the reasons behind it. The National Society of Professional Engineers concludes: "Modern engineering services, performed by professional engineers in private practice, cover such diverse classes of projects and wide ranges in scope that use of 'percentage of construction cost' is diminishing as a basic method for computing compensation. This trend should be recognized and engineers should avoid its use when possible."⁽⁸⁾

Many state highway departments have developed extensive cost and performance records in dealing with consultants since 1956. These records not only provide an excellent means for establishment of fees on a salary cost basis, but also provide a basis for decisions concerning the most effective uses of consultants. The net result is that most of the state highway departments are predicting more frequent use of consultants as a means of keeping the Federal-aid highway program on schedule.

USE OF CONSULTANTS

According to Bureau of Public Roads records of Federal-aid highway consulting contracts, the number of contracts per year has increased from 288 basic agreements in 1956 to 869 in 1964, with an aggregate total of over \$500,000,000 in consultant fees for the eight year period, 1956 through 1963.^{(13)*}

* Information presented at the 50th annual meeting of AASHO by Mr. August Schofer, Regional Engineer, Bureau of Public Roads, Hagerstown, Maryland.

The trend, indicated by replies received from state highway departments, is toward a greater use of consultants, but the respondents offered a wide range of changing legal, social and economic factors affecting the decision as to when a consultant should be engaged.

Some of the many reasons given for the use of consultants are as follows:

- (1) The state desires to use consultants rather than build up its highway organization for a short time to handle a program substantially larger than normal. Employment of sufficient personnel to handle the full volume of current engineering work would eventually result in retrenchments and layoffs contrary to the fundamental policies of career development and security in public employment.
 - (2) An intensive recruiting program, restricted by state administrative policies affecting highway department salary structure and personnel training and assignment opportunities, has proven incapable of producing sufficient personnel.
 - (3) Unusual work, requiring specialized skills, is accomplished quicker, better and more economically by consultants possessing the necessary skills.
 - (4) The discreet and timely use of consultants allows the state highway organization more flexibility in the planning and scheduling of all work to achieve greatest economic advantage.
- The construction of the Interstate System can be kept on

schedule without depriving the highway department of the staff needed to handle its primary, secondary, and urban highway programs and its vastly increasing maintenance program.

- (5) The work of consultants reflects fresh, unbiased thinking which sets an example for state forces and provides a yardstick of accomplishment.
- (6) The crash program of highway construction since 1956 has resulted in considerable engineering consultant experience in conforming with state standards and BPR procedures and thus has reduced many of the "unknowns" previously reflected in the fees proposed by consultants. This, coupled with continuing free enterprise (professional) competition among experienced consultants, has constantly increased the number, types and scope of "bargin" consultant services.

Historically, the Bureau of Public Roads has encouraged state highway departments to build up adequate organizations to handle the expanding level of highway activity. From the very beginning of the Federal-aid highway program it has been required as a prerequisite to receiving Federal-aid funds, that the state should have a highway department adequately staffed and equipped to carry out the authorized work. However, while adhering to the basically sound policy of placing major reliance on the staff employees of state highway departments, the Bureau has approved the use of consultants as a necessary adjunct in accomplishing the accelerated Federal-aid highway program. The use of

consultants is often essential in spite of the fact that Federal regulations with respect to adequate highway department staffing are being complied with. The great variation in the extent of use of consultants in different states is largely a result of differences in the ratio of normal work load to the peak work load imposed by the mileage and character of Interstate System highways in each state. Bureau approval of the use of consultants is therefore on a state-by-state basis with consideration given to the quality and completeness of each highway department organization and the relative status of its Federal-aid highway program progress.

In some states, statutory limitations prohibit the use of consultants except in cases where the state highway department staff does not have the capacity, equipment or experience needed to accomplish the project under consideration. Most states seldom employ consultants for complete handling of a project from preliminary surveys and studies through contract plans and construction inspection. In general, current practice is to contract only for the phase or phases of engineering work on which the press of manpower is greatest or on which the highway department is lacking in experience already accumulated by available consultants.

Such limitations on the volume of work let to consultants might not appear to be justified by the currently available information on relative costs of consultant versus highway department handling of the engineering work involved in Federal-aid highway projects. Information submitted to the Bureau of Public Roads by state highway departments in 1961 indicated that the total cost of engineering by state

highway organizations and consultants ranged from 6.67 percent to 34.78 percent of construction costs, with a median preliminary and construction engineering cost of 12.09 percent. The median cost for preliminary engineering was 5.28 percent, and the median cost for construction engineering was 7.17 percent. These percentages are higher than the average of 3.9 percent for all engineering work performed exclusively by consultants (including preparation of plans, specifications and estimates) on Federal-aid highway projects awarded during the period July 1, 1956 through June 30, 1964. However, because of the type and amount of information normally provided to consultants by the state highway departments, these percentages are quite misleading.

Location surveys, alternate route location studies, subsurface explorations, or other preliminary engineering work, together with standard specifications, geometric design standards and varying amounts of administrative and legal guidance are often provided to the consultant at considerable cost which is always reflected in the cost of highway department operations but not always reflected in the cost of engineering by consultants.

Truly definitive data are not available for such a general comparison of the cost of engineering work by consultants and by government agencies.⁽¹⁴⁾ If the decision to use consultants is to be justified on this basis, it should, at best, be limited to specific projects or specific phases of projects.

The important question in most states is whether or not consultant services are currently needed to keep the Federal-aid highway program on schedule. This question involves a far greater amount of money than the question of relative costs of engineering by consultants and by highway departments. Any appreciable stretch-out of programmed highway construction due to lagging engineering work can result in construction costs increases exceeding the total cost of engineering work commonly let to consultants.

During the four-year interval since 1961, increases in unit costs of construction have added \$1,100,000,000 to the estimated total cost of completing the Interstate system. ^{(15)*} This is more than twice the amount of all consultant engineering fees paid for Federal-aid highway work during the period 1956 through 1963.

Both the unit costs of construction and the right-of-way costs of highways are time dependent variables of such magnitude that they tower above all economic considerations affecting the means by which the engineering work is to be accomplished. Sufficient engineering forces must currently be applied to the task of keeping programmed construction on schedule, regardless of the relative emphasis placed on the use of consultants and the build-up of highway department organizations.

*This increase is based only on FAI construction remaining to be done during and after 1961. Information presented by Federal Highway Administrator Rex M. Whitton at the February 1965 meeting of the Board of Governors of the Regular Common Carrier Conference at Miami Beach, Florida.

Except in cases like California and Texas, the growth in capacity of state highway department engineering forces has generally not kept pace with the growth in volume and the complexity of highway research, planning, design and construction inspection requirements. The current trend toward greater use of consultants is, therefore, prompted as much by the overwhelming volume and increasing complexity of engineering work as it is by any consideration given to the most economic means of accomplishing it.

SUMMARY

There is a trend toward greater use of consultants, influenced primarily by the economic considerations involved in keeping the Federal-aid highway program on schedule. In general, current practice is to contract only for the phase or phases of engineering work on which the press of manpower is greatest or on which the highway department is lacking in experience already accumulated by available consultants.

The usual policy for selection of consultants is to place major emphasis on experience, capacity, qualifications and current availability and somewhat less emphasis on rotation of assignments among a selected group of experienced engineers and engineering firms.

Most state highway departments are developing extensive engineering cost and performance records in recognition of the need for a more flexible and realistic basis for estimation of consultant fees than is provided by historical percentages of construction cost. Because of the amount of guidance and information normally provided by highway

departments , the fees paid for consultant engineering services represent lower percentages of construction cost than are reflected in the guides prepared by professional societies . (1,2,5,8,9)

The need for continuity and the extensive record keeping activities involved in obtaining consultant engineering services have prompted most state highway departments to assign several key staff personnel to a committee or board having responsibility for (1) selection of consultants , (2) estimation of fees , (3) negotiation of contracts for engineering services , and (4) preparation of contract performance evaluations .

PART II

RECOMMENDATIONS

Kentucky Department of Highways procedures for obtaining highway engineering services from professional engineers in private practice^(16,17) were reviewed in the light current practices and trends.

In general, the practices followed in Kentucky were found to be a combination of the most desirable points of procedure represented in the replies from other state highway departments. Among the strong points in Kentucky's procedure are:

- (1) The use of a definitive time-cost basis for analysis of factors affecting the determination of fees.
- (2) General compliance with the intent of procedures recommended by the professional societies for selection of consultants and negotiation of contracts.

DETERMINATION OF FEES

Although the time-cost basis for negotiation requires extensive records, it is of benefit to both the Department and the consulting engineer; it permits known aspects of a project to be evaluated for time requirements, while also providing a fair method of billing for work arising out of unknown factors. Even if the consultant uses the "percentage of construction cost" basis and then works backward to get man hour requirements, the resulting breakdown of items and cost provides the consultant with a clear perspective of costs and efficiencies in his operations. Consultant proposals and performance records can be compared with Department man hour estimates to provide the Department with a yardstick of accomplishment for measuring the performance of its own staff.

Fees established solely on the basis of percentages of construction cost can result in widely different consultant profit margins because of differences in type of area (urban or rural), quantity of earthwork and rock excavation, number of repetitive structures, and many other factors having little effect on the cost of providing engineering services. This is not in keeping with the intent of providing "fair payment for the services performed" as stated in Bureau of Public Roads policy (11) and implied by common law. The currently maintained cost and performance records provide a much more appropriate means of allowing for variation in the size and complexity of projects and the scope of engineering services provided.

The degree of consultant acceptance of the current basis for negotiation is indicated by recent Department experience. Approximately forty-seven contracts for professional engineering services have been completed with consultants since the time-cost basis for establishment of fees was initiated in Kentucky. During this time, negotiation with a second or alternate consultant has been necessary in only two cases.

COMPETITIVE BIDDING

Kentucky Department of Highways Official Order number 73646 is designed to protect against the potential use of the unethical and undesirable practice of competitive bidding, on a price basis, for professional engineering assignments.

