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Construction Incentive Guidance



CONSTRUCTION INCENTIVE GUIDANCE

MAY 1989

**OFFICE OF WATER
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460**

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SECTION 1
INTRODUCTION

1.1 Purpose

The purpose of this guidance is to encourage the use of the construction incentive (CI) clause in the EPA Construction Grants Program and the State Revolving Fund (SRF) Program. Applied during construction, the use of the CI clause is effective in ensuring that the contractor and the project owner can jointly benefit from useful changes that reduce construction costs. This guidance applies to EPA-funded and SRF-funded wastewater treatment facilities that are to be constructed, renovated, expanded, or improved.

This guidance is intended for use by Federal, State, and local officials, to explain the use of the CI clause in construction contracts. It discusses the role of the contractor in the CI program, and explains the policy and procedures for soliciting and evaluating construction incentive change proposals (CICPs), including essential elements that facilitate prompt review and approval of CICPs.

1.2 Background

The Construction Grants Program was initially authorized and funded under the Federal Water Pollution Control Act of 1956. In

1978, EPA authorized the use of the CI clause in the Construction Grants Program, provided that incentive payment limitations imposed by EPA were not exceeded. During the ensuing ten years, few project owners used the clause, and even fewer contractors submitted CICPs. In 1987, in order to encourage project owners to use the CI clause, and to encourage contractors to submit CICPs under contracts which include the clause, EPA modified its limitations on incentive payments for approved CICPs. This guidance includes an explanation of these modified payment limitations.

1.3 Discussion

The CI clause offers a mechanism by which construction contractors can be motivated to apply their construction expertise to reduce contract costs. This positive motivation is achieved through substantial monetary incentives for submitting a CICIP that reduces a facility's construction costs, without compromising its reliability or performance characteristics. The sharing arrangement, contained in the CI clause, is established to encourage contractor ingenuity and initiative in identifying and challenging high cost design or specification requirements.

SECTION 2
CONSTRUCTION INCENTIVE PROGRAM REQUIREMENTS

2.1 Authority

Section 212(2)(B) of the Federal Water Pollution Control Act requires the use of a cost-effective approach to wastewater treatment projects. This requirement is met by:

- a. cost-effectiveness analysis during facilities planning,
- b. value engineering (VE) studies during design, and
- c. CI clause application during construction.

2.2 Applicability

The basic guidance pertaining to the CI program, which is contained in this guidance document, reflects only EPA requirements for the CI program. Many states and municipalities have laws, regulations, and policies which supplement Federal requirements. Before including the CI clause in construction contracts, project owners should ensure that they are in compliance with existing State and local requirements.

2.3 Implementation Procedures

Project owners may include the CI clause in any construction bid package where a potential exists for contractor participation in the CI program. However, the clause may not be added after bids have been received, due to the potential for collusion between

the project owner and one of the bidders, giving the bidder the unfair advantage of knowing that the CI clause would be added after the bid opening.

2.4 Subcontractor Participation

Both the prime contractor and subcontractors may participate in the CI program when the clause is included in the construction contract, but subcontractor participation must be effected through the prime contractor, because no direct contractual agreement exists between the subcontractors and the project owner. Moreover, sharing arrangements between the prime contractor and subcontractors are made solely between these parties, and therefore may differ from the cost sharing provisions of the prime contract, unless the prime contract specifically requires the contractor to insert the same CI clause in all subcontracts.

2.5 Participation Limitations

Individuals and firms who have had prior involvement in the project's design or the project's VE study are not eligible to participate in the development of a CICP, or to share in any of the savings resulting from approved CICPs. Furthermore, contractors should continue the construction work as scheduled while a CICP is being evaluated. Delays in processing CICPs by the project owner, the State, or EPA cannot be used as a basis for extending the completion date of a construction project, unless the project owner agrees to do so by executing a change order. If the project owner

agrees to such an extension, any additional costs incurred by the project owner (such as the cost of additional resident inspection services) will usually be unallowable costs under the EPA Construction Grants Program.

2.6 CICP Review Process

Because technical and cost data for each CICP submitted by the contractor must be carefully reviewed, the organization that reviews the CICP must possess the needed expertise and resources for performing an effective review. When a CICP is submitted by a contractor in response to the CI clause, the project owner should proceed with the following steps:

- a. Expeditiously review the CICP in accordance with the time limit specified by the contractor in the CICP. The primary review may be performed by the project owner's own employees (if qualified), the construction management firm, the firm providing inspection services during construction, or the design firm. If the primary review is not performed by the design firm, the design firm should also review the CICP, because the design firm remains legally responsible for design integrity. In unusual cases, the project owner may request technical assistance from EPA or from the State. These agencies, in turn, may request assistance from the U.S. Army Corps of Engineers (COE) under its interagency agreement with EPA. When a project owner requests such assistance,

the project owner is responsible for distributing copies of the CICP to the appropriate offices for review.

