

Your Money's Worth—Highway Maintenance by Contract

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More and more highway departments, both state and local government groups, are awarding maintenance work to contractors. An increasing variety of maintenance work is being awarded. In view of the great interest on the part of both the highway departments and contractors in seeing that more work is done by contract, the Associated General Contractors of America were extremely pleased that we were invited to discuss the subject of highway maintenance by contract at the 40th Annual Purdue Road School. A.G.C. membership consists of 6,500 leading general contractors throughout the United States, and of this number over 3,000 are highway contractors interested in the programs of the various highway departments.

EXPANDED PROGRAM OF ROAD CONSTRUCTION IS EXPECTED

Due to the great increase in federal aid for highways recently approved by Congress, the nation's highway construction program is to be expanded greatly. The new modern highways to be constructed will require maintenance just as do our present roads. With this expanded work, many highway departments will find that their maintenance program will be increased and that it will continue to offer numerous problems. The more foresighted departments have already sought the help of contractors on many of their maintenance projects. Other departments may find it desirable to do so. We believe their "experiment" will be most rewarding. The construction industry has the flexibility, ability, and capacity to handle the newly planned construction. It also can adapt itself to performing many of the maintenance functions regularly performed by the highway agencies with their own forces.

HIGHWAY MAINTENANCE PROBLEM REMAINS LARGE

Each year the nation's highways have been called upon to handle greater traffic and heavier loads. Even with a greatly increased highway construction program it will be years before the nation's highway system can be brought into balance with traffic needs. During this period, highway maintenance organizations, both state and local, will be heavily burdened, trying to keep existing deficient highways in service.

A.A.S.H.O. LONG AWARE OF ADVANTAGES OF CONTRACT METHOD

The American Association of State Highway Officials has long been aware of the advantages of performing construction by contract. Almost all new highway construction is so performed. Records of the Bureau of Public Roads reveal that during the past eight years 99% of the Federal-Aid Highway Program has been accomplished by the contract method, which forcefully illustrates the complete acceptance of the contract system for new construction projects.

SPECIAL A.A.S.H.O. SUBCOMMITTEE IS FORMED

Likewise, the A.A.S.H.O. has been aware of the many advantages of performing highway maintenance by contract. The A.A.S.H.O. knew that the contracting industry had capacity available for performance of many types of highway maintenance and was anxious to have a maximum of this capacity used for such work. In order to study the matter fully, the Maintenance and Equipment Committee of the A.A.S.H.O. established a Contract Maintenance Subcommittee late in 1952 at the A.A.S.H.O. annual convention. The purpose was to study highway maintenance functions that might be susceptible to contract awards. Under the chairmanship of C. W. McCaughey, Deputy Director of the Ohio State Department of Highways, the A.A.S.H.O. Subcommittee did an excellent job in making this study.

FINDINGS OF COMPREHENSIVE STUDY ARE RELEASED

Recently this subcommittee released the findings of its comprehensive survey of maintenance procedures by all state highway departments. The data collected are most informative, and I will give you the highlights. The study showed:

- I. That 38 states, or all but 10 states, are now performing some road maintenance by contract.

- II. That of the \$600 million combined expenditure in 1952 by the state highway departments for road maintenance, one-sixth, or \$100 million, of this work was awarded to contractors.
- III. That 12 state highway departments alone awarded a total of over \$65 million of highway maintenance work to contractors. These 12 states and the amount of maintenance work they awarded in 1952 are:

Ohio	\$9,300,000
New York	7,260,000
Texas	6,550,000
California	6,410,000
Virginia	6,380,000
North Carolina	5,460,000
Kentucky	5,250,000
West Virginia	4,700,000
Minnesota	4,630,000
Illinois	4,160,000
Missouri	2,620,000
Michigan	2,450,000
	\$65,170,000

CONTRACT EXPERIENCE OF STATES IS REPORTED

That portion of the A.A.S.H.O. report dealing with replies from the state highway departments on their experience on maintenance projects awarded to contractors reveals:

- 22 states reported satisfactory experience with contract maintenance.
- 3 additional states reported very satisfactory experience.
- 10 states reported some difficulties and unsatisfactory experience on some jobs.
- 13 states, including those 10 states that made no use of the contract method for maintenance work in 1952, made no comment on their experience in using the method.