None of the provisions of Kentucky Revised Statutes can be interpreted as requiring professional services to be obtained on a bid basis. The 1964 State Purchasing Law (18) states that "...competitive bids may not be required for professional, technical, or artistic services." Courts throughout the country have specifically exempted the engineering profession from those clauses in public works laws which typically read:

"Every contract or purchase made by the State Highway Department which contemplates the expenditure of more than \$1,000.00 shall be let after being advertised under rules and regulations to be made and published by the Department."⁽³⁾

McQuillin on Municipal Corporations Vol. 2, states:

"Provisions as to competitive bidding have been held not to apply to contracts for personal services depending upon the peculiar skill or ability of the individual, such as the services of ...or a consulting and supervising engineer, and generally the requirement does not apply to the employment of a professional man, in which case the authorities have a discretion as to his qualifications."

In the case of Miller vs Boyle (43 Cal. App. 39) the courts ruled as follows:

"An architect is an artist. His work requires taste, skill, and technical learning and ability of a rare kind. Advertising might bring many bids, but it is beyond peradventure that the lowest bidder might be the least capable and most inexperienced, and absolutely unacceptable. As well advertise for a lawyer, or civil engineer for the city, and entrust its vast affairs and important interests to the one who would work for the least money."

In the case of Hunter et. al. vs Whiteaker and Washington (Tex. Civ. App., 230 S. W. 1098) the court stated:

"To hold that the act would require that the services of a man belonging to a profession such as that of the law, of medicine, of teaching, civil engineering, or architecture should be obtained by a county only through the competitive bidding would give a ridiculous meaning to the act, and require an absurdity ...Such a construction would require the selection of attorneys, physicians, school teachers, and civil engineers by competitive bids, the only test being the lowest bid for the services of such men. Such a test would probably be the best that could be conceived for obtaining the services of the least competent man, and would be most disastrous to the material interests of a county."

In the case of Louisiana vs McIlhenny (201 La. 78, 9 So 2d 467, 1942), the Court observed that:

"Civil engineering is a profession, requiring years of education and service to obtain perfection in it, and calling, in its application, for a high order of intelligence and extraordinary skill and learning, and it was never contemplated by the legislature that the money of the citizens of a county, raised for road purposes, should be expended upon the advice of a civil engineer who had obtained his employment by underbidding his competitors without

regard to his ability to fill the position."

There are countless other decisions supporting the contention that laws requiring bidding for public works contracts do not apply to the procurement of professional services.*

Occasionally there is some question as to the professional nature of some of the services involved in contracts with consultants. This question most often arises in connection with such items as surveying services, soil borings and traffic studies. Neither the replies from the state highway departments nor the information provided by professional societies have indicated any clear agreement on the answers to this question. However, there is little doubt of the trend toward considering certain engineering tasks to be routine "sub-professional" services subject to competitive bidding. In a recent survey conducted by the Ethics and Practices Committee of the Soil Mechanics and Foundation Division of the Illinois Section, ASCE, the following conclusions were reached: (19)

"Laboratory testing of soils and services involving identification and classification of soils are considered 'professional services' by 80 percent of the group; 60 percent asserted that soil sampling is a 'contractual service' and, therefore, subject to competitive bidding."

Delaware awards contracts to the lowest competitive bidder for the engineering work associated with right-of-way acquisition (Table 1), but none of the other states mentioned competitive bidding as a means of obtaining any type of engineering service.

*City of Hazard et. al. v. Salyers et. al., City of Hazard v. Goodlette (224 S.W. 2d 420) Court of Appeals of Kentucky, June 14, 1949; Jeffersontown v. Cassin et. al. (102 S.W. 2d 1001) Court of Appeals of Kentucky, March 5, 1937; State ex rel. Doria vs Ferguson, Auditor (60 NE 2nd 476) Supreme Court of Ohio 1945; Stratton vs Allegheny County (245 Pa. St. 519-1914); No. 17369, McNichols vs City and County of Denver, Supreme Court of Colorado, Sept. 20, 1954; Gulf Bitulithic Co. vs Nueces County (Tex. Civ. App), 297, S.W. 747, at 754; etc. (quoted in reference 3).

The U. S. Army Corps of Engineers is preparing to implement a new policy whereby surveying contracts will no longer be bid. (20,21) Such a change in policy would be in keeping with the recent American Society of Civil Engineers recommendation that surveyors should be considered to be professionals. (2)

Because of the general lack of agreement concerning classification of sub-professional engineering tasks and the disputable feasibility of separating the professional and sub-professional aspects of most engineering tasks, competitive bidding is not recommended as a means of obtaining sub-professional engineering services. It is recommended that local sections of the professional societies represented in Kentucky be consulted in any case in which competitive bidding for sub-professional engineering services is to be considered. Competitive proposals should not be considered in connection with any contract involving both sub-professional and professional services.

PERSONNEL RAIDING

The Department's statement of policy and procedures (16) contains a provision for guarding against pirating of engineering personnel away from the Department of Highways. The provision reads as follows:

"During the period of a contractual agreement with the Department, the consultant shall not engage for any purpose, any active professional or technical personnel who are, or have been, in the employ of the Department of Highways, or, shall engage such former personnel for at least two years after termination of employment with occurs after March 3, 1965. This prohibition shall not apply to employees who have reached the age of 65, and who have been retired under the mandatory retirement policy of the Department."

Several state highway departments currently operate under a policy which results in little or no consideration given to obtaining engineering services from consulting firms that recruit personnel from the state highway department. Unfortunately, a strict written policy of this nature has an adverse effect on the highway department's own recruiting program; A potential highway department

employee feels that he will automatically relinquish part of his future right to work for whomever he pleases in the development of his career. This attitude has been quite noticeable among engineering students at the University of Kentucky.

If a written policy of this nature is deemed necessary, some provision should be made to decrease its adverse effect on the Department's recruiting program. That is, the policy should be broad enough to allow application to the great variety of situations that may arise.⁽²²⁾ Each case in which a former Department employee is hired by a private engineering firm should be evaluated in the light of the particular circumstances involved. The first sentence of the Department's statement of policy in this matter could be modified by addition of the phrase, "without the prior written consent of the Commissioner of Highways." With this addition, the intent of the statement would remain quite clear, and yet the policy could be administered with the flexibility needed to lessen its adverse effect on the Department's recruiting program.

The most important aspect of the Department's current policy in this matter is the prohibition of employment practices which could result in a "conflict of interest" on the part of its employees. A conflict of interest could exist in the case of a Department employee who is engaged by a consultant during off duty hours to accomplish work which is subject to Department approval. A similar situation exists when a Department employee is reviewing or approving the work of a consultant with whom he is seeking employment or with whom he has been promised employment.

The recommended statement of policy in this matter (page 23) retains those features of the Department's current policy relating to a conflict of interest, but does not place a general two-year restriction on the future employment opportunities of all the Department's technical and professional personnel.

This recommendation is based on the opinion that the current two-year general restriction is (1) extremely detrimental to the Department's recruiting program, (2) not conducive to good morale and proper attitudes on the part of current employees, and (3), in view of general recognition of the fact that the Department does not wish to serve as a "training ground" for consultant employees, this restriction is not an essential deterrent to personnel raiding. The engineering consultants contacted in connection with this study were already aware of the Department's views regarding personnel raiding. These views, and their implications in connection with the Department's selection of consultants, are an important deterrent to personnel raiding and should, therefore, be made known to all consultants on the Department's List of Qualified Consulting Engineers.

The following recommended statement of consulting engineering contracting policy and procedures is, except for the first paragraph beginning on page 23, a restatement of Kentucky Department of Highways Official Order No. 73646. This Order was prepared by members of the administrative and legal staff of the Kentucky Department of Highways prior to the beginning of the phase of study reported herein. It embodies most of the desirable features that have been recommended by the professional societies, the Bureau of Public Roads and the highway department officials contacted in connection with this study, and is restated here in response to the many requests from state highway departments that contributed to the information on which it is based.

RECOMMENDED STATEMENT OF
CONSULTING ENGINEERING CONTRACTING POLICY AND PROCEDURES

INTRODUCTION

The Kentucky Department of Highways shall maintain an engineering staff capable of performing and accomplishing a normal workload of design and construction engineering projects; however, whenever design projects cannot be undertaken and accomplished by the Department on a timely basis with regard to construction plans, or, when the project requires specialized technical talents, consulting engineers may be employed upon recommendation of the State Highway Engineer and approval of the Commissioner of Highways.

Selection and employment of consulting engineers for engineering studies, preparation of design plans and specifications and inspection of construction shall be based upon the qualifications of the consultant, specialized experience in the type of work required, ability of the firm to complete the work in the time required, past experience with the Department, and ability of the firm to satisfactorily perform the services required. Because of these important features, consulting engineering contracts shall be negotiated, as are other professional services contracts, and are not awarded on a competitive bid basis.

Consulting engineering firms, considered for contracts with the Department of Highways, must warrant that they do not employ or retain any company or person, other than a bona fide employee working solely for the consultant, to solicit or secure a contract with the Department,

and will not pay anyone a fee, commission, percentage, gift, or any other consideration as a result of the award of a consulting engineering agreement with the Department.

During the period of a contractual agreement with the Department, the consultant shall not engage for any purpose, any active professional or technical personnel who are in the employ of the Department of Highways, nor shall, without the prior written consent of the Commissioner of Highways, engage such former Department employees who have participated in the Department's review or approval of work submitted by the consultant within the past two years. This prohibition shall not apply to employees who have reached the age of 65, and who have been retired under the mandatory retirement policy of the Department.

ESTABLISHMENT OF QUALIFICATIONS

Engineering firms interested in qualifying for consideration for consulting engineering contracts with the Kentucky Department of Highways must indicate their interest and availability for consulting engineering contracts by furnishing information describing the firm's engineering and financial qualifications, capabilities, experience, and present consulting engineering activities. The State Highway Engineer's Office shall furnish interested engineering firms the necessary forms, Form HD 40-1, Kentucky Department of Highways-Engineer Questionnaire, for use in filing the necessary data required for prequalification of consultants. Brochures, if available, should be attached to Form HD 40-1, and submitted along with the questionnaire.

