AID 1020-24 (10-69)

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AGENCY FOR INTERNATIONAL DEVELOPMENT (A.I.D.)

PROJECT AUTHORIZATION

1. PROJECT NUMBER	3. COUNTRY	4. AUTHORIZATION NUMBER
931-11-995-919	World-Wide	TA 0104
2. PROJECT TITLE		5. AUTHORIZATION DATE
Reducing Costs and Improving Performance in Construction of Public Works		2/4/71
		6. PROP DATED

7. LIFE OF PROJECT

a. Number of Years of Funding: 2
Starting FY 19 71; Terminal FY 19 72

b. Estimated Duration of Physical Work After Last Year of Funding (in Months): 12

8. FUNDING BY FISCAL YEAR (in U.S. $ or $ equivalent)	DOLLARS		P.L. 480	LOCAL CURRENCY Exchange Rate: $1 =			
				U.S. OWNED		HOST COUNTRY	
	~~GRANT~~ Contract	LOAN	CCC + FREIGHT	GRANT	LOAN	JOINTLY PROGRAMMED	OTHER
Prior through Actual FY							
Operational FY 71	125,000						
Budget FY 72	60,000						
B + 1 FY							
B + 2 FY							
B + 3 FY							
All Subsequent FY's							
TOTAL	185,000						

9. DESCRIBE SPECIAL FUNDING CONDITIONS OR RECOMMENDATIONS FOR IMPLEMENTATION, AND LIST KINDS AND QUANTITIES OF ANY P.L. 480 COMMODITIES

None.

10. CONDITIONS OF APPROVAL OF PROJECT

EA/TECH: Moderate priority for EA/TECH. No objection.

(Use continuation sheet if necessary)

11. Approved in substance for the life of the project as described in the PROP, subject to the conditions cited in Block 10 above, and the availability of funds. Detailed planning with cooperating country and drafting of implementation documents is authorized.

This authorization is contingent upon timely completion of the self-help and other conditions listed in the PROP or attached thereto.

This authorization will be reviewed at such time as the objectives, scope and nature of the project and/or the magnitudes and scheduling of any inputs or outputs deviate so significantly from the project as originally authorized as to warrant submission of a new or revised PROP.

A.I.D. APPROVAL	CLEARANCES	DATE
[signature] E. Williams	ENGR, Vernon (in draft)	12/30
	~~LA/DR, Sleeper~~	
	AFR/TAC, Belcher " "	"
	NESA/TECH, Blume (Reviewed, No Comment)	"
SIGNATURE	VN/ND, Jacobs (in draft)	"
AA 2/4/71	~~EA/TECH, Johnson (see Item 10)~~	
TITLE DATE	A/CONT [initials]	2/1/71

NONCAPITAL PROJECT PAPER (PROP)

COUNTRY: Office of Science and Technology, Technical Assistance Bureau

PROJECT NO: _____

SUBMISSION DATE: Dec. 1970 ORIGINAL: X REVISION NO.: _____

PROJECT TITLE: Reducing Costs and Improving Performance in Construction of Public Works

U.S. OBLIGATION SPAN: FY 1971 through FY 1972

PHYSICAL IMPLEMENTATION SPAN: FY 1971 through FY 1973

GROSS LIFE-OF-PROJECT FINANCIAL REQUIREMENTS: FY 1971 - $125,000

FY 1972 - 60,000

I. SUMMARY DESCRIPTION

A. Objective

This project is directed to reducing costs--including both the short-term and long-term drain on the national budget--of public works in developing countries. It will assist organizations in developing countries concerned with civil engineering projects financed by Government agencies to identify, formulate, and carry out materials research and adaptation projects which are designed to broaden the use of local materials, use less expensive substitute materials, and extend the lifetime, enhance the safety, reduce the maintenance, and improve the performance of structures.

