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ON
REHABILITATION OF
PHILIPPINE HIGHWAYS

During the late war the road and street system in the Philippines suffered extensive damage. Hundreds of bridges have been destroyed and traffic is hampered as vehicles struggle over one-way raily spans and makeshift detours. Equally extensive, if not so obviously apparent, is the damage to the roadway surfaces which was occasioned by the heavy, abnormal wartime traffic and the complete breakdown of routine maintenance activities during the war and occupation period. If the Philippine Government had to restore the destroyed facilities and repair the damaged roadways with the limited resource now at its command it would require many years to gain even the position obtaining at the signing of the war.

Another effect of the war which is of great importance in its bearing upon the future of the highways in the Philippines is the dissolution and scattering of the personnel of the Bureau of Public Works. Many competent employees are gone, never to return, and the organization is now seriously undermanned.

The Congress of the United States recognized the great need existing here in the Philippines and has extended its aid through the passage of Public Law 370. Title I of that Act authorizes appropriations for the restoration and improvements of public property and essential public services in the Philippines. As applied to public roads, Section 302 of the Act provides:

"(a) As recommended in a report based upon an investigation made in the Philippines by the Public Roads Administration of the Federal Works Agency and to the extent that the findings in such report are approved by the President, the Public Roads Administration is authorized, after consultation with the Philippine Government, to plan, design, restore, and build, in accordance with its usual contract procedures, such roads, essential streets, and bridges as may be necessary from the standpoint of the national defense and economic rehabilitation and development of the Philippines.

"(b) The Commissioner of Public Roads is authorized, under such regulations as he may adopt, to provide training for not to exceed ten Filipino engineers, to be designated by the President of the Philippines from the regularly employed staff of the Philippine Public Works Department subject to the provisions of section 311 (c), in highway traffic engineering and the construction, maintenance, and control necessary for the continued

maintenance and for the efficient and safe operation of highway transport facilities."

To implement this act and enable the necessary reconstruction to get under way the two Governments, after consultation, signed an Executive Agreement on February 14, 1947, outlining the duties and responsibilities of each Government. For the Philippine Government the Department of Public Works and Communications is the authorized agent, and for the United States Government the U. S. Public Roads Administration, acting in liaison with the United States Ambassador, is charged with the responsibility of carrying out the program.

Even before the signing of the Executive Agreement the U. S. Public Roads Administration was going ahead with the setting up of their organization here. A Division Office was established in Manila, under the writer as Division Engineer. This Division Office is comparable in all respects with the nine established Division Offices in the United States which regularly work with the various State highway departments of the Union in carrying on the highway program there. The Division Office consists of five sections, each headed by a staff officer who individually is responsible to the Division Engineer for the work entrusted to his section. These five sections are:

- Programming and Planning
- Highway Construction
- Bridge Construction
- Materials
- Administration Management

The Programming and Planning Section has the responsibility for approving the selection of individual projects for construction. It also has the broader responsibility of assisting the Bureau of Public Works in developing a long-range plan for improvement, maintenance and financing of an adequate highway system. Necessary work in the development of such a plan will include the inventory of the existing system continuing traffic counts to determine road usage and the need for further improvement and development, and an analysis of revenues and expenditures to guide the expansion of the system on a business-like basis.

The Highway Construction and Bridge Construction Sections have parallel duties, the one to assist in the design, construction, and maintenance of the roads and streets, the other to furnish similar assistance in the specialized field of bridges and structures.

The Materials Section will help the Bureau of Public Work in their effort to use most advantageously the local materials of construction and to control

all materials to insure the integrity and quality of the physical structures.

The Administrative Management Section handles the internal personnel problems of the Division and exercises adequate fiscal control over the expenditure of funds.

In more than thirty years of experience in working with the highway departments of the various States, the U. S. Public Roads Administration has developed a scheme of cooperation which works with a minimum of conflict and the maximum of results. This system is being followed here with only such minor modifications as are dictated by local conditions. The basic tenet of this system is that the initiative lies with the local authority and the Public Roads Administration acts solely in an advisory, supervisory, and administrative capacity. The local authorities are much more conversant with the needs and limitations of the system and the special qualifications which govern the design of the facilities than an outside agency can be, so the initial choice of priority, location, and design should be their responsibility. On the other hand the Public Roads Administration, because of their freedom from the pressure of local interests, can impartially weigh the merits of each individual project and thereby weld these individual projects into an efficient and coordinated over-all plan. The staff, comprised of men of specialized training and long experience in their fields, is well qualified to furnish valuable advice and counsel in all features of location and design to insure an adequate facility with the most economical expenditure of public funds.

Work under the procedure as developed proceeds along these lines: The Department of Public Works chooses projects for immediate construction from among those most urgently needed and submits a program. The individual projects are inspected for need, adequacy of design, and suitability to an over-all development of the system. If found satisfactory the program is approved and the Bureau of Public Works is advised to proceed with the detailed design of the projects. In the design of the projects the U. S. Public Roads Administration provides the benefit of their specialized knowledge as requested. While it would be desirable for all the design to be done by the local authorities the depleted condition of the Bureau of Public Works personnel is recognized and much of the actual design at present, particularly of major structures requiring especially skilled designers, is being done directly by the U. S. Public Roads Administration. As the Bureau's staff is expanded the design work will be turned back to them as rapidly as they can handle it.