The State Highway Engineer shall be responsible for prequalification of consultants. Engineering firms shall be prequalified by the Department according to experience and capability, and when qualified, shall be included in the Department's List of Qualified Consulting Engineers grouped according to complexity of work requirements of highway projects and the firms' ability to perform such projects.

Based upon contracts awarded and completed by consulting engineers, an Engineers Experience Record shall be maintained by the Department to reflect the Department's evaluation of services rendered by consultants under each contract and previous experience of each consultant with the Department.

DECISION TO EMPLOY CONSULTING ENGINEERS

The decision to employ consulting engineers for engineering studies, design plans, specifications, or, inspection of construction projects, shall be based upon the availability of state engineers to perform the required engineering services, the urgency for completion of plans and specifications in terms of plans for letting construction contracts or, special technical requirements of the project which warrants employment of consulting engineers. If state engineering forces are unavailable, or, if special technical requirements are involved, the State Highway Engineer, upon making this determination, may recommend employment of consulting engineers for the project being considered. The Commissioner of Highways must approve the recommendation for employment of consultants prior to proceeding with the selection of firms and negotiation of contracts.

PROCEDURES FOR SELECTION OF ENGINEERING FIRMS

Upon approval by the Commissioner of Highways to employ consulting engineers , the following procedures shall be used by the State Highway Engineer in selecting an engineering firm qualified to accomplish the project:

- 1) From the List of Qualified Consulting Engineers , and on the basis of information contained in the Engineers Experience Record , shall prepare a listing of engineering firms qualified to perform the engineering services required for the particular project , based on their qualifications and performance records .
- 2) Shall select three firms whom the Department will invite to consider a consulting engineering contract for the proposed project .
- 3) Shall furnish each of the three consultants with a brief outline of the project involved and the services required .
- 4) Shall determine the interest and availability of the three firms to perform the engineering services required for the proposed project .

PROCEDURES FOR NEGOTIATION OF CONTRACTS

The State Highway Engineer shall be responsible for negotiation of contracts with consulting engineering firms . The following procedure applies to contract negotiations:

1) State Highway Engineer

- (a) Shall discuss the proposed project with the first preferred consulting engineering firm on the list of three to determine its interest in submitting a proposal to perform the engineering services required for the proposed project.
- (b) Shall furnish the consultant the following information and forms for use in submitting a proposal:
 - 1) Invitation and Proposal, including Form HD 40-2, Consulting Engineers Fee Proposal, for use by consultant in showing the basis for the proposed fee.
 - 2) Detailed Job Description
- (c) Using Form HD 40-3, Department's Estimate for Consulting Engineers Fee Determination, shall prepare an estimate of the cost of engineering services to be performed by the consulting engineering firm on the proposed project and determine the fee to be paid.

2) Consultant

Shall complete and submit proposal to the State Highway Engineer as a basis for further negotiation of a consulting engineering agreement.

3) State Highway Engineer

- (a) Shall analyze the consulting engineer's proposal in detail.
 - 1) Shall prepare Form HD 40-4, Pre-Award Survey, to determine the current capability of the consultant to

satisfactorily perform the engineering services required for the project under consideration.

2) Shall compare the consulting engineer's proposed fee with the Department's fee estimate to determine the reasonableness of the fee and areas of substantial differences requiring further discussion and negotiation.

(b) Shall conduct further discussion and negotiations with the consulting engineer, as necessary, in arriving at a reasonable fee for the engineering services to be performed under the contract.

(c) If unable to successfully negotiate an agreement with the first firm, shall conclude negotiations and proceed to negotiate, as outlined herein, with the second preferred consulting engineering firm on the list, and, if unsuccessful with that firm, shall proceed with the third firm. If no agreement is reached with any of the three consultants, the State Highway Engineer shall select three other consultants, and follow the procedures outlined herein.

(d) Shall determine the fee to be recommended for payment to the consultant and prepare an Agreement to cover the services to be performed by the consultant, incorporating into the Agreement the scope of the project as outlined in the proposal furnished the consulting engineering firm.

- (e) Shall prepare HD 40-5, Record of Contract Negotiations , including the Department's estimate of the cost of engineering services .
- (f) Shall submit the Agreement to the consultant for signature of approval and return.
- (g) Shall recommend approval of the Agreement by signature.
- (h) Shall transmit the following documents to the Board of Review:
 - 1) Agreement
 - 2) Record of Contract Negotiations
 - 3) Engineer's Pre-Award Survey
 - 4) Consultant's Proposal
 - 5) Engineer's Questionnaire and other current information.

4) Board of Review

Shall review all documents related to contract negotiations , determine the qualifications of the consulting engineers to perform the proposed engineering services , the fee to be paid , terms of the proposed contracts , and make written recommendation to the Commissioner of Highways for employment of consulting engineering firms .

CONTRACT EXECUTION

1) Commissioner of Highways

- (a) The Commissioner of Highways must approve by signature all consulting engineering agreements with the Department of Highways .

- (b) If federal funds participate in the cost of proposed projects, the Bureau of Public Roads must approve the employment of consulting engineering firms. (Bureau of Public Roads' approval shall be obtained by the State Highway Engineer.)
- (c) Upon approval of the consulting engineering agreements by the Commissioner of Highways, and the Bureau of Public Roads if federal funds are involved, the Division of Contract Controls shall process the executed agreement and issue the necessary encumbrance documents.

2) Division of Contract Controls

- (a) Shall issue CH Contract and processes contract and agreement through the Highway Division of Accounts and the Department of Finance for encumbrance of funds.
- (b) Shall receive approved CH Contract documents from the Department of Finance and notify the State Highway Engineer that the consultant may be given notice to begin work.
- (c) Shall maintain a file of all consulting engineering CH Contracts and Agreements and audit all progress vouchers prior to payment.

3) State Highway Engineer

- (a) Shall notify consultant to begin work.
- (b) Shall exercise necessary supervision over consulting engineers during the period of the contract.
- (c) Shall approve payments for work accomplished.

COMPLETION OF CONTRACTS

Upon completion of work required under a consulting engineering contract, the State Highway Engineer shall take the following actions:

- 1) Ensure that all terms and conditions of the contract have been complied with and that all services to be performed under the contract have been completed prior to processing final vouchers for payment to the consultant and prior to final release of the consultant.
- 2) Prepare Form HD 40-6, Contract Performance Evaluation, to evaluate the services rendered by the consultant under the contract, and file this report in the contract file.
- 3) Update the Engineer's Experience Record to reflect the pertinent data on the completed contract.

Consultants who have unsatisfactory performance records on contracts with the Department of Highways shall be disqualified and removed from the List of Qualified Consulting Engineers until requalified by the Department.

KENTUCKY DEPARTMENT OF HIGHWAYS CONSULTING ENGINEER QUESTIONNAIRE		See explanatory notes on page 9.	DATE (Month, day, and year)													
1. FIRM NAME		2. ESTABLISHED A. YEAR B. STATE														
		3. TYPE OF ORGANIZATION (Check one) <input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> CORPORATION <input type="checkbox"/> OTHER <input type="checkbox"/> PARTNERSHIP <input type="checkbox"/> JOINT VENTURE (Explain in item 22)														
4. FORMER FIRM NAME(S), IF ANY, AND YEAR(S) ESTABLISHED		5. HOME OFFICE BUSINESS ADDRESS AND TELEPHONE NO.														
6. PRESENT BRANCH OFFICE(S)	A. ADDRESS	B. TELEPHONE NO.	C. NAME OF PERSON IN CHARGE													
	7. PRINCIPALS OF FIRM NAMES		8. ASSOCIATE MEMBERS OF FIRM NAMES													
9. KEY PERSONNEL OF FIRM (Names)																
A. ARCHITECTS		D. STRUCTURAL ENGINEERS														
B. LANDSCAPE ARCHITECTS		G. ELECTRICAL ENGINEERS (Indicate Specialty)														
C. CIVIL ENGINEERS		H. PLANNERS (Indicate Specialty as Site, City, Town, Community, etc.)														
		I. OTHER KEY PERSONNEL (Indicate Specialty)														
		F. MECHANICAL ENGINEERS (Indicate Specialty)														
10. NUMBER OF PERSONNEL IN YOUR PRESENT ORGANIZATION																
LOCATED AT	a. PRINCIPALS & KEY PERSONNEL*			b. OTHER PERSONNEL										TOTALS		
	ARCH. (1)	ENG. (2)	OTHER (3)	STRUCT. DESIGN (4)	ROAD DESIGN (5)	ELEC. (6)	SPEC. WRITER (7)	OTHER (8)	DRAFTSMEN (9)	PLANNERS (10)	ESTIMATORS (11)	INSPECTORS (12)	SURVEYORS (13)		BALANCE (14)	(15)
A. HOME OFFICE																
B. BRANCH OFFICE IN																
C. TOTALS																
11. NUMBER OF PERSONNEL IN YOUR ORGANIZATION DURING LAST 5 YEARS		A. MAXIMUM NO.	B. YEAR	C. NORMAL STRENGTH												

*(Total of items 7 and 9)

12. OUTSIDE ASSOCIATES AND CONSULTANTS USUALLY EMPLOYED BY YOUR FIRM (Furnish a separate completed questionnaire for each firm or individual listed below but see note c, page 9)			
a. CATEGORY	b. NAME OF FIRM OR INDIVIDUAL AND ADDRESS	a. CATEGORY	b. NAME OF FIRM OR INDIVIDUAL AND ADDRESS
A. ARCHITECTS		F. GEOLOGIST	
B. LANDSCAPE ARCHITECTS		G. ELECTRICAL ENGINEERS	
C. CIVIL ENGINEERS		H. PLANNERS	
D. STRUCTURAL ENGINEERS		I. PHOTOGRAMMETRY	
E. SANITARY ENGINEERS		J. OTHER CONSULTANT AFFILIATIONS	