LEGAL RESTRICTIONS ARE REPORTED

The A.A.S.H.O. study also investigated the legal restrictions pertaining to the award of contract maintenance projects to contract. Findings regarding this matter included:

- 31 states have no legal restrictions on the use of the contract system for doing maintenance work.

- 2 states require the use of some convict labor on road maintenance work, which would reduce the opportunity for contractors to participate in the program.
- 1 state has a limitation requiring the taking of bids if a maintenance or betterment project costing more than \$3,000 is planned.
- 1 state requires that, for a project costing more than \$3,000, bids must be taken before the state can do the work with its own forces.
- 4 states have miscellaneous restrictions regarding the use of state forces for maintenance work.
- 9 states did not report regarding legal restrictions on maintenance work.

MUCH RESURFACING WORK IS AWARDED

That section of the A.A.S.H.O. report pertaining to major types of maintenance work awarded to contract was informative. This part revealed that \$58 million worth of resurfacing work, including road-mix jobs and high-type mix products, was awarded in 1952.

EXPANSION POSSIBILITIES LISTED FOR CONTRACT MAINTENANCE

As part of the comprehensive investigation, the various states were asked to list highway maintenance items which they thought could be handled by contract. A total of 120 such items were listed in the replies. Although many states reported the same items, 38 different types of maintenance work were listed. These are:

- 1. Furnishing and applying (or applying only) liquid bituminous materials.
- 2. Furnishing and applying (or applying only) aggregate as cover.
- 3. Furnishing and applying (or applying only) bituminous dust layer.
- 4. Furnishing and applying (or applying only) chemical dust layer.
- 5. Full performance of surface sealing or mixed-in-place resurfacing ($\frac{3}{4}$ inch or less in thickness).
- 6. Furnishing and applying (or applying only) bituminous mixes ($\frac{3}{4}$ inch or less in thickness).
- 7. Seal or spot patching of bituminous pavements.
- 8. Other patching.
- 9. Portland cement concrete pavement repairs.
- 10. Undersealing of Portland cement concrete pavements.

11. Mudjacking of Portland cement concrete pavements.
12. Furnishing and spreading aggregate on traffic-bound roads.
13. Street sweeping.
14. Other surface work.
15. Application of additional shoulder aggregate.
16. Other shoulder work.
17. Ditch cleaning and shaping.
18. Culvert cleaning.
19. Other drainage work.
20. Roadside mowing.
21. Weed killing.
22. Tree trimming.
23. Other roadside work.
24. Sign erection, painting, or cleaning.
25. Painting of pavement markings.
26. Repair of guardrail installations.
27. Painting of guardrail installations.
28. Maintenance of traffic lights.
29. Other traffic service work.
30. Bridge cleaning and painting.
31. Repair of bridge abutments and culvert headwalls.
32. Replacement of timber decks on bridges.
33. Maintenance of buildings used by highway departments.
34. Winter maintenance contracts, including snow removal.
35. Extraordinary maintenance following slides, washouts, etc.
36. Contracts for rental of maintenance equipment.
37. Production of maintenance materials.
38. Contracts for haulage of maintenance material.

SPECIAL STUDY PLANNED BY A.A.S.H.O.

Recently the A.A.S.H.O. Subcommittee launched a new project to obtain from the various state highway departments those special specifications and contract documents which have been singularly successful in the letting of maintenance work to contract. This is a timely and worthwhile project. Out of such study will come a group of recommended specifications for all the various types of highway maintenance that have been carried out successfully by contract. With such specifications widely circulated, many highway engineers may receive helpful suggestions on how to get their particular highway maintenance problem done by contract. We are looking forward to completion of this task unit's latest project.