- b. Carefully review the contractor's cost figures. Compare the pertinent bid items against the engineer's estimate, to ensure that cost savings are not based on a bid item that was unbalanced (i.e., artificially high) when bids were submitted.
- c. Review all comments, and when appropriate, call a special meeting with all concerned parties to resolve any outstanding comments.
- d. Subject to State and/or EPA approval, notify the contractor in writing of the decision made on the CICP.
- e. If the CICP has been approved, in whole or in part, prepare a deductive change order and follow normal procedures for change order review and approval.

2.7 Acceptance of CICPs

Acceptance or rejection of a CICP requires no justification in the letter to the contractor. When a proposal involves partial acceptance, or adjustment of the contractor's estimated savings, justification should be provided for the project owner's estimated savings. If the project owner modifies a proposed change before granting approval, such modifications must be fully described in the letter of acceptance.

SECTION 3

USE OF THE CONSTRUCTION INCENTIVE CLAUSE

3.1 Purpose

The CI clause has three basic purposes:

- a. to take advantage of a contractor's construction expertise;
- b. to allow contractors to isolate high-cost areas where viable lower-cost alternatives exist; and,
- c. to provide a contractual means for sharing savings that will accrue from CICPs submitted by contractors.

3.2 The CI Clause Defined

The CI clause is an option that may be included in the contract documents, if not prohibited by State or local laws. The CI clause allows a contractor or subcontractor to propose changes in the project which will:

- a. provide at least a \$50,000 gross capital savings (a lower amount may be specified in the CI clause by the project owner, if it can be demonstrated that a smaller CI proposal can be cost-effectively reviewed).
- b. result in a net life cycle cost (LCC) savings over the life of the project; and,
- c. not reduce the quality or integrity of the project, including compliance with National Pollutant Discharge Elimination System (NPDES) or State Pollutant Discharge Elimination System (SPDES) permit requirements.

3.3 Contractor's Incentive

Contractors are in the construction business to make a profit. The CICP rewards contractors who propose changes without sacrificing the essential functions and characteristics of a treatment facility. The contractor may not share in any savings resulting from a decrease in operation and maintenance (O&M) costs, because no provision is made for such savings in the CI clause. However, the CI clause offers the contractor an opportunity to receive 55 percent of the net capital savings that accrue from accepted CICPs.

3.4 Contractor's Role

There are many valid reasons why contractors can improve on the best of wastewater treatment designs. First and foremost, they are in a better position to keep current on the latest advances in construction methods and cost of materials. They know first hand the day-to-day problems involved in the construction of treatment facilities. They also are in a better position to get new and innovative ideas from subcontractors and vendors.

3.5 Contractor's Risk

The CI clause encourages entrepreneurship by rewarding contractors for the financial risks they undertake to develop CICPs. Entirely voluntary in nature, the clause permits a contractor to ignore this provision and still perform satisfactorily under the contract. If the contractor chooses to submit one or more proposals, he risks the investment necessary to prepare and

submit CICPs, since he will not be reimbursed for this effort. Because the contractor is not allowed to delay the construction schedule for CICI development or for any other reason not approved by the project owner, he further risks paying liquidated damages for any delay that may occur as a result of his participation.

3.6 Project Owner's Incentive

There is a powerful incentive for project owners to include the CI clause in construction contracts - the chance to save substantial amounts of capital funds, without the need to undertake an effort to identify sources of potential savings. The construction contractor will initiate and develop potential cost-saving ideas, which the project owner needs only to review - a review very much similar in nature to that performed for other change orders initiated by the construction contractor.

3.7 Project Owner's Role

Project owners are encouraged to insert the CI clause in their construction contracts. Although the CI program is voluntary, the contractor may participate in the program only if the clause is included in the original contract documents. The CI clause may not be added after the bids are received on the project. Where the CI clause is included in the contract, the contractor can propose changes in construction techniques or materials at any time after contract award.

Since insertion of the CI clause in the contract does not guarantee contractor participation in the CI program, it is important for the project owner to encourage development of CICPs, and to assure contractors that the proposals will be processed fairly, impartially, and expeditiously.