13. INDICATE IN ORDER OF PRECEDENCE, USING "1," "2," "3," ETC., THE TYPES OF PROJECTS IN WHICH YOUR FIRM SPECIALIZES (Work specialties not sufficiently identified by the printed general categories are to be listed separately in the spaces provided)

<input type="checkbox"/> AIRFIELD FACILITIES <input type="checkbox"/> AIR COND. - REFRIG. - VENT. <input type="checkbox"/> BRIDGES <input type="checkbox"/> COMMUNICATIONS <input type="checkbox"/> COMMERCIAL BUILDINGS <input type="checkbox"/> EARTH FILL DAM WORK <input type="checkbox"/> ELECTRONIC FACILITIES <input type="checkbox"/> URBAN ROADWAY DESIGN	<input type="checkbox"/> RURAL ROADWAY DESIGN <input type="checkbox"/> INDUSTRIAL BUILDINGS <input type="checkbox"/> LABORATORIES <input type="checkbox"/> MANUALS <input type="checkbox"/> MASTER PLANNING - SITE DEVELOP. <input type="checkbox"/> POWER - HEATING PLANTS	<input type="checkbox"/> PUBLIC BUILDINGS <input type="checkbox"/> SURVEYS AND REPORTS <input type="checkbox"/> UTILITIES <input type="checkbox"/> WATER - SEWAGE <input type="checkbox"/> URBAN TRANSPORTATION PLANNERS <input type="checkbox"/> TRAFFIC <input type="checkbox"/> HIGHWAY STRUCTURES A. CULVERT B. BRIDGE UNDER 450' SPAN C. BRIDGE OVER 450' SPAN
---	--	--

14. INDICATE THE SCOPE OF SERVICES PROVIDED BY YOUR FIRM WITHOUT USE OF OUTSIDE ASSOCIATES OR CONSULTANTS ON TYPES OF PROJECTS INDICATED IN ITEM 13 (i.e. Architectural, Mechanical, Electrical, Structural, etc.)

15. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES WITHIN YOUR FIRM (Furnish complete data but keep to essentials)									
A. NAME (Last-first-middle initial)					D. NAME (Last-first-middle initial)				
DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL	DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL
EDUCATION (College, degree, year, specialization)					EDUCATION (College, degree, year, specialization)				
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS					MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS				
REGISTRATION (Type, year, State)					REGISTRATION (Type, year, State)				
B. NAME (Last-first-middle initial)					E. NAME (Last-first-middle initial)				
DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL	DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL
EDUCATION (College, degree, year, specialization)					EDUCATION (College, degree, year, specialization)				
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS					MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS				
REGISTRATION (Type, year, State)					REGISTRATION (Type, year, State)				
C. NAME (Last-first-middle initial)					F. NAME (Last-first-middle initial)				
DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL	DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL
EDUCATION (College, degree, year, specialization)					EDUCATION (College, degree, year, specialization)				
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS					MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS				
REGISTRATION (Type, year, State)					REGISTRATION (Type, year, State)				

15. CONTINUED PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES WITHIN YOUR FIRM (Furnish complete data but keep to essentials)									
G. NAME (Last-first-middle initial)					J. NAME (Last-first-middle initial)				
DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL	DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL
EDUCATION (College, degree, year, specialization)					EDUCATION (College, degree, year, specialization)				
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS					MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS				
REGISTRATION (Type, year, State)					REGISTRATION (Type, year, State)				
H. NAME (Last-first-middle initial)					K. NAME (Last-first-middle initial)				
DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL	DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL
EDUCATION (College, degree, year, specialization)					EDUCATION (College, degree, year, specialization)				
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS					MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS				
REGISTRATION (Type, year, State)					REGISTRATION (Type, year, State)				
I. NAME (Last-first-middle initial)					L. NAME (Last-first-middle initial)				
DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL	DATE OF BIRTH (Month-day-year)	YEARS OF EXPERIENCE	AS PRINCIPAL IN THIS FIRM	AS PRINCIPAL IN OTHER FIRMS	OTHER THAN PRINCIPAL
EDUCATION (College, degree, year, specialization)					EDUCATION (College, degree, year, specialization)				
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS					MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS				
REGISTRATION (Type, year, State)					REGISTRATION (Type, year, State)				

17. PRESENT ACTIVITIES ON WHICH YOUR FIRM IS ASSOCIATED WITH OTHERS (Indicate phase of work for which your firm is responsible)							
NAME OF PROJECT AND PHASE OF WORK	LOCATION	OWNER	ESTIMATED CONSTRUCTION COST OF		ESTIMATED COMPLETION DATE		FIRM ASSOCIATED WITH
			ENTIRE PROJECT	WORK FOR WHICH YOUR FIRM IS RESPONSIBLE			
TOTAL NUMBER OF PRESENT PROJECTS:			TOTAL ESTIMATED CONSTRUCTION COST OF WORK FOR WHICH YOUR FIRM IS RESPONSIBLE:				

18. COMPLETED WORK ON WHICH YOUR FIRM WAS DESIGNATED ARCHITECT OR ENGINEER OF RECORD DURING THE LAST 10 YEARS					
NAME AND TYPE OF PROJECT	LOCATION	YEAR YOUR WORK COMPLETED	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	CON-STRUCTED (Year or No)
TOTAL NUMBER OF COMPLETED PROJECTS:		TOTAL ESTIMATED CONSTRUCTION COST:			

19. COMPLETED WORK ON WHICH YOUR FIRM WAS ASSOCIATED WITH OTHER FIRMS DURING THE LAST 10 YEARS (Indicate phase of work for which your firm was responsible)							
NAME OF PROJECT AND PHASE OF WORK	LOCATION	OWNER	YEAR YOUR WORK COMPLETED	ESTIMATED CONSTRUCTION COST OF		CON-STRUCTED (Yes or No)	FIRM ASSOCIATED WITH
				ENTIRE PROJECT	WORK FOR WHICH YOUR FIRM WAS RESPONSIBLE		
TOTAL NUMBER OF COMPLETED PROJECTS:				TOTAL ESTIMATED CONSTRUCTION COST OF WORK FOR WHICH YOUR FIRM WAS RESPONSIBLE:			

20. IN THE EVENT SPACES PROVIDED ON THE FORM ARE NOT SUFFICIENT FOR ENTRIES, OR IF YOU WISH TO FURNISH ADDITIONAL INFORMATION OR PHOTOGRAPHS, IT MAY BE INSERTED HERE, ON THE REVERSE OF THIS PAGE, OR ON SEPARATE SHEETS, WITH APPROPRIATE REFERENCES

21. PURPOSE OF SUBMITTING THIS QUESTIONNAIRE (Check A or B, not both)

A. I/We wish to be considered for architectural or engineering services in connection with the study, design, inspection, supervision (check applicable box or boxes) of construction projects for Kentucky Dept. of Highways.

B. This completed questionnaire is submitted as evidence of employment as outside associate or consultant. (See item 12.)

NAME OF FIRM ASSOCIATED WITH

As of this date: the foregoing is a true statement of facts.

NAME OF FIRM OR INDIVIDUAL SUBMITTING QUESTIONNAIRE	TYPE NAME AND TITLE OF PERSON SIGNING	SIGNATURE

NOTES: (a) Form is to be completed by typewriter. Completed forms may be reproduced in any quantity deemed necessary to meet distribution requirements. (b) It will be to a firm's advantage to maintain its experience record on a current basis. This may be accomplished by periodically forwarding current data. (c) It is NOT necessary for individuals or firms who check item 21B to furnish separate questionnaires for their outside associates and consultants.

FINANCIAL STATEMENT ----- BALANCE SHEET AS OF _____, 19____.

(DATE)

A CORPORATION _____ STATE IN WHICH INCORPORATED
 A CO PARTNERSHIP
 INDIVIDUAL

FIRM NAME _____

ASSETS		This Space for Highways Only	LIABILITIES AND NET WORTH	
CURRENT ASSETS			CURRENT LIABILITIES	
CASH:	\$	\$	Judgments & Accts, Payable	\$
On Hand			Notes Payable	
In Banks			(a) To Banks for Certified Checks	
Cert'f. Checks on Deposit for Bids			(b) To Banks for Payrolls and Other Purposes	
Notes Receivable (Less Discount)			(c) To Material Companies	
Accounts Receivable			(d) To Equipment Companies	
Stocks and Bonds			(e) To Other (exclusive of equipment)	
Inventories			Owing Subcontractors	
Interest Receivable Accrued on Notes, Securities, etc.			Accrued Taxes	
Life Insurance			Accrued Salaries & Payrolls	
	\$	\$	Accrued Interest Payable	
Total Current Assets				\$
FIXED ASSETS (Net Book Value)	\$	\$	Total Current Liabilities	\$
Plant and Equipment			FIXED AND OTHER LIABILITIES	\$
Real Estate			Mortgage on Plant Equip.	
	\$	\$	Mortgage on Real Estate	
Total Fixed Assets			Other Liabilities	
OTHER ASSETS	\$	\$		\$
Real Estate (Not used in business)			Total Fixed and Other Liabilities	\$
Land, bldg. Improvement, etc.				\$
Misc. Assets			NET WORTH	\$
	\$	\$	Individual or Partnership Capital	
Total Other Assets			Capital Stock	
TOTAL ASSETS	\$	\$	Surplus	
			TOTAL LIABILITIES AND NET WORTH	\$

HD 40-2

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

CONSULTING ENGINEERS FEE PROPOSAL

COUNTY _____

ROAD NAME _____

PROJECT NO. _____

	MAN HOURS	AVERAGE RATE	ESTIMATED COST
<u>ENGINEERING STUDY</u>	_____	_____	_____
<u>TRAFFIC PROJECTIONS</u>	_____	_____	_____
<u>PRELIMINARY PLANS</u>	_____	_____	_____
<u>FINAL SURVEY</u>	_____	_____	_____
<u>GRADE & DRAIN PLANS</u>	_____	_____	_____
<u>RIGHT OF WAY PLANS</u>	_____	_____	_____
<u>UTILITY PLANS</u>	_____	_____	_____
<u>STRUCTURE PLANS</u>	_____	_____	_____
<u>SOILS & SUBSURFACE EXPLORATIONS</u>	_____	_____	_____
<u>LIGHTING PLANS</u>	_____	_____	_____
<u>SIGNING PLANS</u>	_____	_____	_____