The contract method of construction is

avored as the most expeditious and economical way to operate and at the same time to help restore the construction, materials, and equipment industries in the islands, although it is recognized that isolated instances will occur where the type of work is such that it can best be done by the Bureau of Public Works' own forces. Most major projects will be done by contracts awarded as the result of competitive bidding.

After the complete detailed plans, specifications, and estimate have been prepared by the Bureau of Public Works they are submitted to the U. S. Public Roads Administration where they are reviewed for completeness and adequacy. Particular attention is paid to the provision regarding construction methods and materials to see that the most efficient methods have been specified and local materials used as advantageously as possible. When the plans, specifications and estimates have been found satisfactory the Bureau of Public Works is authorized to advertise for the receipt of bids. American contractors are invited to bid on an equal footing with Filipino contractors since ordinarily most of the

financing is from funds supplied by the United States. Sealed bids are received and publicly opened and read. Award of contract is made to the lowest responsible bidder by the Bureau of Public Works, with the concurrence of the U. S. Public Roads Administration, if everything is in order and the bid prices are adjudged reasonable.

The contract for construction of a project is between the contractor and the Philippine Department of Public Works and Communications, and the United States Government is in no way a party to that contract. A separate covenant between the Department of Public Works and Communications and the U. S. Public Roads Administration covers the financing of the work from the Philippine Rehabilitation Funds provided in Public Law 370 of the U. S. Congress.

Engineering supervision and inspection of the work in progress is performed by the Philippine Bureau of Public Works. During construction, engineers of the U. S. Public Roads Administration make frequent inspections of the work in progress, giving counsel and advice to the

resident engineer as needed. The inspecting engineer's thorough knowledge of and wide experience in modern construction practices have proved valuable aids in obtaining first-class results. The contacts during the inspections also provide valuable on-the-job training to the Resident Engineers.

The Executive Agreement provides that the U. S. Public Roads Administration will reimburse the Department of Public Works and Communication periodically for work done on cooperative projects. This feature permits the prosecution of a greater volume of work than would be possible if the Department had to finance the operations until each project was completed.

The United States Congress has appropriated P20,000,000 for highway rehabilitation and training for the fiscal year ending June 30, 1947. Of this sum P2,000,000 has been reserved for administration, training, and contingencies, and projects have been programmed which will absorb the remainder of the first year's appropriation. This fund is currently programmed as follows:

Item	Project	Character of Proposed Work	Item	Project	Character of Proposed Work
1	HPS— 1 (1)	Planning, traffic surveys, inventory			San Cristobal Bridge, Laguna
2	PR— 3 (1)	Replacement of one 336-foot 2-hinged steel arch, Quezon Bridge, Manila	12	PR— 4 (3)	Reconstruction of 13 160-foot deck steel truss spans, Plaridel Bridge over Agno River, Pangasinan
3	PR— 2 (1)	Construction of high type pavement with sidewalks, Sta. Mesa Boulevard, Manila	13	PR— 7 (1)	Construction of three 40-foot concrete rigid frame spans, San Juan River Bridge, Manila
4	PR— 1 (1)	Construction of high type pavement with sidewalks, Quezon Boulevard, Manila	14	PR— 8 (1)	Reconstruction of three 160-foot deck steel truss spans, Talavera River Bridge, Nueva Ecija
5	PR— 4 (1)	Construction of high type pavement and widening, Malolos-Calumpit Road	15	PR— 9 (1)	Reconstruction of one 40-foot and two 25-foot RCDG spans, Tigbauan Bridge, Bituminous mat and seal, Highway 54 Iloilo
6	PR— 5 (1)	Relocation and construction of high type paving, Manila South Road	16	PR— 10 (1)	Bituminous mat and seal, Highway 54
7	PR— 4 (2)	Reconstruction of three 189-foot steel truss spans and substructure, Calumpit Bridge, Bulacan	17	PR— 1 (2)	Bituminous mat and seal, Quezon Blvd.
8	PR— 6 (1)	Replacement of two 240-foot steel truss spans, Banaoang Bridge over Abra River	18	PR— 2 (2)	Bituminous mat and seal, Quezon City
9	PR— 6 (2)	Replacement of two 160-foot steel truss spans, Gilbert Bridge over Laoag River	19	PR— 11 (1)	Bituminous mat and seal, Pasig Blvd.
10	PR— 6 (3)	Replacement of three 160-foot steel truss span, Amburayan River, Ilocos Sur	20	PR— 12 (1)	Replacement of three steel girder spans 107'-540'-107' in length, Jones Bridge, Manila
11	PR— 5 (2)	Replacement of three 160-foot steel truss and widening of two 40-foot RCDG spans,	21	PR— 6 (4)	Replacement of one 140-foot steel truss span, Bucong Bridge, Ilocos Sur

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REHABILITATION . . .