3.8 Project Owner's Risk

The project owner assumes a very minimal financial risk from using the CI clause, since most costs that result from implementing accepted CI proposals (redesign costs, net increases in inspection and testing costs, and the present value of net increases in O&M costs during the useful life of the project) are deductible from gross CICIP savings, and thus have only a small negative impact on the LCC of the treatment facility. The costs of including the CI clause in the approved contract documents, promoting use of the CI clause, reviewing CI proposals, and processing deductive change orders are not deductible from gross CICIP savings, but these costs will be a very small portion of a construction project's total administrative costs.

3.9 Model CI Clause

To assist project owners in implementing the CI program, a model CI clause has been developed. However, project owners should review this model clause carefully, and should only use language

which implements this model clause, consistent with State and local laws, regulations, and court decisions.

I. PURPOSE

This clause defines a "construction incentive change proposal" (CICP) and establishes the policy and procedures for application of CICPs.

II. REQUIREMENTS

A CICP is a formal written proposal for a deductive change order during the construction of a wastewater treatment project. A CICP must be initiated, developed, and identified as such by the contractor or subcontractor. A CICP must result in a gross capital savings of \$50,000 or more. A CICP must also result in a net capital cost reduction, while meeting all of the following conditions:

1. The total life cycle cost of the project will not increase.
2. The required functions, reliability, and safety of the project will be maintained.
3. The proposed change will not result in any contract rebidding.
4. The proposed change will not cause undue interruption of the contract work.
5. The proposed change will be in compliance with all Federal, State, and local permits and regulations.

III. CONTENT

A CICP must contain pertinent information and supporting documentation for evaluation by the project owner. As a minimum, the following information must be included:

1. Names of individuals associated with the development and preparation of the CICP.
2. A detailed description of the present design and the proposed changes. Clear identification of any advantages and disadvantages for each proposed change.
3. A detailed procedure and schedule for implementing the proposed change. This should include all necessary contract amendments, as well as the latest date that the CICP could be approved for implementation, without disrupting the construction schedule. Normally, at least 90 days should be allowed for the project owner's review of the CICP.
4. A summary of the estimated costs, including the following:
 - a. project construction costs before and after the CICP. This should be a detailed estimate identifying the following items for each trade involved in the CICP:
 1. quantities of materials and equipment.
 2. unit prices of materials and equipment.
 3. labor hours and rates for installation.
 - b. life cycle operation and maintenance costs before and after the CICP;

- c. costs for implementing the CICP not included in item 4a above, to the extent that they can be identified by the contractor (e.g., additional resident inspection services);
- d. contractor's share of the savings, based on paragraph III below;
- e. other data as required in the contract specifications for change orders; and
- f. time required for executing the proposed change.

To the extent indicated below, contractors may restrict the use of any CICP, or the supporting data submitted pursuant to this clause, by the project owner and by other Federal, State, and local government agencies. Suggested wording is provided below:

"The data, furnished pursuant to the construction incentive clause of contract # _____, shall not be disclosed beyond that which is necessary to accomplish the review of the CICP, or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate CICPs submitted under said clause. This restriction does not limit the right of the project owner, or any Federal, State, or local government agency, to use information contained in the data if it is or has been obtained, or is otherwise available, from the contractor, or from any other source, without limitation. If

such a proposal is accepted by the project owner under said contract, the project owner and all other Federal, State, and local government agencies shall have the right to duplicate, use, and disclose such data, in any manner and for any purpose whatsoever, and to have others do so also."

The project owner may modify, accept, or reject the CICP. However, if a CICP is modified, or is not acted upon within the time frame specified in the CICP, the contractor may withdraw the proposal, in whole or in part. In any event, the project owner will not be liable for the contractor's cost of developing the CICP.

When a CICP is accepted by the project owner, the processing procedure for change orders will be used, except that for a CICP, a deductive change order, for 45 percent of the net capital savings, will be processed. (The remaining 55 percent of the net capital savings will be retained by the contractor.) When a CICP is rejected, the contractor may not appeal the rejection to any Federal, State, or local government agency.

IV. SHARING PROVISIONS

Upon acceptance of a CICP, the contractor will share the net capital savings pursuant to this contract, based on the formula

below. Computation for the net savings is to be based on the following formula:

Net capital savings equals initial construction cost less revised construction cost, and less CICIP implementation cost.

The CICIP implementation cost shall include the project owner's cost of redesign, the net increases (but not decreases) in inspection and testing costs, and the present value (using the EPA discount rate in effect on the date of grant award or loan approval) of the net increases (but not decreases) in operation and maintenance costs during the useful life of the project. However, change order processing costs incurred by the project owner and the reviewing agency are not included in the CICIP implementation cost.