TOTAL DIRECT PAYROLL \$ _____

TRANSPORTATION \$ _____

LODGING \$ _____

OVERHEAD \$ _____

PROFIT \$ _____

OTHER (Specify) _____ \$ _____

TOTAL PROPOSED FEE \$ _____

FIRM NAME _____

BY _____

DATE _____

HD 40-3

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

DEPARTMENT'S ESTIMATE FOR CONSULTING ENGINEERS FEE DETERMINATION

COUNTY _____

ROAD NAME _____

PROJECT NO. _____

	MAN HOURS	AVERAGE RATE	ESTIMATED COST
<u>ENGINEERING STUDY</u>	_____	_____	_____
<u>TRAFFIC PROJECTIONS</u>	_____	_____	_____
<u>PRELIMINARY PLANS</u>	_____	_____	_____
<u>FINAL SURVEY</u>	_____	_____	_____
<u>GRADE & DRAIN PLANS</u>	_____	_____	_____
<u>RIGHT OF WAY PLANS</u>	_____	_____	_____
<u>UTILITY PLANS</u>	_____	_____	_____
<u>STRUCTURE PLANS</u>	_____	_____	_____
<u>SOIL & SUBSURFACE EXPLORATIONS</u>	_____	_____	_____
<u>LIGHTING PLANS</u>	_____	_____	_____
<u>SIGNING PLANS</u>	_____	_____	_____
		TOTAL DIRECT PAYROLL	\$ _____
		TRANSPORTATION	\$ _____
		LODGING	\$ _____
		OVERHEAD	\$ _____
		PROFIT	\$ _____
OTHER (Specify) _____			\$ _____
		TOTAL PROPOSED FEE	\$ _____

BY _____

DATE _____

KENTUCKY DEPARTMENT OF HIGHWAYS
ENGINEER PRE-AWARD SURVEY

HD 40-4

COUNTY		PROJ. NO.	
ROAD NAME			
NAME OF FIRM			
The following items, as applicable, have been considered in light of information known to the Department and each item rated as shown.			
ITEM	SATIS-FACTORY	QUESTION-ABLE	REMARKS
1. ABILITY TO COMPLY WITH THE REQUIRED OR PROPOSED DELIVERY OR PERFORMANCE SCHEDULE, TAKING INTO CONSIDERATION ALL EXISTING BUSINESS COMMITMENTS.			
2. PAST RECORD OF PERFORMANCE.			
3. APPARENT ABILITY TO CONFORM TO THE REQUIREMENTS OF THE STANDARD NON-DISCRIMINATION CLAUSE.			
4. GENERALLY QUALIFIED AND ELIGIBLE TO RECEIVE AWARD UNDER APPLICABLE LAWS AND REGULATIONS.			
5. NECESSARY ORGANIZATION, EXPERIENCE AND TECHNICAL SKILLS TO PERFORM THE WORK (or ability to obtain same).			
6. NECESSARY CONSTRUCTION AND/OR TECHNICAL EQUIPMENT AND FACILITIES FOR PERFORMING THE WORK (or ability to obtain same).			
From the foregoing ratings, the above named Engineering Firm is deemed capable of satisfactory performance under the contract for which the contractor is being considered.			
REC. BY DEPT. NEGOTIATOR _____		APPR. BY STATE HWY. ENGR. _____	
DATE _____		DATE _____	

KENTUCKY DEPARTMENT OF HIGHWAYS
RECORD OF CONTRACT NEGOTIATIONS

HD 40-5

Sheet 1 of 3

(FOR OFFICIAL USE ONLY)

RECORD OF CONTRACT NEGOTIATIONS		CHANGE ORDER <input type="checkbox"/>
COUNTY		SUPL. AGREE. <input type="checkbox"/>
ROAD NAME		CONTRACT NO.
PROJECT NO.		
DATE		
TO:	FROM:	
BOARD OF REVIEW	STATE HIGHWAY ENGINEER	
TYPE OF SERVICES <input type="checkbox"/> STUDY <input type="checkbox"/> DESIGN <input type="checkbox"/> OTHER (SPECIFY)		
1. SERVICES IN CONNECTION WITH (Project Identification, Location and Description)*		
2. NAME AND ADDRESS OF CONSULTANT		
3. PLACE AND DATE OF NEGOTIATION		
4. CONSULTANT REPRESENTATIVES (Name and Title)		
5. DEPARTMENT REPRESENTATIVES (Name and Title)		

8. PRICING DATA

(1) THE NEGOTIATED CONTRACT PRICE OF \$ _____ IS LESS THAN THE SAME AS OR GREATER THAN THE DEPARTMENT ESTIMATE OR DEPTS.

(2) IS SUPPORTED BY A STATEMENT AND FULL JUSTIFICATION OF RECORD WHICH WILL ADEQUATELY SATISFY SUBSEQUENT REVIEWS.

(3) THAT PART OF THE CUMULATIVE CONTRACT PRICE TO DATE WHICH IS APPLICABLE STRICTLY TO THE PRODUCTION AND DELIVERY OF DESIGNS, PLANS, DRAWINGS AND SPECIFICATIONS IS \$ _____ IT REPRESENTS _____ % OF THE ESTIMATED CONSTRUCTION COSTS OF \$ _____ TO WHICH THE DESIGN SERVICES RELATE

(4) THE TOTAL CUMULATIVE NEGOTIATED CONTRACT PRICE OF \$ _____ IS _____ % OF THE TOTAL ESTIMATED CONSTRUCTION COST OF \$ _____ TO WHICH THE OVERALL SERVICES RELATE.

9. PERIOD OF SERVICE: (Should performance schedule be based on authorized use of overtime, so state, giving name and title of officer authorizing such use and date of action.)

10. TYPE OF CONTRACT: (Check Applicable Type)

(A) FIXED PRICE (Lump Sum or Unit Price) (C) PERSONAL SERVICES

(B) PRICE REDETERMINATION TYPE (D) OTHER COST TYPE

11. FUNDS CITATION: FUNDS IN THE AMOUNT OF \$ _____ ARE AVAILABLE TO COVER THE COSTS OF THIS PROPOSED AWARD AS INDICATED IN THE ATTACHED DIRECTIVE(S).

12. ALLOTMENT NUMBER * (CH)

13. THE PAST PERFORMANCE OF THE CONSULTANT WAS:

15. THE FINANCIAL STATUS OF THE CONTRACTOR IS: *

14. NEGOTIATIONS WERE CONCLUDED ON _____ 19____ WITH THE CONSULTANT

15. THE FINAL CONTRACT PRICE, MUTUALLY AGREED TO IS:

16. THIS NEGOTIATED PRICE WAS CONCURRED IN BY: (Signature of individual authorized to approve contract price)

TYPEWRITTEN NAME AND SIGNATURE TITLE

For application when change orders are involved: Description of services required by Item 1 may be limited to an identification of the line item or specific phase of work to which the change order relates. Information specified by Item 2 may be confined to the name of the contractor. A statement of "Not Applicable" (N/A) may, where appropriate, be substituted for the data called for by Items 6C through 6E, and Items 12. through 13.

KENTUCKY DEPARTMENT OF HIGHWAYS

**PERFORMANCE EVALUATION
CONSULTANT ENGINEER -ENGINEER PROFESSIONAL SERVICES**

NAME AND ADDRESS OF CONTRACTOR		County: Road Name: Project No:	
OFFICE RESPONSIBLE FOR			
SELECTION OF CONSULTANT	NEGOTIATION OF CONTRACT	ADMINISTRATION OF CONTRACT	
CONTRACT DATA			
TYPE OF WORK <input type="checkbox"/> STUDY <input type="checkbox"/> DESIGN <input type="checkbox"/> OTHER (SPECIFY)		TYPE OF CONTRACT <input type="checkbox"/> FIXED PRICE <input type="checkbox"/> COST PLUS FIXED FEE	
CONTRACT NUMBER (CH)		COMPLEXITY OF WORK <input type="checkbox"/> DIFFICULT <input type="checkbox"/> ROUTINE	
AMOUNT OF ORIGINAL CONTRACT \$	TOTAL AMOUNT OF MODIFICATIONS \$	TOTAL AMOUNT OF CONTRACT \$	
DATE CONTRACT AWARDED	CONTRACTED COMPLETION DATE, INCLUDING EXTENSIONS	ACTUAL COMPLETION DATE OF CONTRACT	
TYPE AND EXTENT OF SUBCONTRACTING			
PERFORMANCE			
WAS CONSULTANT RESPONSIVE AND COOPERATIVE?	YES	NO	WAS PRESENTATION ACCURATE, CLEAR, AND COMPLETE?
DID TOP MANAGEMENT ACTIVELY PARTICIPATE?			WAS END PRODUCT ECONOMICAL AND SUITABLE FOR INTENDED PURPOSE?
WAS WORK ORGANIZED AND ACCOMPLISHED IN AN EFFICIENT MANNER?			IS CONSULTANT CAPABLE OF DOING MORE COMPLEX WORK?
PERFORMANCE RATING <input type="checkbox"/> OUTSTANDING <input type="checkbox"/> SATISFACTORY <input type="checkbox"/> UNSATISFACTORY			
EXPLANATION OF RATING (Indicate specific reasons for rating given, describing quality of work performed and efficiency of execution. Comment on all items checked negative above.)			
<i>CONTINUE ON REVERSE</i>			
RATED BY	TYPED NAME AND TITLE		SIGNATURE
			DATE
RATING REVIEWED BY	TYPED NAME AND TITLE		SIGNATURE
			DATE