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Item	Project	Character of Proposed Work	Item	Project	Character of Proposed Work
22	PR— 4 (5)	Replacement of three 130-foot steel deck girder spans continuous, Bamban Bridge, Tarlac	27	PR— 4 (9)	Replacement of one 189-foot steel truss and minor repairs, Sulipan Bridge
23	PR— 4 (6)	Replacement of one 160-foot steel truss span, Cut Cut Bridge, Tarlac	28	PR— 8 (3)	Replacement of five 150-foot steel truss spans with sidewalk, Gen. Luna Bridge, Nueva Ecija
24	PR— 4 (7)	Replacement of two 80-foot steel pony trusses, addition of one 80-foot span, and minor repairs, Bued Bridge	29	PR— 5 (3)	Construction of one 80-foot steel deck girder span Viga Bridge, Batangas
25	PR— 4 (8)	Replacement and widening of four 80-foot pony trusses, Labangan Bridge over Angat River	30	PR— 4 (4)	Widening of existing structures between Malolos and Calumpit
26	PR— 8 (2)	Construction of four 130-foot steel deck girder continuous and one 70-foot steel I-beam span, Plaridel Bridge over Angat River	31	PR—14 (1)	Bituminous mat and seal on Manila streets on National System
			32	PR—15 (1)	Bituminous mat and seal on Manila streets not on National System

There has been some delay in starting full scale construction, due to the necessary time required for setting up a complete Division Office of the U. S. Public Roads Administration in Manila and to the scarcity of trained employees in the Philippine Bureau of Public Works. However, contracts have been awarded on three projects totalling \$1,678,000, and other projects involving an additional \$5,000,000 are readied for inviting bids. Plans are being prepared on the remaining items as rapidly as our available forces can prepare them. Two of the three awarded contracts are well under way, and some urgent work already has been completed by force account. In order to expedite the preparation of plans the U. S. Public Roads Administration has recruited a corps of Filipino design-

ers and draftsmen to work under their direct supervision on the design of some of the programmed projects. While the starting of the actual construction was understandably slow, a firm basis has been laid and the tempo of the work will increase rapidly.

Similar appropriations are anticipated for the next three fiscal years, so it may be expected that by 1950 a great amount of much-needed highway rehabilitation work in the Philippines will have been accomplished.

The U. S. Public Roads Administration has four objectives which they hope to accomplish while here in the Philippines. These are:

1. The rehabilitation of war-damaged facilities and the expansion of the highway system as needed to assist

in the development of national resources and to provide for the national defense.

2. Provide assistance to the Philippine Bureau of Public Works in adopting the best in modern methods of design and construction practices to use in the Islands.
3. Provide training for members of the Bureau of Public Works.
4. Further improve the friendly relations between the two Governments.

They are dedicating all their efforts toward these objectives and the warm wholehearted cooperation being received from all members of the Department of Public Works and Communications provides ample assurance that their objectives will be attained.

TECHNOLOGICAL EDUCATION . . .

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nological education to be covered and their respective priorities of emphasis, based on a careful consideration of the country's present and future needs;

(4) Policy statements and details on the expansion of existing technological-educational facilities, and the establishment of new ones, including the acquisition of adequate instructional equipment and of capable teaching staffs;

(5) A thorough analysis of the tangible and intangible value of such program to the nation's development, and a statement of policies and details relative to the financing of the program;

(6) Policy statements and details on the administrative machinery for effectively carrying out such program; and finally,

(7) Features of legislative enactments that would be needed to implement and make possible the starting and successful prosecution of the program.

We must not stop with merely a fervent wish or hope that such a program could be carried out. We must take concrete and definite steps now that will bring about the actual formulation and early execution of that program. For this

arduous task, we must gather together as many civic-spirited and qualified technological educators and industrialists as we can find, from among Filipinos, in order that the words spoken or written during this conference may be translated into vigorous action through the drafting of the actual action-plans necessary for the purpose. This is a task which we must undertake now, not postpone till later. Otherwise, the nation would soon be facing huge technological problems which, whether we like it or not, we would have to solve; and we may find that, having failed to provide for and carry out a systematic technological education program, our national manpower would be unprepared to cope with the task, and our national existence thus dangerously imperilled.

Moreover, while it is true that the technological education program proposed herein will have favorable effect directly upon local conditions, still there is every reason to expect that our advancement in the technological fields will, in the long run benefit other countries. With necessary facilities, both in material resources and technological talents, our industries

will enable us to deal economically and socially with other countries. It will encourage travel abroad not only for advancing business pursuits and industrial enterprises, but also for establishing educational and cultural relations. It will invite foreigners to come to our shores for pleasure or business ventures and thus promote mutual understanding. Opportunities will thereby be created wherein we can collaborate with other nations in the interest of mankind and international peace.

From the foregoing observations and considerations, we have clearly revealed the importance and value of technological education, as well as the nature of the proposed comprehensive education program pointed out above and the manner of executing it by those fully concerned.

WHEREFORE, we hereby advocate the formulation and immediate carrying out of such technological education program as an essential step towards making the Philippines economically independent, thus enabling her to contribute effectively to international understanding and world peace.