The contractor's cost for developing the CICIP is not an allowable cost, but is to be offset by a portion of the contractor's share of the net capital savings.

The contractor will receive 55 percent of the net capital savings (or a lower amount specified in the contract).

SECTION 4
POTENTIAL SAVINGS

4.1 Introduction

Although the CI program has been in existence in EPA since 1978, few project owners have used the CI clause, primarily because the clause and its potential benefits are not understood by project owners, and because its use is not mandatory. Similarly, construction contractors have been unfamiliar with the incentive provisions where the clause was included in their contracts. Unfortunately, if the clause was not part of the contract documents at the time of bid opening, it could not be added later, even though the contractors may have uncovered areas for potential CIGP savings.

Project owners are encouraged to insert the clause in all construction contracts. Once the CI clause has been developed, the cost to make it a part of the contract is insignificant, while the potential savings can be quite significant. For example, COE savings from the use of incentive clause provisions during the last four fiscal years were \$31.6 million. During this period, the COE received a total of 2,086 proposals and approved 1,358 proposals, which is 65 percent of the proposals received.

4.2 Environmental Protection Agency Examples

The following examples represent CICPs submitted by contractors and accepted by project owners for EPA-funded construction projects:

- a. A CICIP in Camden County, New Jersey resulted in a 1.6 percent capital savings through realignment of portions of an interceptor sewer to avoid construction near overhead power lines. Because of the extreme caution required when working near power lines, the new alignment enabled the contractor to work more rapidly. Net savings to the Camden County Municipal Utilities Authority equaled \$220,014.
- b. A CICIP in Keokuk, Iowa produced capital savings of 1.3 percent through structural design modifications. The modifications included:
 - (1) Replacement of drilled piers with driven steel pilings;
 - (2) Substitution of lightweight vermiculite concrete with a structural cap for standard concrete fill; and
 - (3) Grit channel modification instead of demolition of existing concrete.

Net savings to the City of Keokuk equaled \$104,961.

- c. A CICIP for an outfall for the Hampton Roads Sanitation

District in Virginia Beach, Virginia resulted in a 1.5 percent capital savings through the use of a Hydro-Pull Method instead of a draw bolt assembly for joining prestressed concrete pipe. Net savings to the Hampton Roads Sanitation District equaled \$44,975.

4.3 Corps of Engineers Examples

The following examples illustrate change proposals submitted by contractors and approved by the COE:

- a. A contractor proposed increasing the maximum weight of stones used in dike construction from 550 pounds to 5,000 pounds, which reduced the total contract cost by \$148,000. The 5,000 pound stone constitutes a standard maximum weight for dike construction.
- b. A contractor proposed using 2-inch wood chips instead of gravel to construct a walkway in a public recreation area, which reduced the contract cost by \$63,000.
- c. In constructing the roof of a building, a contractor proposed using elastomeric roofing material in lieu of polyvinyl chloride (PVC) single-ply roofing, which reduced the cost of construction by \$22,000.

SECTION 5

CONTRACTOR MOTIVATION AND GUIDANCE

5.1 Introduction

The success of the CI program depends on motivating contractors to develop innovative ideas and to submit CICPs. Their basic incentive is the monetary share of the savings that they receive when the CICP is accepted, but more use of the CI clause does not of itself ensure success. Project owners should encourage contractors by highlighting the fact that their contract contains a CI provision, and that the project owner is receptive to receiving and approving proposals that reduce the contract cost without reducing the quality or changing the design characteristics of the facility. A successful program requires a cooperative effort by the project owner and the contractor.

This section is intended to give project owners a concise source of information needed to gain contractor acceptance of the CI program. If project owners understand the basic needs of their contractors, they will be more likely to gain their confidence and encourage the development of CICPs.

5.2 Program Participation Benefits

The most obvious tangible benefit derived from contractor participation in the CI program is the share of savings that accrue

from CICIP approvals. The savings represent an increase in the contractor's return on investment in contract performance.

In addition to their share of savings from implemented CICIPs, contractors who develop and submit CICIPs gain an advantageous competitive edge over other contractors by constructing facilities at lower cost; hence, they gain a reputation as cost-conscious contractors.

5.3 CICIP Opportunities

Although a CICIP may be submitted at any time after contract award, a proposal originated soon after contract award tends to produce greater savings. Early CICIP submittal allows sufficient time for review and approval by the project owner, permits proposals to be submitted on all phases of construction, and facilitates acceptance of new and improved components or subsystems that require testing and/or evaluation prior to acceptance. Consequently, during pre-award and post-award contractor conferences, project owners should not only highlight the fact that the proposed contract contains the CI clause, but also stress the value of early CICIP submittal.