TABLE 1. FEES PAID FOR PROFESSIONAL SERVICES

STATE	ENGINEERING CONSULTANTS	ATTORNEYS	RIGHT-OF-WAY APPRAISERS	RIGHT-OF-WAY BUYERS	ARCHITECTS
Alabama	Negotiated fee depending on complexity of problems involved and details required. Fees run close to 4% of construction cost of work designed by the consulting engineer.	Attorneys are employed on a project basis and according to a fixed schedule of fees; Rate is \$20 per hour for work not covered in fixed schedule.	Negotiated lump sum contract; Fee per parcel is generally \$50 to \$100; Per diem rates are \$50 to \$100 for conference and court work. Fees range into thousands of dollars for commercial and industrial properties.	All right-of-way purchases handled by staff personnel.	Architectural work is handled through the Alabama State Building Commission.
Alaska	Negotiated fixed fee to be added to actual cost of production of the work. Percentage of construction cost is never used as a basis for establishing fees. Engineering consultants are rarely used.	Attorneys are provided by Attorney General's office.	Negotiated lump sum for the project or fixed fee per parcel; Average fee per parcel is \$300; Fee for court appearances is \$125 per day plus expenses.	Department of Highways does not engage right-of-way buyers.	Architectural services are provided by Dept. of Public Works, Division of Buildings.
Arizona	Negotiated lump sum based on percentage of construction cost curve developed for projects within the State; Similar to ASCE guide. Average fee is approximately 3.5% of construction cost. Fee for additional work is usually at or below contract percentage unless extenuating circumstances are involved.	Attorneys are employed at \$25 per hour for preparation for trial and \$250 per day or any portion thereof for trial. Expert witnesses are paid \$100-\$150 per day or on an hourly basis for portions of days for preparation for trial and \$100-\$150 per day or portion thereof for trial.	Fees based on \$150 per day (8 hours) for MAI appraisers and \$100 per day for non MAI appraisers; Same fee per day or portion thereof for trial; Equivalent rate per hour for trial preparation.	State Highway Dept. negotiators currently handle all acquisitions; Some exploration and analysis of "Fee Negotiation" has been made; State and Contract Attorney's have the authority to negotiate with concurrence of the Chief Right-of-Way Agent.	State Statutes limit fees to 4% of actual or proposed cost plus an additional 2% of actual cost for supervision of construction.
Arkansas	Negotiated lump sum; Fee depends on complexity of problem involved and details required and is based on estimated man hours, equipment and out of pocket expense plus a reasonable charge for overhead and profit, within the limits established by ASPE for work of the nature contemplated.	Fees usually based on hourly rate of \$25 for trial preparation and a per diem rate of \$225 for actual litigation.	Negotiated contract based on customary local rates for various types of property.	Highway Department does not engage right-of-way buyers.	Fee determined in accordance with AIA approved fee schedule.
California	Maximum fee is \$150 per day plus incidental expenses. Selection of consultants generally conforms to procedures recommended by professional societies.	Services normally provided by California Division of Contracts and Rights-of-Way(Legal)	Maximum fee is \$150 per day plus incidental expenses. Department estimates number of working days required to complete the assignment.		Services normally provided by California Division of Architecture.
Colorado	Estimate of cost of doing the work with state forces (man hour & average cost per road-mile or per square foot of bridge deck); Historical cost of similar work both on the above basis and on the basis of % of construction cost. Production cost analysis, prepared by the consultant, is also considered in the case of more complex projects.	Outside attorneys rarely used; Negotiated per diem fee of \$60 to \$120 (plus reasonable expense) has been paid in recent years.	Negotiated contracts with independent fee appraisers, chosen from Dept. list. Recent annual average cost per parcel was \$145 with range from \$35 to \$1920.	Use of fee buyers is neither practiced nor contemplated.	Architects are used occasionally for buildings; Handled in accord with professional ethics.
Connecticut	Negotiated lump sum or salaries plus a lump sum based on estimated man hours required; Construction costs are not considered to be good criteria for establishing fees. Fee for extra work is based on hourly rates of pay specified in contract and actual man hours involved, unless an accurate lump sum fee can be determined in advance.	Fee attorneys are contracted by Attorney General's office for condemnation work at \$50 per day plus travel and communication expenses.	Fee per parcel ranges from \$100 to \$500 for total taking and from \$150 to \$600 for partial taking depending on class of property; Scheduled fees apply to single or group assignments.	Highway Department does not engage right-of-way buyers on a fee basis.	Architects are usually retained by another state agency; Work on Conn. Turnpike was contracted on basis suggested in Architect's Blue Book, but such arrangements were not considered desirable.
Delaware	Estimated man days required to complete the work; Surveys are paid for separately on a per diem basis. Fee is stated either as actual salaries plus lump sum or as a single lump sum. Fee, based on man days, is compared to the construction cost on a percentage type basis. ANBA procedures and definitions are followed, generally.	Fee attorneys are engaged on a slide scale basis for search and title certificate preparation; Rates from \$40 to \$300 for properties valued from less than \$20,000 to more than \$100,000, respectively.	Usual rates are \$50 for total taking and \$75 for partial taking; In unusual cases, contracts are negotiated for higher rates.	Fee buyers are not employed by the State of Delaware; Contracts for engineering work associated with ROW acquisition are awarded to lowest competitive bidder on basis of hourly rates for various types of services to be provided.	
District of Columbia	Estimated labor cost (man days) required to complete the project plus overhead, materials, supplies, travel and miscellaneous expenses and profit. Proposals more than 5% above the estimated fee are negotiated to the satisfaction of all or else another firm is selected.	Government of D.C. does not engage attorneys; Requirements are handled by a central legal staff.	Fees handled by a central real property organization for all D.C. activities.	Government of D.C. does not engage buyers; Services are provided by a central purchasing staff.	
Florida	Lump Sum fee negotiated on the basis of anticipated man hours times man hour rate times a multiplier (overhead, profit expenses, etc., Approx. 2.2).	Average Fee is \$100 per condemnation suit plus 2 1/2 percent of State Road Department appraisal. Department staff handles all other legal actions.	Negotiated fee per parcel depending on complexity of the appraisal problem, the appraisers professional ability, experience and education and the geographic area of the job; Fees are subject to re-negotiation prior to approval by the District and/or Chief Appraiser.	All right-of-way is purchased by State Road Department Right-of-Way Agents.	% of the final construction job costs.

(Table 1 continued)

STATE	ENGINEERING CONSULTANTS	ATTORNEYS	RIGHT-OF-WAY APPRAISERS	RIGHT-OF-WAY BUYERS	ARCHITECTS
Georgia	Engineering contracts are handled in accordance with Federal regulations and professional ethics.	Services either provided by the State Attorney General's Office or contracted for and billed to the Highway Department.	Negotiated contracts on per parcel basis for FAI projects; local authorities pay all costs including local authority-aided projects.	Negotiated contracts on per parcel basis for FAI projects. 10% of ROW costs on FA primary projects and furnish right-of-way for FAS projects.	(Contracts are handled in accordance with professional ethics.)
Hawaii	Estimated man hour requirements to complete State employee, assigned Transportation, provides legal services.	Attorneys are employees of the Department.	Agreement is negotiated on basis of total fee per parcel involved in the assignment.	All are state employees. Fee appraisers are paid based on Department estimate of number of days involved in the assignment.	Architects are selected from among those located in the Department.
Idaho	Negotiated fee based Department's Committee estimate of cost for the work; consists of State Highway Engineer, Survey 6 Plans Engineer, Admin. Officer, and Bridge Engineer. Consultants used only on Federal aid projects. Department is limited.	Attorneys submit an itemized statement of time and fees per parcel.	Contracts negotiated on basis of appraisals of each parcel; per diem cost of appraisals each of appraisals of parcels; per diem cost of appraisals of parcels; per diem cost of appraisals of parcels; per diem cost of appraisals of parcels.	Right-of-way buyers are selected from among those located in the Department.	Architectural services are provided by the III. Division of Architecture and Engineering.
Illinois	IFP Schedule B of recommended fees for Engineering Services (% of construction cost) sum of percentages of increments of construction cost, normally ranging from 10% of first \$20,000 increment to 4.5% of all over \$2,000,000; IFP schedule covers detail plans and specifications and construction supervision, 27.5% of gross fee, 0.4% of estimated construction cost is deducted from calculated gross fee and representing construction supervision costs.	Attorneys submit an itemized statement of time and fees per parcel.	Negotiated appraisals agree-ments based on cost per parcel; Dwellings range from \$150 to \$250 per parcel; Commercial, Industrial, farm properties based on complexity of problem.	Right-of-way buyers are selected from among those located in the Department.	Architectural services are provided by the III. Division of Architecture and Engineering.
Indiana	Fee is negotiated and justified on basis of % of construction cost curves in ASCE Bulletin No. 38; Consultants submit proposal on both lump sum and man hour basis.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
Iowa	Fees are justified by man hour estimates on basis of doing the work with State forces; notes are extended and a multiplier (normal 2.0) is applied; for non-pilot design jobs, fees are calculated by use of Illinois Society of Professional Engineers Charts.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
Kansas	Negotiated fee either on a per-mile basis with maximum local or on a total fixed fee basis with a provision for payment for extra work on the basis of a schedule of hourly pay rates submitted by the consultant.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
Kentucky	Negotiated lump sum based on breakdown of man hour costs (checked against Dept. estimate) and allowances for transportation, lodging, overhead and profit; Dept. estimate compared with records of fees paid for work of similar type, scope & complexity; engineering cost and (2) percentage of construction cost, ranging from about 1.60 to 2.02 and from about 3.2% to 5.0%, respectively.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
Louisiana	Current ASCE and ARBA guides; Normally consultants are employed only for design and preparation of plans for FAI System projects.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
Maine	Negotiated fee based on ASCE and ARBA guides.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
Tennessee	Negotiated fee based on ASCE and ARBA guides.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
Texas	Negotiated fee based on ASCE and ARBA guides.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
Virginia	Negotiated fee based on ASCE and ARBA guides.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
Washington	Negotiated fee based on ASCE and ARBA guides.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
West Virginia	Negotiated fee based on ASCE and ARBA guides.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
Wisconsin	Negotiated fee based on ASCE and ARBA guides.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.
Wyoming	Negotiated fee based on ASCE and ARBA guides.	Attorneys submit an itemized statement of time and fees per parcel.	Approved schedule of rates for buyers are normally not engaged. Only on major buildings or road-side development shelter houses; State VIA recommendations are followed.	Division of Land Acquisition handles purchase.	Architectural services are provided by the III. Division of Architecture and Engineering.