A.G.C. CHAPTERS ARE ANXIOUS TO HELP

Local chapters of A.G.C. are anxious to work with all highway officials and engineers in solving problems pertaining to highway maintenance. A.G.C. chapters are anxious to assist state and local highway departments in preparing special specifications, contract forms, and procedures that would permit a larger volume of maintenance work to be awarded.

OUTLOOK FOR CONTRACT MAINTENANCE VERY ENCOURAGING

The completed study of the A.A.S.H.O. Subcommittee gives an encouraging outlook for maintenance by contract. The 23 states that have experienced satisfactory results will continue to use the contract method and to an increasing extent. Neighboring states that have not used this procedure, or who have not been completely satisfied with results, will no doubt study the specifications and methods that have resulted in many types of maintenance work being handled satisfactorily by contract in other areas. It is believed that reports this year, and in the years to follow, will show more and more state and local highway organizations turning to contract maintenance.

MANY FACTORS FAVOR CONTRACT WORK

The reasons for this assumption are as follows:

- (a) Highway agencies can stabilize and reduce their own maintenance forces by awarding some of their maintenance operations to contractors.
- (b) Sufficient maintenance work has now been done by contract that definite specifications and satisfactory payment procedures can be prepared for many types of work.
- (c) Award of maintenance work to contractors permits the highway departments to determine more closely the cost of many operations.
- (d) Keen competition prevails today for road contracts, including both new construction and maintenance projects—last calendar year the national average number of bidders on federal-aid highway projects was 6.6 bidders, much higher than the previous year.
- (e) By awarding maintenance jobs to contractors, highway departments can have the work performed at economical cost by well-trained, experienced crews that the contractor has devel-

oped into highly efficient units to meet today's keen competition.

- (f) A major asset of the highway contractor over the years has been his ability to adapt existing equipment or to develop special machines to handle difficult operations.

PENNSYLVANIA TURNPIKE MAINTENANCE WORK IS AWARDED

Because of the factors just listed, toll roads, which are privately financed and must of necessity keep close track of their expenditures, are awarding maintenance work to contractors. For example, the Pennsylvania Turnpike, the granddaddy of modern toll roads and now 14 years old, last year awarded contracts to two separate construction firms for replacement of 16,000 square yards of broken concrete pavement sections. Repair work was required at many locations and the work had to be done under heavy traffic, since the turnpike in 1952, the latest year for which figures are available, carried more than 11,000,000 vehicles. Included in the contracts were items for excavation, base material, borrow material, and underdrains. The entire project has been described in technical journals as highly successful.

LONG-RANGE PLANNING IS IMPORTANT ON MAINTENANCE

Although many of our new toll roads, freeways, and urban expressways are already operating at, or near, capacity, their useful life will continue for years with proper maintenance. Long-range planning is important in the construction of these highways, and it will be important also in their maintenance. In view of this fact, highway departments are urged to program their maintenance on a long-range basis.

HIGHWAY MAINTENANCE PATTERN WELL ESTABLISHED

The pattern of highway maintenance is well established. It, of course, depends on local conditions, which generally vary widely within a given state and frequently within a county. But even with the maintenance pattern established, perhaps a review should be made of the local highway maintenance procedures. We would like highway departments to give serious study to the following important questions:

- (a) Does your highway organization maintain a fleet of equipment which is used extensively, or do many of these units stay in the shed several months of each year?

- (b) Can the equipment budget of each highway department keep that organization supplied with so much specialized equipment and tools, especially when much of this equipment is already being used by contractors on new construction and for other operations?
- (c) Can the payroll budget of each department carry on its payrolls sufficient skilled workmen to operate and maintain all the specialized pieces of equipment, particularly where the units are to be operated for only short periods?
- (d) Would it be more economical on those projects which occur at infrequent intervals to do the work by letting a contract?