5.4 CICIP Submittal

The probability of CICIP acceptance can be increased by the effort the contractor expends in its preparation. First and

foremost, the proposal should contain sufficient information to answer all reasonable questions that an evaluator may have. To avoid delays in processing because of insufficient information or the appearance of inadequate investigation, each CICP should:

- a. Be complete. The CICP should present the proposal to the evaluator in a clear and concise manner. Although no forms are required to submit a proposal, the recommended format contained in paragraph II of the model CI clause should be followed, to enhance the evaluator's ability to make a positive decision regarding the proposal.
- b. Provide technical supporting data. Supporting data should include the benefits and risks to the project owner, tolerances, operating manuals, test data, LCC impact, and previous uses of the proposal. This type of data is most beneficial to the evaluator. In particular, test results and a description of the tests performed are of significant value in gaining acceptance of new methods or materials.
- c. Sell the proposal. An oral presentation should be offered by the contractor, through the project owner, to the technical evaluator. This approach is particularly valid if the CICP is a high dollar value proposal and/or presents a significant departure from current technology.
- d. Provide a detailed cost analysis. In addition to "before and after" costs for the proposed change, the contractor

should address any potential LCC benefits, as well as any intangible benefits (such as increased reliability) that may accrue if the CICP is accepted.

5.5 Informal Notification

Rather than risk significant funds to develop, prepare, and submit a formal CICP, contractors may informally notify the project owner that they intend to submit a proposal having a major impact on the wastewater treatment process or on the total cost of the construction contract. The project owner may then informally tell the contractor whether the proposal should be pursued or dropped. At the same time, the contractor should be informed that a positive response by the project owner does not ensure that a formal CICP will be accepted. Also, unlike the formal CICP, informal disclosure does not establish the contractor's rights to the proposal or to supporting data.

5.6 CICP Transmittal Letter

Although the contractor is not required to submit a transmittal letter, it is a good marketing tool that improves the rapport between the project owner and the contractor, speeds up the evaluation and acceptance process, and increases the probability that the proposal will be accepted by the project owner. At a

minimum, the letter should contain the following items:

- a. a statement that the CICP is being submitted in accordance with the CI provisions of Contract # _____;
- b. a summary of the proposed change, including the proposed change in the contract amount and the total net capital saving expected if the CICP is approved;
- c. any additional advantages that may be derived as a result of the change, including intangible benefits; and
- d. the contractor's point-of-contact for questions that may arise during proposal evaluation.

APPENDIX A

REFERENCES

For additional information on project management methodology and processing of change orders, EPA has several publications available from its Instructional Resource Center, 1200 Chambers Road, Room 310, Columbus, Ohio 43212. Specific ordering information may be obtained by calling 614-292-6717.

1. Management of Construction Change Orders - A Guide for Grantees, U.S. EPA, March 1983.
2. Prevention and Resolution of Contractor Claims, U.S. EPA, March 1985.
3. Management of a Construction Project - A Guide for Grantees, U.S. EPA, April 1986.

For additional information on the methodology of life cycle costing, the following book can be obtained commercially through most bookstores.

4. Life Cycle Costing for Design Professionals, Alphonse J. Dell'Isola and Stephen J. Kirk, McGraw Hill, 1981.

APPENDIX B

CONSTRUCTION INCENTIVE COORDINATORS

<u>Region</u>	<u>Name</u>	<u>Commercial Phone</u>	<u>FTS Phone</u>
1.	William Bulter	617-565-3564 Boston, MA	835-3564
2.	Raymond Kvalheim	212-264-7177 New York, NY	264-7177
3.	Bruce Smith	215-597-9890 Philadelphia, PA	597-9890
4.	Don J. Cotter	404-347-3633 Atlanta, GA	257-3633
5.	Harold Heavlin	312-886-0269 Chicago, IL	886-0269
6.	Gene P. Wossum	214-655-7130 Dallas, TX	255-7130
7.	Gerald Gutekunst	913-236-2813 Kansas City, KS	757-2813
8.	Mohammad Razzazian	303-293-1551 Denver, CO	564-1551
9.	Enio Sebastiani	415-974-8316 San Francisco, CA	454-8316
10.	Richard Hetherington	206-442-1941 Seattle, WA	399-1941
HQ	Thomas J. Moran	202-382-7274 Washington, DC	382-7274