(Table 1 continued)

STATE	ENGINEERING CONSULTANTS	ATTORNEYS	RIGHT-OF-WAY APPRAISERS	RIGHT-OF-WAY BUYERS	ARCHITECTS
Michigan	Negotiated lump sum based on estimate of man hours required and any special job conditions or requirements. Review of fee proposal is based on fees paid for similar work, percentage of construction cost suggested in ASCE and ARBA guides, and estimated man hours required. Lump sum fee is further justified by analysis of man hours required to complete plans, number of plan sheets, cost per-mile for roads and cost per square foot for bridges.	State Attorney General furnishes attorneys as required for Highway Department activities.	Contracts negotiated on basis of staff estimate of cost of the assignment.	All right-of-way acquisition is by State Highway Department Right-of-Way Agents.	When employed, architects are awarded contracts based on schedule of fees for professional services (curve) prepared by State Department of Administration, Building Division.
Minnesota	Negotiated lump sum based on breakdown of man hour costs (checked against Department man hour estimate) plus 100% to cover other benefits plus allowance for out-of-pocket expenses such as computer time, special printing and predetermined travel expenses. Out-of-pocket expenses are not increased by any percentage to cover extra overhead and travel expenses due to location of consultant offices.	State Attorney General's office furnishes staff for all types of legal work except some title work, the fee for which is based on minimum State Bar Ass'n. fee schedule.	Appraisal fees vary from \$50 to \$1000 per parcel depending on whether it is partial or total, improved or unimproved, urban or rural, etc., as stated in ROW Manual Fee Schedule. Per diem rates are usually \$100 for court appearances and \$50 for review of appraisal for court appearance.	All ROW acquisitions are made either by direct purchase by staff employees or by condemnation proceedings through State Attorney General.	Fees based on AIA recommendations; Contracts are negotiated for 6% of construction cost on new construction and on a cost plus basis (with maximum limit) on building modifications.
Mississippi	Consultants not used except on extraordinary projects.	Attorney General's office serves the Highway Department; Basis for fees paid to local attorneys is amount of involvement in each case.			
Missouri	Negotiated lump sum based on estimate of man hours required to perform each major phase of work; ASCE and ARBA guides and staff experience are used in review of fee proposal. Work by consultants seldom involves complete design of the project from preliminary engineering through contract plans.		About 1/3 of appraisal work is handled by fee appraisers; Standard fee per parcel is \$75 which is adjusted upward in the case of more complicated work; Per diem rates are paid when special industrial equipment is involved.	All negotiation for right-of-way is accomplished with staff negotiators. Contracts with abstract companies for title information, including title certificates and closing fees, are often established by competitive bidding; (This normally runs \$75 per parcel.	
Montana	Negotiated fee based on both (1) actual cost plus a fixed fee for profit, officer cost and overhead, and (2) lump sum, using past experience of previous negotiations; ASCE Manual No. 38, and ARBA Bulletin No. 253 are used as guides.	Limited number of fee attorneys are utilized; Fees are based on Mont. Bar Ass'n. schedule; Usual range is from \$20 to \$25 per hour.	Appraisal fees are negotiated on lump sum contracts after staff appraisers have viewed and evaluated the projects' appraisal problems. Most contracts are based upon \$100 to \$125 per day.	All Right-of-Way negotiation is accomplished by Highway Department personnel.	Fees cover three classes of structures (Specialty, Conventional and Utilitarian); Range is from 3.5% to 8% of the actual construction cost (includes supervision of construction); Architects are selected in the locale of the project and require approval by the Board of Examiners.
Nevada	Negotiated fee based on estimate of cost of services to be provided; Consultant submits schedule of costs of proposed services; Contract amount is a "not-to-exceed" price or a lump sum price. Department of Highways has developed detailed procedures and records systems for all types of outside professional services normally required.	(Procedure same as for engineering consultants).	(Procedure same as for engineering consultants)		
Nebraska	Negotiated fee based on ASCE recommendations.	Fee attorneys are not retained.	Negotiated fee per tract based on complexity of the appraisal.		Fees run 4 to 4 1/2% (small buildings); The higher percentage applies when preliminary work is required.
New Hampshire	Negotiated fee based on past experience; ASCE & ARBA recommendations used as a guide; Fees usually run at or below ASCE & ARBA percentages, depending on amount of information made available to the consultant.	Attorneys are employees of the State Attorney General's Office.	Fee based on appraiser's proposed charge per parcel or project but cannot exceed scheduled maximum amounts for various classes of property.	Fee buyers are not engaged.	Fees based on prepared fee schedule containing scaled percentages of construction cost (from 3.5 to 7.5%) for each of three classes of structures with table of added percentages for structure modifications and detailed quantity survey cost estimates.
New Jersey	ARBA Bulletin No. 253 is used whenever possible, but fees more usually conform to ASCE recommendations; All recommended percentages are adjusted on basis of Department experience.	Attorneys are employees of Department of Law & Public Safety and assigned to Highway Department.	Negotiation of appraisers' fees was stopped in 1964; Department now uses a fixed fee schedule based on nature of property and acquisition involved.	Right-of-way buyers are Department employees.	Negotiated fee based on architect's proposal and Department experience.
New Mexico	Negotiated fees based on past experience. ASCE and ARBA recommendations used as a guide. Fees are considerably below ASCE and ARBA percentages because of the amount of information furnished by the State.	Fees are based on minimum hourly rate prescribed by N.Mex. Bar Ass'n. and paid on a contract basis.	Negotiated lump sum on contract basis; Estimate is prepared by staff appraisers.	Fee buyers are not engaged; Their use is not anticipated.	6% of the construction cost of the project; This constitutes complete compensation for all services.

(Table 1 continued)

STATE	ENGINEERING CONSULTANTS	ATTORNEYS	RIGHT-OF-WAY APPRAISERS	RIGHT-OF-WAY BUYERS	ARCHITECTS
New York	For survey and design agreements a negotiated lump sum based on: cost per mile (usually \$5000 for survey; 1/4 of cost of near estimated construction cost using preliminary design, 3/4 of agreement for preliminary design, 1/4 of 3-7% of near estimated construction cost using schedule of unit prices bound in agreement for preliminary design, 1/4 of 3-7% of near estimated construction cost using schedule of unit prices bound in agreement for detailed contract plans; (for increase project these fees are fixed prior to initiation of each design phase); \$100 each for individual Right-of-Way approval and a general map and a Right-of-Way key map or plan; and for supervision and inspection agreements a lump sum based on 2% of verified low bid plus reimbursement of actual salaries paid for overhead, general expenses and profit. In unusual cases allowance is provided on an average basis for extended surveys at Interchanges.	Attorneys are employees of the State Attorney General's office.	Rates range from \$180 to \$400 for total taking and from \$245 to \$500 for partial taking depending on class of property involved. Contracts are negotiated in cases where these rates are disproportionate to the value of the property.	Fee buyers are engaged. Rates based on schedule of percentages of construction cost ranging from 6.00% (for over \$70,000) to 3.00% (for over \$5,500,001) for buildings of conventional character and from 6.75 to 3.75% for buildings of a memorials and monumental buildings and for alteration or rehabilitation of existing structures are subject to negotiation.	Fee based on schedule of percentages of construction cost ranging from 6.00% (for over \$70,000) to 3.00% (for over \$5,500,001) for buildings of conventional character and from 6.75 to 3.75% for buildings of a memorials and monumental buildings and for alteration or rehabilitation of existing structures are subject to negotiation.
North Carolina	Agreements are based on BPR requirements (11)	Fee based on North Carolina Bar Association minimum fee schedules.	Fee negotiated on basis of estimated time required to complete the assignment at the basic rate of \$100 per day.	Right-of-way Negotiators are employed by the Highway Department has a staff of personnel. The fee is negotiated on a lump sum fee, normally about 6% of estimated cost of the structure, is paid on major buildings.	Very limited use of fee buyers; State's Dept. of Public Works; fees based on scheduled percentages of construction cost ranging from 3% for repetitive structures over \$2,000,000 to 8% for remodeling work under \$1,000,000.
North Dakota	Negotiated lump sum based on percentage of estimated construction cost. A very small percentage of highway engineering work is done by consultants.	Fee based on Bar Ass'n minimum fee schedule; \$150 per day for actual trial work and \$15 per hour for other work.	Fee based on complexity of assignment, value of property involved, and number of appraisals to which the same basic data apply.	Contracts processed through State's Dept. of Public Works; fees based on scheduled percentages of construction cost ranging from 3% for repetitive structures over \$2,000,000 to 8% for remodeling work under \$1,000,000.	Contracts processed through State's Dept. of Public Works; fees based on scheduled percentages of construction cost ranging from 3% for repetitive structures over \$2,000,000 to 8% for remodeling work under \$1,000,000.
Ohio	Negotiated lump sum based on Department estimate and ABC Manual No. 38; on non-federal aid work, percentage of official estimate of construction cost is used, except for location studies, preliminary engineering reports, etc., where cost plus 100% is used.	Attorney General staff provides all departmental and allied legal services	Fees estimated by review staff based on time and talent required. Contract negotiated on individual parcel basis with pre-qualified appraisers; \$100 - \$150 per day for conference time and testimony.	Very limited use of fee buyers; State's Dept. of Public Works; fees based on scheduled percentages of construction cost ranging from 3% for repetitive structures over \$2,000,000 to 8% for remodeling work under \$1,000,000.	Very limited use of fee buyers; State's Dept. of Public Works; fees based on scheduled percentages of construction cost ranging from 3% for repetitive structures over \$2,000,000 to 8% for remodeling work under \$1,000,000.
Oklahoma	Oklahoma Society of Professional Engineers Minimum fee schedule: percentage of construction cost adjusted to reflect job complexity and type and location of project. All contracts are lump sum contracts. All projects under \$100,000 construction cost are on per item or negotiated fee basis. Future use of some basis other than % of construction cost is being considered.	Fee is \$100 per day for condemnation work; County Bar Association cost based on number of days required to accomplish the appraisal, are requested from three independent appraisers.	Standard rate is \$100 per day; appraisals, are requested from three independent appraisers, require approval of the Governor.	Fee based on salary of \$550 per month plus expenses; Negotiator submits estimate of number of man days required to acquire a particular project.	Standard rate is \$100 per day; appraisals, are requested from three independent appraisers, require approval of the Governor.
Oregon	Experience is limited to one project negotiation prior to February, 1965.	Fee for the required service is fixed before work is undertaken. Staff personnel handle over 80% of appraisal work and court room testimony.	Standard appraisal fee is \$100 except in Philadelphia and Pittsburgh where staff negotiates fees; Higher fees, for more complicated appraisals, require approval of the Governor.	Fee buyers have never been engaged.	Standard appraisal fee is \$100 except in Philadelphia and Pittsburgh where staff negotiates fees; Higher fees, for more complicated appraisals, require approval of the Governor.
Pennsylvania	Percentage of estimated construction cost somewhat lower than ABA curves, for survey and design fees; varies from 3.25% to 6.75% and is based on Department experience with cost of various types of service location studies and reports are on lump sum or per mile basis, negotiated between 5% & 15% of the survey & design fee. Negotiation is on lump sum basis when BPR participates in engineering costs.	Fee schedule established by the Department of Justice, based on type of service required; Ranges from \$25 flat rate for preparation and filing of motion for new trial to \$100 per day for jury trials and hearings.	Fee per parcel is generally \$100 to \$600; per item rates of \$50 to \$100 are paid for conference and court work.	Have never been engaged.	Have never been engaged.
Puerto Rico	Negotiated fee depending primarily upon the complexity of problems involved and details required. Consideration is given to % of construction cost curves developed by I.E.A.S.P.R.; fees run close to 4% of construction cost of work designed by the consultant.	Attorneys are Department of Public Works employees	Fee per parcel is generally \$100 to \$600; per item rates of \$50 to \$100 are paid for conference and court work.	Have never been engaged.	Have never been engaged.