Operating in the U.S. and participating countries, the project will also develop a technical basis and provide an impetus for subsequent steps by developing countries--with or without cooperation of external development agencies--to (a) undertake the types of materials projects which are most appropriate at different levels of national development, (b) increase the capabilities of local engineers and institutions in the analysis, testing, research, and innovation aspects of materials technologies, and (c) encourage both government and private industry to adopt the concepts of cost reduction or value engineering. Moreover, it will clarify for AID and its successor organizations and other international development

agencies--as well as for developing countries themselves--the types of adaptive research and other action programs in developing countries that offer the most promise of making a significant impact in the field of materials technology.

In summary, this project will assist in mobilizing U.S. scientific and technical expertise to work collaboratively with developing countries in an area of major economic importance to these countries. Strengthening indigenous research capabilities in materials technology is a good candidate for priority emphasis within IDI and this project should help to clarify realistic possibilities for future programs.

B. Project Components

The project will include consideration of the principal types of construction projects involving financing by developing country Governments, including public buildings, roads, dams, bridges, culverts, sewers, and retaining walls and will emcompass a variety of materials including concrete, asphalt, bricks, steel, wood, and ceramics. The inherent properties and applicability of the materials, manufacturing and construction processes, specifications, standards, quality control, preservation and maintenance will be examined. In country-specific situations primary attention will be given to locally available materials or those which are inexpensive to import. Also, it may be necessary to delimit the scope of the project more

sharply in country-specific situations to correspond more closely to the responsibilities of the concerned research organization in the country.

This project will be carried out in collaboration with host country counterpart organizations in selected and concurring developing countries. A U.S. organization with demonstrated expertise and experience in (a) materials technology, (b) establishing and managing applied research programs, (c) quality control and "value engineering," (d) business aspects of dealing with government and industry, and (e) carrying out of collaborative activities with research centers in developing countries in the field of materials technology will provide leadership. While the precise formulation of the project will depend on negotiations with the contractor, the following general approach is envisaged:

1. Literature search and consultations with U.S. experts concerning past efforts and experiences in this field. (10 percent of effort)
2. With the assistance of AID and drawing on the contractor's existing ties with developing countries, identification of promising technical institutions in four developing countries which are (a) in the mainstream of materials development and usage, and (b) known to be interested in collaborative activities. (10 percent of effort)

3. Working in collaboration with each of the selected "country project centers" and the appropriate government ministries, assessment of the current state of materials technology, clarification of gaps and weaknesses, identification of research opportunities and priorities, and formulation of specific action programs as appropriate. Preparation of summary reports for each country. (50 percent of effort)

4. Assistance to the selected local institutions in organizing local conferences and seminars for government planners, financial managers, building organizations, and engineering firms to relate research interests to operational needs and to gain a broad base of support for a program of improvement of public works. (30 percent of effort)

C. Justification:

Most developing countries invest substantial funds in the materials used for public works. Not only will the use of better basic building materials contribute substantially to the wellbeing of the population. Of equal importance is the reduction in the long-term construction and maintenance costs of public works realizable through greater durability.

Most developing countries have given some attention to specifications, codes, and quality standards for building materials. Yet in nearly all there is ample evidence that these important concepts are not fully utilized. Often these concepts are based on developed country standards with little attention given to innovative approaches to use local materials and talents. Roads deteriorate prematurely, buildings crumble, walls give way under normal loads and bridges become unsafe. The consequences are not only inconvenience but injury, delays, and unnecessarily high expenditure of resources. The causes are not thoroughly understood but undoubtedly include one or more of the following:

1. lack of appreciation of the problem--particularly by government planners;
2. lack of technical competence to test materials and develop locally acceptable improvements;
3. inadequate testing facilities;
4. lack of clear, reasonable, unequivocal and available regulations;
5. disregard of codes and specifications due to ignorance or lack of effective enforcement;
6. communicative gap between researchers and planners and construction firms; and

7. lack of conviction that research can be cost-effective.