Of course, local conditions and requirements govern. This we fully appreciate, but we are certain that numerous highway departments are anxious to study all of the possibilities and advantages of maintenance by contract.

REPRINTS ILLUSTRATE SUCCESSFUL CONTRACT WORK

Our association is certain that there are plenty of contractors that would like an opportunity to bid on maintenance work, whether it occurs in winter, summer, spring, or fall. We have heard it mentioned by some highway officials that contractors term maintenance items "nuisance items." Perhaps in some areas this is true, but generally contractors are eager to have the opportunity to bid on highway maintenance items of any type. Our A.G.C. chapters will be most happy to work with you on locating contractors that will bid on such work, giving you assurance of numerous bidders, which will result in the lowest possible price.

MAJOR ADVANTAGES OF CONTRACT METHOD ARE NUMEROUS

By now you are ready for a listing of the several major advantages of the contract system. These important advantages include:

1. Definite cost of a project is known before the work starts.
2. Quality is guaranteed in accordance with plans and specifications.
3. Completion on schedule is assured, or the contractor will pay liquidated damages.
4. Lowest possible cost is secured through free and open competition.

5. Each project is planned to fit the needs most effectively.
6. Centralized responsibility for the work is secured.
7. Operation is performed through the normal channels of the construction industry.
8. The contractor can exercise the function of creative management.
9. Safety measures can be correlated.
10. The contract system is the free enterprise method that has made America the world's greatest nation.

METHODS TO SECURE MAXIMUM ECONOMY

We believe it is also appropriate that we recommend a few simple procedures that would permit increased economy on maintenance work awarded to contract, just as these steps provide increased economy on new construction. We strongly recommend:

1. That in preparing both the contract documents and the design, the engineer constantly keep in mind the methods to be used for economical operations by the contractor.
2. That designs take into account new methods of construction.
3. That it be remembered that a design that appears most economical from a purely design standpoint may actually be more costly if it calls for special construction methods.
4. That the engineer be responsible for the accuracy of engineering data shown on plans.
5. That engineering plans be complete and definite, yet sufficiently flexible so that they may be adapted without loss of time and, if possible, without increase in cost, when conditions change in the field.
6. That designs permit, whenever possible, duplication of operations.
7. That specifications permit the most economical use of construction equipment and the use of large units whenever possible. Today, hand labor is expensive, and the contractor must use mechanized methods for economy.
8. That interpretation of specifications be entrusted to supervisory personnel who have had practical experience on highway work, who have authority to make binding decisions, who understand the contractor's methods of obtaining results, and who are able to interpret the specifications accurately without making unreasonable restrictions on the contractor's operations.

Might the A.G.C. further suggest to awarding agencies seeking greater economy, that these agencies aid the contracting industry by the following logical steps:

1. Provide sufficient inspectors that the contractor can operate "round-the-clock" if conditions require; the contractor's investment in equipment is large, and economical methods demand long hours of operation of this machinery when weather permits.
2. Work for a balanced program each year; that is, do not have a lot of resurfacing work one year and none the next.
3. Make each year's construction season as long as possible by awarding all projects as early as possible.
4. Pay the contractor promptly for completed work; his workmen demand that they be paid each pay day, and prompt payment of vouchers from equipment distributors and materials men results in lower prices.

AMERICAN METHODS ATTRACT WORLD-WIDE ATTENTION

To conclude, the United States is known throughout the world for its assembly line methods and for the use of its machine tools and equipment to do the job with minimum man hours. In our Washington office, hardly a week goes by without a visit by engineers or contractors from a foreign country wanting information about highway projects they might visit to observe our methods and our use of the world's best road equipment. The American combination of men, machinery, know-how, and incentive is hard to beat. On new construction it has been tried and proven. Try it on your maintenance program. Results will speak for themselves.