(Table 1 continued)

STATE	ENGINEERING CONSULTANTS	ATTORNEYS	RIGHT-OF-WAY APPRAISERS	RIGHT-OF-WAY BUYERS	ARCHITECTS
Rhode Island	Negotiated lump sum based on payroll costs plus a multiplier of 1.0 to 1.25; Consultant proposal includes design surveys and boring stakeout; Cost of borings and ROW plats and descriptions are added without a multiplier; The letter runs from \$200 to \$400 per sheet depending on number of parcels and other culture involved in each sheet of taking plan. Prior to 1964, all fees were based on ASCE Manual No. 38 curves showing percentage of construction cost; Fees for projects with no federal participation are based on a percentage of construction cost (ARBA Bulletin No. 253).	The Department has its own legal staff.	Fees are established parcel by parcel on basis of Department ROW staff estimate.	Fee buyers are not engaged.	
South Carolina	Very limited experience in employment of consultants; Fee was negotiated on basis of population and dwelling units for two traffic surveys.	Fees set by the Office of the Attorney-General, and are based on approved County Bar Association rate. Fees for title search and closing right-of-way acquisition transactions are usually about one and one-half percent of the consideration for the transactions above \$5,000.	Negotiated fee per parcel based on type and size of property for urban areas; Negotiated fee per day (about \$100) based on estimated time plus expenses for rural property.	Fee buyers are not engaged.	
South Dakota	Negotiated lump sum based on percentage of estimated construction cost: 2.1 to 2.5% for roadway design; Between 4.0 to 4.5% for structure design.	Legal services are not contracted.	Negotiated lump sum contract dependent upon size of the unit, amount of the taking and apparent damages involved; A rough average for rural properties would be \$75 for a 160 acre unit with the taking from one side to \$450 for a 4000 to 5000 acre ranch newly severed by the Interstate and \$300 to \$500 for commercial establishments severely damaged by controlled access taking; Court appearance at \$75 to \$100 per day including expenses.	Purchasing services are not contracted.	Fee and contracts arranged by S. Dak. State Engineers office; Fee based on schedule of graduated percentages of construction cost published by AIA and NSPE.
Tennessee	NSPE and ARBA guides, with consideration given to fees previously established in contracts negotiated with consultants.	Fees set by Attorney General.	Fees based on prevailing local charges experienced by the Department of Highways for work of like scope and complexity.	Right-of-way buyers are not engaged; Staff employees handle all right-of-way negotiations.	
Texas	Consulting engineers not engaged; Department has sufficient staff capacity to perform these services.	Fee attorneys not engaged; Attorney General handles all legal representation.	Fees based on fixed schedule ranging from \$20 to \$40 per parcel for projects involving more than 6 properties; Upward adjustment is made for smaller projects; Per diem rate of \$100 for special use properties. Fees for commercial and industrial properties are predetermined lump sums based on complexity of appraisal problem.	Fee buyers not engaged.	Lump sum fee, normally about 6% of estimated cost of structure.
Utah	Lump sum fee negotiated on a basis of estimated production cost computed by the consultant and compared with previously experienced fees related on a percentage of estimated construction cost basis and adjusted for complexity and other pertinent factors. As a check, it is also compared with Figure 2, ASCE Manual No. 38 and ARBA Bulletin No. 253. The latter guides are considered somewhat high, particularly for projects below \$2,000,000.	(not normally engaged)	(not normally engaged)	(not normally engaged)	
Vermont	Negotiated fee based on staff estimate of cost of surveys, bridge design, roadway design, and right-of-way plans.	Fees based on County Bar Ass'n. rates; Attorney General negotiates all contracts.	Contracts awarded on the basis of either proposals submitted by pre-qualified appraisers or negotiated fees depending upon the size of the project.	Fee buyers are not engaged.	Lump sum fee, normally about 6% of estimated cost of structure.
Virginia	Negotiated lump sum fees based on complexity of proposed work; Fees average between 3.5% and 5.0% of the construction cost; Small single bridges will increase the fee.	Fees established by State Attorney General; Standard fees range from \$15 to \$200 per normal task or transaction with additional fees for contested condemnation cases, the amount of additional fees being based on complexity of the work.	Negotiated lump sum fees based on volume and complexity of the work; Contract provides that appraiser will testify in court on a fixed per diem basis.	Fee buyers are not engaged.	Fees based on percentages of construction cost ranging from 8% (for projects costing \$25,000 or less) to about 5.5% (for projects costing \$1,000,000 or more).

REFERENCES

1. "Consulting Engineering - A Guide for the Engagement of Engineering Services," American Society of Civil Engineers, Manual No. 45, April, 1964.
2. "Professional Practice of Surveying and Mapping Within Civil Engineering," American Society of Civil Engineers, Manual No. 45 A, January, 1965.
3. "Negotiated Engineering Contracts Protect Public Interest - Competition on Price Basis Unsound," American Society of Civil Engineers, February, 1955, Revised December, 1961.
4. "Selection of a Consulting Engineer," Garvin H. Dyer, Journal of American Water Works Association, Vol. 54, No. 3, March, 1962.
5. "Guide for the Selection of Engineers in Private Practice," Adopted September 28, 1961 by the Coordinating Committee on Relations of Engineers in Private Practice with Government (AICE, ARBA, ASCE, CEC, NSPE), published by Consulting Engineers Council.
6. "A Reference Guide for Negotiation of Engineering Services to be Performed by Consultants on Highway Projects in the United States," American Road Builders Association, Technical Bulletin No. 253, 1964.
7. "Private Practice of Civil Engineering," American Society of Civil Engineers, Manual No. 38.
8. "Guide for Selecting, Retaining and Compensating Professional Engineers in Private Practice," National Society of Professional Engineers, February, 1963.

9. "Guide to Engagement of and Compensation for General Engineering Services," Kentucky Society of Professional Engineers and Kentucky Association of Consulting Engineers, October, 1964.
10. "Compilation of Consulting Engineer Fee Schedules," Consulting Engineers Council, May, 1962.
11. Employment of Consultants for Engineering Services, Bureau of Public Roads Policy and Procedure Memorandum 40-6, Transmittal 38, August 23, 1965.
12. Contracts for Consulting Engineering Services, Bureau of Public Roads Circular Memorandum to Regional and Division Engineers, April 30, 1964.
13. Private Enterprise Bulletin, Consulting Engineers Council, December, 1964.
14. "What did Hoover Really Report?" Consulting Engineer , Page 100-109, August, 1960.
15. "Roads Administrator Explains Increase in Financial Deficiency," Transport Topics, page 18, February 22, 1965.
16. "Consulting Engineering Contract Procedures", Kentucky Department of Highways, Official Order No. 73646, March 2, 1965.
17. "Study of Design Engineering Cost, Department of Highways, Commonwealth of Kentucky", Ernst and Ernst, April, 1965.
18. Kentucky Revised Statutes, 45.360 Director of Purchases, powers and duties.
19. "Illinois Section Committee Conducts Ethics Survey," Civil Engineering, page 56, December, 1964.
20. "Washington Observer," Engineering News Record, p.11, August 19, 1965.
21. Letter, D. A., Office of the Chief of Engineers, Subject: Procurement of Surveying and Mapping Services, August 13, 1965.
22. "Personnel Policies," page 47-50, Personnel: The Management of People at Work, by Dale S. Beach, MacMillan, 1965.