For a number of years AID and other development agencies have financed public works projects on a broad scale and have as a consequence made substantial contributions to the level of materials technology currently in practice in developing countries. This project will complement these past heavy investments by placing a sharper focus on the institution-building aspects of indigenous research capabilities in materials technology and the integration of these capabilities with construction activities.

D. Estimated Project Costs:

1. Based upon four countries

2. Subject to refinement upon selection of contractor

Salaries, including overhead		
Professional	2 man-years in field	$ 90,000
	preparation and report (in U.S.)	45,000
Clerical		20,000
Travel		8,000
Per diem		12,000
Printing, supplies, etc.		10,000
		$185,000

FY 1971 $125,000

FY 1972 60,000

Salaries of local personnel and logistics within countries to be furnished by selected developing countries.

II. SETTING AND ENVIRONMENT

In general, developing countries are beginning to rely more heavily on local expertise in determining the materials technology aspects of specific public works projects, and in many countries research institutions and laboratories charged with this responsibility have been established. For example, in Africa, the Ministries of Works, in countries such as Nigeria, have recently increased their concern with building indigenous research capabilities. In Latin America, building research institutions are beginning to appear. In East Asia Ministries of Construction are expanding research activities.

This project is designed to take into account the special conditions of developing countries. For example:

(a) Many developing countries will continue to rely on foreign contractors for some time. As yet these countries may not have enough experienced personnel to judge the worth of complex proposals received from foreign or even domestic contractors, nor to monitor the quality of the work done. As a consequence they may select inferior proposals, underestimate the lifetime costs of lower quality work, or receive less than they pay for.

(b) To an even greater extent than in developed countries, the developing countries suffer from budget constraints. Consequently, their need to reduce the lifetime costs of public works is correspondingly greater.

(c) Most of these countries have attempted to develop a competent infrastructure of personnel and facilities but found that planning, managing, and "marketing" capabilities are as essential as technical skills to the effective adoption of quality cousciousness and "value engineering" concepts.

(d) Small differences in the raw materials (sand, limestone, coke, etc.) of developing countries may result in construction materials having different properties from the corresponding material in a developing country. Alternatively, availability or economics may dictate a different approach. For such reasons, foreign practices, standards, and specifications may not be optimum.

III. STRATEGY

A principal objective of this project is to upgrade the capabilities of the developing countries to analyze not only the technical problems of materials technology but also the institutional and social barriers to the utilization of improved materials. Therefore,

equal emphasis will be placed upon (a) the identification of technological opportunities and (b) the techniques of penetrating the industrial sector with the improved technology.

These problems apply to private construction as well as public works. However, the current proposal is directed at public works on the premise that government contracts not only constitute the bulk of such work but also offer the best opportunity for introduction of technical adaptations and leverage for enforcement of desired standards.

The general strategy envisioned is to conduct this project as a pilot or experimental phase in four countries that want to participate, selected to reflect different conditions and levels of economic development. Possible candidates include such countries as Nigeria, Korea, Colombia and Thailand.

In addition to providing the selected countries with an improved indigenous capability to upgrade their material technology and reduce costs, these activities should provide the basis for considering possible involvement of AID or other development agencies in a second phase of the program which might involve:

(a) inclusion of additional countries in the program;

(b) support of specific high priority materials research projects at local research institutions, or in the United States;

(c) more broadly based technical assistance projects to strengthen the overall capabilities of selected research instutions.

IV. COURSE OF ACTION

A suitable organization will be selected to carry out the project from qualified U.S. institutions such as Southwest Research Institute, Battelle Memorial Institute, Stanford Research Institute, Denver Research Institute, Midwest Research Institute, and Arthur D. Little. In collaboration with the AID Regional Bureau and appropriate AID Missions candidate research institutes in four or more countries will be identified. The successful contractor will participate in the final selection and then proceed to carry out the work described. The contractor will work with the collaborating institution in preparing joint reports in each of the selected countries and will prepare an overall evaluation of the project.

Appropriate reports will be furnished to the AID/W Country Desks, the Regional Bureaus, TA/OST, and the participating countries.